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LLM Minor Dissertation
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The requirement of plant variety protection in TRIPS and its importance for the cut flower export industry in developing countries

Research dissertation presented for the approval of Senate in fulfilment of part of the requirements for the LLM in international law in approved courses and a minor dissertation. The other part of the requirement for this qualification was the completion of a programme of courses.

I hereby declare that I have read and understood the regulations governing the submission of LLM dissertations, including those relating to length and plagiarism, as contained in the rules of this University, and that this dissertation conforms to those regulations.

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20 February 2006

1 Introduction

Intellectual property protection for plant varieties has for a long time been the concern of only a handful of interested parties. The recent linkage of intellectual property protection with the world trading system has however made plant variety protection one of the targets of the globalisation debate. Civil society organisations and other interested parties point out the gross injustices of imposing the advanced norms of developed countries on developing countries.[1] The 1999 Human Development Report of the United Nations Development Programme stated that the agreements on intellectual property were signed 'before most governments and people understood the social and economic implications of patents on life. They were also negotiated with far too little participation from many developing countries now feeling the impact of their conditions.'[2]

On the other side of the spectrum are the representatives of biotechnological industries who emphasise the positive impact that global intellectual property protection will have for all countries. In between all this tumult developing countries have to make decisions on how to implement the obligations which the world trading system imposes. At the same time they strive to adjust the global intellectual property standards to their specific problems and interests.

The times in which global trade was treated as a goal in itself have passed. Development issues are climbing on the global trade agenda. Pascal Lamy, Director–General of the World Trade Organisation (WTO), reminds us that

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[1] In this paper 'developing countries' includes least-developed countries, unless otherwise specified.

[2] United Nations Development Programme, Human Development Report 1999, 74
Quoted by S. Sell, *Post-TRIPS developments: the tension between commercial and social agendas in the context of intellectual property* (2002) 14 Florida Journal of International Law 193 at 202 .

'trade is only a tool to elevate the human condition; the ultimate impact of our rules on human beings should always be at the centre of our consideration.'[3]

This paper addresses the issue of protection of plant varieties under the agreement on Trade-Related Aspects of Intellectual Property Rights. It describes the origins of plant variety protection, discusses the available options for developing countries and looks at the current status of compliance with the TRIPS provisions. Against this background the relationship between plant variety protection and global trade is analysed for one particular aspect: the cut flower export industry in developing countries.

2 The TRIPS Agreement

2.1 Background

The eighth GATT trade round, known as the 'Uruguay round' started in 1986 and lasted seven and a half years. The major results of these trade negotiations were the establishment of the World Trade Organisation (WTO) and its three pillars: the General Agreement of Tariffs and Trade (GATT 1994), the General Agreement on Trade in Services (GATS) and the agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Two important tools were added to these agreements: the monitoring of compliance by means of regular trade policy reviews and the enforcement of obligations through the WTO dispute settlement system.

TRIPS has been acclaimed as 'the most ambitious international intellectual property convention ever attempted' and as 'the most comprehensive multilateral agreement on intellectual property.' [4]

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[3] P Lamy *Humanising Globalization* speech 30 January 2006 Santiago de Chile, Chile, available at http://www.wto.org/english/news_e/sppl_e/sppl16_e.htm, (accessed 13 February 2006).

[4] J Linarelli *Trade-Related Aspects of Intellectual Property Rights and biotechnology: European aspects* (2002)6 Singapore Journal of International and Comparative Law 406 at 410.

Earlier international agreements on intellectual property rights (IPR) include the Paris Convention for the Protection of Industrial Property (the Paris Convention) signed in 1883 and the Berne Convention for the Protection of Literary and Artistic Works (the Berne Convention) signed in 1886.[5] Both treaties have over 100 signatories.[6] The Paris Convention regulates patents, trademarks and industrial design while the Berne Convention covers copyright.

The main obligation of the Paris Convention is to give citizens of other member states national treatment. Member states are however free to choose the level of protection because the convention does not impose any minimum standards.[7] The Berne Convention requires member states to provide both national treatment and a minimum level of protection.[8]

The Paris Convention as well as the Berne Convention are administered by the World Intellectual Property Organisation (WIPO).[9] WIPO was established in 1967 and has currently 183 members.[10] The organisation promotes the protection of intellectual property worldwide through cooperation between member states.[11] The weaknesses of WIPO are that it does not provide effective legal remedies against infringements of rights and that it does not have an enforceable dispute resolution mechanism.[12] Industrialised countries, whose economies would benefit from the global protection of intellectual property rights, have attempted to give the organisation more teeth.[13] But WIPO proved

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[5] E Su *The winners and the losers: the agreement on Trade-Related aspects of Intellectual Property Rights and its effects on developing countries* (2000) 23 Houston Journal of International Law 169 at 181.

[6] Ibid at 179-181.

[7] Ibid at 181.

[8] Ibid.

[9] World Intellectual Property Organisation *General Information* available at http://www.wipo.int/about-wipo/en/gib.htm#P52_8261 (accessed 10 February 2006).

[10] Ibid.

[11] Ibid.

[12] Su (note 5) at 183-184.

[13] Ibid at 184.

to be the wrong forum for these efforts.[14] The majority of its members are developing nations who traditionally have little to gain from strong intellectual property rights.[15] With a 'one-nation, one-vote' decision-making system, the developed countries' proposals did not stand a chance. [16]

In the absence of effective international agreements, the United States sought to protect the interests of American intellectual property rights holders through its trade policy.[17] Since 1988, the United States Trade Representative annually reviewed the intellectual property regimes of its trading partners.[18] Countries who failed to provide adequate and effective protection were put on a watch list. If the situation did not improve, the United States imposed unilateral trade sanctions such as the withdrawal of favourable market access agreements or the elevation of import duties.[19] This strategy was especially effective towards developing countries which relied heavily on exports to the United States.[20]

The United States renewed its efforts to reach international agreement in the GATT forum, where the balance of bargaining power was in favour of the developed countries.[21] By integrating the protection of intellectual property rights into the GATT agenda, the industrialised world could use its economic

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[14] Ibid.

[15] L Petherbridge *Intelligent TRIPS implementation: a strategy for countries ion the cusp of development* (2001) 22 University of Pennsylvania Journal of International Economic Law 1029 at 1030-1031.

[16] Ibid at 1031 and footnote 11.

[17] A Adewopo *The global intellectual property system and sub-Saharan Africa: a prognostic reflection* (2002) 33 University of Toledo Law Review 749 at 752.

[18] United States Omnibus Trade and Competitive Act of 1988 Para 301.

[19] P Drahos *Negotiating intellectual property rights: between coercion and dialogue (2001)* (available at http://www.grain.org/bio-ipr/?id=182).

[20] Petherbridge (note 15) at 1030.

[21] A Crocker *Will plants finally grow into full patent protection on an international level? A look at the history of US and international patent law regarding patent protection for plants and the likely changes after the Supreme Court's decision in J.E.M. AG Supply v Pioneer Hi-Bred* (2003) 8 Drake Journal of Agricultural Law 251 at 285.

power to dictate the outcome of negotiations.[22] Despite their objections the developing countries could simply not afford to reject TRIPS.[23] TRIPS was linked to the entire GATT agenda with its provisions on the much needed access to the rich consumer markets of developed countries.'[24] Developing countries may also have feared that a deterioration of trade relations would negatively affect the inflow of development aid.[25] The United States, backed by the European Community and Japan, thus succeeded in its aim to create an international system of intellectual property protection.[26]

The TRIPS agreement has serious implications. Developing countries which previously had no system of intellectual property protection are required to implement the high standards of protection normally found in developed countries. Non-compliance with TRIPS is not a valid option because it can lead to trade sanctions, which may be authorised by the WTO Dispute Settlement Body.[27] And because TRIPS is part of the package deal of WTO membership, the TRIPS obligations will also be binding on all future WTO members.

2.2 Contents of the TRIPS Agreement

The recitals of the TRIPS agreement express the desire to 'reduce distortions and impediments to international trade.' In order to achieve this, the agreement covers a number of issues. Part I states how the basic principles of the global trading system such as Most-Favoured-Nation and National Treatment should be applied and how TRIPS relates to other IPR treaties.

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[22] Ibid.

[23] C Gulati *The 'tragedy of commons' in plant genetic resources: the need for a new international regime centered around an international biotechnology patent office* (2001)4 Yale Human Rights and Development Law Journal 63 at 72.

[24] Ibid.

[25] Ibid.

[26] D Scalise and D Nugent *International intellectual property protections for living matter: biotechnology, multinational conventions and the exception for agriculture* (1995) 27 Case Western Reserve Journal of International Law 83 at 114.

[27] Article 64 TRIPS and Article 22 WTO Dispute Settlement Understanding.

Part II sets minimum standards of protection for seven categories of intellectual property: copyright, trademarks, geographical indications, industrial designs, patents, layout-designs (topographies) of integrated circuits and undisclosed information, including trade secrets.

Part III prescribes how countries should effectively enforce intellectual property rights. The subsequent parts cover acquisition and maintenance of IPR, dispute prevention and resolution, transitional arrangements and institutional arrangements.

The objectives of the TRIPS agreement are stated in article 7:

> 'The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations'.

2.3 Patents under TRIPS

Part II, section 5 of TRIPS covers the protection of patents. Article 27.1 imposes on members the general rule that 'patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application'. There are three categories of exceptions to this general rule.

Firstly, 'Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law'.[28]

[28] Article 27.2 TRIPS.

Secondly, members may exclude from patentability 'diagnostic, therapeutic and surgical methods for the treatment of humans or animals'.[29]

The third allowed exception to patentability is for 'plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes'. The provision then continues: 'However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof.'[30]

The TRIPS Agreement thus obliges all WTO members to grant intellectual property rights to certain living organisms and related processes. Patent protection is mandatory for micro organisms and non-biological and microbiological processes for the production of plants and animals. Patent protection for plants is optional. But if plants in general are not protected by patents, members are required to protect plant varieties through patents or by a system which is specially designed for that purpose.[31] A combination of both systems is also permitted.

Developed countries were required to implement TRIPS before 1 January 1996.[32] Developing countries had until 1 January 2000.[33] A further five year transition period existed for developing countries for mandatory product patents in areas of technology which were not previously protectable.[34] This extension did not apply to patentability of plants (as they may be excluded from patentability), nor to the implementation of a sui generis system for plant variety protection (because it is not patent protection).[35] Least-developed countries had

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[29] Article 27.3(a) TRIPS.

[30] Article 27.3(b) TRIPS.

[31] Sui generis is Latin for 'of its own kind'.

[32] Article 65(1) TRIPS.

[33] Art. 65(2) TRIPS.

[34] Art. 65(4) TRIPS.

[35] D Leskien and M Flinter *Intellectual Property Rights and Plant Genetic*

until 1 January 2006 to implement TRIPS. Extension of this period is possible 'upon duly motivated request by a least-developed country Member.'[36]

3 Background of article 27 TRIPS

3.1 Introduction

Intellectual property rights on life forms were a highly contested subject in the TRIPS negotiations.[37] Developed countries opted for a broad definition of patentable subject matter, while developing countries strongly opposed the patentability of living organisms.[38] The 'compromise' which was made reflects the balance of bargaining power.[39] The adopted text of article 27 is based on the current status of the European and the American systems of intellectual property rights in biotechnology.[40] An insight in those systems is therefore helpful to understand the scope of the TRIPS obligations.

3.2 Plant variety protection in the United States

The protection of plant varieties started in the United States in 1930 with the Plant Protection Act. This act gives patent protection to plant breeders for asexually reproduced (cloned) varieties of plants.[41] In order to qualify for this patent, a variety must be novel, distinct and non-obvious.[42] There is no written description requirement such as for utility patents (which must enable others to 'make and use' the invention after the protection expires).[43]

Resources: Options for a sui generis system (1997) Issues in Genetic Resources no 6 available at http://www.ipgri.cgiar.org/publications/pdf/497.pdf (accessed 15 January 2006) 4-5.

[36] Art. 66(1) TRIPS.

[37] Gulati (note 23) at 73.

[38] Ibid.

[39] Ibid.

[40] Linerelli (note 4) at 412.

[41] Crocker (note 21) at 257.

[42] B Bai *Protecting plant varieties under TRIPS and NAFTA: should utility patents be available for plants?* (1997) Texas International Law Journal 139, 147.

[43] Crocker (note 21) at 257.

Instead, it is sufficient to deposit an exact specimen of the plant.[44] The act has a limited working because most varieties are reproduced sexually (through seeds).[45] A plant patent gives the holder protection for 20 years against others making, selling or reproducing the variety. [46]

In response to developments in Europe, the United States adopted the Plant Variety Protection Act in 1970.[47] This act gives patent-like protection for plant varieties, but under a different regime than the Plant Protection Act.[48] Certificates for plant varieties are administered by the Department of Agriculture instead of by the Patent and Trademark office.[49] Varieties need to be new, distinct, uniform and stable.[50] A written description is not required; the breeder can deposit a seed sample instead.[51] The protection includes sexually reproduced plants, provided that they produce the same characteristics over several generations.[52] The period of protection is twenty years during which others are prevented from selling, offering for sale, reproducing, importing or exporting the variety.[53]

The Plant Variety Protection Act has two important exemptions, the research exemption and the farmers' exemption. The research exemption allows others to use the protected variety for the development of new varieties.[54] In 1994 the exemption was narrowed to the extent that new varieties which were 'essentially derived' from the protected variety are considered an infringement of the

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[44] Ibid at 258.

[45] Ibid.

[46] Ibid.

[47] Ibid at 259.

[48] Ibid.

[49] Ibid.

[50] Ibid.

[51] Ibid.

[52] Ibid.

[53] Ibid at 260.

