

**THE RELATIONSHIP BETWEEN INTELLECTUAL  
PROPERTY RIGHTS (TRIPS) AND FOOD SECURITY**

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## 1. Introduction

Hunger is a profound affront to human dignity and human rights. It is a fundamental constraint to development, fuels conflict and crime, reduces productivity and shortens life span. At the World Food Summit, convened in Rome in 1996, by the Food and Agriculture Organization of the United Nations (WFS) it was reported that more than 800 million people, particularly in developing countries, do not have enough food to meet their basic nutritional needs. It was estimated that some 400,000 people were killed by malnutrition daily. The 185 countries participating at the Rome Summit, vowed to achieve universal food security. Food security as defined as physical and economic access of all peoples at all times to sufficient high-quality, safe and nutritious food to meet their dietary needs and food preferences to lead active and healthy lives.<sup>1</sup> The Rome Declaration, which was issued by the Summit pledged to cut the number of hungry people in half by 2015. This goal was also included in the Millennium Declaration of the United Nations in 2000. This objective required the number of undernourished to fall at a rate of 20 million per year. However, data in 2001 indicated that the rate of decline was less than 8 million per year.<sup>2</sup>

At the current rate of global population increase it has been estimated that the global demand for cereals will increase by 20% between 1995 and 2020 and that net cereal imports by developing countries will have to double to meet the gap between production and demand.<sup>3</sup> Currently, the developing world is a net importer of 88 million tons of cereals a year at a cost of US\$14.5 billion and that the global demand for cereals will increase by 40% between 1995 and 2020.<sup>4</sup> Paradoxically, a 1999 study of the International Food Policy Research Institute (IFPRI) has estimated that world food supply would continue to outpace population growth at least to 2020.<sup>5</sup>

There is a complex of factors which is responsible for food insecurity in developing countries. Among these factors, poverty and deficiencies in access to food are major contributors. Over 1.3 billion of the world's population have incomes of less than \$US1.00 per day, while another 2 billion people are only marginally better off.<sup>6</sup> The Plan of Action adopted at the WFS identified poverty eradication as a prerequisite for the attainment of food security. It stressed the importance of access to: land, water, improved seeds and plants, appropriate technologies and farm credits.

The massive increases in food productivity in the 30 years between 1960 and 1990, which is described as the Green Revolution, was achieved by increasing the productivity of cereals, expanding the area of arable land and by massive increases in fertiliser and insecticide use. To meet the food security needs of the next 30 years and to create wealth in poor communities, there is a need to increase agricultural

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<sup>1</sup> FAO, 'Global meeting to assess progress on World Food Summit goals', <[www.fao.org/news](http://www.fao.org/news)>.

<sup>2</sup> Ibid.

<sup>3</sup> P. Pinstруп-Andersen, R. Pandya-Lorch and M.W. Rosegrant, *World Food Prospects: Critical Issues for the Early Twenty First Century* (Washington, DC: International Food Policy Research Institute, 1999), ch.1.

<sup>4</sup> I. Serageldin and G.J. Pursley, *Promethean Science. Agricultural Biotechnology, the Environment and the Poor* (Washington: CGIAR, 2000), 3.

<sup>5</sup> See Pinstруп-Andersen, n.3 supra.

<sup>6</sup> World Bank, *World Development Report 1997*, Oxford: Oxford University Press, 1997.

productivity on the presently available land, while conserving the natural resource base.<sup>7</sup>

A reliance upon the chemically nurtured, high yielding crop varieties of the past is no longer economically or environmentally acceptable. A second Green Revolution is required which combines traditional agronomic wisdom with modern agricultural science.<sup>8</sup> It is in this area of agricultural innovation that intellectual property rights plays an important role.

## **2. Intellectual Property Rights and Agriculture**

As early as the 1883 Paris Convention for the Protection of Industrial Property, agriculture was envisaged as an area of enterprise in respect of which property rights could be secured, thus Article 1(3) of the Convention had declared that

Industrial property shall be included within the broadest sense and shall apply not only to industry and commerce proper, but likewise to agricultural and extractive industries and to all manufactured or natural products, for example, wines, grain, tobacco leaf, fruit, cattle, minerals, mineral waters, beer, flowers and flour.

Given the state of technology in 1883, the inclusion of these agricultural subjects within the Paris Convention, was probably in the context of the protection of trade marks and indications of source. The importance of the latter was reflected in the Second Conference of Revision of the Paris Convention, held at Madrid in 1890-91, which proposed a special agreement for the repression of false indications of origin.

As is indicated below, the first significant application of intellectual property to agriculture occurred with the evolution on the initiative of associations of horticulturalists and plant breeders of the UPOV Convention for the protection for plant varieties. The traditional practice of farmers in replanting, exchange and sale of seed from the previous harvests impacted upon the capacity of breeders in recouping investments through repeat sales of improved varieties. Consequently, the UPOV convention was amended to permit limitations to the extent of seed saving. These limitations have had an impact on food security in circumscribing the availability of saved seed to farming communities.

In any event, the development of the modern biotechnology, which has led to the patenting of the genetic composition of new varieties, provides on the threat of a patent infringement action an effective bar to the capacity of farmers to save seed.

Although the patent laws and UPOV recognise and reward the contribution made to agricultural innovation by plant breeders and agricultural biotechnologists, they ignored the contribution of traditional farmers to the conservation and development of plant genetic resources from which some of these new varieties derived. The FAO International Treaty on Plant Genetic Resources for Food and Agriculture seeks to establish principles for

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<sup>7</sup> See G.Conway, *The Doubly Green Revolution- Food for All in the Twenty-First Century*, Harmondsworth: Penguin, 1997.

<sup>8</sup> See I. Serageldin and G.J.Persley, *Promethean Science.Agricultural Biotechnology, the Environment and the Poor*, Washington D.C.:Consulting Group for International Agricultural Research, 2000, 6.

facilitating access to plant genetic resources and establishing fair and equitable mechanisms of benefit sharing.

A recent suggestion for the protection of the contribution of traditional farmers, both to the conservation of genetic resources and to the preservation of traditional varieties, is through the application of geographical indications protection.

### **3. Legal and Institutional Aspects**

#### **3.1 An Overview of IP Rights Related to Food and Agriculture**

Intellectual property rights impact food security in three principal areas: plant variety rights protection, patenting and geographical indications.

##### **(a) Plant Variety Rights Protection**

###### **(i) Introduction**

As with other categories of intellectual property, a key role in the inclusion of agricultural innovations within the international regulatory regime was played by industry associations. The Congrès pomologique de France, held in 1911, had called for special protection for plant varieties. The International Union of the Horticultural Profession, also considered the matter at its Congresses in Luxemburg (1911), London (1912) and Ghent (1913). The International Institute of Agriculture in its 1927 Congress had stated that the protection of a denomination was insufficient and that a way had to be found to require “any grower who engaged in reproduction of those breeds for the purposes of sale to pay a royalty to the producer”.<sup>9</sup> The International Federation of Breeders of Staple Crops had in its 1931 conference, expressed the hope that the legal status of new varieties be assimilated to that of industrial inventions. Discussions concerning the creation of a new organization to agitate for the promulgation of an international legal regime for the protection of plant varieties, occurred at the meetings of the International Breeders’ Congress at Leeuwarden in 1936 and the 1937 Conference of the International Organization of Agricultural Industries, also held in the Netherlands. The direct result of these discussions was the foundation in Amsterdam on 17 November 1938, of the International Association of Plant Breeders for the Protection of Plant Varieties (ASSINSEL). The first ASSINSEL Congress, held in Paris on July 8 and 9, 1939 adopted a three-point resolution:

- (a) To accept internationally the filing of trademarks and appellations as a means of protection (pending introduction of a patent);
- (b) To adopt the principle of a licence, to be drawn up by ASSINSEL for the purposes of multiplication and sale; and
- (c) To accept internationally the definition of the word ‘original’ [as] seed produced, offered or sold by the breeder of the variety or under his control by his licensees or successors in title.

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<sup>9</sup> Quoted in UPOV, ‘The History of Plant Variety Protection’ in The First Twenty-five Years of the International Convention of the Protection of New Varieties of Plants, UPOV, Geneva, 1987, 80

The Second World War interrupted these developments. At its Semmering Congress in June 1956 a resolution of ASSINSEL called for an international conference to promulgate an international system for the protection of plant varieties. The French Government had been approached by ASSINSEL, because it had indicated a favourable attitude. On 22 February 1957, the French Government issued invitations to 12 Western European countries<sup>10</sup> to attend a diplomatic conference in Paris Conference from May 7 to 11, 1957 to consider establishing an international regime for the protection of plant varieties. Participation was limited by the French to those states who were known to have similar concerns to it on this subject. The conclusions of the 1957 Conference were set down in its Final Act, adopted on May 11, 1957. This recognised the legitimacy of breeders' rights and established as the preconditions for protection, that a variety had to be distinct from pre-existing varieties and sufficiently homogenous and stable in its essential characteristics. It defined the rights of the breeder and acknowledged the principle of the independence of protection. Following three meetings of the Drafting Committee and two meetings of Committees of Experts, the second session of the Conference was held in Paris from 21 November to 2 December, 1961. An International Convention for the Protection of New Varieties of Plants (UPOV) was presented for the Consideration of the Conference.

## **(ii) Definitions**

Most plant variety protection (PVP) laws are modelled on the UPOV Convention. Generally, under this legislation the plant breeder is conferred an exclusive right to do or to licence the following acts in relation to propagating material of the variety:

- produce or reproduce the material;
- condition the material for the purpose of propagation;
- offer the material for sale;
- sell the material;
- import the material;
- export the material;
- stock the material for the purposes described above.

Generally excepted from these rights are acts done privately and for non-commercial purposes, or for experimental purposes, or for the purpose of breeding other plant varieties. Under the 1978 and 1991 versions of UPOV, seed saved by a farmer from harvested material and treated for the purpose of sowing a crop on that farmer's own land may be permitted under legislation as a non-infringing use. In some countries plant variety rights might be exempted from infringement when propagating material is used as a food, food ingredient or fuel, or for any other purpose not leading to or involving the production or reproduction of propagating material.

The general duration of PBR under the UPOV Convention is 25 years in the case of trees and vines and 20 years for any other variety.

As with patents, PVP is established after a registration process. A plant variety is considered to be registrable, if it has a breeder, is distinct, uniform, stable and has not been or has only recently been exploited. A plant variety is considered distinct if it is clearly

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<sup>10</sup> I.e Austria, Belgium, Denmark, Finland, Federal republic of Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and the UK.

distinguishable from any other variety whose existence is a matter of common knowledge. It is uniform if, subject to the variation which may be expected from the particular features of its propagation, it is uniform in its relevant characteristics on propagation. A plant variety is stable if its relevant characteristics remain unchanged after repeated propagation. A plant variety is taken not to have been exploited if it or propagating material has not been sold to another person by or with the consent of the breeder. The test of no commercial exploitation is easier to satisfy than the test for novelty under patent law and the choice between the two forms of intellectual property right is a matter to be considered by the agricultural research institute.

PVP, following from the 1991 version of UPOV, discussed below, also extends to varieties which are “essentially derived” from protected varieties. Although in practice there is a fair degree of confusion as to the criteria to be applied in ascertaining whether a variety is essentially derived.

Legislation based on the UPOV Convention generally provides for the grantee of PVP to take all reasonable steps to ensure reasonable public access to the plant variety. This requirement is taken to be satisfied if propagating material of reasonable quality is available to the public at reasonable prices, or as gifts to the public, in sufficient quantities to meet demand. An appropriate person may be licensed to sell or produce propagating material of plants of that variety on reasonable terms and conditions. Generally an exception to the grant of a compulsory license applies in the case of a plant variety which has no direct use as a consumer product.

### **(iii) International protection of plant varieties**

#### **1. The UPOV Convention**

The UPOV Convention was signed on 2 December 1961 by the representatives of Belgium, France, the Federal Republic of Germany, Italy and the Netherlands. On 26 November 1962, the signatures of Denmark and the UK were added, followed by Switzerland on 30 November 1962. The Convention entered into force on 10 August 1968, following its ratification by Netherlands, the Federal Republic of Germany and the UK. The Convention applied to “all botanical genera and species”, but it was envisaged that the it would have a gradual introduction. A list of 13 genera was annexed to the Convention: wheat, barley, oats or rice, maize, potato, peas, beans, Lucerne, red clover, ryegrass, lettuce, apples, roses or carnations. Article 4(3) required each member State on entry into force of the Convention to apply it to at least five genera from this list and within eight years to all the listed genera.

Article 27 of the 1961 Convention provided for its periodic review, with the first revision scheduled for 1972. Within the first 19 years of its life, the UPOV Convention had attracted the accession of only 12 States. A reason which was identified for the reluctance of States to adopt the Convention was the stringency of its provisions, in particular the obligation of states to select either patent or UPOV-style protection for plant varieties. Article 2 of the Convention was amended to permit the accession of countries like the USA, which had laws allowing or the double protection of varieties under patent and sui generis laws. The list of genera, annexed to the 1961 Convention was removed. This list had contained mainly species from temperate climates. Under

the new Article 4, member states agreed to apply the Convention to at least five genera or species, rising to 24 genera of species within eight years. Additionally a grace period was introduced, to permit the marketing of varieties 12 months prior to an application for plant variety protection being made.

A further broadening of the UPOV Convention occurred with the 1991 Revision. The 1991 Act requires states to protect at least fifteen plant genera or species upon becoming members of the Act, and to extend protection to all plant varieties within ten years (Article 3(2)). In response to demands from breeders in industrialized countries, the 1991 Act removed the prohibition against dual protection. The 1991 Act recognized the right of breeders to use protected varieties to create new varieties. However, this exception is itself restricted to such new varieties as were not "essentially derived" from protected varieties (Articles 14(5), 15). The drafters added this restriction to prevent second generation breeders from making merely cosmetic changes to existing varieties in order to claim protection for a new variety. The concept of essential derivation has proved highly controversial in practice, however. Breeders have been unable to agree on a definition of the minimum genetic distance required for second generation varieties to be treated as not essentially derived from an earlier variety and thus outside of the first breeder's control.<sup>11</sup>

From the perspective of farmers, probably the most contentious aspect of the 1991 Act was the limitation of the farmers' privilege to save seed for propagating "on their own holdings" the product of the harvest which they obtained by planting a protected variety "on their own holdings", "within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder" (Article 15(2)). Unlike the 1978 Act, the 1991 version of the farmers' privilege does not authorize farmers to sell or exchange seeds with other farmers for propagating purposes. This is criticized as inconsistent with the practices of farmers in many developing nations, where seeds are exchanged for purposes of crop and variety rotation.<sup>12</sup>

A number of developing countries have resisted the adoption of the 1991 Act as the standard for plant variety protection laws. The foreign ministers of Organization for African Unity issued a statement at a January 1999 meeting calling for a moratorium on IPR protection for plant varieties until an Africa-wide system had been developed that granted greater recognition to the cultivation practices of indigenous communities.

## 2. The TRIPS Agreement

Probably the most notorious requirement of the TRIPS Agreement is that in Article 27.3(b) which requires that Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof". Article 8 of the Agreement, in enunciating the principles which are to animate it, provides that "consistent with the provisions of the Agreement, signatories may "adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development". It would not be too difficult to construct an argument that the obligation

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<sup>11</sup> See L. Helfer, *Legal Study on Intellectual Property Rights in Plant Genetic Resources*. FAO, Rome, 2001. para.1.1.1.4.

<sup>12</sup> D. Leskien, and M. Flitner, 'Intellectual Property Rights and Plant Genetic Resources: Options for a *sui generis* system'. (1997) No 6, *Issues in Genetic Resources*, Rome, IPGRI, 60.

to protect plant varieties might be inconsistent with food security. However, the opening words of Article 8 suggest that in a conflict between these provisions, the obligations within the Agreement, such as Article 27.3(b) are paramount.

The principal technical issues which have been raised in relation to the implementation of effective *sui generis* protection of plant varieties under TRIPS are: (a) what is meant by “effective”? and (b) what *sui generis* options are open to Member states?

Article 27.3(b) provides no guidance on what is meant by “effective”, the debate in the TRIPS Council having focused upon which *sui generis* systems satisfy the obligation, One interpretation is that effective refers to the enforceability of the PVP rights granted by the relevant legislation. It has been suggested that if the debate shifted to the meaning and implication of “effective”, the following would be among the conclusions reached:

- the *sui generis* system should be effective to *protect plant varieties* as such (including varieties developed by local communities and national/public research institutes);
- the rights of plant breeders should be protected as an international obligation as and when assumed by Members;
- the rights to be protected should be those set out in the obligations Members have assumed (for instance under the Agreement on TRIPS and equally the CBD);
- the rights should be protected in accordance with national objectives referred to in article 7 and the principles in article 8 (Agreement on TRIPS) as apply in the country should be protected within the overall framework of the CBD and the first recital of the preamble to the WTO Agreement - on sustainable development, and
- the protection should be consistent with international obligations that Members have assumed, for instance under the CBD.

Since the TRIPS provision makes no reference to the UPOV Convention there is considered to be some leeway in the formulation of *sui generis* systems. Furthermore, key elements for the shaping of *sui generis* systems are either unclear or not defined. First, there could be several ways to define the term plant variety. For granting protection under the traditional plant breeders right (PBR) system, plant varieties must meet the criteria of being distinct, uniform and stable (DUS). It has been suggested that "Uniformity" and "stability" could be replaced by the criterion of identifiability, allowing the inclusion of plant populations which are more heterogeneous, thus taking into account the interests of local communities.<sup>13</sup> The scope of protection could be limited to cover only the reproductive parts of plants, or could be extended to include also harvested plant materials.

Secondly, the TRIPS Agreement does not prohibit the development of additional protection systems, nor does it prohibit the protection of additional subject matter to safeguard local knowledge systems and informal innovations as well as to prevent their illegal appropriation.

A *sui generis* option in the intellectual property context is usually taken to refer to a specially coined IP right outside the traditional categories of IP protection. The *sui generis* system may be defined and provided in various legal forms. For example, the system could be a stand-alone plant variety law, or it could be provided by, say, a modified patent law, as

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<sup>13</sup> Seiler, 'Sui Generis Systems: Obligations and options for developing countries.' Biotechnology and Development Monitor, (1998) No. 34, *Biotechnology and Development Monitor* 2.

is, for example, with the United States Plant Patent Act, which protects asexually reproduced plants through a modified patent system. Alternatively, the *sui generis* system could be embedded within non-IPR legislation, such as a biodiversity conservation or access and benefit sharing law, as in Costa Rica.

UPOV has advanced its system as the principal workable example of a *sui generis* plant variety protection system. It is interesting to note that the drafters of the TRIPS Agreement, who felt free to import into the agreement, provisions from other named international instruments, such as the Paris, Berne and Rome Conventions and the Washington Treaty on Integrated Circuits, in the area of plant varieties desisted from specifically importing the UPOV Convention.

Realistic proposals for non-UPOV plant variety protection systems have been few. This is probably one of the reasons why more developing countries are joining UPOV. Nonetheless, it is important to consider alternatives to UPOV so that informed decisions can be made.

In order to help countries devise an appropriate *sui generis* system, the International Plant Genetic Resources Institute (IPGRI) came up with a list of key questions that decision makers should take into account<sup>14</sup>. These are as follows:

- What kind of domestic seed industry exists?
- What kind of public breeding sector exists?
- What kind of seed supply system is in place?
- To what extent is farm-saved seed used in the country?
- What is the current capacity of breeders?
- What do local breeders want to do in the next 5-10 years?
- Are external inputs to agriculture low or high?
- What are the country's production needs and objectives?
- What is the country's biotechnology capacity?
- What are the goals and realistic expectations of the biotechnology sector?
- What kinds of strategic alliances will the country want to enter into in the next 5-10 years and how involves will other countries be?

The fact that the answers to these questions will vary widely from one country to another suggests that, as with patents, one size is unlikely to fit all.

A primary question is how could a *sui generis* system be devised to resolve the alleged difficulties concerning UPOV's protection requirements? Leskien and Flitner, in their report for IPGRI on options for a *sui generis* system<sup>15</sup>, suggest a number of alternative requirements.

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<sup>14</sup> IPGRI, *Key Questions for Decision-makers: Protection of Plant Varieties under the WTO Agreement on Trade-related Aspects of Intellectual Property Rights*, IPGRI, Rome, 1999.

<sup>15</sup> D. Leskien, and M. Flitner, *Intellectual Property Rights and Plant Genetic Resources: Options for a Sui Generis System. Issues in Genetic Resources No. 6*, International Plant Genetic Resources Institute, Rome, 1997.

The first is to apply a less strict interpretation of ‘uniformity’ and ‘stability’ requirements. In theory this might provide an incentive for breeders to rely less on elite germplasm and to seek out less researched and more genetically diverse resources. This could in turn result in more seed varieties appearing on the market and those available differing more widely from the others. More choice for farmers is likely to enhance the viability of agricultural systems everywhere.

The second is to differentiate between homogeneous/uniform varieties and heterogeneous and traditional varieties in extent of rights available. The latter varietal types could still be protectable if they are clearly identifiable but since broader claims would result, the rights should be weaker. However, one possible danger of allowing broader claims in this way is that corporate bioprospectors rather than local communities would take advantage of this and ‘jump the queue’ by promptly submitting applications for discovered landraces (or those they already hold in their collections).

The scope of protection of UPOV 1978 is somewhat weaker than that of UPOV 1991 and might be preferable for developing and least developed countries that have no experience of administering a plant variety right system and find it difficult to identify possible beneficiaries of an IPR system for plant varieties. Upholding the farmers’ privilege would lessen possible intrusion on the customary practices of local communities. Therefore, a *sui generis* system using UPOV 1978 as its model in terms of scope of protection but with different protection requirements as described above might be more appropriate than a patent or UPOV 1991-type system for some countries. However, countries that wish to join UPOV are now required to accept the 1991 version.

Leskien and Flitner refer to various additional components to balance the IPRs granted to plant breeders with the interests of society as a whole and/or to local communities. One is an additional requirement for protection, based on early German PVP law, of ‘value for cultivation and use’ (VCU). Defining the VCU requirement would be left to national governments and could be adopted to ensure that breeders contribute to certain national priorities. For example, for a new variety to acquire protection, VCU might require applicants to demonstrate the socio-economic welfare or environmental benefits of the new variety, such as how it might benefit small farmers in terms, say of enhancing productivity or requiring fewer inputs.

Another is to introduce a community gene fund. Such a fund might be financed through a levy on the gross value of seeds sold. If genetic material in these seeds can be traced to a locality, the communities could be rewarded for their efforts in conserving the genetic material in question. In cases where provenance cannot be established, Leskien and Flitner suggest that funds could then be used to support *in situ* conservation in priority regions where biodiversity is particularly threatened. However, when discussing the apportioning of benefits, it may be unrealistic to suppose that such a fund would be very large or could benefit single communities to any significant extent. Moreover the transaction costs incurred in the tracing of beneficiaries and distributing of benefits would probably be too high for community gene funds to serve as an effective benefit sharing mechanism.

A few interesting model *sui generis* systems have been proposed with Article 27.3 (b) in mind, notably Leskien and Flitner’s plant variety protection seal model, as described in the

above report, and Butler and Pistorius<sup>16</sup> remuneration system. These are briefly presented and analysed below.

(i) *The plant variety protection seal model* would grant the right holder an exclusive right to a seal or certificate for a variety that has fulfilled the requirements laid down in the *sui generis* system, one of which they suggest could be identifiability. The difference between such a seal and a trademark is that the seal would not only constitute the variety's denomination but would also certify full compliance of the variety with the protection requirements. Only the use of the seal in combination with the registered denomination and the material of the variety would be the exclusive right of the holder and those having the holder's authorisation.

Once seed has been sold by the seal owner or others authorised by the owner, there will be no further restrictions on use and sale of the variety. Thus farmers would be allowed to save and sell seed. Leskien and Flitner argue that in spite of this, the seal holders could still enjoy a competitive advantage especially if the protection requirements of the *sui generis* system were adapted to the needs of farmers. Given that the rights are not as strong as those provided by the UPOV Convention or patents, Leskien and Flitner suggest that the duration of the right could be made longer than the minimum protection terms required by UPOV or the TRIPS patent provisions.

However, it seems very doubtful that seal holders really could sustain a comparative advantage for any length of time when other breeders (or farmers) can so easily produce and sell the same variety. Therefore, the system would almost certainly be highly unpopular with plant breeders, who, if the system came into existence, would very likely respond by focusing more of their research on developing genetically-uniform hybrids and crops that lend themselves to hybridisation.

(ii) *The 'remuneration without ownership/property right' model* is designed with the following objectives: (i) to remunerate innovative plant breeding and provide incentives to encourage the development of novel plant varieties; (ii) to allow farmers access to varieties available on the commercial market and to save, sell, exchange, and use these varieties for breeding purposes, without violating private property rights; and (iii) to provide incentives to preserve, create and enhance biodiversity. Butler and Pistorius propose that the system should follow the example of a Dutch law in force between 1941 and 1966 by eliminating the concepts of 'ownership' and 'property rights' in plant genetic resources and relaxing the conditions for the registration of new varieties. The model would require all farmers to pay a tax on each crop based on the number of hectares they planted in each crop variety. The funds collected this way would be used to pay plant breeders a remuneration for breeding new varieties with payment based on the proportion of total hectares planted each year for 25 years. The right of farmers to save, sell and use seed for breeding purposes would not be restricted. According to the two authors, although breeders are likely to be concerned about these freedoms, in developing countries they may have little to lose from not being able to enforce exclusive rights to their varieties. This is because most of the seed trade in developing countries is in the informal sector, and farmers often cannot afford new commercial varieties.