[54] Ibid.

original breeder's rights.[55] The farmer's exemption originally allowed farmers to save and sell seed, provided that the sales did not form the majority of the farm income.[56] This exemption led to widespread informal seed sales and a decline in revenues for seed companies.[57] In 1994 the exemption for farmers was limited to saving seeds to replant on their own acres. Selling seeds without permission from the certificate holder is now prohibited.[58]

Living organisms were originally not regarded as patentable subject matter for utility patents in the United States.[59] This changed in 1980, when the Supreme Court decided in *Diamond v. Chakrabarty* that a 'human-made, genetically engineered bacterium capable of breaking down multiple components of crude oil' could obtain utility patent protection.[60] Although the classification of a life form as patentable subject matter was a breakthrough, the question remained if this would also apply to plants and animals. The case of a genetically altered sexually reproduced plant was brought before the United States Patent and Trademark Office in 1985 in *Ex parte Hibbard*.[61] The Board of Appeals decided that the existence of the Plant Protection Act and the Plant Variety Protection Act did not exclude plants from obtaining regular utility patents.[62] The plant-specific acts were more the result of the initial difficulties for plant breeders to meet the requirements of utility patents.[63]

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[55] Ibid at 261.

[56] World Bank *Impacts of strengthened Intellectual property rights regimes on the plant breeding industry in developing countries, a synthesis of five case studies* available at http://www.cgn.wageningen-ur.nl/pgr/images/IPR%20in%20breeding%20industry.pdf (accessed 13 January 2006) 33.

[57] Ibid.

[58] Crocker (note 21) at 261.

[59] Bai (note 42) at 147.

[60] *Diamond v Chakrabarty* (1980) 447 US 303. Citation by Crocker (note 21) at 263.

[61] *Ex parte Hibbard* (1985) 227 USPQ 443.

[62] Crocker (note 21) at 266.

[63] Ibid.

In order to qualify for a utility patent, the invention must be new, non-obvious and useful and meet the written description requirement.[64] The fulfilment of this last criterion was the problem with traditional plant breeding. The development of genetic engineering however has enabled plant breeders to identify and distinguish between plants based on their genetic composition.[65] Ten years after *Ex parte Hibbard* , the Supreme Court confirmed the ruling of the United States Patent and Trademark Office in *J.E.M. Ag Supply v. Pioneer Hi-Bred*.[66] Utility patents are now not only available for the plant a whole, but also for the different plant parts, genes and seeds as well as the methods to use the variety to make others and the resulting varieties or hybrids.[67]

Utility patents give much stronger rights than the traditional plant patents or breeders' certificates. The extensive case law concerning patents is strongly in favour of protecting the patent holder and there are very limited exemptions.[68] The simultaneous existence of a utility patent and a plant breeder's certificate for the same variety has the effect that the exemptions to the breeders' rights based on plant variety protection become meaningless.[69]

3.3 Plant variety protection in Europe

Plant variety protection started in Europe with the use of protected seals for seeds from the original breeder and the granting of prizes to breeders by farmers' organisations.[70] The earliest legislation was the Dutch Breeders' Decree of 1941.[71] In 1954 the International Association of Plant Breeders for

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[64] Bai (note 42) at 147.

[65] Crocker (note 21) at 262.

[66] *J.E.M. Ag Supply v. Pioneer Hi-Bred.* (2001) United States Supreme Court, 122 S Ct 593.

[67] Bai (note 42) at 147.

[68] Crocker (note 21) at 262.

[69] A Nelson *Is there an international solution to intellectual property protection for plants?* (2005) 37 George Washington International Law Review 997 at 1019.

[70] World Bank (note 56) at 31.

[71] Plantum *Intellectueel eigendom* available at http://www.plantum.nl/intellectueel_eigendom.htm (accessed 12 January 2006).

the Protection of New Plant Varieties[72] started a lobby for an international system of protecting new plant varieties, after concluding that patent protection for plants would be unachievable in Europe.[73] The French government supported the objectives and organised a Diplomatic Conference in which 13 European countries participated. Other participants were the European Economic Community, the predecessor of the WIPO, the Food and Agriculture Organization of the United Nations (FAO), the Organization for Economic Co-operation and Development (OECD) and four non-governmental organisations who represented mainly breeders and seed traders.[74]

As a result of this conference a group of European countries signed the International Convention for the Protection of New Varieties of Plants in 1961, which is known as the UPOV Convention. UPOV stands for the International Union for the Protection of New Varieties of Plants (from the French 'Union internationale pour la protection des obtentions végétales') which was established by the convention. The mission statement of UPOV is 'to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society'.[75]

The UPOV Convention sets minimum standards of protection for plant breeder's rights which members have to convert into their national legislation. This results in a more or less harmonised system of plant variety protection in

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[72] Otherwise known as ASSINSEL, which has now been integrated in the International Seed Federation.

[73] B Le Buanec *Protection of plant-related innovations: Evolution and current discussion* (2006) 28 World Patent Information 50 at 51.

[74] R Jördens *Progress of plant variety protection based on the International Convention for the Protection of NewVarieties of Plants (UPOV Convention)* (2005) 27 World Patent Information 232 at 233.

[75] UPOV Mission Statement available at http://www.upov.int/en/about/mission.html (accessed 12 January 2006).

member states.[76] The benefits of UPOV membership include the technical, legal and administrative assistance to member states and the cooperation and assistance regarding the examination of plant varieties.[77] UPOV has a cooperation agreement with the World Intellectual Property Organization (WIPO). The Director General of WIPO is the Secretary-General of UPOV.[78]

The UPOV Convention entered into force in 1968 and was amended by an additional act in 1972. The convention was further revised by the 1978 Act and 1991 Act. This last act entered into force in 1998.[79] Since 1998 countries can no longer accede to the 1978 Act.[80] This means that new members have to implement the1991 Act.

Once a state is a member of UPOV however, it is not obliged to accede to later acts. As a consequence, of the current 59 member states and one member organisation (the European Union), two states are bound by the 1961/1972 Act, 25 states by the 1978 Act and 33 states plus the European Union by the 1991 Act.[81]

The purpose of the 1961 Act is to 'recognise and ensure' the rights of breeders of new plant varieties.[82] The act allows does not preclude members from granting patents on plants. However, if a member's national law provides for both forms of protection, only one form can be granted for one and the same botanical species.[83] This provision is referred to as the prohibition of 'dual' or 'double' protection.

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[76] UPOV *What it is, what it does* available at http://www.upov.int/en/about/pdf/pub437.pdf (accessed 27 January 2006) 1-2.

[77] Ibid at 2.

[78] Ibid.

[79] Ibid at 1.

[80] Article 37 UPOV 1991 Act.

[81] UPOV (note 76) at 2. Status on 15 September 2005.

[82] Article 1.1 UPOV 1961 Act.

[83] Article 2.1 UPOV 1961 Act

The term 'plant varieties' in the 1961 Act refers to 'any cultivar, clone, line, stock or hybrid which is capable of cultivation.'[84] The protection therefore applies to both sexually and asexually reproduced varieties. In order to qualify for breeders' rights a variety must be clearly distinguishable from other varieties of common knowledge, novel (not yet offered for sale or marketed in the country of application and no longer than four years abroad), sufficiently homogeneous and stable.[85] The breeders' right has the effect that his authorisation is necessary for certain activities with the protected variety. These activities are limited to producing the reproductive or vegetative propagating material of the variety for purposes of commercial marketing and the offering for sale or marketing of such material.[86] **'**Vegetative propagating material' includes whole plants.[87] The breeders' right is further extended to 'ornamental plants or parts thereof normally marketed for purposes other than propagation when they are used commercially as propagating material in the production of ornamental plants or cut flowers.'[88] The prohibition of producing propagating material for *commercial* purposes is believed to implicitly allow the use of farm saved seed and exchanging it with other farmers without having to pay royalties**.**[89]

An explicit exception to the breeders' right is the use of protected varieties to create new varieties and to market those new varieties.[90] This provision is known as the 'breeders' exception' and is regarded as one of the cornerstones of the UPOV system.[91] The breeders' right may further be restricted when public

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[84] Article 2.2 and 6.1 (c) and (d) UPOV 1961 Act.

[85] Article 6.1 UPOV 1961 Act.

[86] Article 5.1 UPOV 1961 Act.

[87] Ibid.

[88] Ibid.

[89] R Nwabueze *Ethnopharmacy, patents and the politics of plants' genetic resources* (2003)11 Cardozo Journal of International and Comparative Law 585at 611.

[90] Article 5.3 UPOV 1961 Act.

[91] World Bank (note 56) 32.

interest requires the widespread distribution of the new variety. The breeder is in that case entitled to equitable remuneration.[92]

The breeder enjoys protection of his new variety for a period of no less than 18 years for vines and trees and 15 years for other species**.** [93] The member states of the 1961 Act were obliged to protect at least 15 species of plants, staggered over an eight year period after the convention entered into force.[94]

The 1972 revision was related to the financial contribution system of UPOV and need not be discussed.[95] The 1978 Act embodied a few relevant changes. It gave UPOV legal personality as an intergovernmental organisation.[96] An exception was made to the prohibition of dual protection to facilitate the joining of UPOV by the United States.[97] A change in the substantial provisions concerned the requirement of novelty. In the 1978 Act a variety is considered novel if it has not been marketed or offered for sale for more than one year in the country of application and more than six years abroad for vines and trees (for other species the period remained four years). The 1978 Act also changed the number of species to be protected from 15 to 24 within an eight year period from the date of entry into force of the revised convention.

In 1991 the UPOV Convention underwent a more serious revision. The UPOV members were afraid that the then current system of protection was not strong enough to cover the costs of developing new varieties. In order to secure the future development of new varieties, breeders' rights had to be strengthened.[98]

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[92] Article 9 UPOV 1961 Act.

[93] Article 8.1 UPOV 1961 Act.

[94] Article4.3 UPOV 1961 Act.

[95] Jördens (note 74) 233-234.

[96] Jördens (note 74) 234.

[97] Ibid.

[98] Diplomatic Conference for the Revision of UPOV Convention cited by B Dhar *Sui generis systems for plant variety protection, options under TRIPS* available at http://www.geneva.quno.info/pdf/sgcol1.pdf (accessed 14 January 2006).

The prohibition of dual protection now disappeared entirely from the Act. This means that all member states are allowed to protect plant varieties by patents as well as plant breeders' rights.[99] The scope of the plant breeders' rights broadened substantially. The following activities in respect of the propagating material of the protected variety require authorisation of the breeder under the 1991 Act:

- production or reproduction (multiplication),
- conditioning for the purpose of propagation,
- offering for sale,
- selling or other marketing,
- exporting,
- importing,
- stocking for any of the purposes mentioned above.[100]

The protection is further extended to the harvested material.[101]

The scope of protection is thus no longer limited to commercial activities, though the breeder's right does not extend to 'acts done privately and for non-commercial purposes' and 'acts done for experimental purposes'.[102] The farmers' exception is now explicitly mentioned in article 15.2 of the 1991 Act, but as an optional provision. This provision allows contracting parties to limit the breeder's right in order to 'permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety (..).'[103]

The optional farmers' right or privilege is thereby limited to seed saving; selling the saved seed or exchanging it with other farmers is no longer permitted. Permitting the use of farm saved seed must furthermore be done 'within reasonable limits and subject to the safeguarding of the legitimate interest of the

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[99] Le Buanec (note 73) at 52.

[100] Article 14.1 UPOV 1991 Act.

[101] Article 14.2 UPOV 1991 Act.

[102] Article 15.1 UPOV 1991 Act.

[103] Article 15.2 UPOV 1991 Act.

breeder'.[104] The legitimate interest of the breeder refers to the royalty that should be paid for the use of the protected seed or restrictions towards the permitted amounts of saved seed. [105]

The UPOV members are not supposed to grant the farmers' privilege for all plant genera and species. The exception should be limited to 'sectors of agricultural and horticultural production' within the member state where the privilege is common practice.[106]

The breeders' exception has remained compulsory, although the 1991 Act prohibits the commercialisation of 'essentially derived' varieties' in order to prevent plagiarism.[107] Under the 1991 Act the breeders' right may still be restricted for reasons of public interest.[108]

The period of protection was extended to a minimum of 25 years for vines and trees and 20 years for other species. The 1991 Act requires protection for all plant genera and species. Members of the Union had to achieve this within five years, new members within ten years.[109]

EU Council Regulation on Community Plant Variety Rights

The European Community (EU) is bound by the 1991 Act and has implemented it with Council Regulation 2100/94 on Community Plant Variety Rights. Article 1 of the Council Regulation establishes 'a system of Community plant variety rights (..) as the sole and exclusive form of Community industrial property rights for plant varieties'. The Council Regulation therefore does not allow dual protection.

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[104] Article 15.2 UPOV 1991 Act.

[105] Dhar (note 98) at 15 and World Bank (note 56) at 33.

[106] Recommendation adopted in the Diplomatic Conference that adopted the 1991 Act cited by Dhar (note 98) at 15.

[107] Article 14.2 UPOV 1991 Act and Le Buanec (note 73) at 52.

[108] Article 17 UPOV 1991 Act.

[109] Article 3 UPOV 1991 Act.

The Council Regulation includes a farmers' exception, which is optional in the 1991 UPOV Act. It is reported to be the first practical implementation of the farmers' exception under the UPOV 1991 Act.[110] With regard to protected varieties, farmers are allowed to use the product of their harvest on their own holding for propagating purposes in the field, provided that the product of their harvest was obtained by planting propagating material on their own holding and with the exception of hybrids and synthetic varieties.[111] The exception is further only valid for a specified list of species of peas and beans, potatoes and cereals.[112] Small farmers can freely use this farm saved seed, other farmers are required to pay an equitable remuneration.[113] The remuneration is currently set at 50% of the normal license fee, unless otherwise agreed.[114]

European Directive on the legal protection of biotechnological inventions

In 1998 the European Parliament and the Council of the European Union published a directive on the legal protection of biotechnological inventions.[115] The member states of the European Union have to implement the provisions of the directive into their national patent law.[116] Article 4 of the directive states that plant and animal varieties shall not be patentable and neither shall essentially biological processes for the production of plants or animals. However, 'inventions which concern plants or animals shall be patentable if the

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[110] Le Buanec (note 73) at 53.

[111] Article 14.1 Council Regulation 2100/94 on Community Plant Variety Rights.

[112] Article 14.2 Council Regulation 2100/94 on Community Plant Variety Rights.

[113] Article 14.3 Council Regulation 2100/94 on Community Plant Variety Rights.