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<sup>16</sup> B. Butler, and R. Pistorius, 'How Farmers' Rights can be used to adapt Plant Breeders' Rights'. (1996) 28 *Biotechnology and Development Monitor*, 7-11.

Butler and Pistorius also acknowledge that estimating the areas of cropland planted in a particular variety could be difficult. One might go further and suggest that the costs of monitoring and enforcement could be so huge as to make the system unworkable, especially in large countries and those that lack an effective seed certification system. Besides, TRIPS states that IPRs are private rights, yet this system does not allow the breeders even to control the level of remuneration due to them. Therefore, it may well be considered unacceptable by the TRIPS Council.

Ghijsen suggests that different Plant Variety Protection (PVP) issues arise in relation to three distinct categories of plant: (a) open pollinated food crops; (b) inbred lines and horticultural crops; and (c) medicinal plants.<sup>17</sup> In relation to open pollinated food crops such as cereals and tubers, seed saving is important for farmers in developing countries. Landraces are excluded from protection by the requirement that a new variety is distinct from "varieties of common knowledge". Similarly, material in germplasm collections, might be preserved from private exploitation through the publication of information about deposited materials, thereby placing them in the public domain. More importantly, the distribution of collected materials may be protected by means of material transfer agreements (MTAs) which prevent the seeking of IPRs in relation to those materials (or from essentially derived varieties).

For inbred lines and horticultural crops, such as ornamentals, fruits, vegetables and plantation crops, seed saving is not generally an attractive option for farmers.

Correa<sup>18</sup> has suggested that a *sui generis* regime may provide for a dual system of protection which includes both "modern" as well as farmers' varieties. Modern varieties would be protected under a UPOV-like legislation, requiring novelty, distinctness, uniformity and stability. For other cases (farmers' varieties) the requirements may be less stringent and be limited, for instance, to sufficient identification and distinctness. This distinction would take account of the more variable nature of farmers' varieties. Since the creation of the latter variety is generally a collective endeavour, the rights would be granted to the community that has developed and used the variety. In the case of farmers' varieties, national legislation may recognize a "remuneration right", that is, an entitlement to receive compensation in all cases of use of a protected variety for propagating purposes outside the respective farming community or communities. This formulation would amount, in practice, to an open licensing system under which any interested party may utilize the protected variety for planting or multiplication, against a payment in favour of the titleholders.

Another possibility for protecting farmers' varieties, suggested by Correa<sup>19</sup> would be through a regime that aims to prevent the misappropriation of such varieties. National legislation would provide that intellectual property rights could not be obtained with respect to farmers' varieties (or derivatives therefrom). In the case of infringement of this rule, the conferred title should be declared void. Given the collective nature of these

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<sup>17</sup> H. Ghijsen, 'Plant variety Protection in a developing and demanding world' *Biotechnology and Development Monitor* (1998) No.36:2-6.

<sup>18</sup> C.M Correa, *Options for the Implementation of Farmers' Rights at the National Level*. Trade-Related Agenda, Development and Equity (T.R.A.D.E.) Working Paper 8. Geneva, South Centre: December, 2000. 7-8.

<sup>19</sup> *Ibid.*, 32-33.

rights and the lack of legal personality for farmers communities, Correa suggests the establishment of an "ombudsman" empowered with the right to act on behalf of the communities so as to enforce their rights.

The features of the misappropriation regime, suggested by Correa are:

- it would recognize the informal, collective and cumulative systems of innovation of local and indigenous communities and farmers;
- no novelty, inventiveness or secrecy would be required;
- there would be no arbitrary time limit for protection;
- the conferred rights would be "non-monopolistic" and would not hinder the non-commercial use and exchange of germplasm within and among communities;
- no registration, and therefore, administrative machinery, would be necessary;
- it would not oblige farmers or communities' members to keep secrecy or change their traditional practices;
- since no monopolies would be recognized, possession of the same knowledge by different communities would be perfectly legitimate;
- the rights against infringers would arise when a variety has been acquired in a manner contrary to certain rules, such as national access legislation or other accepted practices on the collection of germplasm.

#### **(iv) PVP and Agriculture in the EU**

On 27 July 1994 the Council of the European Union adopted Regulation 2100/94 on Community plant variety rights. This Regulation was based on the 1991 Act of the UPOV Convention. The Regulation enables applicants, on the basis of one application to the Community Plant Variety Office (CPVO) in Angers, France, to be granted a single PVP right, throughout the EU. From 1996 the number of applications received by the CPVO rose from 1385 to 2013 in 2000. Of the total applications, 86% were received from EU-countries.

A Community Plant Variety Right (CPVR) has a uniform effect throughout the EU and can only be granted, transferred or ceased within this territory on a uniform basis. The EU system exists alongside national systems as an alternative. It is not possible to hold Community and national plant variety rights simultaneously for the same variety. Also, the CPVR cannot coexist with a patent. Where a CPVR is granted in relation to a variety for which a national right or patent has already been granted, the national right or patent is suspended for the duration of the CPVR.

Varieties of all botanical genera and species, including in particular their hybrids, can be the object of a CPVR. For the definition of the term "plant variety" the regulation refers to the UPOV Convention 1991, Article 1. Protectable varieties must be distinct, uniform, stable and novel and also be designated by a prescribed variety denomination (Articles 5 and 6)

Article 13 of the Regulation provides that Community plant variety rights confer to their holder the right to perform the following acts: production or reproduction, conditioning for the purpose of propagation, offering for sale, selling, exporting from the Community, importing in the Community, etc. of the variety for which Community protection has been granted. This is also the case for essentially derived varieties. Once granted, the maximum duration of a CPVR is 25 years, or 30 years in case of vine and tree varieties. These periods may be extended by legislation for a further 5 years in relation to specific genera or species; the duration of the right in relation to potato varieties has been extended to 30 years.

In order to safeguard agricultural production, farmers are authorised by Article 14 to use, for propagation purposes in fields on their own holding, the product of the harvest obtained by cultivating on their own holding. The derogation applies only to certain prescribed agricultural crops.

Besides the farmer's privilege, the following categories do not fall within the scope of the CPVR:

- acts done privately and for non-commercial purposes;
- acts done for experimental purposes;
- breeders' privilege: acts done for the purpose of breeding, or discovering and developing other varieties;

- the above mentioned breeders' privilege does not extend to essentially derived or non-distinct varieties;
- acts whose prohibition would violate the provisions in accordance to public morality, public policy, public security or "public order". Also, acts which would violate the principles of compulsory exploitation rights which are non-exclusively granted by the CPVO on grounds of public interest and after consulting the Administrative Council.

An application for a Community plant variety right may be filed by any individual or company whose domicile, seat or establishment is located in the European Union. Individuals or companies from a signatory state to the UPOV Convention, who are not nationals of the EU can also apply, provided that an agent domiciled in the Community has been nominated. An application may also be filed by nationals of any other state who do not meet the requirements above, if a reciprocal situation exists between the state and the European Union.

The holder of a CPVR may bring an action for an injunction or compensation against infringement. This is also the case for such acts in relation to "material" from the protected variety, in relation to essentially derived varieties, other indistinct varieties and hybrid varieties dependent on the protected variety for their production. The holder of a CPVR may also bring an infringement action against those who have used a variety denomination that may be confused with that of the holder, or who did not use a variety denomination correctly. An action for infringement may also be brought against any person who has an exploitation right and violates its terms or conditions.

There are a few differences in the substantive law between CPVR and the 1991 Act of the UPOV Convention. In the conditions for protection such as distinctness, uniformity and stability are minor wording differences with respect to the former called "important characteristics" distinguishing a new from already existing varieties. However, it is not clear yet whether this will lead to different interpretation by the courts. With respect to the conditions for novelty, the EC CPVR is more detailed than the UPOV Convention providing that, "A variety is deemed to be new if, at the date of application, the variety constituents or harvested material of the variety have not been sold or otherwise disposed of to others, by the breeder or with his consent for purposes of exploitation of the variety:

- within the territory of the Community, for more than one year as from the filing date of the application;
- outside the territory of the Community, for more than four years or, in the case of fruit trees or vines, for more than six years as from the filing date of the application."

The scope of protection of a plant variety may be different in respect of products obtained directly from material of the protected variety. This protection is clearly granted by the UPOV Convention (Article 14 (3)), but restricted to "specific cases" by

the Council Regulation concerning the CPVR (Article 13 (4)). The latter makes use of the exemption for farm saved seeds that is opened by the UPOV Convention.

All EU Member States, excluding Greece and Luxembourg, which are not parties to the UPOV Convention have already either implemented the basic principles defined by UPOV in their domestic laws, or will do so. Therefore, a substantial degree of harmony exists or will exist in the near future in the practical operation of the protection system.

As is discussed below, the EU does not permit the patenting of plant varieties. The Biotechnology Directive<sup>20</sup> allows patent protection for plants provided the application of the invention is not technically confined to a single plant or animal variety and where a plant grouping is characterised by a particular gene and not its whole genome.

The Directive also allows a farmer to produce seed or other plant propagation material for a specific plant variety which is protected by patent for his own enterprise, provided that he acquired the original material from the patentee and/or with his agreement. In this respect the Directive grants a privilege to farmers.

## **(b) Patents**

### **(i) Introduction**

Plant Variety Protection laws were developed in response to industry calls for sui generis protection for agricultural and horticultural innovation. The inclusion of a seed saving exception for farmers, was a public policy safeguard which was an early reflection of food security concerns. This safeguard does not exist in patent statutes and this absence was an inducement for seed companies to shift their attention to the patent system as a means of protecting their innovations. This attention shift coincided with the development of modern biotechnologies.

Patent protection was not originally considered to be a particularly effective system for the protection of plant varieties. Prior to the development of modern biotechnology, the breeding of a new variety could not be said to involve an inventive step and such innovations as were made, could be considered to be obvious rather than inventive. However with the extension of patent protection to recombinant methods for producing transgenic plants and the resulting products, patents have begun to assume an increasing significance in plant variety protection. The broader ambit of patent rights is a particular advantage of this form of intellectual property protection, covering, as it does, plants, seeds and enabling technologies. PVRs are highly specific to the variety and their scope is limited by reference to the physical (propagating) material itself, combined with the description of the variety given in the documentary grant of the rights

### **(ii) Definitions**

A patent is a statutory privilege granted by a government to an inventor and to other persons deriving their rights from the inventor, for a fixed period of years, to exclude other persons from manufacturing, using or selling a patented product or from using a patented method or process. Patent rights are conferred by statute as a matter of right to the person

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<sup>20</sup> Directive, 98/44/EC

who is entitled to apply for it and who fulfils the prescribed registration requirements. The international standard for the protection of patents is prescribed in Article 27 of the Agreement on Trade Related Intellectual Property Rights (TRIPs), which is binding on all members of the World Trade Organization. Article 27(1) provides 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”. Article 27(2) envisages that inventions may be excluded from patentability to protect “*ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment”. Article 27 (3) permits signatories to exclude from patentability “plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological or microbiological processes”. Additionally, article 27(3) requires that “Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof”.

The first requirement for patent protection is that the subject of protection is an invention. This is generally interpreted to mean that an invention must have a technical character or, in other words, must make a technical contribution to the art. Thus if a patent application merely relates to a discovery, scientific theory or mathematical method or rules and methods for performing mental acts or doing business, or to computer programs as such, a patent will not issue.

An invention is considered to be new if it does not form part of the “state of the art”. The state of the art is taken to comprise all matter (whether a product, a process, information about either, or anything else) which has been disclosed to the public by prior publication in a tangible form or in the subject country by oral disclosure, or by use in any way prior to the filing of the patent application. Disclosure may also have occurred in through scholarly publication, through a public address or lecture, being placed on the Internet or through use of a product or process embodying the invention.

The law requires that before an invention can be patented, it must make an inventive step, i.e. significantly advance the state of the art. In patent law a distinction is drawn between inventions which are patentable and discoveries which are not. A similar dichotomy is made between inventions which are obvious and unpatentable and inventions which are non-obvious. In practice these dichotomies are somewhat difficult to apply, particularly in the area of agricultural research. The distinction between inventions and discoveries was explored by the Australian High Court in *National Research Development Corporation v. Commissioner of Patents* (the *NRDC* case)<sup>21</sup> This case concerned a patent which was sought in relation to a chemical method of killing weeds growing in fodder crops, leaving the useful plants unharmed. The applicant applied for a patent for a method of applying chemicals to kill weeds growing in fodder crops, leaving the crops unharmed. The Commissioner of Patents rejected the application on grounds which included the fact that as the invention involved an agricultural process it could not be a method of manufacture and that it lacked novelty. The court considered the process to be patentable because it proposed “taking advantage of a hitherto unknown or unsuspected property of the material” to produce a useful result. In that case, the chemicals involved in the weed killing process were not new compounds rather the inventiveness lay in their combination for a new purpose.