[114] Le Buanec (note 73) at 53.

[115] Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions.

[116] Article 1 Directive 98/44/EC on the legal protection of biotechnological inventions. The directive has however still not been fully introduced by all member states, several years after the deadline. Reuters *EU executive seeks end to logjam over patent rules* available at http://today.reuters.com/sponsoredby/amex/article.aspx?type=innovationNews&storyID=2006-01-16T160937Z_01_L16762285_RTRUKOC_0_US-EU-PATENTS.xml (accessed 12 February 2006).

technical feasibility of the invention is not confined to a particular plant or animal variety'.[117] If the scope of the patent extends to a plant variety, the sale of the propagating material implies authorisation for the use of farm saved seed by farmers under the conditions set in the Council Regulation on Community Plant Variety Rights.[118] This means that there is no practical difference for farmers between patented seed or seed protected by plant breeder's rights.

European Patent Convention

European patents are regulated by the Convention on the Grant of European Patents of 1973 (European Patent Convention). Membership to this convention is not restricted to EU members, nor is the convention part of the EU legal system.[119] The convention does however have a provision on the patentability of plants and animals that is very similar to the one in the abovementioned European Directive. Article 53(b) of the European Patent Convention states that European patents shall not be granted for 'plant or animal varieties or essentially biological processes for the production of plants or animals (…)'. Although the wording of the convention seems clear, the developments in biotechnology tend to blur the distinction between what is and what is not patentable subject matter. An important step towards broader patentability of biological matter was the *NOVARTIS/Transgenic plant* ruling in 1999 by the Enlarged Board of Appeals of the European Patent Organisation.[120] Subject of the dispute was the patentability of transgenic plants and the method to make them. The transgenic plants contained certain specific foreign genes which produced a substance that inhibits the growth of disease-producing pathogens.[121] The method used to

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[117] Article 4.2 Directive 98/44/EC on the legal protection of biotechnological inventions.

[118] Article 11.1 Directive 98/44/EC on the legal protection of biotechnological inventions.

[119] Linerelli (note 4) at 431.

[120] Novartis II/Transgenic Plant, G 0001/98, (2000) EPOR 303.

[121] K McClatchey *The impact of Novartis on the European patent convention's exception to patentability for 'plant varieties'* (2004) 2 Oklahoma Journal of Law and Technology 21 (no page numbers available).

make them was the insertion of recombinant DNA into the genes of an existing plant.[122]

After the initial refusal of a European patent based on article 53(b) of the European Patent Convention, the Enlarged Board of Appeal ultimately ruled that the *Novartis* application was permissible.[123] After examining the UPOV system of plant variety protection, the Enlarged Board of Appeal concluded that the exclusion of plant varieties as patentable subject matter was purely the result of the prohibition of dual protection in the UPOV Convention.[124] Therefore, inventions which are not protected by the plant breeders' rights system should be patentable if they meet the other requirements of patentability.[125] Excluded from patentability are therefore inventions which are confined to a specific plant variety.[126] The exclusion is irrespective of the manner in which the plants are produced.[127] However, the mere fact that plant varieties are embraced by a claim (but are not specifically identified) does not prevent an invention from being patentable.[128]

This reasoning is not embraced by everyone. The granting of patents for inventions applicable to groups of plant varieties as opposed to specific plant varieties has been described as 'concluding from a law prohibiting bigamy that polygamy is permitted'.[129]

The *Novartis* decision and the European Directive on the legal protection of biotechnological inventions seem to have opened the door to extended patent

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[122] Ibid.

[123] Ibid.

[124] Ibid.

[125] Ibid.

[126] Ibid.

[127] Ibid.

[128] Ibid.

[129] The Board of Appeal of the EPO in its comments (T1054/96) in 1997 cited by C Then *No patents on life!* Available at http://www.grain.org/bio-ipr/?id=94 (accessed 2 February 2006).

protection on plant material. But in contrast to the United States, plant varieties as such are still exempt from patent protection on a European level. The national laws of European countries are however diverse and some are said to allow the patenting of plant varieties.[130] The European Commission has been trying for years to introduce a patent system for the whole of the European Union, but without any success. New consultations on this subject focus more on harmonisation of national laws.[131]

3.4 Conclusion

After reviewing the European and American system of intellectual property protection for plants and plant varieties, the conclusion that article 27.3(b) TRIPS is in essence a combination of these systems seems justified. The developed countries thus imposed their most advanced set of norms on developing countries.[132] Because most developed countries already had some system of plant variety protection in place, the task of TRIPS compliancy for this clause concerns mostly developing countries.[133]

4 Developing countries' opposition against article 27 TRIPS

4.1 Introduction

The TRIPS Agreement gave an incentive for two important trends. The first was the 'vigilant monitoring and surveillance of TRIPS compliancy' by representatives of industries with strong interests in intellectual property rights. The second trend was the mobilisation of opposition in civil society against the implications of TRIPS for developing countries**.**[134] The following contains an

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[130] Bai (note 42) at 151.

[131] Reuters (note 116).

[132] D Gervais *Intellectual property, trade and development; the state of play* (2005) 74 Fordham Law Review 505, 509.

[133] P Cullet *Plant variety protection in Africa: towards compliance with the TRIPS Agreement* (2001) 45 1 Journal of African Law 97 at 99.

[134] Sell (note 2) at 193.

overview of the concerns which were expressed by or on behalf of developing countries.

4.2 General concerns about TRIPS

A commonly expressed view is that the implementation of the TRIPS obligations will benefit developed countries which export intellectual property.[135] The result for developing countries, which are generally importers of technology, will be an increased payment of royalties.[136] Developing countries therefore see no real advantage in strengthening their intellectual property laws.[137] Furthermore, strong intellectual property protection can be seen as a blockage to the (previously free) transfer of technology towards the developing world.[138]

The TRIPS standards of intellectual property rights are designed for market-based economies.[139] Beneficiaries from intellectual property rights are most likely to reside in an economy where private capital is available and which is characterised by open trade.[140] As most developing countries are not (yet) market-based economies, the TRIPS standards are considered inappropriate and the model not readily applicable.[141]

Of great concern for developing countries are the costs for implementing the intellectual property system as required by TRIPS.[142] Developing countries will have to allocate their limited resources to an administrative system to facilitate

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[135] K McCabe *The January 1999 review of article 27.3(b) of the TRIPS Agreement diverging views of developed and developing countries toward the patentability of biotechnology* (1999) 6 Journal of Intellectual Property Law 41, 52.

[136] Ibid at 55.

[137] Su (note 5) at 205.

[138] Ibid and McCabe (note 135) at 54. .

[139] McCabe (note 135) at 54.

[140] Ibid.

[141] Ibid.

[142] Ibid at 54-55.

the different intellectual property rights.[143] An effective administration requires trained personnel which is not readily available.[144] Additionally developing countries are required to provide an effective judicial system for the enforcement of intellectual property rights.[145] The fact that most developing countries expect no direct revenues from introducing intellectual property rights make the financial burden even more sour.

Another concern is the time frame. While it took developed countries 150 years to develop the intellectual property system which is embedded in TRIPS, least developed countries are expected to introduce the system in ten years.[146]

4.3 Concerns regarding article 27 TRIPS

Besides the abovementioned issues, developing countries have expressed a more fundamental concern about the patenting of biotechnological processes and products.[147] Most developing countries morally oppose the concept of patenting living organisms.[148] They are of the opinion that genetic material belongs in the public domain and fear that intellectual property protection will make genetic resources unavailable for others than the rights holder.[149]

Access to genetic resources and traditional knowledge

A related problem for developing countries is the unauthorised and uncompensated use of their own genetic resources and traditional knowledge.[150]

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[143] Ibid.

[144] Ibid.

[145] R Sherwood *The TRIPS Agreement: implications for developing countries* (1997) 37 IDEA 491, 495.

[146] S Ragavan *Can't we all get along? The case for a workable patent model* (2003) 35 Arizona State Law Journal 117, 149-150.

[147] R Gana *Prospects for developing countries under the TRIPs Agreement* (1996) 29 Vanderbilt Journal of Transnational Law 735, 753.

[148] Ibid.

[149] L Ewens *Seed wars: intellectual property, and the quest for high yield seed* (2000) 23 Boston College International and Comparative Law Review 285, 308.

[150] Sell (note 2) 202.

Breeders and pharmaceutical companies increasingly rely on the genetic materials found in the 'South' because the 'North' has lost almost all its plant and animal genetic resources.[151] 'Bioprospecting' or 'gene hunting' is very lucrative business for seed and pharmaceutical industries.[152] Botanists are sent by the industries to indigenous communities in developing countries to collect plants which can be used for the creation of new products.[153] A famous example of this practice is the rosy periwinkle from Madagascar from which anti-cancer drugs have been developed and patented. This resulted in annual sales of US$ 100 million for Eli Lily.[154] While many good things can come from 'bioprospecting', the problem lies in the fact that genetic material is often transferred to developed countries freely and without the consent of the country of origin.[155] The valuable substances and related technology are then patented and become the property of industries in developed countries.[156] Traditional indigenous seed varieties are slightly altered and protected with a patent or a breeders' right.[157] Eventually those products are said to be sold at 'exorbitant prices' to the very people from who the material and knowledge was obtained.[158] This 'theft and patenting' of genetic resources is referred to as

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[151] 'Naomi Roht-Arriaza estimates that America has lost 97 percent of its vegetable varieties, 87 percent of pear varieties and 86 percent of apple varieties. Europe, Roht-Arriaza also estimates, lost 50 percent of its animal species.' Nwabueze (note 89) at 588.

[152] V Tejera *Tripping over property rights: is it possible to reconcile the Convention on Biological Diversity with article 27 of the TRIPS Agreement?* (1999)33 New England Law Review 967, 971.

[153] S Holwick *Developing nations and the agreement on Trade-related Aspects of Intellectual Property Rights* (1999) Colorado Journal of International Environmental Law and Policy 49, 61.

[154] Ibid at 57.

[155] Tejera (note 152) 971 and C McManis *The interface between international intellectual property and environmental protection: biodiversity and biotechnology* (1998) 76 Washington University Law Quarterly 255, 268.

[156] McManis (note 155) 268.

[157] K Aoki *Neocolonialism, anticommons property, and biopiracy in the (not-so-brave) new world order of international intellectual property protection* (1998) 6 Indiana Journal of Global Legal Studies 11, 47.

[158] Sell (note 2) at 203.

'biopiracy'.[159] At the same time developed countries are fighting the pirating of their intellectual property by developing countries, some of which will be based on genetic material that was pirated itself. [160]

The inequality of this practice is further enhanced by the granting of broad patents for agricultural products. A good example is the Basmati case. In 1997 the American company Rice-Tec Inc. obtained a patent in the United States for 'all Basmati rice lines and grains' on the grounds that it had developed a method to screen the lines which have a certain quality.[161] Rice-Tec also claimed the trademark 'basmati'.[162] However, Basmati rice has been grown in India for centuries.[163] The potential danger existed that the patent would be used to prohibit imports of Basmati rice from India into the United States.[164] The Indian government has challenged the patent on 20 claims.[165] The challenge has caused Rice-Tec to withdraw four claims of uniqueness.[166] The case is still pending but the US Patent and Trademark Office has agreed to review the entire patent.[167]

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[159] Tejera (note 152) at 971 and Holwick (note 153) at 62.

[160] McManis (note 155) at 268.

'One of the best known and most recent cases of biopiracy had to do with Hoodia, an appetite suppressant that capitalized on the traditional knowledge of the San people. Developed and patented by the South African Council for Scientific and Industrial Research (CSIR), exclusive rights were sold to a British company. It was only after worldwide outcry that a percentage of the royalties -- a miniscule percentage -- came to the San in the form of a trust. The Hoodia case is still cited as a prime example of inadequate benefit sharing and questionable prior informed consent.' Grain *Widespread biopiracy in Africa* available at http://www.grain.org/bio-ipr/?id=467 (accessed 12 february 2006).

[161] Le Buanec (note 73) at 57.

[162] Gulati (note 23) at 77.

[163] Ibid.

[164] S Sahai *Rice tech withdraws Basmati claims* available at http://www.genecampaign.org/Publication/IPR/IPR-RiceTECH.pdf (accessed 12 February 2006).

[165] Ibid.

[166] Ibid.

[167] Ibid.

Another example is the patent on 'all yellow beans' granted in 1999 to John Procter, the director of an American seed company, on the ground that he had selected a line with uniform and stable yellow colour out of a population of beans he obtained in Mexico.[168] He then sued several companies which sell Mexican beans in the United States, demanding royalties of six US cents per pound on imported yellow beans.[169] Subsequently customs officials inspected all Mexican beans being brought into the United States for patent infringements, which has led to a sharp decline in imports, also affecting the market for non-yellow beans.[170]

The patent was officially challenged by the International Center for Tropical Agriculture with support from FAO. After five years, the challenge seems to become successful. Although the case in not finally decided yet, the US Patent and Trademark Office has cancelled or rejected all of the 64 patent claims. [171]

Biodiversity

Intellectual property protection for plants or plant varieties is also associated with negative impacts on biodiversity conservation and the environment.[172] The spread of (patented) genetically engineered monocultures threatens to erode the biodiversity of developing countries.[173] It also changes the ecology through interactions with locally existing species.[174] TRIPS based intellectual property rights do not reward traditional farmers who have contributed to biodiversity for

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[168] Le Buanec (note 73) at 57.

[169] ETC *Mexican bean piracy* available at http://www.etcgroup.org/article.asp?newsid=31 (accessed 12 February 2006).

[170] G Rattray *The Enola bean patent controversy: biopiracy, novelty and fish-and-chips* (2002) Duke Law & Technology Review 0008 available at http://www.law.duke.edu/journals/dltr/articles/2002dltr0008.html (accessed 13 February 2006).

[171] ETC *Whatever Happened to the Enola Bean Patent Challenge?* December 21, 2005 available at http://www.etcgroup.org/article.asp?newsid=529 (accessed 10 February 2006).

[172] Holwick (note 153) at 58

[173] McManis (note 155) at 268

[174] Holwick (note 153) at 58

centuries by preserving and improving crops.[175] Instead the intellectual property system focuses on varieties which are novel, stable and uniform and therefore potentially vulnerable monocultures.[176]

Convention on Biological Diversity

The international acknowledgement of the importance of the conservation of biodiversity, genetic resources and traditional knowledge came with the entry into force in 1993 of the Convention on Biological Diversity (CBD). The objectives of the convention are '…conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources…'.[177] The CBD confirms the sovereign rights of states over their genetic resources.[178] The convention further 'recognizes the importance of traditional knowledge and methods conducive to biodiversity conservation and urges their generalization, dissemination and compensation'.[179] Contracting parties are obliged to give 'reasonable access to genetic resources in their sovereign territories on the basis of prior informed consent and equitable sharing of benefits.' [180] In return for access to the genetic resources of developing countries, developed countries should transfer relevant technologies.[181]

CBD has been criticised for not giving developing countries anything they did not have before the convention and for the confusion and uncertainty regarding the proper method of implementation.[182] In contrast to the strict obligations of TRIPS, CBD offers only a vague idea of how the objectives should be achieved.[183]

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[175] McManis (note 155) at 268-269.

[176] Ibid at 269.

[177] Article 1 CBD summery by Nwabueze (note 89) at 598.

[178] Article 3 CBD

[179] Article 8 CBD summery by Nwabueze (note 89) at 598.

[180] Article 15 CBD summery by Nwabueze (note 89) at 598.

[181] Article 16 CBD.

[182] Nwabueze (note 89) at 600-601.

[183] Ewens (note 149) 304.

CBD and TRIPS are based on potentially conflicting visions on the use of genetic resources.[184] TRIPS does not mention CBD and developing countries are concerned about their mutual compatibility.[185]

Farmers' rights

The conservation of biodiversity is strongly related to farmers' rights. The concept of 'farmer's rights' as opposed to breeders' rights was taken up by FAO in order to recognise the efforts historically made by farmers to domesticate the currently existing agricultural varieties.[186] FAO Resolution 5/89 defines farmers' rights as:

> '[R]ights arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in centres of origin/diversity . . . [T]hese rights are vested in the International Community as trustees for present and future generations of farmers, for the purpose of ensuring full benefits to farmers, and supporting the continuation of their contributions.[187]

The initial FAO strategy to firmly entrench farmers' rights in an international treaty has not been realised. The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) which entered into force in 1994 acknowledges the contributions of farmers but leaves the implementation of farmers' rights to national governments.[188] The contracting parties are required to 'take measures to protect and promote Farmers' Rights', including the protection of traditional (agricultural) knowledge, entitlement to benefit-sharing and participation in decision-making on issues of conservation and

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[184] Ewens (note 149) at 302.

[185] T Cottier and M Panizzon *Legal perspective on traditional knowledge: the case for intellectual property protection* (2004) 7(2) Journal of International Economic Law 371 at 379.

[186] K Aoki *Malthus, Mendel, and Monsanto: Intellectual property and the law and politics of global food supply: an introduction* (2004) 19 Journal of Environmental Law and Litigation 397, 429.

[187] Citation by S Brush *Protecting traditional agricultural knowledge* (2005) 17 Washington University Journal of Law and Policy 59, 87.

[188] Brush (note 187) at 91.

access to plant genetic resources.[189] The obligation is softened by the phrase that the measures should be taken 'in accordance with their needs and priorities (…), as appropriate and subject to their national legislation.'[190] The recognition of farmers' rights on an international level therefore shows the same weaknesses of implementation and utility as CBD.[191] Many developing countries are concerned if and how the protection of farmers' rights is compatible with TRIPS.

Farmers' rights can also relate to the legal recognition of plant varieties historically bred by farmers. These farmers' varieties do not qualify for plant variety protection under systems like UPOV. Developing countries are generally of the opinion that farmers' varieties also need to be rewarded.[192]

The term 'farmers' rights' furthermore refers to the traditional practice of farmers to save, replant, exchange or sell seed.[193] The 1991 UPOV Act has turned this farmer's right into a restricted exception to the breeder's right.[194] Restrictions on the use of farm-saved seed can have enormous implications for smallholder farmers in developing countries who supply the majority of the national food needs.[195]

The seed industry's ultimate goal, to prohibit the practice of saving and replanting seed altogether, threatens the agricultural sector in developing countries and food security.[196] The recent patenting of the 'terminator' technology in Europe and Canada confirms the industry's strategy. [197]

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[189] Article 9.2 ITPGRFA

[190] Ibid.

[191] Nwabueze (note 89) at 619

[192] Cullet (note 133) at 109-110.

[193] J Haapala *Farmers' rights* (2004)19 Journal of Environmental Law and Litigation 467, 467.

[194] Article 15.2 UPOV 1991 Act.

[195] Sell (note 2) at 202.

[196] Le Buanec (note 73) at 60.

[197] 'Plants created using Terminator technology will produce sterile seeds, creating a monopoly and unnatural control of the seeds. Farmers will not be able to use seeds from such plants for the

The commercial seed industry is feared because it controls a considerable portion of the global market. The world seed industry is divided into commercial seed, farm-saved seed and seed from public institutions. All three account for a third of the total value of the seed industry.[198]

A related concern is the strong trend towards market concentration in the private seed sector.[199] In 2005 the top ten seed companies controlled about 50 per cent of the US$ 21 billion commercial seed trade. The top three giants Monsanto, Dupont/Pioneer and Syngenta have combined seed revenues of over US$ 6.5 billion per year.[200] The last ten years have showed an upsurge in industry mergers and acquisitions. Monsanto has spent billions to become the world number one seed industry.[201] The domination of the market by a few companies raises fears for higher seed prices and an increased dependency on patented varieties.[202] Seed industry consolidation is also said to result in 'fewer choices for farmers and greater vulnerability for local farming communities and global food security.' [203]

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following season's cultivation. The seeds will rot in the soil without producing new plants. If this technology is introduced in crops such as soya, wheat, canola and cotton it will force farmers to buy new seeds every year from the same company.'
Grain *Corporates gain control - Terminator patent granted* available at http://www.grain.org/bio-ipr/?id=455 (accessed 12 February 2006).

[198] The Daily Star *Int. organisations oppose patents on life forms* available at http://www.thedailystar.net/law/200306/04/news.htm (accessed 12 February 2006)

[199] Ewens (note 149) at 308.

[200] ETC *Global Seed Industry Concentration – 2005* available at http://www.etcgroup.org/documents/Comm90GlobalSeed.pdf (accessed 12 February 2006).

[201] Ibid. See also ETC *Seed Industry Consolidation: Who Owns Whom?* Available at http://www.etcgroup.org/article.asp?newsid=186 (accessed 10 February 2006).

[202] M Jain *Global trade and the new millennium: defining the scope of intellectual property protection of plant genetic resources and traditional knowledge in India* (1999) 22 Hastings International and Comparative Law Review 777, 789.

[203] ETC *Global Seed Industry Concentration – 2005* (note 200).

5 Defence of article 27 by developed countries

Developed countries have justified the far-reaching implications of TRIPS with a number of reasons. One of the more moral arguments is the belief that an intellectual property right is a human right, as embodied in the Universal Declaration of Human Rights.[204] However, the main drive for strengthened intellectual property rights seems to be the enormous loss of revenues by industries in developed countries due to 'piracy'. The value of pirated goods in China alone was estimated at US$ 2.8 billion in 1998.[205] Industries need intellectual property rights to receive the benefits of technological inventions.[206]

The biotechnological industry especially relies on intellectual property protection because of the 'astronomical' costs associated with research and development. [207] The private sector in developed countries spent over US$ 10 billion on agricultural research in 1995.[208] The costs associated to piracy of biotechnological inventions are even higher.[209] But the justifications do not only relate to developed countries. The implementation of TRIPS is said to benefit developing countries as well.

Effective patent protection is seen as an incentive for innovation.[210] The granting of exclusive rights reduces the risk of the investment in research and development expenses.[211] Companies are keener to invest in research when

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[204] Jain (note 202) at 787.

[205] Su (note 5) at 171.

[206] Ibid.

[207] McCabe (note 135) at 50.

[208] P Pardey and B Koo *Creating, protecting and using crop biotechnologies worldwide in an era of intellectual property* (2004)6 Minnesota Journal of Law, Science & Technology 213, 216

[209] An investigation into effects on domestic trade in 1987 found that American businesses lost approximately $23.8 billion (in 1986) to bio-piracy. V Spier *Finders' keepers: the dispute between developed and developing countries over ownership of property rights in genetic material* (2001) 7-SPG Widener Law Symposium Journal 203, 213-214.

[210] Jain (note 202) at 787.

[211] McCabe (note 135) at 46.

there is a good chance to get return on investment.[212] Intellectual property rights will thus create an incentive for local research and development which will eventually make developing countries less dependant on foreign technology. [213]

Another issue is the access to foreign technologies. Industries will be reluctant to introduce their inventions in countries that lack effective intellectual property protection.[214] This means that for instance farmers in those countries do not have access to the latest biotechnical innovations which could increase productivity and crop yields.[215] Implementation of TRIPS will therefore ensure access to new varieties and inventions and enable developing countries to benefit from breakthroughs in fields as biotechnology. [216]

Another benefit is the increase in foreign direct investment (FDI).[217] FDI is usually accompanied by formal or informal knowledge and technology transfer.[218] Global firms however need the assurance that their inventions will be protected before any substantial transfer of technology is made.[219] The availability of effective patent protection in a certain country can be viewed as a 'comparative patenting advantage' and adds to the country's 'comfort level' for FDI. [220] Protection of intellectual property can therefore encourage FDI into

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[212] Spier (note 209) at 214-215.

[213] Su (note 5) at 204.

[214] McCabe (note 135) at 66.

[215] McCabe (note 135) at 67.

[216] Ibid.

[217] Gervais (note 132) at 534.

[218] Ibid.

[219] Ibid at 521-522.

[220] J Straus *Bargaining around the TRIPS Agreement: the case for ongoing public-private initiatives to facilitate worldwide intellectual property transactions* (1998) 9 Duke Journal of Comparative and International Law 91, 98 and Gervais (note 132) at 530.

developing countries, which is associated with positive effects such as the creation of highly skilled and high paying jobs.[221]

In relation to the numerous concerns expressed by developing countries, it is suggested that developing countries should use the flexibilities in TRIPS to design a system of intellectual property that reflects their specific needs. Rather than fighting TRIPS, developing countries must stretch the 'built-in normative elasticity' to the extent necessary to benefit their own societies.[222] To appreciate this last argument, it is important to examine the exact scope of the TRIPS obligations and its flexibilities.

6 Options and requirements of article 27.3(b) TRIPS

6.1 Introduction

Recall that article 27.3(b) TRIPS offers member states three choices for protecting plants varieties: by patents or by an effective sui generis system or by any combination thereof. This paragraph examines the requirements of the different systems of protection under TRIPS.

6.2 Patent requirements in TRIPS

If developing countries choose to protect plant varieties by patents, they have to abide the minimum standards for patent protection under TRIPS. According to article 27.1 of TRIPS a patent should be available inventions which are 'new, involve an inventive step and are capable of industrial application'. Member states may interpret the criteria of 'inventive step' as 'non-obvious' and 'capable of industrial application' as 'useful'.[223] In granting patent rights member states are not allowed to discriminate 'as to the place of invention, the field of

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[221] Gervais (note 132) at 522. *Intellectual property protection is however not the only factor relevant for FDI, other factors are 'market liberalization and deregulation, technology development policies, and competition regimes'*. Gervais (note 132) at 517.

[222] Gervais (note 132) at 528 and Gana (note 147) at 757.

[223] Article 5 TRIPS.

technology and whether products are imported or locally produced'.[224] Patented inventions are to be protected for at least 20 years from the date the patent application is filed.[225]

TRIPS does not define the term 'invention'. It is a basic principle of patent law however, that an 'invention' does not include a mere discovery of something that already exists in nature.[226] For plant varieties this would mean that a newly discovered variety is not patentable subject matter.[227] Developed countries like the United States, Japan and members of the European Union tend to allow patents for products of nature if they are 'isolated and purified by human intervention' and were previously unknown.'[228] But this broad concept of invention is not mandatory under TRIPS, nor does the agreement indicate how inventions and discoveries must be distinguished.[229]

The 'novelty' requirement relates to the concept of 'prior art'. An invention is new if it is not part of the 'prior art', the publicly available knowledge anywhere in the world.[230] But this concept is not applied in a uniform way. The United States requires only 'relative' novelty, an invention is new if it is not known in the United States and not *written down* anywhere in the world. [231] For most

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[224] Article 27.1 TRIPS.

[225] Article 33 TRIPS.

[226] L Helfer *Intellectual property rights in plant varieties: an overview with options for national governments* FAO legal papers online No 31 available at http://www.fao.org/Legal/Prs-OL/lpo31.pdf (accessed 2 February 2006) at 25 and
C Correa *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options* (2000), 51-52

[227] Ibid.

[228] Ibid. See also Leskien and Flinter (note 35) at 8.

[229] Correa (note 226) at 228.

[230] Helfer (note 226) at 26.
Correa (note 226) at 57.

[231] Correa (note 226) at 57-58.

countries however, an invention is only new if it has not been expressed in any form.[232]

The concept of 'prior art' is also used in the United States to determine if the application encompasses an 'inventive step' and is thus 'non-obvious' to a skilled person.[233] Other countries focus more on the question if a technical problem is solved by the invention.[234] The latter method to examine the inventive step is considered to be more objective.[235]

The third requirement for patent protection under TRIPS is that the invention has industrial applicability. If this criterion is explained as 'useful' it also includes experimental inventions.[236] The applicability in agriculture or horticulture is in most systems sufficient to meet this requirement.[237]

If plant varieties are not totally excluded from patentability, certain plant material may nevertheless be excluded on other grounds. Article 27.2 allows members to exclude from patentability 'inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment'. The 'necessity requirement' which was given a narrow interpretation by GATT and WTO panels, will make exclusion on grounds of morality or *ordre public* difficult to justify.[238] It is not clear if and to what extent developing countries will be able to use this exception to protect their genetic resources.[239]

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[232] Ibid at 58.