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<sup>21</sup> (1959) 102 *Commonwealth Law Reports* 252.

The threshold question of obviousness in the patenting of plant varieties was considered by the US Patent Office in a 1992 determination concerning a patent application in relation to disease resistance which was bred into soybeans. The claimed, novel soybean plant differed from the prior art soybeans in pod colour, pubescence colour and *Phytophthora* root rot resistance. The Patent Office reasoned that it was well known in the art that resistance to root rot and other phenotypes could be bred into a soybean line by crossing it with one that possessed the desired phenotype. In assessing whether an invention effects an advancement of the pre-existing art, the test which the courts apply is whether the claimed invention was obvious to one who is skilled in the relevant technology. The expert resources of a research institute may well be accessed in providing witnesses who have the requisite skills.

The condition for patentability that an invention is capable of an industrial application requires that products can be produced, or that industrially useful results can be achieved, through the application of a process. Agricultural patents are considered to satisfy this requirement. Thus in the *NRDC* case, the Australian High Court ruled that the weed killing process had an industrial application in the agricultural or horticultural industries. To ascertain whether an invention is industrially applicable, most laws require that the patent application must describe the invention in sufficient detail to enable others in the field to make the invention and the patent specification must teach those of skill in the art how to make the invention and must describe the best mode of carrying out the invention.

The basis for the patentability of biotechnological innovations was the 4:3 decision of the US Supreme Court patentability of living microorganisms was allowed by the Supreme Court in *Diamond v Chakrabarty*<sup>22</sup> which concerned the development of a bacterium genetically engineered to degrade crude oil. The basis of the Supreme Court's decision was that new microorganisms not found in nature were "manufacture" or "composition of matter" within the meaning of s.101 of the US Patent Act and were thus patentable. The general approach which patent offices have taken, following the approach in *Diamond v Chakrabarty*, is that gene-sequences are inventions when they have been isolated and purified. A number of patent offices in developed countries have permitted the patenting also of partial DNA sequences and Expressed Sequence Tags (ESTs). The value of the patented invention regarding DNA (isolation or synthetization) lies in the encoded information programming the production of a protein or other substances.

### **(iii) International Protection of Patents**

#### **1. The Paris Convention for the Protection of Industrial Property**

The International Union for the Protection of Industrial Property was established by the Paris Convention in 1883. This Convention prescribes minimum standards for the protection of "industrial property", which is defined as "patents, utility models, industrial designs, trademarks, service marks, trade names, indication of source of appellations and the repression of unfair competition". It includes in its definition of industrial property, agricultural and extractive industries and all manufactured and or natural products. This Convention offers to parties that are filing patent applications in a member country, a grace period within which patent applications can be filed in other member countries. Thus, the

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<sup>22</sup> 447 US 303 (1980).

Paris Convention allows an applicant to file in one country, that is a party to the convention and to claim the same filing or “priority” date in another member country, if the application is filed in that other country within the applicable grace period. Priority dates are of critical importance enabling an inventor to state that s/he is the first to file a patent application for a particular invention.

## 2. Patent Co-operation Treaty

The Paris Convention provides for subordinate treaties for the protection of industrial property. This includes the worldwide system for simplified multiple filing of patent applications –the Patent Cooperation Treaty (“PCT”). The PCT allows applicants to prepare one patent application that can be submitted to any national patent office that is a contracting party to the treaty. This treaty also covers rules for cooperation in searching and examination of patent applications. A PCT application must contain “a request, a description of the invention, one or more claims, one or more drawings (where required) and an abstract”.

This treaty provides for a standard application format and regulations dealing with how a filing date is obtained, the publication of the application (disclosure) and search procedures. A certified patent searching authority performs an international search and the results are published as an international search report. The examination authorities, such as the European Patent Office (EPO), have become recognized as the world’s leading authorities for performing prior searches for patent application examinations. The international search seeks to ensure that there is no prior art that is the same as or that suggests the innovation claimed in the application. Most national offices will use this International Preliminary Examination Report (IPER) as the basis for their decision to issue a national patent on the claims in an application, when the application has been filed through the PCT.

An inventor (or assignee) can file a PCT application if the applicant is a national or a resident of one of the PCT Contracting States. An application can be filed in a national office of one of the contracting states (an international receiving office). At the time of the filing, the applicant lists (or designates) the national (or in some cases the regional) offices in which it is anticipated a national application will be filed.

## The Patent Law Treaty

The Patent Law Treaty which was signed on 11 June 2000, covers the regional phase or the national phase of a PCT application. Standards are set for the assignment of a filing date, priority dates for applications and other procedural details such as the recording of a change in name or address, change in applicant or owner, or license or security interest.

#### (iv) Patents and agriculture in the EU

In Europe the Directive on the Legal Protection of Biotechnological Inventions specifically provides in Article 3.2 that “Biological material which is isolated from its natural environment or produced by means of a technical process may be the subject of an invention even if it previously occurred in nature”.

Article 53(b) of the European Patent Convention (EPC) excludes plant varieties, as well as “essentially biological processes” from the scope of patentable subject matter. This raises, in the first instance, the definitional distinction between plants and plant varieties. The UPOV Convention defines plant variety in terms of a plant grouping within a single biological taxon of the lowest known rank, which grouping can be:

- defined by the expression of characteristics (such as shape, height, colour and habit) resulting from a given genotype or combination of genotypes;
- distinguished from any other plant grouping by the expression of at least one of the said characteristics; and
- considered as a unit with regard to its suitability from being propagated unchanged

The first consideration of the distinction between plant and plant variety by the Technical Board of Appeal of the European Patent Office (EPO) occurred in 1984 in the *Ciba/Geigy* determination.<sup>23</sup> This concerned a plant which had been treated with a chemical compound to confer on the plant a degree of protection from the toxic side-effects of certain herbicides. The Examination Division had refused the patent application on the basis of Art.53(c). This was reversed by the Technical Board of Appeal, which, applying the definition of plant variety in the UPOV Convention, stated that “Article 53(c), “prohibits only the patenting of plants or their propagating material in the genetically fixed form of the plant variety...Plant varieties in this sense are all cultivated varieties, clones, lines, strains and hybrids”.<sup>24</sup> In this case the claims covered merely the application of a chemical treatment and not plant varieties as such.

This approach was applied by the Technical Board of Appeal in the *Lubrizol (Hybrid Plants)* case<sup>25</sup> where the Board held that “the term ‘plant varieties’ means a multiplicity of plants which are largely the same in their characteristics (i.e. homogeneity) and remain the same within specific tolerances after every propagation or every propagation cycle (i.e. ‘stability’)”.<sup>26</sup> The Board then ruled that as the hybrids in issue were not stable, they did not fall within the excluded category of plant varieties.

The European Biotechnology Directive permits the patentability of inventions concerning plants, where “the technical feasibility is not confined to a particular plant...variety”.<sup>27</sup> Patent claims can therefore be made in respect of plant groupings, or as stated in Recital 31 to the Directive,

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<sup>23</sup> Case T 49/83 [1984] *O.J. EPO* 112.

<sup>24</sup> *Ibid.*, at 114-115.

<sup>25</sup> Case T320/87 [1990] *O.J. EPO* 71.

<sup>26</sup> *Ibid* at 79.

<sup>27</sup> *Directive on the Legal Protection of Biotechnological Inventions*, Article 4(1) para.2,

Whereas a plant grouping which is characterized by a particular gene (and not its whole genome) is not covered by the protection of new varieties and is not excluded from patentability even if it comprises new varieties of plants.

This qualification was addressed by the Technical Board of Appeal in *Novartis/Transgenic Plant*.<sup>28</sup> The application concerned a patent containing claims to transgenic plants comprising in their genomes specific foreign genes, the expression of which resulted in the production of antipathologically active substances, and to methods of preparing such plants. The EPO had denied registration, supported by the Technical Board of Appeal, on the ground that art.53(b) denied the patentability of an invention which could embrace plant varieties.

In its decision of 20 December 1999, the Enlarged Board of Appeal indicated that it would favour the application because, in substance, it did not involve an application for a plant variety. This determination contains some useful guidance on the legal definition of plant varieties. The Enlarged Board of Appeal noted that the definitions of plant variety in the UPOV Convention and the EC Regulation on Community Plant Variety Rights refer to "the entire constitution of a plant or a set of genetic information", whereas a plant defined by a single recombinant DNA sequence "is not an individual plant grouping to which an entire constitution can be attributed". It observed that the claimed transgenic plants in the application before it were defined by certain characteristics which allowed the plants to inhibit the growth of plant pathogens. No claim was made for anything resembling a plant variety. The tribunal noted that in the case of PVR an applicant had to develop a plant group, fulfilling in particular the requirements of homogeneity and stability, whereas in the case of a typical genetic engineering invention, a tool was provided whereby a desired property could be bestowed on plants by inserting a gene into the genome of a specific plant. It observed that the development of specific varieties was not necessarily the objective of inventors involved in genetic engineering.

Outside Europe the prohibition against the patenting of plant varieties is absent. In the USA for example, the Federal Circuit resolved any potential conflict between patent protection and protection under the Plant Variety Protection Act in its decision in *Pioneer Hi-Bred International Inc. v. J.E.M. Ag Supply Inc.*<sup>29</sup> The defendants objected that Pioneer had obtained both patent protection and certificates of protection under the Plant Variety Protection Act for the same seed-produced varieties of corn. The defendants argued that the enactment of the Plant Variety Protection Act had removed seed-produced plants from the realm of patentable subject matter the Patents Act. The Federal Circuit rejected this argument noting that the Supreme Court held that "when two statutes are capable of co-existence, it is the duty of the courts . . . to regard each as effective".

The impact of patenting on food security is illustrated by the recent Canadian Federal Court of Appeal case of *Monsanto Canada, Inc. v. Schmeiser*.<sup>30</sup> This case concerned the cultivation by a farmer of Canola, which contained chimeric genes conferring tolerance to glyphosphate herbicides, which Monsanto had patented. Monsanto had marketed these

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98/44/EC [1998] *O.J.* L213/130.

<sup>28</sup> [2000] *O.J. EPO* 511.

<sup>29</sup> 200 F.3d 1374 (Fed. Cir. 2000), *cert. granted*, 148 L. Ed. 2d 954 (2001)

<sup>30</sup> 2004 SCC 34, Decision, January 20, 2004.

genes in its product “Roundup Ready Canola”. Schmeiser had cultivated Canola derived from plants on his land which he claimed had developed this tolerance from wind-borne genetic pollution. The trial court had found that cultivation of a plant was not an infringement of patented genes contained in that plant, however, the majority of the Federal Court of Appeal agreed with Monsanto that this was infringing use.

Counsel for Schmeiser raised the moral question of whether it was right to manipulate genes in order to obtain better weed control or higher yields. The Federal Court of Appeal ruled that this was a question for Parliament to consider and that the court’s job was to “interpret the Patents Act as it stands.”<sup>31</sup> The majority explained that, “Under the present Act, an invention in the domain of agriculture is as deserving of protection as an invention in the domain of mechanical science. Where Parliament has not seen fit to distinguish between inventions concerning plants or other inventions, neither should the courts”.<sup>32</sup>

As the minority judge pointed out, the TRIPS Agreement in Art.27.2(b) permits the exclusion of plants from patentability, but that plant varieties might be patented. The *Novartis* determination, among others, suggests that the addition or modification of genetic material to confer disease resistance is not the creation of a new variety. If the view of the majority in *Schmeiser*, that the patenting of a cell confers exclusive patent rights in relation to a plant in which that cell is included, then the Art.27.2(b) exception becomes meaningless.

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<sup>31</sup> Ibid., para. 93.

<sup>32</sup> Ibid., para. 94.

## **(c) Geographical Indications**

### **(i) Introduction**

Marks indicating the geographical origins of goods were the earliest types of trademark.<sup>33</sup> Until the industrial revolution, which commenced in the 18<sup>th</sup> Century, the principal products, which entered international trade, were primary products, such as minerals and agricultural produce and simple manufactured goods, such as pottery and woven fabrics. In the competition to earn revenues from the international trade, which was developing at that time, it became apparent that the products of particular regions were more saleable than comparable products from other regions, because of their superior quality. This superior quality, resulted either from natural geographic advantages, such as climate and geology (eg Seville oranges, Kentish hops, Burgundy wine); recipes and food processing techniques, local to a region (eg Kyoto bean cakes, Malmesbury mead, Frankfurter sausages) or indigenous manufacturing skills (eg Toledo steel, Delft ceramic ware, Korean celadon ware).

In each case, the commercial attractiveness of these products was attributable to the traditional knowledge of the local communities. To protect the commercial reputation of these communities, local legislators passed laws to prevent the adulteration of local produce by the addition of inferior introduced goods or ingredients. These laws punished the adulteration of goods and established systems of marking approved local goods with marks certifying their quality (eg wool marks for cloth, hallmarks, for goods made from precious metals) Where the reputation of local goods were attributable to the skills and technology of local artisans, associations, or guilds, of masterworkers grew up. The taxing authorities saw an advantage in preserving the skills and revenue earning capacities of these guilds and conferred upon them a monopoly of manufacture. To regulate this monopoly, the guilds developed service marks, or heraldic-type designs which were placed upon goods produced by guild members.

The legislation which sought to protect the commercial reputation of traders in discrete geographical localities evolved principally in Europe into systems for the protection of geographical indications. As will be seen below, these systems permit products emanating from the region to carry the geographic indication. Producer representatives from those regions police the use of geographic indications.

The Industrial Revolution, which commenced in Britain in the eighteenth century, saw the emergence of the modern trademark. The development of large scale industrial production led to the desire of individual producers to identify themselves as the place of origin of goods, as a warrant for the quality of those goods. The registered trademarks system was thus developed to permit individual traders to enforce their marks as a private proprietary rights. This contrasted with the system for the protection of geographic indications which conferred public rights upon producers in defined localities.

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<sup>33</sup> Generally, on the history of trademarks and geographical indications see: Schechter, *The Historical Foundations of the Law Relating to Trade-Marks* (1925); Diamond, "The Historical Development of Trademarks" (1983) 73 TMR 222; McCarthy and Devitt, 'Protection of Geographical Denominations: Domestic and International' (1979) 69 TMR 1979; Coerper, 'The Protection of Geographical Indications in the United States of America, with Particular Reference to Certification Marks' (July/August 1990) Industrial Property 232.

The evolution of the private trademark system did not result in the disappearance of geographic marks. Particularly in Europe, substantial processed foods markets and markets for alcoholic beverages are dependent upon the continued recognition of geographical marks.

## **(ii) Definitions**

Because of the diverse ways in which the protection of geographical indications has evolved under national laws, there is no generally accepted terminology. The following are the conventional definitions which can be found in the literature on geographical indications:<sup>34</sup>

‘Indication of Source’ refers to a sign that indicates that a product originates in a specific geographical region.

‘Appellation of Origin’ refers to a sign that indicates that a product originates in a specific geographic region only when the characteristic qualities of the product are due to the geographical environment, including natural and human factors.

‘Geographical Indication’ includes both of the above concepts.

For the purposes of the discussions of reform proposals in April 2001 by the TRIPs Council, the WTO Secretariat adopted the term "indications of geographical origin" to designate the different expressions used by WTO Members to protect geographical origin of products.<sup>35</sup>

A geographical indication is a generic description which is applicable to by all traders in a particular geographic location to goods which emanate from that location. A trademark is a sign which distinguishes the products of a specific trader from those of its competitors. Thus it is not likely to be descriptive and it cannot be generic.

The right to protect a geographical indication from wrongful appropriation is enjoyed by all traders from the particular geographical location, whereas a trademark is protected from wrongful appropriation at the suit of the registered proprietor of that mark. Generally, geographic indications are monitored and protected by producer associations from the relevant region.

Unlike trademarks, geographical indications are not freely transferrable from one owner to another, as a user must have the appropriate association with the geographical region and must comply with the production practices of that region.

## **(iii) International protection of geographical indications**

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<sup>34</sup> Eg see Conrad, ‘The Protection of Geographical Indications in the TRIPS Agreement’ (1996) 86 TMR 11 at 13-14.

<sup>35</sup> See Note by the WTO Secretariat IP/C/W/253, dated April 2001, on "Review under Article 24.2 of the application of the provisions of the section of the TRIPS Agreement on geographical indications. Summary of the responses to the checklist of questions (IP/C/13 and Add.1)".

1 Paris Convention for the Protection of Industrial Property, 1883<sup>36</sup>

The first multilateral agreement, which included "indications of source or appellations of origin" as objects for protection by national industrial property laws, was the Paris Convention. Under Article 10(1) of the Paris Convention, provision is made for seizure upon importation of goods bearing false indications of the source of goods or the identity of the producer.

Under Art. 10(2), any

...producer, manufacturer, or merchant whether a natural person or legal entity, engaged in the production or manufacture of or trade in such goods and established either in the locality falsely indicated as the source, or in the region where such locality is situated, or in the country falsely indicated, or in the country where the false indication of source is used, shall in any case be deemed an interested party.

Article 10*bis* also afforded protection against false or misleading indications of source as a means of repressing unfair competition.

Included under the definition of unfair competition are any acts which create confusion, or allegations, the use of which in the course of trade are liable to mislead the public, as to the nature, the manufacturing process, the characteristics, the suitability for their purpose, or the quantity, of goods.

2 Madrid Agreement for the Repression of False or Deceptive Indications of Source of Goods, 1891<sup>37</sup>

The original form of Paris Convention prohibited the use of false geographical indications. A number of signatory nations proposed a more comprehensive form of regulation for what was considered to be a significant intellectual property abuse. The 1891 Madrid Agreement concerning the protection of geographical indications was their response. Article 1 provided that all goods 'bearing a false or misleading indication' to signatory country, or to a place in that country 'shall be seized on importation' However, this agreement failed to attract the accession of significant trading nations such as the USA, Germany and Italy. A threshold problem with this agreement and with subsequent revisions, was the inability of nations to exempt geographical indications which had become generic within their borders.

3 International Convention on the Use of Appellations of Origin and Denominations of Cheeses ("Stresa Convention"), 1951

The parties to the Stresa Convention, which are some of the cheese producing countries of Europe<sup>38</sup>, "pledge themselves to prohibit and repress within their respective territorial

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<sup>36</sup> The Paris Convention was agreed in 1883 and complemented by the Madrid Protocol of 1891. It was revised at Brussels (1900), Washington (1911), The Hague (1925), London (1934), Lisbon (1958), and Stockholm (1967), and amended in 1979. The Paris Convention as of May 2001, had 160 member states.

<sup>37</sup> The Madrid Agreement was adopted in 1891 and revised at Washington (1911), The Hague (1925), London (1934), and Lisbon (1958). It was supplemented by the Additional Act of Stockholm (1967).

confines the use, in the language of the state or in a foreign language, of the “appellations d’origine”, denominations and designations of cheeses contrary to the principles stated in Articles 2 to 9 inclusive. The Convention, which entered into force on 1 September 1953, applies to all specifications which constitute false information as to the origin, variety, nature or specific qualities of cheeses, which are stated on products which might be confused with cheese. The term “cheese”, according to Art.2.1 of the Convention is reserved for “fresh and matured products obtained by draining after the coagulation of milk, cream, skimmed or partially skimmed milk or a combination of these”, or by “products obtained by the partial concentration of whey, or of buttermilk, but excluding the addition of any fatty matter to milk”.

Article 3, provides that the appellations of origin of those cheeses “manufactured or matured in traditional regions, by virtue of local, loyal and uninterrupted usages” which are listed in Annex A are exclusively reserved to those cheeses, “whether they are used alone or accompanied by a qualifying or even corrective term such as “type”, “kind”, “imitation” or other term”. Annex A lists: Gorgonzola, Parmigiana Romano, Pecorino Romano and Roquefort.

Annex B lists a number of designations for cheese, which are prohibited by article 4.2 for products which do not meet the requirements provided by contracting parties in relation to “shape, weight, size, type and colour of the rind and curd, as well as the fat content of the cheese”. Listed in Annex B are Asiago, Camembert, Cambozola, Danablu, Edam, Emmental, Esrom, Fiore Sardo, Fontina, Gruyère, Pinnzgauer Berkäse, Samsöe, and Svecia.

The Stresa Convention came into force prior to the EEC Treaty and its regime providing for the free movement of goods. In the *Deserbais* case<sup>39</sup> the ECJ held that the EEC Treaty did not affect the duty of a Member State to respect the rights of non-member countries under the prior agreement. Similarly, in the *Cambozola* case<sup>40</sup> the ECJ ruled that the free movement of goods principle was subordinated to the Stresa Convention and Council Regulation (EEC) No 2081/92 permitting the registration and enforcement of rights in relation to designations of origin.

#### 4 Lisbon Agreement for the Protection of Appellations of Origin and their Registration, 1958

The Lisbon Agreement established an international system of registration and protection of appellations of origin. It adopted the French definition of appellation of origin by restricting the protected indications to cases in which the quality and characteristics of a product are ‘due exclusively or essentially to the geographical environment, including natural and human factors’.

The Agreement provided for the registration, at the International Bureau of WIPO, of appellations of origin which are ‘recognized and protected as such, in their country of

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<sup>38</sup> The Stresa Convention was ratified by Austria (12 June, 1953); Denmark (2 August 1953); France (20 May 1952); Netherlanda (29 October 1955); Norway (31 August 1951); Sweden (27 January 1951) and Switzerland (5 June 1951).

<sup>39</sup> [1988] ECR-4907, 22 September 1988.

<sup>40</sup> [1999] ECR I, 4 March 1999.

origin'. Countries are thus free to adopt their own system of designating appellations, either by judicial or administrative decision, or both. Once registered, a geographic indication is protected in other member nations. The countries have to ensure that any kind of usurpation or imitation is prohibited under their laws. Finally, the Agreement, provides that no generic indication can be deemed generic in any other country, as long as it is protected in its country of origin.

The Lisbon Agreement failed to attract support from more than a few nations. One problem was that accession was confined to those nations which protected appellations of origin 'as such'. Thus, states which protected this form of intellectual property under unfair competition or consumer protection laws were locked out. Also the Agreement did not make exception for geographic indications which had already become generic in member states.

## 5 WIPO Proposals

In 1975 WIPO issued a Draft Treaty on the Protection of Geographical Indications. The Draft Treaty provided for the protection both of appellations of origin and geographical indications. Unlike the Lisbon Agreement, it did not require signatories to have domestic laws for the protection of appellations of origin. In 1990 WIPO issued a memorandum asserting the continuing need for a treaty on this subject.<sup>41</sup>

In 1975 WIPO also issued a Model Law on geographical indications for adoption by developing countries. The Model Law defined 'appellation of origin' as

The geographical name of a country, region, or specific place which serves to designate a product originating therein, the characteristic qualities of which are due exclusively or essentially to the geographical environment, including natural factors, human factors, or both...; any name which is not that of a country, region or specific place is also considered a geographical name if it relates to a specific geographical area, when used in connection with certain products.

The Model Law also defined 'indication of source' as 'any expression or sign used to indicate that a product or service originates in a country or region or a specific place'. This would embrace symbols such as an Egyptian pyramid or the Eiffel Tower, as well as the birds and animals associated with a place.

The Model Law establishes a system for the registration of appellations of origin and includes an optional provision permitting national courts to determine whether particular terms are generic. Upon registration, appellations are only protected if used by producers of products carrying on business in the area described by the appellation and only if their products possess the essential characteristics associated with the appellation.

Finally, the Model Law provided that:

It shall be unlawful to use, in the course of trade, a registered appellation of origin of origin, or a similar name, with respect to the products specified in the Register or similar products, even if the true origin of the products is indicated,

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<sup>41</sup> WIPO, The Need for a New Treaty and its Possible Contents, WIPO doc., GEO/CE/1/2 (1990).

or if the appellation is in the form of a translation or is accompanied by terms such as ‘kind’, ‘type’, ‘make’, ‘imitation’, or the like.

In 1990 WIPO issued a memorandum asserting the continuing need for a treaty on this subject. This has not been taken up by the WIPO Committee of Experts on the International Protection of Geographical Indications.

## 6 TRIPS Agreement

Section 3 of the TRIPS Agreement covers six topics: (i) Definition and scope of a geographical indication; (ii) Minimum standards and common protection provided for geographical indications corresponding to all kinds of products; (iii) the interrelationship between trademarks and indications of origin; (iv) Additional protection for geographical indications for wines and spirits; (v) Negotiation and review of section III on geographical indications; and (vi) Exceptions to the protection of geographical indications.

Article 22 defines geographical indications as:

... indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin.

This definition expands the Lisbon Agreement concept of appellation of origin to protect goods which merely derive a reputation from their place of origin without possessing a given quality or other characteristics which is due to that place. Also, under the TRIPS Agreement a geographical indication to be protected has to be an indication, but not necessarily the name of a geographical place on earth. Thus, for example, “Basmati” is taken to be an indication for rice coming from the Indian sub-continent, although it is not a place name as such. The indication has to identify goods as originating in the territory of a Member, a region or a locality of that territory. This definition also indicates that goods to be protected should originate in the territory, region or locality to which it is associated. This suggests that licenses for the use of geographical indications can not be protected under the TRIPS Agreement.

The TRIPS definition permits Members protect geographical indications of goods where the quality, reputation or other characteristic of goods are attributable to their geographical origin.