[233] Helfer (note 226) at 27.

[234] Correa (note 226) at 60.

[235] Ibid.

[236] Ibid at 232.

[237] Helfer (note 226) at 27.

Correa (note 226) at 60-61.

[238] Leskien and Flinter (note 35) at 15.

[239] Helfer (note 226) at 27.

Once a patent is granted for a product the patent holder shall have the exclusive right to prevent others from 'making, using, offering for sale, selling, or importing for these purposes that product' without his consent.[240] A patent for a process prevents others from 'using the process' and from 'using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process'.[241] The exclusive rights can therefore encompass whole plants and plant parts and the method to make the plants.[242]

The exclusive rights of the patent holder may be subject to limited exceptions.[243] Member states are free to define these exceptions, 'provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner'.[244] The 'legitimate interests of third parties' must also be taken into account.[245]

A common exception is the 'experimental' or 'research' exception.[246] In the United States the exception was developed by case law and can be admitted for scientific purposes only.[247] In European countries experimentation on the invention (not *with* the invention) is allowed for commercial purposes as well.[248] A narrow definition of the research exception can seriously restrict access to genetic resources, which are needed to make new varieties.[249] Some countries have chosen for unrestricted access to all biological material. The Mexican patent law allows the use of patented plant varieties as an 'initial

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[240] Article 28.1 TRIPS.

[241] Ibid.

[242] Helfer (note 226) at 27

[243] Article 30 TRIPS.

[244] Ibid.

[245] Ibid.

[246] Correa (note 226) at 75-76.

[247] Correa (note 226) at 192.

[248] Ibid.

[249] Ibid.

source for variation or propagation to obtain other products (…)'.[250] It is however unlikely that such a broad research exception will be found compliant with article 30 of TRIPS if challenged under the WTO dispute settlement system.[251]

Another exception to the exclusive rights of the patent holder could be some form of 'farmers' privilege'. Article 11.1 of the European Directive on the Legal Protection of Biotechnological Inventions authorises a farmer 'to use the product of his harvest for propagation or multiplication by him on his own farm'. The conditions for this use are the same as for the farmers' privilege under plant variety protection; the exception applies to a limited list of species and free use is restricted to small farmers, other farmers are required to pay remuneration to the rights holder. A like exception does not exist in American patent law.

It can also be argued that the farmer's right to use his harvested material is allowed under the doctrine of exhaustion of rights.[252] Once a product has been legally obtained, the use of the product does not require the consent of the patent holder.[253] However, in the case of plant varieties or plant parts the 'use' of the product can often be considered as 'making' the product, which is prohibited without the patent holders consent.[254]

Member States are allowed to grant compulsory licenses in their national legislation, meaning the authorisation to use a patented invention without the patent holders' consent.[255] The conditions for these licenses are extensively regulated in article 31 of TRIPS. One of the conditions is that the patent holder

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[250] Article 22, V Mexican patent law 1991, revised 1994, cited by Correa (note 226) at 193

[251] Helfer (note 26) at 28.

[252] Leskien and Flinter (note 35) at 23.

[253] Ibid.

[254] Ibid.

[255] Correa (note 226) at 193.

is entitled to adequate compensation.[256] The grounds for compulsory licenses are not part of TRIPS, they have to be stated by national legislation. TRIPS therefore does not exclude the possibility to grant compulsory licenses for patented plant material in the interest of availability to farmers, food security or the development of new varieties.[257] The actual authorisation of the licenses is however limited by the conditions set in article 31 of TRIPS.[258]

TRIPS further requires that the applicant for a patent must 'disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art'.[259] Member states are free to choose the manner of disclosure.[260] For plant related inventions the deposit of the protected would be sufficient, but member states are not obliged to recognise this manner of disclosure.[261]

6.3 Requirements of a sui generis system for plant variety protection

If WTO members exclude plants from patentability, they have to provide protection of plant varieties by an 'effective *sui generis* system'.[262] A sui generis system is a system that is 'unique' or 'of its own kind'.[263] TRIPS does not define what an effective sui generis system is and the limited drafting history gives no further explanation.

Nevertheless, Leskien and Flinter have formulated five minimum requirements for an effective sui generis system based on the context of article 27.3(b), the place of TRIPS in the WTO and the objectives of TRIPS.[264]

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[256] Article 31(h) TRIPS.

[257] Correa (note 226) at 194.

[258] Helfer (note 226) at 29.

[259] Article 29.1 TRIPS.

[260] Helfer (note 226) at 26.

[261] Ibid and Leskien and Flinter (note 35) at 11.

[262] Article 27.3(b) TRIPS.

[263] Helfer (note 226) at 11.

[264] Leskien and Flinter (note 35) at 27.

Firstly, a sui generis system must protect all genera and species of plants.[265] TRIPS only states that protection must be given to 'plant varieties', without any indication for which species or types of species protection has to be provided.[266] Based on the absence of further specification as to the scope of protection, Leskien and Flinter conclude that the obligation covers all species. [267]

A further requirement is that a sui generis system has to be an intellectual property right. There has been some discussion about this subject, but Leskien and Flinter's conclusion has been confirmed in 2002 by the WTO Appellate Body.[268] This means that a sui generis system has to provide the rights holder with a 'legally enforceable right either to exclude others from certain acts in relation to the protected plant variety, or to obtain a remuneration in respect of at least certain uses of the plant variety.'[269]

Because a sui generis system is an intellectual property right, the system has to abide the 'national treatment' principle, which means that each WTO member must give the nationals of another WTO member 'treatment no less favourable' than its own nationals.[270]

The same is true for the 'most favoured nation' principle, according to which 'any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and

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[265] Ibid.

[266] Article 27.3(b) TRIPS, Leskien and Flinter (note 35) at 27.

[267] Leskien and Flinter (note 35) at 27-28.

[268] Leskien and Flinter (note 35) at 28

United States – Section 211 Omnibus Appropriations Act of 1998 (2002) AB-2001-7 WT/DS176/AB/R. The Appellate Body mentioned as an example the option to protect plant varieties 'by *sui generis* rights (such as breeder's rights) instead of through patents,' and concluded that *sui generis* rights were a form of intellectual property protected by TRIPS. Summery by Helfer (note 226) at 33.

[269] Leskien and Flinter (note 35) at 30.

[270] Article 3.1 TRIPS.

unconditionally to the nationals of all other Members.'[271] Leskien and Flinter note however that the role of the latter principle is minimal with regard to intellectual property rights, because countries normally will not give foreigners more favourable treatment than their own nationals.[272]

The last requirement for a sui generis system is explicitly mentioned in TRIPS. The system has to be 'effective'.[273] Leskien and Flinter conclude that 'effective' refers to the obligation under article 41.1 TRIPS to provide for 'enforcement procedures' which 'permit effective action against any act of infringement of intellectual property rights (…).'[274]

What follows from the examination of the system requirements of patent protection and plant variety protection is that the patent system is to a large extent prescribed by TRIPS and has few flexibilities. A sui generis system for plant variety protection however is not prescribed and only a few requirements can be implicitly drawn from the context.

More specific, TRIPS does not require membership of UPOV or implementation of any of the UPOV Acts.[275] UPOV is not even mentioned in TRIPS as opposed to other conventions such as the Paris Convention and the Berne Convention. This gives WTO members the freedom to draft their own sui generis system for plant variety protection. Recently a few initiatives to do so have emerged.

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[271] Article 4 TRIPS.

[272] Leskien and Flinter (note 35) at 31.

[273] Article 27.3(b) TRIPS.

[274] Leskien and Flinter (note 35) at 32.

[275] Leskien and Flinter (note 35) at 27.

6.4 Sui generis systems other than UPOV

India has chosen to exclude plants from patent protection and to develop its own sui generis system for plant variety protection. As a developing country, India had to make its national laws TRIPS compliant by 2000.[276] After much public debate in which seed organisations, farmers and NGO's fiercely expressed their concerns and defended their interests, the Indian Parliament finally passed the Protection of Plant Varieties and Farmer's Rights Act 2001 (the Act).[277]

The Act protects four types of plant varieties which are compliant with the interests of different stakeholders.[278] A 'new variety' can be registered if it conforms to the criteria of novelty, distinctiveness, uniformity and stability.[279] These requirements are the same as in the UPOV conventions. The protection of new varieties is the conventional form of plant breeders' rights and is most likely to be used by private sector.[280] The Act does not apply to all new varieties, but refers to a specification of genera or species made by the Central Government.[281]

The act also allows the registration of 'essentially derived varieties'. This term was introduced in the 1991 UPOV Act. Like in the 1991 UPOV Act, authorisation from the breeder of the initial variety is required for commercial exploitation of the essentially derived variety.[282]

'Extant varieties' are defined as the locally available varieties which are notified under the 1996 Seed Act (mostly varieties bred in the public sector), as well as

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[276] Article 65.2 TRIPS.

[277] A Ramanna and M Smale *Rights and access to plant genetic resources under India's new law* (2004) 22(4) Development Policy review 423, 427-428.

[278] Ibid at 428-429.

[279] Section 15(1) Protection of Plant Varieties and Farmer's Rights Act 2001.

[280] Ramanna and Smale (note 277) at 429.

[281] Section 29(2) Protection of Plant Varieties and Farmer's Rights Act 2001.

[282] Section 23(6) Protection of Plant Varieties and Farmer's Rights Act 2001.

farmers' varieties, varieties about which there is public knowledge or any other variety in the public domain.[283] The rights to existing varieties have to be claimed within a certain timeframe otherwise the government will be deemed to own the right.[284] The possibility to grant rights for already existing varieties is a novelty which does not fit well in the traditional framework of intellectual property rights.[285]

A farmers' 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 the farmers possess the common knowledge'.[286] The Indian legislation thus recognizes the breeding efforts of farmers and provides them with protection.

Every application for registration must be accompanied by an extensive set of documents and declarations.[287] The most noticeable are related to farmers' rights and disclosure of the origin of the genetic material which was used to develop the variety. The applicant has to swear that the variety does not contain any 'terminator technology' which causes the plant to produce sterile seeds. [288] The application further has to contain a 'complete passport data of the parental lines from which the variety has been derived along with the geographical location in India from where the genetic material has been taken and all such information relating to the contribution, if any, of any farmer, village community, institution or organisation in breeding, evolution or developing the variety.'[289]

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[283] Section 2(j) Protection of Plant Varieties and Farmer's Rights Act 2001. See also Ramanna and Smale (note 277) at 427.

[284] Sections 15(2) and 28(1) Protection of Plant Varieties and Farmer's Rights Act 2001

[285] Ramanna and Smale (note 277) at 429.

[286] Section 2(l) Protection of Plant Varieties and Farmer's Rights Act 2001

[287] Section 18(1) Protection of Plant Varieties and Farmer's Rights Act 2001

[288] Section 18(1)c Protection of Plant Varieties and Farmer's Rights Act 2001

[289] Section 18(1)e Protection of Plant Varieties and Farmer's Rights Act 2001

These requirements cannot be found in the UPOV Conventions. UPOV strongly opposes any additional condition of protection 'since the UPOV Convention provides that protection should be granted to plant varieties fulfilling the conditions of novelty, distinctness, uniformity, stability and a suitable denomination and does not allow any further or different conditions for protection.' [290]

In addition, the applicant has to declare that the 'genetic material or parental material acquired for the breeding, evolving or developing the variety has been lawfully acquired.'[291] Again, UPOV opposes any additional requirement for protection of plant varieties.[292] UPOV suggests that this subject should be regulated in a different legal framework, one of the reasons being that the 'competent authority for the grant of plant breeder's rights is not in the position to verify whether the access to genetic material has taken place in accordance with the applicable law in this field.' [293]

Once the certificate has been issued, the breeder has the exclusive right 'to produce, sell, market, distribute, import or export the variety' and may authorise any other person for those activities. [294]

The terms of protection for registered varieties are nine years for vines and trees and six years for other crops.[295] Afterwards the certificate of registration may be reviewed and renewed up to a total of 18 years for vines and trees and 15 years for other crops. [296] The terms of protection are equal to those in the 1978 UPOV act but shorter than the 25 and 20 years respectively in the 1991 UPOV Act.

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[290] UPOV *Reply of UPOV to the Notification of April 12, 2005, from the Executive Secretary of the Convention on Biological Diversity (CBD))* Annex 1 page 2 available at http://www.upov.int/en/about/pdf/cbd_respons_oct_31_2005.pdf (accessed 12 February 2006).

[291] Section 18(1)h Protection of Plant Varieties and Farmer's Rights Act 2001

[292] UPOV (note 290) Annex 1 page 3.

[293] Ibid.

[294] Sections 28(1)-(2) Protection of Plant Varieties and Farmer's Rights Act 2001

[295] Section 24(6) Protection of Plant Varieties and Farmer's Rights Act 2001

[296] Ibid.

The rights of farmers are explicitly described and not as an exception to breeders' rights like in the 1991 UPOV Act. Farmers' rights include the right to 'save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under this Act in the same manner as he was entitled before the coming into force of this Act.'[297] The saved seed may however not be sold as 'branded seed'.[298]

Farmers who contribute to the 'conservation of genetic resources of land races and wild relatives of economic plants and their improvement through selection and preservation' are entitled to benefit sharing if the said material is used by a breeder to develop a new variety.[299] The breeder has to pay annual fees for the use of this genetic material depending on the royalties received for the protected variety.[300] The fees are deposited into the 'National Gene Fund' which is used for benefit sharing and conservation of genetic material.[301] The act also gives farmers a claim towards the breeder if a sold material does not live up to the 'expected performance under the given conditions' which the breeder is obliged to disclose.[302]

The use of protected varieties is allowed for experimentation, research and the creation of new varieties.[303] Repeated use of the protected variety necessary for the commercial production of the new variety is however subject to authorisation by the breeder of the protected variety.[304] This formulation is compatible with the breeder's exception in the 1978 UPOV Act.

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[297] Section 39(1)iv Protection of Plant Varieties and Farmer's Rights Act 2001

[298] Ibid.