Article 22.2 of the TRIPS Agreement requires that Members ‘shall provide the legal means for interested parties to prevent ‘the use by any means in the designation or presentation of a good that indicates that the good in question originates in a geographical area other than the true place of origin in a manner which misleads the public as to the geographical origin of goods’. Thus, for example, the use of symbols such as the Eiffel Tower or the Statue of Liberty to infer an association with France or the USA, or the use of a language or script to evoke an erroneous connotation of origin would fall within this prohibition.

The TRIPS Agreement does not specify the legal means to protect geographical indications. This is left for Members to decide.

Article 22.2 also prohibits any use which ‘constitutes an act of unfair competition under Article 10*bis* of the Paris Convention. The ambit of Art 10*bis* is extended to a geographical indication ‘which, although literally true as to a territory, region or locality in which the goods originate, falsely represents to the public that the goods originate in another territory’.

The interrelationship between the protection of trademarks and of appellations of origin is accommodated by Art.22.3 of the TRIPS Agreement which permits a Member, *ex officio* if its legislation so permits or at the request of an interested party, ‘refuse or invalidate the registration of a trademark which contains or consists of a geographical indication with respect to goods not originating the territory indicated, if the use of the indication in the trademark for such goods in that Member is of such a nature as to mislead the public as to the true place of origin’.

Cognizant of the fact that for most countries the protection of geographical indications will be an innovation, Art 24.4 exempts from this form of protection trademarks which have been ‘applied for or registered in good faith’ or where the rights to the trademark ‘have been acquired through use in good faith’ either before the implementation of the TRIPS provisions, or before the geographical indication is protected in its country of origin.

Article 24.7 provides that a Member may provide that any request made under the section in connection with the use or registration of a trademark must be presented within five years after the adverse use of the protected indication has become generally known in that Member, or after the date of registration of that trademark, provided the registration has been published and ‘provided that the geographical indication is not used or registered in bad faith’.

Similar to the analogous provision in most trademark laws, Art.24.7 preserves ‘the right of a person to use, in the course of trade, that person’s name or the name of that person’s predecessor in business, except where such name is used in such a manner as to mislead the public’.

Finally, Art.24.9 provides that there is no obligation under the TRIPS Agreement to protect geographical indications ‘which are not or cease to be protected in their country of origin, or which have fallen into disuse in that country.’

In addition to the general protection for geographical indications for wines and spirits within the general context for the protection of geographical indications contained in Art.22, additional protection is accorded geographical indications for wines and spirits by Art.23. This additional protection has two components: (i) protection for each geographical indication for wines in the case of homonymous indications; and (ii) the establishment of a multilateral system of notification and registration of geographical indications for wines eligible for protection in those Members participating in the system.

These provisions give geographical indications for wines and spirits stronger protection than that provided in Article 22 for all products. For some countries, this additional

protection is regarded as an unacceptable discrimination against all other products and they have agitated for an extension of that protection to all kinds of geographical indications.

Article 24.1 obliges Members 'to enter into negotiations aimed at increasing the protection of individual geographic indications under Art.23'. Although Art.24 contains a number of paragraphs excepting certain matters from protection as geographical indications, Art.24.1 disallows Members from using these exceptions as an excuse for the refusal to conduct negotiations. Also in implementing this negotiation obligation, Art. 24.3 requires that a Member 'not diminish the protection of geographical indications' which existed in that Member prior to the date of the entry into force of the WTO Agreement. Nevertheless a group of countries considers the above interpretation constitutes to be a very legalistic approach. They believe that this provision permits negotiations to extend the additional protection for geographical indications for wines and spirits to all kinds of products.

In order to facilitate the protection of geographical indications for wines, Art.23.4 provides that 'negotiations shall be undertaken in the Council for TRIPS concerning the establishment of a multilateral system of notification and registration of geographical indications for wines eligible for protection in those Members participating in the system'. The effect of this provision will be to absorb the registration scheme established under the Lisbon Agreement and to remove the justification for the negotiations within WIPO for a new treaty on the protection of geographical indications which has been under preparation since 1974.

#### **(iv) Protection of geographical indications in the EU**

The EC has promulgated a series of regulations dealing providing for the registration of geographical indications concerning both designations for wines and spirits<sup>42</sup> and on the protection of geographical indications and designations for agricultural products and foodstuffs<sup>43</sup> These provide a useful model which could be followed by other countries if a system for the multilateral registration of agricultural products is adopted.

Regulation No. 2081/92, which entered into force on 25 July 1993, states, in its fifth recital, "the labelling of agricultural products and foodstuffs is subject to the general rules laid down in Council Directive 79/112 of 18 December 1978 on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs... in view of their specific nature, additional special provisions should be adopted for agricultural products and foodstuffs from a specified geographical area". The Regulation notes in its seventh recital that, "there is diversity in the national practices for implementing registered designations of origin and geographical indications; ... a Community approach should be envisaged; ... a framework of Community rules on protection will permit the development of geographical indications and designations of origin since, by providing a more uniform approach, such a framework will ensure fair competition between the

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<sup>42</sup> The Council Regulations which are still in force are: 1493/1999 of 17 May 1999 on the common organization of the market in wine, *OJL* 179, 14 July 1999, p.16; 1576/89 of 29 May 1989 laying down general rules on the definition, description and presentation of spirit drinks, *OJL* 275, 25 April 1989, p.1.

<sup>43</sup> *OJL* 208, 24 July 1992, p.1, as amended by 535/97 of 17 March 1997, *OJL* 83, 25 March 1997, p.3.

producers of products bearing such indications and enhance the credibility of the products in the consumers' eyes".

The ninth and tenth recitals of the Regulation state that:

Whereas the scope of this Regulation is limited to certain agricultural products and foodstuffs for which a link between product or foodstuff characteristics and geographical origin exists; whereas, however, this scope could be enlarged to encompass other products or foodstuffs;

For the purposes of the Regulation, Article 2(2) provides that:

(a) *designation of origin*: means the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or a foodstuff:  
-- originating in that region, specific place or country, and  
-- the quality or characteristics of which are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors, and the production, processing and preparation of which take place in the defined geographical area

Article 2(2) defines a protected geographic indication (PGI) to mean

the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or a foodstuff:

-- originating in that region, specific place or country, and  
-- which possesses a specific quality, reputation or other characteristics attributable to that geographical origin and the production and/or processing and/or preparation of which take place in the defined geographical area.

The Regulation states, in its 12th recital, that "to enjoy protection in every Member State geographical indications and designations of origin must be registered at Community level" and that "entry in a register should also provide information to those involved in trade and to consumers".

Articles 5 to 7 of the Regulation lay down the procedure for the registration of geographical indications and designations of origin mentioned in Art.2, which is known as the "normal procedure". According to Art.5(4), the application is to be sent to the Member State in which the geographical area is located. Under Art.5(5), the Member State is to check that the application is justified and forward it to the Commission.

Article 17 of the Regulation establishes a simplified registration procedure applicable to the registration of names already in existence on the date of entry into force of the Regulation. It provides that within six months of the entry into force of the Regulation, "Member States shall inform the Commission which of their legally protected names or, in those Member States where there is no protection system, which of their names established by usage they wish to register pursuant to this Regulation." In accordance with the procedure laid down in Art.15, the Commission shall register these names, provided they comply with Arts 2 and 4. However, generic names are excluded. Member States are

permitted under this Article to maintain national protection of the names communicated in accordance with this provision until such time as a decision on registration has been taken.

Under Art.8 of the Regulation, "the indications PDO, PGI or equivalent traditional national indications may appear only on agricultural products and foodstuffs that comply with this Regulation".

Article 13.1 provides that registered names shall be protected against:

- (a) any direct or indirect commercial use of a name registered in respect of products not covered by the registration in so far as those products are comparable to the products registered under that name or insofar as using the name exploits the reputation of the protected name;
- (b) any misuse, imitation or evocation, even if the true origin of the product is indicated or if the protected name is translated or accompanied by an expression such as style, type, method, as produced in, imitation or similar;
- (c) any other false or misleading indication as to the provenance, origin, nature or essential qualities of the product, on the inner or outer packaging, advertising material or documents relating to the product concerned, and the packing of the product in a container liable to convey a false impression as to its origin;
- (d) any other practice liable to mislead the public as to the true origin of the product.

Where a registered name contains within it the name of an agricultural product or foodstuff which is considered generic, the use of that generic name on the appropriate agricultural product or foodstuff is not considered to be contrary to sub-paragraphs (a) or (b) in the first subparagraph.

In order to allow for the fact that the first proposal for registration of geographical indications and designations of origin which the Commission was to draw up pursuant to Art.17(2) of Regulation No. 2081/92 was not submitted to the Council until March 1996, when the major part of the transitional period of five years provided for by Art.13(2) of that Regulation had elapsed, Regulation No. 535/97, which entered into force on 28 March 1997, replaced the latter paragraph with the following:

- By way of derogation from paragraph 1(a) and (b), Member States may maintain national systems that permit the use of names registered under Art.17 for a period of not more than five years after the date of publication of registration, provided that:
- (a) the products have been marketed legally using such names for at least five years before the date of publication of the Regulation;
  - (b) the undertakings have legally marketed the products concerned using those names continuously during this period and;
  - (c) the labelling clearly indicates the true origin of the product.
- However, this derogation may not lead to the marketing of products freely within the territory of a Member State where such names were prohibited.

The aim of this Regulation is "within the limits of the adjustment of agricultural policy, to encourage the diversification of agricultural production and promote products having certain characteristics to the benefit of the rural economy".

### 3.2 The International Debate Concerning IP Aspects of Food Security

#### (a) WTO

The issue of food security has been discussed in the WTO in the context of the TRIPS Council discussions on the built-in reviews of Articles 27.3(b) and the regulation of geographical indications and in the context of the Agreement on Agriculture.

#### (i) Review of Art.27.3(b)

The concluding words of Article 27.3(b) envisaged its review by the Council for TRIPS by the end of 1999. A *Communication* to the WTO from Kenya, on behalf of the African Group, to assist the Preparations for the 1999 Ministerial Conference, pointed out the review would pre-empt the outcome of deliberations in other related fora such as the Conference of parties of the Convention on Biological Diversity (CBD), UPOV, FAO, and the OAU (which had developed a model law on Community Rights and Control of Access to Biological Resources). At the 23 March 2001 meeting of the Council for TRIPS, the Chairman set out a list of key issues which had arisen in the review of Article 27.3(b).<sup>44</sup> These were:

- the link between Article 27.3(b) and development;
- technical issues relating to patent and plant variety protection under article 27.3(b);
- technical issues relating to the *sui generis* protection of plant varieties;
- ethical issues relating to the patentability of life-forms;
- the relationship to the conservation and sustainable use of genetic material; and
- the relationship with the concepts of traditional knowledge and farmers' rights.

A number of these issues were reflected in part in the Doha Ministerial Declaration of November 2001, which in Clause 19 provided:

19. We instruct the Council for TRIPS, in pursuing its work programme including under the review of Article 27.3(b), the review of the implementation of the TRIPS Agreement under Article 71.1 and the work foreseen pursuant to paragraph 12 of this Declaration, to examine, *inter alia*, the relationship between the TRIPS Agreement and the Convention on Biological Diversity, the protection of traditional knowledge and folklore, and other relevant new developments raised by Members pursuant to Article 71.1. In undertaking this work, the TRIPS Council shall be guided by the objectives and principles set out in Articles 7 and 8 of the TRIPS Agreement and shall take fully into account the development dimension.”

The Doha Ministerial had set the deadline of December 2002 within which the review, referred to in Clause 19 of the Doha Declaration had referred, was to be finalised and reported to the Trade Negotiations Committee (TNC) "for appropriate action". However, after Doha, the discussions in the TRIPS Council were dominated by the consideration of the public health and patenting issue and the question of plant variety protection under Article 27.3(b) was somewhat neglected. However, in anticipation of the Cancun Ministerial, Morocco, on behalf of the African Group of countries made a

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<sup>44</sup> WTO Doc., IP/C/M/26

Joint Communication to the Council for TRIPS, on 20<sup>th</sup> June 1993, in an endeavour to finalise the longstanding issues relating to the review of Article 27.3(b) (i) indicating the solutions that the African Group considered needed to be found; (ii) setting out possible areas of agreement on issues that have arisen; (iii) providing suggestions on how to resolve issues on which members had not been able to reach a common understanding.<sup>45</sup>

The Joint Communication maintained that the requirement to protect plant varieties should be consistent with and supportive of the public policy goals of Member States relating to food security, nutrition, the elimination of rural poverty, and the integrity of local communities. The Also asserted was the importance of the preservation of the system of seed saving and exchange as well as selling among farmers in which the legitimate rights of commercial plant breeders should be protected and but balanced against the needs of farmers and local communities, particularly in developing Members.

The Joint Communication urged that in implementing the TRIPS Agreement, the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources in a mutually supportive and consistent manner, Members should retain the right to require, within their domestic laws, the disclosure of sources of any biological material that constitutes some input in the inventions claimed, and proof of benefit sharing.