[299] Section 39(1)iii Protection of Plant Varieties and Farmer's Rights Act 2001

[300] Section 45(1)a Protection of Plant Varieties and Farmer's Rights Act 2001

[301] Section 45(2) Protection of Plant Varieties and Farmer's Rights Act 2001

[302] Section 39(2) Protection of Plant Varieties and Farmer's Rights Act 2001

[303] Section 30(a)-(b) Protection of Plant Varieties and Farmer's Rights Act 2001

[304] Section 30(b) Protection of Plant Varieties and Farmer's Rights Act 2001

The Act excludes varieties from registration in 'cases where prevention of commercial exploitation of such 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.'[305] This exclusion is clearly borrowed from article 27.2 TRIPS, which permits the exclusion from patentability on these grounds. The Act also provides for compulsory licenses of protected plant varieties.[306]

As required by TRIPS, the act provides for enforcement instruments. The producing, selling, exporting and importing of protected varieties or other varieties under the same or similar denomination are infringements under the act.[307] The rights holder may institute a suit in a district court which may grant relief in the form of an injunction and damages or a share of the profits.[308]

India's Plant Variety Protection and Farmers' Rights Act has publicly been received as a model for non-UPOV sui generis protection of plant varieties.[309] However, to the surprise of many civil society organisations, India is about to 'make a U-turn'.[310] The Indian government had decided to join UPOV and is now in the process of acceding to the 1978 UPOV Act.[311] UPOV has made an exception for India to its rule that new members have to adopt the 1991 UPOV Act.[312] The Indian government has claims that the Indian legislation is compatible with the 1978 Act and therefore does not have to be adapted.[313] However, the fear has been expressed that the joining of UPOV is India's first

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[305] Section 29(1) Protection of Plant Varieties and Farmer's Rights Act 2001

[306] Sections 47-53 Protection of Plant Varieties and Farmer's Rights Act 2001

[307] Section 64 (a)-(b) Protection of Plant Varieties and Farmer's Rights Act 2001

[308] Sections 65(1)b and 66(1) Protection of Plant Varieties and Farmer's Rights Act 2001

[309] R Adhikari *Enduring enigma of UPOV* Kathmandu post 21 feb 2003 available at http://www.nepalnews.com.np/contents/englishdaily/ktmpost/2003/feb/feb21/features1.htm (accessed 2 February 2006).

[310] Ibid.

[311] S Saraf *UPOV a threat to farmers* available at http://www.tribuneindia.com/2002/20021230/agro.htm#2 (accessed 2 February 2006).

[312] World Bank (note 56) at 69.

[313] Saraf (note 311).

step towards ratification of the 1991 UPOV Act with its restrictions on farmers' rights.[314]

The African Model legislation

Another initiative for a non-UPOV system for plant variety protection was developed in Africa. In 1999 the Organisation of African Unity (now the African Union) adopted a 'Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources.'[315] The model legislation rejects the patenting of life forms and every part or derivative thereof as being a violation to the 'fundamental human right to life'.[316] As the title indicates, the model legislation gives separate rights to communities, farmers and breeders and regulates the access to biological resources.

The access to biological resources is subject to 'written prior informed consent' of the competent national authority as well as the concerned local communities, 'ensuring that women are also involved in the decision making.'[317] An access permit may be granted in the form of an agreement between the 'collector' of the biological resource, the competent national agency and the concerned local community.[318] Part of this agreement is the commitment by the 'collector' 'not to apply for any form of intellectual property protection over the biological resource or parts or derivatives thereof and not to apply for intellectual property rights protection over a community innovation, practice, knowledge or technology without the prior informed consent of the original providers.' The patenting of any life forms or biological processes in this respect is totally prohibited. [319]

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[314] Ibid.

[315] Organisation of African Unity *Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources* available at www.grain.org/br/?docid=798&lawid=2132 (accessed 12 February 2006).

[316] Ibid final recital.

[317] Article 5(1) Model legislation (note 315).

[318] Article 7 Model legislation (note 315).

[319] Article 9(2) Model legislation (note 315).

Community rights are the rights of local communities over their biological resources and the benefits of their use. [320]The term further encompasses their 'innovations, practices, knowledge and technologies acquired through generations' which they may use in the 'conservation and sustainable use of biological diversity' and the benefits of the utilisation by others.[321] Communities may refuse access to these resources where this access would be 'detrimental to the integrity of their natural or cultural heritage.'[322] The model legislation further introduces 'Community Intellectual Rights' for community innovation, practice, knowledge or technology.[323] These rights shall at all times remain inalienable. [324]

The model legislation recognises a number of different aspects of farmers' rights. It protects farmers' varieties with a variety certificate which gives communities the exclusive rights to 'multiply, cultivate, use or sell the variety, or to license its use (…).'[325] Farmers' varieties do not have to meet the criteria of distinction, uniformity and stability.[326] Farmers' rights further include the protection of their traditional knowledge and the right to obtain an equitable share of benefits arising from the use of biological resources.[327] Farmers also have the right to participate in decision-making on matters of conservation and the sustainable use of biological resources.[328]

The rights concerning farm-saved seed are described as farmer' rights and not as an exception to breeders' rights. These rights include the right to 'collectively

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[320] Article 16 Model legislation (note 315).

[321] Ibid.

[322] Article 19 Model legislation (note 315).

[323] Article 23(2) Model legislation (note 315).

[324] Article 23(1) Model legislation (note 315).

[325] Article 25(2) Model legislation (note 315).

[326] Ibid.

[327] Article 26(1)a-b Model legislation (note 315).

[328] Article 26(1)c Model legislation (note 315).

save, use, multiply and process farm-saved seed of protected varieties.'[329] The selling of farm-saved seed of a protected breeders' variety in the seed industry on a commercial scale is however prohibited.[330]

Plant breeder's rights are granted for the development of new varieties provided that they are distinct, stable and sufficiently homogeneous. [331] The rights holder has the exclusive right to sell and produce to sell the protected variety.[332] The terms of protection are 25 years for vines and grapes and 20 years for annual crops.[333] Breeders' rights are subject to a detailed list of exceptions which can be categorised as for private and small-scale commercial use, use for further breeding and research and the use of farm-saved seed as described under the section on farmers' rights.[334]

In 2001 the Organisation of African Unity consulted WIPO and UPOV on their model legislation.[335] Their comments were devastating. WIPO targeted the incompatibility of the prohibition of patenting of all life forms with article 27 of TRIPS.[336] WIPO also objected to the provision of inalienability of community rights.[337] UPOV redrafted more than 30 articles of the model legislation to make them compatible with the UPOV Acts.[338] The consultations have however not led to a revision of the model legislation.

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[329] Article 26(1)f Model legislation (note 315).

[330] Ibid.

[331] Article 29 Model legislation (note 315).

[332] Article 30 Model legislation (note 315).

[333] Article 34 Model legislation (note 315).

[334] Article 31 Model legislation (note 315).

[335] H Singh *Emerging plant variety legislations and their implications for developing countries: experiences from India and Africa* available at www.iprsonline.org/ictsd/docs/ResourcesTRIPSharbir_singh.doc (accessed 2 February 2006), para 2.3.

[336] Ibid.

[337] Ibid.

[338] Ibid.

The African model legislation started out as a broadly supported document which would form the basis for the development of African national laws. However, the French speaking countries who are united in the African Intellectual Property Organisation instead decided to revise the Bangui Agreement to make it compatible with the UPOV 1991 Act.[339] The common plant variety protection system is available since 1 January 2006.[340]

Another reported initiative comes from Bangladesh who in 1999 also developed a sui generis system for plant variety protection which deviated substantially from the 'UPOV standard'.[341] But it is said that the bill never made it to Parliament because the European Trade Commissioner Pascal Lamy (the current Director-General of the WTO) threatened to stop aid.[342] The European Union - Bangladesh agreement on partnership and development of 2001 requires Bangladesh to 'make every effort' to join UPOV.[343] New legislation on plant variety protection, based on the UPOV Convention, is said to be drafted.[344]

6.5 TRIPS-plus

The example of Bangladesh does not stand by itself. The Grain update of August 2005 on bilateral agreements imposing TRIPS-plus standards of intellectual property rights on biodiversity is telling.[345] The following information can be extracted from this update.

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[339] Jördens (note 74) at 235.

[340] Ibid.

[341] Grain *Beyond UPOV* available at www.grain.org/briefings/?id=127 (accessed 2 February 2006).

[342] Adhikari (note 309).

[343] The Daily Star (note 198).

[344] Adhikari (note 309).

[345] Grain *Bilateral agreements imposing TRIPS-plus intellectual property rights on biodiversity in developing countries* available at http://www.twnside.org.sg/title2/FTAs/Intellectual_Property/IP_and_other_Topics/BilateralAgreementsImposingTRIPS+IPRsOnBiodiversityInDevelop.PDF (accessed 2 February 2006).

The United States, the European Union, the European Free Trade Association (Iceland, Norway, Switzerland and Liechtenstein) and Switzerland all impose their own system of intellectual property protection on developing countries. The European Union and the European Free Trade Association require developing countries to join UPOV, give patent protection for transgenic plants and animals or implement 'the highest standards for intellectual property protection. ' The United States requires developing countries to join UPOV but also to provide patents for plants and animals. The United States - Singapore Free Trade Agreement states that 'each party may exclude inventions from patentability only as defined in articles 27.2 and 27.3(a) of the TRIPS Agreement.' The exclusion for plants and animals in article 27.3(b), which does not conform to the American system, has been left out.

Countries who have thus committed themselves to join UPOV include Jordan, Lebanon, Bahrain, Morocco, Tunisia, Algeria, Egypt, Bangladesh, Korea, Vietnam, Cambodia, Laos, Singapore, Chile, Mexico, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Ecuador, Trinidad and Tobago. Countries which have to provide full patent protection for plants include Jordan, Morocco, Laos, Mongolia, Singapore, Sri Lanka, Vietnam, Chile and Nicaragua.

TRIPS-plus standards of intellectual property protection are also negotiated in the framework of the Cotonou Agreement, the African Growth and Opportunities Act, the Free Trade Area of the Americas and bilateral agreements between the United States and Andean countries and the Southern African Customs Union respectively.

It follows that the built-in flexibility of article 27.3(b) TRIPS which would allow developing countries to develop their own system of plant variety protection has become somewhat illusory. Bilateral pressure from the United States and Europe forces developing countries to adopt the highest standards of developed countries. Despite the aforementioned concerns about the TRIPS

obligations, many developing countries have thus committed themselves to do even more than TRIPS requires.

7 Article 27.3(b) TRIPS, compliance and review

7.1 The implementation of article 27.3(b)TRIPS

In 1999 the TRIPS Council launched a survey on TRIPS compliancy regarding article 27.3(b). [346] Because this was before 2000, the deadline for developing countries to implement TRIPS, the survey only targeted developed countries.

Grain reported in March 2000 on compliancy of developing country members of the WTO (as opposed to the least developed countries who had until 2006). Their research suggests that in 2000 on average 70 per cent of the developing countries did not have a plant variety protection system in place.[347] This non compliancy was reported in 80 per cent of the African and Asian developing countries and in 56 per cent of the Latin American and Caribbean states.[348]

In September 2004 Grain reported that still less than half (47 per cent) of the developing country members of the WTO had enacted some form of plant variety protection law.[349] In the same publication Grain concludes that half of the developing countries which have enacted plant variety protection laws have also joined UPOV.[350] Another 26 countries were at that point in the process of joining UPOV and 30 more were said to be consulting UPOV on their draft

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[346] WTO *Background and current situation* available at www.wto.org/english/tratop_e/trips_e/art27_3b_background_e.htm (accessed 4 February 2006).

[347] Grain *For a full review of TRIPs 27.3(b). An update on where developing countries stand with the push to patent life at WTO* available at http://www.grain.org/briefings/?id=139(accessed 4 February 2006).

[348] Ibid.

[349] Grain *PVP in the South: caving in to UPOV* available at http://www.grain.org/rights_files/PVP-South-status-Sep-2004.pdf (accessed 2 February 2006).

[350] Ibid.

bills. [351] Grain's 2005 index on plant variety protection laws shows that at least another six countries have enacted plant variety protection laws since the last reported update by Grain.[352] UPOV membership increased with four countries in 2004 and two countries in 2005 to a total of 60[353].

7.2 Review of article 27.3(b) TRIPS

Article 27.3(b) TRIPS provides that '[t]he provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement' and is thus part of the WTO 'built-in agenda.'[354] The implementation of TRIPS in general was to be reviewed in 2000.[355] In de lead up to the review a controversy arose between developing countries and developed countries. Developing countries wanted article 27.3(b) substantially reviewed, developed countries wanted to focus only on implementation.[356] While the TRIPS council started to collect data on the implementation of TRIPS, developing countries agreed on almost a dozen proposals for the reform of TRIPS, to be discussed during the 1999 Seattle Ministerial Conference.[357] The core of those proposals addressed the failure of TRIPS to protect biodiversity and traditional knowledge.[358] Developing countries also opposed the patenting of any life forms and proposed a longer period for implementation of article 27.3(b) TRIPS for developing countries.[359] Developing countries further wished a clarification on several implementation issues.

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[351] Ibid.

[352] Grain *Plant variety protection* available at http://www.grain.org/brl/?typeid=10 (accessed 14 February 2006).

[353] UPOV *Membership Status on September 15, 2005* available at http://www.upov.int/en/about/members/pdf/pub423.pdf (accessed 14 February 2006).

[354]Linerelli (note 4) at 414.

[355] Article 71 TRIPS.

[356] Linerelli (note 4) at 415.

[357] Ibid at 415-416.

[358] Ibid at 416.

[359] Ibid.

The European Union and the United States responded that the UPOV system was regarded as an effective sui generis system for plant variety protection.[360] The European Union urged all members to draft their laws in compliance with the UPOV Convention.[361]

The Seattle Ministerial Conference was however declared 'suspended' and no decisions were made.[362] The discussion on implementation versus substance continued the following years in the TRIPS Council with many submissions being made by developing and developed countries. By 2001, the time the Doha Ministerial Conference took place, the issue was still unsolved. Developed countries remained their position to focus on implementation, but also wanted some progression to avoid another failed conference.[363] Developing countries took a hard line in demanding the discussion to be broadened to other areas. [364]

The Doha Ministerial Declaration can be seen as a compromise between the two sides. On the one hand the declaration stresses the importance of implementation-related issues.[365] On the other hand the declaration instructs the TRIPS Council to examine the relationship between TRIPS and CBD and the protection of traditional knowledge, fully taking into account the development dimension.[366] Guided by this mandate the TRIPS Council resumed its work and numerous proposals were made by both developing and developed countries.

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[360] Ibid at 416.

[361] Ibid.

[362] Ibid at 418.

[363] Ibid at 419.

[364] Ibid at 419-420.

[365] WTO *Doha Ministerial Declaration* available on http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm (accessed 4 February 2006) under 12.

[366] Ibid under 19.

The 2003 Cancún Ministerial Conference brought no visible progress because it ended without consensus.[367] The deliberations are even now still continuing. The scope of the issues involved is too broad to discuss here in full. The aforementioned objections of developing countries remain valid. The discussion is currently focussed on whether a patent applicant should disclose the origin of genetic resources and the traditional knowledge which he has used for his invention, along with proof that he received 'prior informed consent' to use them under conditions of 'fair and equitable' benefit sharing.[368]

In the recent Hong Kong Ministerial declaration the WTO Director General was requested to intensify his consultations on all outstanding implementation issues, including those related to the relationship between TRIPS and CBD.[369] Article 27.3(b) TRIPS will thus continue to be the object of discussion.

7.3 The way forward

The fact that article 27.3(b) TRIPS is still under review is probably the main reason why developed countries have not yet addressed specific non-compliance issues in the WTO Dispute Settlement system. It is therefore still uncertain if the plant variety protection systems which have been developed in India and the African Union will be considered TRIPS compliant. In the meantime developing countries have to decide how to proceed with their national legislation regarding plant variety protection. The implementation deadline for least developed countries has also passed.

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[367] WTO *The Cancún Ministerial Statement* available at http://www.wto.org/english/thewto_e/minist_e/min03_e/min03_14sept_e.htm#statement (accessed 4 February 2006).

[368] WTO *Briefing Notes Hong Kong Ministerial Conference* available at http://www.wto.org/english/thewto_e/minist_e/min05_e/brief_e/brief06_e.htm (accessed 12 February 2006).

[369] WTO *Hong Kong Ministerial declaration* available at http://www.wto.org/english/thewto_e/minist_e/min05_e/final_text_e.htm (accessed 12 February 2006).

There are many factors that will influence the choice of developing countries for a plant variety protection system. Whatever system may be chosen, it is clear that the implementation of article 27.3(b) TRIPS will result in high costs for developing countries, while the benefits remain somewhat uncertain. The impacts of intellectual property rights on the developing country's industry will be sector specific and should not be generalised. The next chapter analyses the relation between 27.3(b) TRIPS and one major source of income for developing countries: the cut flower export industry.

8 The cut flower export industry in developing countries

8.1 Introduction

The traditional centres of commercial flower growing are all in the Northern hemisphere. The Netherlands has a long tradition in cut flowers and remains one of the most important distribution centres because of its high tech flower auctions and specialised infrastructure. The flower growing industries in the North however experience a number of problems that are hard to solve. The winter season is long and dark, but is also the season in which flowers are most in demand. Labour is expensive and land is scarce.

The conditions in the Southern hemisphere are quite the opposite. The climate in the tropical and sub tropical South allows for round the year growing of flowers. Labour is cheap and land more available. In the 1970s countries in the Southern hemisphere started to gain a competitive advantage over the North.[370] Developing countries' share in cut flower export industry has increased from less than 10 per cent in 1980 to more than 30 per cent in 2002.[371]

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[370] N de Groot *Floriculture worldwide* available at www.agrsci.unibo.it/wchr/wc1/degroot.html Para 7.2

[371] ITC press release *From China, Saying it with Flowers* available at http://www.intracen.org/docman/PRSR5219.pdf (accessed 10 February 2006).

In the direct future it is expected that competition will be fierce, including between developing countries themselves.[372] The export of cut flowers as a high value product is promoted as an alternative to traditional commodities to developing countries by organisations such as The International Trade Centre, the technical cooperation agency of UNCTAD and WTO.[373] New exporting countries are constantly emerging, as many countries desire a share in the cut flower export trade, which amounts to US$ 4 billion annually.[374]

In order to establish a relation between the flower export industry and plant variety protection, it is necessary to review the relevant players in the industry.

8.2 Flower consumers

The consumer markets for cut flowers are predominantly found in Europe (44 per cent) the United States and Canada (21 per cent) and Japan (15 per cent).[375] There is a strong regional link between exporters and importers of cut flowers: basically said African flowers go to Europe, South American flowers are exported to the United States and Thailand and Taiwan supply the growing Asian market.[376] Each market has its own preferences: 'Russians like their roses open, Europeans want them closed and Americans are somewhere in between.' Trends in flower consumption are fashion-related.[377] The Dutch Flower Council has identified six different types of flower consumers, of which the 'Trendy-Ambience' group is the most important for flower sales.[378] Because the flower

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[372] International Labour Organization *The world cut flower industry: Trends and prospects* available at http://www.ilo.org/public/english/dialogue/sector/papers/ctflower/index.htm (accessed 10 February 2006).

[373] ITC press release *From China, Saying it with Flowers* (note 371).

[374] Ibid.

[375] T Seideman *Despite Globalization Traumas, Flower Industry Blooms* available at http://www.worldtrademag.com/CDA/Archives/4e61cf5149af7010VgnVCM100000f932a8c0____ (accessed 10 February 2006).

[376] Ibid.

[377] Consumer market insights *Trends in cut flowers in The Netherlands* 4 Market: Europe, November 2004.

[378] Ibid.

industry is essentially a fashion industry, novelty is extremely important.[379] New and special varieties sell for up to seven times the price of comparable flowers.[380] Consumer preferences are however to a certain extent influenced by wholesalers and flower growers, who decide on the available assortment.[381]

8.3 Auctions

The Dutch flower auctions with their highly efficient distribution system handle a major share of the world trade in flowers.[382] It is on these auctions that prices for flowers worldwide are set.[383] The dominant position of the auctions is however weakening by the emerging trend of flower sales in supermarkets.[384] Instead of buying flowers from wholesalers through the auction system, supermarkets prefer to buy directly from growers or importers.[385] In some European countries supermarkets already account for more than half of the total flower sales.[386] But the increased sales through supermarkets have not led to a preference for cheap flowers. Instead supermarkets focus increasingly on quality and are trendsetters in quality labels for growing and trading practices.[387]

8.4 Flower growers

Flower growers in developing countries have some significant advantages over the traditional growers in for instance the Netherlands. The growers that are

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[379] MDG Bangladesh *Flower export - a new dimension of income generation* available at http://www.mdgbangla.org/striving_mdg/goal1/actors/individual/flower/indiv_flower.htm (accessed 10 February 2006).

[380] International Labour Organization *The world cut flower industry: Trends and prospects* (note 372).

[381] D Hamrick and N Laws *What's new with roses?* available at http://www.floraculture intl.com/archive/articles/922.asp (accessed 10 February 2006).

[382] International Labour Organization *The world cut flower industry: Trends and prospects* (note 372).

[383] Ibid.

[384] Ibid.

[385] Ibid.

[386] Ibid.

[387] Ibid.

located near the equator have round the year growing conditions and high altitudes, the perfect combination for high production and quality.[388] Other important factors are the availability of water for irrigation and low labour costs.[389]

Because most developing countries have virtually no domestic market for cut flowers, the growers totally depend on exports to developed countries.[390] Transportation to the countries of destination is a major factor because cut flowers are highly perishable. In order to reach their destination on time, flowers need to be transported by air. The flower growing industry in developing countries needs to reach a critical mass to justify investment in cargo facilities such as refrigerated storage.[391] The high transportation costs are worthwhile if the flowers have high value per weight.[392]

The growing facilities for the rose, which is the major export crop, and others like chrysanthemum require large investments and technical expertise. This makes flower growing impossible for small-scale farmers.[393] Funding for those investments is generated through development aid and foreign direct investment.[394]

Another vital factor is access to the developed countries' markets. Developing countries benefit from agreements such as the Cotonou agreement which allows duty free imports into European markets. The Cotonou agreement expires in 2008 and is being replaced by varying bilateral agreements.[395] This has caused

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[388] L Labuschagne *IPM Revolution in East African Flower Industry—Web Exclusive*! available at http://www.floracultureintl.com/archive/articles/1335.asp (accessed 10 February 2006).

[389] Ibid. See also D Gray *Growing around the world: Floriculture in East Africa* available at http://www.floracultureintl.com/archive/articles/705.asp (accessed 10 February 2006).

[390] Gray *Growing around the world: Floriculture in East Africa* (note 389).

[391] Ibid. See also Seideman *Despite Globalization Traumas, Flower Industry Blooms* (note 375).

[392] Seideman *Despite Globalization Traumas, Flower Industry Blooms* (note 375).

[393] Gray *Growing around the world: Floriculture in East Africa* (note 389).

[394] Ibid.

[395] Ibid.

unrest under flower growers, who consider moving to a country with a more favourable trade agreement.[396] Although the European Union recently announced that it will continue to exempt African flowers from import tariffs after 2008, the example accentuates the importance of duty free access.[397]

Given the high costs of investment and transportation, flower growers in developing countries want to grow the varieties from which they will get the highest revenue.[398] These are typically the new varieties, which sell for significantly higher prices than older ones. Access to new varieties is therefore vital to flower growers. To obtain the new varieties, growers are totally dependent on breeders and propagators.

8.5 Flower breeders

Although the production of cut flowers increasingly takes place in developing countries, the breeding of new flower varieties is predominantly a developed countries' activity. Most of the major breeding companies are Dutch.[399] The breeding of new varieties is a lengthy and expensive process. It takes several years to develop a new variety and for every new variety that makes it to the market, many others prove useless. In order to succeed, the new variety has to better or different than other varieties. The novelty can relate to colour, scent, stem length, longer vase life, etcetera.[400]

The release of a new variety into the market has to be done carefully. If the market is flooded with the new variety the price will fall quickly. [401] To

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[396] Ibid.

[397] All Africa *EU to Exempt Flowers From Import Tariffs* available at http://b2b-worldwide.com/5_12/5_12_08_EU_flowers_import.asp (accessed 10 February 2006).

[398] Hamrick and Laws *What's new with roses?* (note 381).

[399] MDG Bangladesh *Flower export - a new dimension of income generation* (note 379).

[400] ACF *Plant piracy* available at http://www.acfnewsource.org/science/plant_piracy.html (accessed 10 February 2006).

[401] J Kras *Dutch comfort* available at http://www.floracultureintl.com/archive/articles/838.asp (accessed 10 February 2006). Hamrick and Laws *What's new with roses?* (note 381).

maintain the value of the new variety the breeder has to introduce it properly and make sure that the quality standards are met.[402] In order to control the release, some unique varieties are licensed exclusively to one grower.[403] Others are licensed with obligations regarding the use of the proper name or the correct tagging or pot.[404] The overall trend is that breeders increasingly try to place restrictions on growers in an attempt to control the market.[405]

In order to get return on investment, private breeding companies sign license agreements with propagators and growers and determine a royalty fee. There are different systems for royalties, depending on the breeder, the variety and the market. The easiest way is to include the royalty in the price which has to be paid for every plant or cutting.[406] Some breeders charge royalties as a percentage of the growers' income and thereby share in the responsibility and the risk.[407] For plants that produce cut flowers over several years the royalty payments are sometimes spread over time.[408] For roses the royalties account for three to six per cent of the production costs, this is about the same as the costs for the actual cuttings.[409]

Once varieties are released in the market, most of them can easily be copied. This especially relevant for crops like roses, which are vegetatively propagated (through cuttings). If a breeder's variety is grown without his authorisation, the breeder misses the income from royalties. It is therefore in his interest to closely monitor the use of his variety. Unauthorised use is detected in several ways. Companies such as Royalty Administration International are hired by breeders to visit their licensed growers worldwide and compare the amount of plants in

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[402] Kras *Dutch comfort* (note 401).

[403] Hamrick and Laws *What's new with roses?* (note 381).

[404] D Hamrick *The state of breeder's rights* available at http://www.floraculture intl.com/archive/articles/840.asp (accessed 10 February 2006).

[405] Ibid.

[406] Ibid.

[407] Hamrick and Laws *What's new with roses?* (note 381).

[408] Ibid.

[409] World Bank (note 57) at 129.

the grower's fields or greenhouses with the license agreement. [410] When the grower has more plants than his license agreement permits, the grower is asked to pay the additional royalties. In severe cases the payment of double royalties can be imposed as a penalty.[411] Incidentally the case goes to court or the license agreement is revoked.[412]

Another way to control the royalty payments is through export statistics. This works in Uganda where all exports go through one handling agent.[413] A third method is the monitoring of wholesale markets. Most flowers that are imported into Europe go through the Dutch flower auctions which closely monitors the statistics.[414]

A fourth method is monitoring at the border of import markets. Under the 1991 UPOV Act it is prohibited to import protected varieties without authorisation of the breeder.[415] Just before Valentine's Day 2004 thousands of roses from Colombia and Ecuador were confiscated at the United States border at the request of the breeder.[416] The breeder chose not to settle and all the roses were destroyed.[417] Before the 'landmark seizure' the breeder had started court proceeding in the growers' countries.[418] But the breeder had difficulties to enforce the judgments in his favour and decided to move the efforts to the United States border.[419] The action drew much media attention and the announcement that a similar action would be held before Mother's Day caused

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[410] Hamrick *The state of breeder's rights* (note 404).

[411] Ibid.

[412] Ibid.

[413] World Bank (note 56) at 129.

[414] Ibid.

[415] Article 14.1 UPOV 1991 Act.

[416] M Bame *Taking Action Against Pirates* available at http://www.floracultureintl.com/archive/articles/1252.asp (accessed 10 February 2006). World Bank (note 56) at 129.

[417] Bame *Taking Action Against Pirates* (note 416).

[418] World Bank (note 56) at 129 and Bame *Taking Action Against Pirates* (note 416).