Areas that were identified as those where delegations had not reached a common understanding concerned the possibility under Article 27.3(b) for members to grant patents on micro-organisms and on non-biological and micro-biological processes for the production of plants or animals.

To deal with the issue of biopiracy, the African Group recommended a combination of access contracts to regulate the activities of researchers and other gatherers and the use of databases of traditional knowledge by patent offices, in examining patent claims to determine whether they meet the requirements of novelty, inventiveness and usefulness. Noting the slowness of progress, which was being made in WIPO, the Joint Communication suggested that the Council for TRIPS should consider adopting a Decision on Protecting Traditional Knowledge.<sup>46</sup>

## **(ii) Geographical indications**

The Council of TRIPS was obliged under Art.24.2 to conduct a review of the operation of the geographical indications provisions within the first two years of entry into force of the WTO Agreement. The Council confined its initial review to the question of a multilateral register of geographical wine indications. Prior to the Seattle Ministerial, a submission by Turkey of 9 July 1999 proposed the extension of the multilateral register beyond wines and spirits<sup>47</sup>, this was endorsed the African group of countries requested that the protection of geographical indications be extended “to other products recognizable by their geographical origins (handicrafts, agro-food products).”<sup>48</sup> This

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<sup>45</sup> WTO Doc., IP/C/W/404, 20 June 2003.

<sup>46</sup> The proposed Decision is reproduced in Annex 1.

<sup>47</sup> WTO Doc No WT/GC/W/249, 13 July 1999.

<sup>48</sup> *Preparations for the 1999 Ministerial Conference the TRIPS Agreement Communication from*

proposal was also taken up by Cuba, Czech Republic, Dominican Republic, Honduras, India, Indonesia, Nicaragua, Pakistan and Sri Lanka, Uganda and Venezuela. At the TRIPS Council meetings in 2000, the President sought to separate the discussion of Article 23.2 from 24.2 to avoid confusion. A response to this suggestion was a proposal from Bulgaria, the Czech Republic, Egypt, Iceland, India, Kenya, Liechtenstein, Pakistan, Slovenia, Sri Lanka, Switzerland and Turkey that the extension of geographical indications to products other than wines and spirits be included as an extension of the built-in agenda.<sup>49</sup> This issue has also been taken up by WIPO's Standing Committee on Trademarks and Geographic Indications.

In opposition to the proposals for an extension of the protection of geographical indications for wines and spirits under TRIPS to all products, on 29<sup>th</sup> June 2001, a communication was sent to the TRIPS Council by Argentina, Australia, Canada, Chile, Guatemala, New Zealand, Paraguay and the United States.<sup>50</sup> The Communication pointed out that proposals for the extension of the TRIPS wines and spirits provisions to all products had insufficiently addressed the costs and administrative burdens of this extension. However, Clause 18 of the Doha Declaration has expressly opened the possibility of the extension of the additional protection, through a multilateral system of registration, to products other than wines and spirits and countries are currently exploring the cost impacts and other practicalities of the extension.

Given the divisions within the TRIPS Council, no consensus has been reached on the nature of the mandate for further negotiations. The Draft Ministerial Text submitted to the Ministers in Cancun, merely proposed the continuation of negotiations.

In relation to the negotiations on the multilateral register, at one extreme is the position of the EU that participation in the multilateral system should be mandatory for all WTO Members and that registrations should have binding effect.<sup>51</sup> The opposing position, taken by Australia, Argentina, Japan and the USA is that there should be voluntary participation in the system in which the register would function as a database which could be consulted by Members in taking decisions on the protection of geographical indications in their countries.<sup>52</sup>

On the question of the extension of the additional protection of Art 23 of the TRIPS Agreement to products other than wines and spirits, the dividing line is perceived to be one between emigrant countries urging extension (Europe, Africa and part of Asia)<sup>53</sup> and immigrant countries which are resisting extension (Australia, Latin America and the USA).<sup>54</sup>

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*Kenya on Behalf of the African Group*, WTO Doc WT/GC/W/302, 6 August 1999.

<sup>49</sup> WTO Doc. IP/C/W/204/Rev.1.

<sup>50</sup> WTO Doc. IP/C/W/289.

<sup>51</sup> See WTO Doc TN/IP/W/3 of 24 June 2002, signed by Bulgaria, Cyprus, the Czech Republic, the EU, Georgia, Hungary, Iceland, Malta, Mauritius, Moldova, Nigeria, Romania, the Slovak Republic, Slovenia, Sri Lanka and Turkey.

<sup>52</sup> See WTO Doc TN/IP/W/5 of 23 October 2002, also signed by Canada, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Namibia, New Zealand, Philippines and Chinese Taipei.

<sup>53</sup> See IP/C/W/204/Rev.1; IP/C/W/247/Rev.1; IP/C/W/308/Rev.1; IP/C/W/353.

<sup>54</sup> See F. Addor and A. Grazioli, 'Geographical Indications Beyond Wines and Spirits- A Roadmap for a Better Protection for Geographical Indications in the WTO TRIPS Agreement' (2002) *Journal of World Intellectual Property* 893.

The US and Australia have argued that the EU scheme for the protection of geographical indications is TRIPS-deficient in a number of areas. For example, the statement of the United States (US) to the WTO on the WTO trade policy review of the European Union expressed the concern that “foreign persons wishing to obtain protection for their GIs in the EU itself face a non-transparent process that appears to come into some conflict with the EU’s TRIPS obligations” and that “EU rulemaking processes are often perceived by third countries as exclusionary, allowing no meaningful opportunity for non-EU parties to influence the outcome of regulatory decisions”.<sup>55</sup>

On the 18 August 2003, the US and Australia each asked the Dispute Settlement Body of the WTO to establish panels on their behalf in order to resolve the dispute that arose between these countries and the EC regarding the Regulation.<sup>56</sup>

The US argued that Regulation 2081/92 does not provide the same treatment to other nationals and products originating outside the EC that it provides to the EC’s own nationals and products, does not accord immediately and unconditionally to the nationals and products of each WTO Member any advantage, favour, privilege or immunity granted to the nationals and products of other WTO Members, diminishes the legal protection for trademarks, does not provide legal means for interested parties to prevent the misleading use of a geographical indication, does not define a geographical indication in a manner that is consistent with the definition provided in the TRIPS Agreement, is not sufficiently transparent, and does not provide adequate enforcement procedures.

Australia argued that as a consequence of the Regulation’s inconsistency with some provisions of the TRIPS Agreement, the EC was not in conformity with its obligations. According to Australia, the Regulation diminishes the legal protection for trademarks under the TRIPS Agreement, does not accord immediately and unconditionally to the nationals and/or products of each WTO Member any advantage, favour privilege or immunity granted to the nationals of any other WTO Member, does not accord to nationals and/or products of each WTO Member treatment no less favourable than that it accords to its own nationals and/or like products of national origin, does not provide the legal means for interested parties to prevent misleading use of a GI and/or prevent any use of a GI which constitutes and act of unfair competition and is not applied in a transparent manner.

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<sup>55</sup> WTO Trade Policy Review of the European Union, Statement by the United States to the WTO, 24 July 2002, <http://www.state.gov/e/eb/rls/rm/2002/12242.htm>.

<sup>56</sup> See documents WT/DS174/20 and WT/DS290/18.

### (iii) Agreement on Agriculture

The objective of the Agreement on Agriculture (AoA) is to establish “a fair and market-oriented agricultural trading system” through “reductions in agricultural support and protection”. The expectation is that this would result in “correcting and preventing restrictions and distortions in world agricultural markets”. The Agreement was primarily directed at the distortion of world agricultural markets through use of export subsidies to dispose of their agricultural surpluses. The problems for developing countries were precisely the opposite: inadequate production and insufficient support to increase agricultural productivity. Thus the need of developing countries has been increased, rather than reduced support. It is suggested that such increased support would have negligible effects on the distortion of world agricultural markets.<sup>57</sup> This issue has been addressed in the negotiations on the AoA after the failure of the Seattle Ministerial.

Intellectual property considerations have had a limited role to play in the negotiations on the AoA. The main subject which has been discussed is the role which geographical indications for agricultural products can play in improving market access for developing countries.

The focus of the WTO Agreement on Agriculture (AoA) is not food security. Its objective is to establish “a fair and market-oriented agricultural trading system” through “reductions in agricultural support and protection”. The expectation is that this would result in “correcting and preventing restrictions and distortions in world agricultural markets”. The most direct form of trade distortion is the escalating use of export subsidies (subsidy “wars”) to dispose of surpluses on world agricultural markets.

Food security has been identified as a “non-trade concern” to be taken into account in the reform of agricultural trade.<sup>58</sup> A number of submissions have emphasised that in developing countries, where the majority of the population depends on agriculture for their livelihood, physical access to food can be ensured only through a minimum level of self-sufficiency.<sup>59</sup> The findings by the FAO on the interrelationship between the promotion of economic growth, reduction of poverty, the enhancement of food security and the development of agricultural capacity were cited in these submissions.<sup>60</sup> Thus, for example, India submitted that the particular vulnerability of agriculture in developing countries justified the extension of special provisions to the developing

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<sup>57</sup> *FAO papers on selected issues relating to the WTO negotiations on agriculture*, FAO, Rome, 2002, 6.

<sup>58</sup> WTO Agreement on Agriculture, Art. 20.

<sup>59</sup> Eg. Submission to the Special Session of the WTO Committee on Agriculture by Barbados, Burundi, Cyprus, Czech Republic, Dominica, Estonia, the European Communities, Fiji,

Iceland,

Israel, Japan, Korea, Latvia, Liechtenstein, Madagascar, Malta, Mauritania, Mauritius, Mongolia,

Norway, Poland, Romania, Saint Lucia, Slovak Republic, Slovenia, Switzerland, and Trinidad

and

Tobago. WTO doc., G/AG/NG/W/36/Rev.1; Submission by India, WTO doc., G/AG/NG/W/102,

15 January 2001; Proposal by Nigeria, WTO doc. G/AG/NG/W/130, 14 February 2001.

<sup>60</sup> Eg FAO Symposium on Agriculture, Trade and Food Security: Issues and Options in the forthcoming WTO Negotiations from the Perspective of Developing Countries, Geneva, 23-24 September 1999.

country members for ensuring their food and livelihood security concerns, such as exempting product specific support given to low income and resource poor farmers from AMS calculations.

The requirement in Art. 20 of the AoA that WTO Members in their reform of the Agreement, shall have regard to non-trade concerns, special and differential treatment to developing country members and the principles of equity and fairness was reformulated in the Doha Ministerial Declaration to take account of the needs and interests of the developing countries, particularly the vulnerability of the least-developed countries and the importance of the objective of sustainable development. In the work programme decided in March 2002, non-trade concerns, including food security, and “special and differential treatment” were to be an integral part of the negotiations. However, the failure of Cancun Ministerial, prevented settlement of a common position on a draft text.

**(b) FAO**

**(i) Consulting Group on International Agricultural Research (CGIAR)**

The First Green Revolution can be traced back to the work of Norman Borlaug, a US plant breeder, who won the Nobel Prize in 1970 for his work in developing high-yielding wheat varieties for Mexico. Borlaug, was the founding father of the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), which became the first of the 15 international agricultural research centres, which became associated in the Consulting Group for International Agricultural Research (CGIAR).<sup>61</sup> Each of these centres undertakes research into crops, livestock and materials of interest to developing countries. In addition to conducting research, the CGIAR, supports a collection of germplasm, which currently comprises over 600,000 accessions of more than 3,000 crop, forage and pasture species which are held at the research centres. In addition to the so-called “designated germplasm”, which is held under the trust relationship with the FAO, the various CGIAR centres have developed “elite germplasm” and biological tools, such as isogenic lines, mutants and mapping populations, from the materials which have been deposited with them.

The international agricultural research centres of the CGIAR were at the forefront of the public agricultural research effort, which until the 1990s represented some 80% of funding for agricultural research. Subsequently, the research expenditures of national research institutes have exceeded that of the CGIAR<sup>62</sup>, but more significantly, the investment in agricultural research by private seed companies has increased to about

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<sup>61</sup> These centres are: the Centro Internacional de Agricultura Tropical (CIAT), Center for International Forestry Research (CIFOR), Centro Internacional de la Papa (CIP), International Center for Agricultural Research in the Dry Areas (ICARDA); International Center for Living Aquatic Resources Management (ICLARM), International Center for Research in Agroforestry (ICRAF), International Crop Research Institute for the Semi-Arid Tropics (ICRISAT); International Livestock Research Institute (ILRI), International Institute of Tropical Agriculture (IITA), International Plant Genetic Resources Institute (IPGRI) International Rice Research Institute (IRRI) and the West Africa Rice Development Association (WARDA).