[419] Bame *Taking Action Against Pirates* (note 416).

illegal growers to settle or remove their plants.[420] It should be noted that the confiscation was based on the infringement of trademark rather than plant variety protection, but the effect would be similar.[421]

Although the unauthorised production of plant varieties can be controlled through monitoring of licenses, imports and wholesale markets, this system is not waterproof. License contracts only work against the licensee, not against his neighbour. In a country where there is no plant variety protection, anyone can grow as much of the breeders' flowers as he likes. The increased imports of flowers through other than the controlled channels as the Dutch flower auctions cause the breeder to lose its grip. In addition to these control mechanisms the breeder therefore needs legal protection for his new varieties in the countries where he sends his products.

This protection can be given through a system of plant breeders' rights, patent protection or both. Important aspects for the breeder are the scope of his rights, the exceptions to those rights and the effectiveness of the administrational and enforcement procedures. Familiar systems such as those based on the UPOV Convention or patent protection are likely to give the breeder confidence that his interests will be protected. Without this confidence, the breeder will be reluctant to release its newest and most valuable varieties.

Several sources confirm that flower breeders are increasingly protective over their new varieties and simply do not deliver in countries which do not have an effective plant variety protection system.[422]

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[420] Ibid.

[421] World Bank (note 56) at 130.

[422] L Fenton *Will China Take Over the World?* available at http://www.floraculture intl.com/archive/articles/1589.asp (accessed 10 February 2006)
ACF *Plant piracy*(note 400);
J Kras *Breeders rights* available at http://www.floraculture intl.com/archive/articles/69.asp (accessed 10 February 2006);
L Ross and L Zhang *Agricultural development and intellectual property protection for plant varieties: China joins the UPOV* 17 UCLA Pacific Basin Law Journal 226, 244;

8.6 Plant variety protection in flower exporting countries

Given the dependence of flower growers in developing countries on export of high value new varieties, this strategy of breeders would indicate that a plant variety protection system is a condition precedent for the flower growing industry. This deduction is supported by the fact that the major flower exporting developing countries, Colombia, Ecuador and Kenya are UPOV members and have implemented the 1978 UPOV Act.[423]

The Colombian legislation already has many of the 1991 Act features and the farmers' privilege has recently been restricted.[424] Kenya is also moving towards the 1991 Act.[425] Another big player is Zimbabwe who has had a plant variety protection system since the 1970s and is currently in the process of joining UPOV.[426] Thailand is reportedly consulting UPOV on its plant variety protection law.[427]

Another indication for the necessity of an effective plant variety protection system comes from Mexico. The flower exports from Mexico have stagnated since1996 and have recently plummeted to a level of before 1990. The problems with protecting new varieties are believed to be one of the causes for this downfall.[428]

Nwabueze (note 89) at 616.

[423] Grain *PVP in the South: caving in to UPOV* available at http://www.grain.org/rights_files/PVP-South-status-Sep-2004.pdf (accessed 2 February 2006). MDG Bangladesh *Flower export - a new dimension of income generation* (note 379).

[424] World Bank (note 56) at 68.

[425] Ibid.

[426] Grain *PVP in the South: caving in to UPOV* (note 423).

[427] Ibid.

[428] Ministry of Agriculture (The Netherlands) *Berichten Buitenland Bloemenspecial* available at http://www9.minlnv.nl/pls/portal30/docs/FOLDER/MINLNV/LNV/BELEID/BELEID_IENH/BERICHTEN_BUITENLAND/2005/BBBLOEMENSPECIAL.PDF (accessed 10 February 2006).

Research on this subject confirms that the existence of an effective plant variety protection system creates an incentive for breeders to export their best and most recent varieties.[429] This phenomenon has been reported for fruit varieties in New Zealand, Chile and Argentina.[430] The ten year review of Canada's Plant Breeders' Rights Act reports that '[f]armers and nurserymen definitely have greater access to more and better varieties.' The enhanced export capability of the floriculture sector was found to be directly related to the introduction of the act.[431]

UPOV recently released a report on the impact of plant variety protection which focussed on Argentina, China, Kenya, Poland and the Republic of Korea.[432] UPOV has observed that the adoption of the UPOV system of plant variety protection has led to an increase in access to foreign new varieties of ornamental crops in the studied countries.

Another example is China. The introduction of the cut flower industry in Yunnan Province, one of China's poorest areas, is described as a major success story.[433] The export orientated industry was set up ten years ago with help from ITC and now accounts for US$ 415 million annually.[434] The project reportedly lifted more than 20.000 Chinese farmer families out of poverty.[435] However, the

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[429] M Maredia *Application of Intellectual Property Rights in Developing Countries: Implications for Public Policy and Agricultural Research Institutes* available at http://www.wipo.int/about-ip/en/studies/pdf/study_k_maredia.pdf (accessed 10 February 2006).

[430] Ibid.

[431] Canadian Food Inspection Agency *10-Year Review Of Canada's Plant Breeders' Rights Act* available at http://www.inspection.gc.ca/english/plaveg/pbrpov/10yre.shtml (accessed 10 February 2006).

[432] UPOV *UPOV Report on the Impact of Plant Variety Protection* (UPOV Publication 353(E)) Executive summery available at http://www.upov.int/en/about/pdf/353_Executive_Summary.pdf (accessed 12 February 2006).

[433] ITC press release *From China, Saying it with Flowers* (note 371).

[434] Ibid.

[435] International Trade Forum Cut Flowers: *A Multi-million Dollar Industry Blooms in Rural China* available at

Chinese flower industry so far mainly exports to Asian countries. The penetration of the European and American markets is expected to happen when problems with transportation and the protection of new varieties are solved.[436]

8.7 Conclusions on relation plant variety protection and flower export industry

The particularities of the flower trade make that the export industry depends heavily on new varieties. Consumers prefer the latest varieties which raises the prices far above those of other varieties. Producers in developing countries need the high value new varieties to cover the costs of investment and transportation. The flower growers are very dependent on the will of the breeder to provide them with the latest varieties. Breeders want return on investment for their breeding efforts in the form of royalties. They are more than reluctant to release their latest varieties in a country where they cannot protect their varieties against unauthorised use. Without protection of plant varieties, by patents or by a sui generis system, a country will not attract the latest flower varieties and will thus be less able to develop or maintain an export industry for cut flowers.

The foregoing analysis of the cut flower export industry in developing countries shows a strong relation between the availability of plant variety protection and the cut flower industry in developing countries. The relevance of this analysis for the choice of a system of plant variety protection will be discussed in the conclusion of this paper. To put things in perspective it is necessary to first look at the effects which the flower export industry has in developing countries.

8.8 The effects of the flower export industry

There is no doubt that a successful flower export industry can bring substantial benefits to developing countries. The flower export industry in Kenya for instance has grown steadily for 25 years and is now with 12 per cent the third

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http://www.tradeforum.org/news/fullstory.php/aid/786/Cut_Flowers:_A_Multi-million_Dollar_Industry_Blooms_in_Rural_China.html
(accessed 10 February 2006).

[436] Dutch Ministry of Agriculture *Berichten Buitenland Bloemenspecial* (note 428).

largest foreign exchange earner.[437] Flowers account for 14 per cent of Kenya's exports with a value of nearly US$ 200 million annually.[438] The industry employs 50.000 local workers and another 60.000 to 70.000 are employed in ancillary industries.[439]

The flower growing industry in Ecuador employs 45.000 people directly and accounted for more than US$100 million in export earnings in 1997. It is estimated that the cut flower trade in Colombia employs 80.000 people directly and another 50.000 indirectly and is the country's fourth largest foreign exchange.[440]

Serious downsides of the flower export industry however have also been reported. The large amount of pesticides that is used in the industry makes working in the greenhouses very unhealthy. The industries in developing countries use pesticides which are prohibited in developed countries and the workers use no protective equipment. About half of the workers report symptoms of pesticide poisoning. Female workers experience fertility problems as well as higher rates of miscarriages and children born with birth defects. [441] The workers are paid low wages with no benefits and have to work long hours before Valentine's Day and Mother's Day without being paid overtime.[442]

Another problem is the environmental impact of the flower growing industry. Alarming reports have been made by local fishermen and residents about the dropping water levels in Lake Naivasha in Kenya.[443] The lake is surrounded by

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[437] Gray *Growing around the world: Floriculture in East Africa* (note 389)
Labuschagne *IPM Revolution in East African Flower Industry—Web Exclusive*! (note 388).

[438] Labuschagne *IPM Revolution in East African Flower Industry—Web Exclusive*! (note 388).

[439] Ibid.

[440] International Labour Organization (note 372).

[441] E Stanton *Flowers for Mother's Day?*Dollars and Sense, the magazine of economic injustice Issue 247, May/June 2003.

[442] Ibid.

[443] ICTSD *Is the flower industry drying out Kenya's Lake Naivasha?* available at http://www.ictsd.org/biores/03-11-14/inbrief.htm (accessed 10 February 2006).

some 30 flower growing companies which use the water for irrigation purposes.[444] The flower growers are also accused of polluting the lake through their use of pesticides, which has had a devastating effect on the lake's biodiversity.[445] Similar problems occur in other flower growing regions.

The focus on export industry is also said to divert the scarce water and land resources away from local food production.[446] According to Shiva, rising agricultural exports are interrelated with declining food output per head. The profits made by the flower growing industry may therefore have very adverse side effects.

Another factor is that the majority of the flower growing industry is foreign owned. Most of the profits are being channelled back to developed countries.[447] And if the profitable circumstances in a particular country cease to exist (such as preferential market access), the foreign investor can move to another country with relative ease.

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[444] Ibid.

[445] Ibid.

[446] V Shiva *Export at Any Cost, Oxfam's Free Trade Recipe for the Third World* available at http://www.zmag.org/content/showarticle.cfm?ItemID=1557 (accessed 10 February 2006).

[447] K Ngotho *Kenya's wealth in foreign hands* available at http://www.eastandard.net/archives/sunday/print/news.php?articleid=18216 (accessed 10 February 2006).

9 Conclusion

It is fair to say that the TRIPS agreement was forced upon developing countries. Despite their initial objections, developing countries had no choice but to accept. TRIPS requires developing countries to implement the high standards of intellectual property which were previously only found in developed countries.

Protection of plant varieties is mandatory in TRIPS. The agreement gives member states the choice between a patent system which includes plants, a sui generis system which protects plant varieties or a combination of the two. This provision is a compromise between the European and the American system of plant variety protection. Utility patents for plant varieties are available in the United States but prohibited in Europe. Both systems provide for sui generis protection of plant varieties.

Developing countries have expressed numerous concerns about the patenting of life forms and the mandatory protection of plant varieties. They are of the opinion that the developed countries' system is not readily transferable to developing countries. The TRIPS agreement omits provisions on important aspect for developing countries such as access to genetic resources and the protection of biodiversity and traditional knowledge. Developed countries on the other hand emphasise the benefits that patent laws and plant variety protection will have for developing countries. One of those benefits is the access to biotechnical inventions.

While article 27.3(b) of TRIPS sets strict requirements for patent protection, the option for a sui generis system of plant variety protection is less specific. Only a few basic requirements can be drawn from the context. TRIPS therefore potentially allows for a sui generis system of plant variety protection which addresses the concerns of developing countries. The Indian legislation and the African model legislation are good examples thereof.

Most developing countries however seem to choose for the UPOV system of plant variety protection. Their choice is likely to be influenced by bilateral agreements which impose TRIPS plus standards.

While the review of article 27.3(b) of TRIPS has been ongoing for years, no decisions have been made as to its fate. Given the content of the discussion however, it is highly unlikely that the obligation to provide for plant variety protection will disappear. Countries who have not yet implemented a system for plant variety protection must therefore analyse their options.

Patent protection for plant varieties is not a likely choice for developing countries because of their moral objections to the patenting of life forms. That leaves the choice for the UPOV system of plant variety protection which is heavily in favour of breeders' rights, or for a system such as India has which may be more appropriate for developing countries.

One of the factors which will influence this choice is the impact of the plant variety protection system on the economies of developing countries. This paper has analysed one aspect of the economy, the cut flower export industry.

The analysis had led to the conclusion that an effective system of plant variety protection is a necessary condition for the cut flower export industry. Flower growers need access to new high value varieties to counter the costs of transportation. Breeders do not release their new varieties in countries who fail to protect them against unauthorised use of the new varieties.

This conclusion suggests that developing countries who wish to participate in the flower export industry need to create an incentive for foreign breeders to release their new varieties. The incentive is likely to be created by the adoption of a plant variety protection system which gains the trust of the breeder. The fact that most flower breeders are familiar with the UPOV system gives this system an advantage over other sui generis systems. The most favourable protection for breeders is currently found in legislation based on the 1991 UPOV Act. This act

gives breeders strong rights with few exceptions. For developing countries who wish to create optimal incentives for a profitable flower export industry, membership of UPOV and implementation of the 1991 UPOV Act would be the best choice.

The overview of plant variety protection systems in the current major flower exporting developing countries however suggests that legislation based on the UPOV 1978 Act is also sufficient to gain the breeder's trust. The 1978 Act is regarded as more appropriate for developing countries because it implicitly allows for the use of farm-saved seed. Countries who base their legislation on this Act could consider making an exception to the use of farm-saved seed for ornamental varieties in order to make the system more attractive for flower breeders. The problem is that UPOV has closed membership to the 1978 Act which means that countries who now choose for the 1978 Act cannot enjoy the benefits of UPOV membership.

While the choice for UPOV may thus be valid in relation to the cut flower export industry, this is not to say that is an overall good choice. Developing countries seriously have to consider the negative effects of the UPOV system on rights of farmers and indigenous communities and choose for a system which best serves their interests as a whole. It should be noted however that the regulation of access to genetic resources and the protection of biodiversity and traditional knowledge does not necessarily have to be integrated in the legislation on plant variety protection. Countries such as Brazil have developed separate legislation for these purposes.

In creating incentives for a cut flower export industry, which can potentially bring huge economic benefits, developing countries should also seriously consider and address the negative impacts the flower growing industry can have. After all, as Pascal Lamy said, trade is only a tool to elevate the human condition. There are no roses without thorns.

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