<sup>62</sup> P. Pardey and R. Beintema, "Slow Magic; Agricultural R&D a Century After Mendel", IFPRI, Oct. 26, 201.

one third of global expenditure.<sup>63</sup> The application of intellectual property rights in agricultural research is the principal explanation for what in effect has become the privatisation of agricultural research. As is discussed below, the creation of intellectual property rights in plant varieties developed through classical breeding and the proprietisation of genetic resources and associated enabling technologies through innovations in patent law have been the vehicles through which private agro-industrial enterprises have assumed a dominant position in agricultural research.

This development has a number of significant implications for food security. Principal among these are: (i) the research priorities of the private agricultural research sector are not necessarily congruent with the interests of developing countries, particularly in relation to the food crops which are the focus of private research; (ii) enabling technologies and useful genetic materials have increasingly become concentrated in the private sector; (iii) the commercial objective of private agricultural innovators, to secure control over seed germination to oblige farmers to pay for each planting, is inconsistent with the traditional seed-saving practices of farmers; and (iv) the commercial objective of private seed companies has been to encourage mono-cultures based on their proprietary products, which has resulted in a loss of important genetic diversity and in adverse environmental impacts. A related development has been a number of instances of “biopiracy” in which the genetic resources of CGIAR centres have been the basis of intellectual property rights applications by private parties.

For example, germplasm ownership concerns were raised in 1998 as a consequence of Plant Breeder's Rights applications made in Australia by a number of agricultural research institutes in relation to a peavine and a lentil which had been bred from genetic stock obtained from the CGIAR gene bank: International Centre for Agricultural Research in the Dry Areas (ICARDA), located in Aleppo, Syria. The 14 February 1998 issue of *New Scientist* contained an editorial and leading article on the alleged biopiracy of two Australian agricultural agencies. The two agencies: Agriculture Western Australia and the Grains Research and Development Corporation (GRDC) had apparently applied for Plant Breeder's Rights (PBR) under the Australian Plant Breeder's Rights Act, 1994, in relation to two species of chickpea which had been bred from material which had been provided by the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT). The Australian Plant Breeder's Rights Office did not have an opportunity to make a determination on the registrability of these varieties because the furore caused by these applications led to their withdrawal, prior to determination.

The *New Scientist* editorialised that "it was hard to imagine what two Australian government agricultural agencies thought that they were up to when they applied for property rights on chickpeas grown by subsistence farmers in India and Iran".<sup>64</sup> A feature article in the *New Scientist* carried an accusation from a spokesperson from the South Asian Network on Food, Ecology and Culture which described the PBR applications as “blatant biopiracy” by “privatising seeds that belong to our farmers and selling them back to us”.<sup>65</sup>

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<sup>63</sup> Ibid., 8.

<sup>64</sup> 'Editorial. Lest We Starve', No. 2121, *New Scientist*, 14 February, 1998, 3.

<sup>65</sup> Edwards and Anderson, 'Seeds of Wrath', *Ibid*, 14.

Research by RAFI suggested that there were numerous other instances of “biopiracy” by other Australian agricultural research institutes. Reacting to the biopiracy controversy, CGIAR called for a moratorium on the granting of intellectual property rights over plant germplasm held in its centres. CGIAR Chairman, Dr Ismail Serageldin, explained the call for a moratorium as “the strongest signal the CGIAR can send governments to ensure that these issues be resolved and the materials in the CGIAR remain in the public domain”.<sup>66</sup> In Australia, serious concerns were expressed about the implications which such a moratorium would have, particularly for its cultivation of cereals. Consequently, to prevent a recurrence of this incident, the operating regulations of the Australian Plant Breeders Rights Office were amended to oblige applicants for PBRs in relation to varieties derived from germplasm obtained from CGIAR Centres, to document that such applications were made with the permission of the relevant Centre.

Responding to concerns about the impact of intellectual property rights upon the operation of the CGIAR, it commissioned a report on the use of proprietary technologies by CGIAR Centres by the International Service for National Agriculture Research (ISNAR), which operates as its legal advisory body.<sup>67</sup> The report noted the burgeoning use of proprietary technologies by the centres and recommended that they undertake audits of their intellectual property management policies. ISNAR established a Central Advisory Service to provide legal counsel for the centres on intellectual property matters.

An issue which has not yet been addressed by the CGIAR or the FAO is the question of the rights, if any, of the indigenous and traditional communities from which seeds might have been collected by the various CGIAR institutes. That collection may have been informed by the knowledge of those communities, or may have occurred without the communication by the collector to those communities of the implications of the act of collection.

An illustration of the impact of patenting upon the research activities of the CGIAR Centres is provided by an incident arising from the development by the International Rice Research Institute (IRRI) of blight resistant rice. In the late 1970s a strain of rice from Mali, *Oryza longistaminata*, was identified by a researcher, working in Cuttack, North India, as being resistant to bacterial blight, a disease which particularly afflicts rice. In 1978 this resistant sample was taken to the IRRI in Los Banos, Philippines for further investigation. Over a fifteen year period, IRRI researchers developed through conventional breeding, a high-yielding, blight resistant strain of rice. The IRRI researchers identified that this resistance was contributed by a single locus called Xa21. A post-doctoral research fellow, Dr Ronald, from the University of California at Davis, who was working at IRRI, was permitted with co-workers at Stanford University to map, sequence and clone the Xa21 gene. The molecular mapping process was facilitated by the construction of a BAC library utilising a biological tool provided by IRRI.

On 7<sup>th</sup> June 1995 the Regents of the University of California filed a patent application for “Nucleic acids, from *Oryza sativa*, which encode leucine-rich repeat polypeptides and enhance *Xanthomonas* resistance in plants. The inventors named in the application were Dr

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<sup>66</sup> CGIAR Press Release 'CGIAR Urges Halt to Granting of Intellectual Property Rights for Designated Plant Germplasm', Feb. 11, 1998, <http://www.cgiar.org:80/germrel.htm>.

<sup>67</sup> J. Cohen, C. Falconi, J. Komen and M. Blakeney, *The Use of Proprietary Biotechnology Research Inputs at Selected CGIAR Centres*. (The Hague: CGIAR, March 1998).

Ronald and her co-workers. The patent was granted by the United States Patents and Trademark Office on 12 January 1999 (U.S. patent 5,859,339).

This patent generated some controversy in CGIAR circles because it was perceived to compromise IRRI's research efforts and those of its clients in the rice-producing regions of Asia. Bacterial blight is not a particular problem for US rice producers and a primary effect of the patent was to prevent the export of bacterial blight resistant rice, utilising the patent to the USA. UC Davis initially sought royalties from IRRI for the use by it or its clients of Xa21. A licence was negotiated with UC Davis to allow non-commercial researchers access to the gene, provided they did not develop commercial products based on that gene. This would have the effect of preventing rice producing countries which used the gene from exporting into the US market. This patent also raised the question of equitable compensation, at least for the traditional farmers of Mali who had conserved *O. longistaminata*. The UC Davis dealt with the issue of compensation by establishing a Genetic Resources Recognition Fund (GRRF) as a mechanism to share benefits arising from the commercial utilisation of its patent. It was also acknowledged that in the absence of this sort of mechanism, it would have been "more difficult for the university in the future to obtain research access to developing countries' national genetic materials."<sup>68</sup>

A particularly egregious example of the propertisation of germplasm relied upon by developing country farmers was the grant by the US Patent and Trademarks Office of a patent (no. 5,894,079) on April 13, 1999 to Larry Proctor for an invention described in the patent grant as relating to "a new field bean variety that produces distinctly colored yellow seed which remain relatively unchanged by season." Mr Proctor, was the president of a Colorado (USA) based seed company, POD-NERS. Upon the grant of the patent, this company was reported to have written to all the importers of Mexican beans in the United States, requiring the payment of a royalty of six cents per pound.<sup>69</sup> According to Miguel Tachna Felix, of the the Agricultural Association of Rio Fuerte, this would have meant an immediate drop in export sales, over 90%. POD-NERS was reported to have brought infringement actions against two companies that were selling Mexican yellow beans in the US. In January 2000, the Mexican government announced that it would challenge the U.S. patent. On 20 December 2000 CIAT filed a formal request for re-examination of the US patent concerning the yellow bean, which was alleged to be the Mexican Enola bean.<sup>70</sup> CIAT's official request for re-examination of the patent stated that the claims for inventiveness contained in the patent failed to meet the statutory requirements of novelty and non-obviousness, and ignored the prior art widely available in the literature. The challenge was particularly critical of the patent's claim of exclusive monopoly on any *Phaseolus vulgaris* (dry bean) having a seed color of a particular shade of yellow. Although, there was no evidence that the patent owner obtained his yellow beans from CIAT's germplasm collection, the patent challenge noted that CIAT maintained some 260 bean samples with yellow seeds, and 6 of the accessions were 'substantially identical' to claims made in the patent.<sup>71</sup> CIAT's patent challenge also asserted that the yellow bean was 'misappropriated' from Mexico, and that this was in breach of Mexico's sovereign rights

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<sup>68</sup> P.Ronald quoted in WIPO/UNEP, *The Role of Intellectual Property Rights in the Sharing of Benefits Arising from the Use of Biological Resources and Associated Traditional Knowledge. Selected Case Studies*, WIPO: Geneva, 2001, 13.

<sup>69</sup> 'Mexican Bean Biopiracy', Biotechnology Notice Board, posted by: PANUPS [panupdates@panna.org](mailto:panupdates@panna.org), January 24, 2000.

<sup>70</sup> RAFI, 'Enola Bean Patent Challenged', News Release, 5 January 2001 [www.rafi.org](http://www.rafi.org).

<sup>71</sup> Ibid.

over its genetic resources, as recognized by the CBD. The USPTO is currently determining this challenge.

The principal impact of these biopiracy episodes, relevant to the question of food security, has been the reluctance of countries to contribute germplasm to CGIAR Centres. This will have an adverse effect upon the plant breeding programmes of the Centres and the consequent provision of improved seed to poor farmers. Another effect has been the response of the donor community, which funds the CGIAR Centres to induce them to emulate the private sector and to exploit their biological resources in support of their research mandate. Some CGIAR Centres perceive that Centre-generated intellectual property might be used as a bargaining chip, to be traded for biological tools patented by the private sector. For example the *Policy on Intellectual Property* of the International Maize and Wheat Improvement Center (CIMMYT) envisages that intellectual property protection may be sought “to facilitate the negotiation and conclusion of agreements for access to proprietary technologies of use to CIMMYT’s research and in furtherance of its mission.”<sup>72</sup> It is questionable whether the trade in CGIAR products will counterbalance the reduction in funding.

## **(ii) FAO International Treaty for the Protection of Plant Genetic Resources in Food and Agriculture**

Plant genetic resources for food and agriculture (PGRFA) were freely exchanged by the international agricultural research institutes of the CGAIR, as well as by their national counterparts on the basis that they were the common heritage of humankind. This principle was embodied in the International Undertaking adopted by the FAO Conference in 1983. The International Undertaking was adopted as a non-binding conference resolution. In subsequent years the principle of free exchange was gradually narrowed by the impact of intellectual property rights upon agriculture. In November 1989 the 25<sup>th</sup> Session of the FAO Conference adopted two resolutions providing an “agreed interpretation” that plant breeders’ rights were not incompatible with the Undertaking. The acknowledgment of plant variety rights obviously benefited industrialised countries, which were active in seed production. In exchange for this concession, developing countries won endorsement of the concept of “farmers’ rights”. A further resolution in 1991 recognized the sovereign rights of nations over their own genetic resources. Agenda 21, promulgated at the Rio Earth Summit in 1992 called for the strengthening of the FAO Global System on Plant Genetic Resources. Resolution 3 of the Final Act to the CBD noted that the access to *ex situ* germplasm collections, such as those maintained by the CGIAR, and the realization of Farmers’ Rights, were the province of the International Undertaking. The 1993 FAO Conference called on member states to harmonize the International Undertaking with the CBD. Negotiations for revision of the International Undertaking to take account of both the CBD and the TRIPS Agreement commenced in November 1994 and was consummated with the adoption of the International Undertaking as the International Treaty on Plant Genetic Resources for Food and Agriculture.

The objectives of the Treaty, are stated in Article 1 to be “the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of

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<sup>72</sup> CIMMYT, *Policy on Intellectual Property*, Article III.4.v, <[www.cimmyt.org/resources/obtaining/seed/ip\\_policy/htm/ip-policy.htm](http://www.cimmyt.org/resources/obtaining/seed/ip_policy/htm/ip-policy.htm)>.

the benefits arising out of their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security”. The term ‘plant genetic resources for food and agriculture’ is defined in Art.2 to mean ‘any genetic material of plant origin of actual or potential value for food and agriculture’. The term ‘genetic material’ is defined in Art. 2 to mean ‘any material of plant origin, including reproductive and vegetative propagating material containing functional units of heredity’.

Article 10.2 contains the agreement of the Contracting Parties to “establish a multilateral system, which is efficient, effective and transparent, both to facilitate access to [PGFRA] and to share, in a fair and equitable way, the benefits arising from the utilisation of these resources, on a complementary and mutually reinforcing basis”. The PGRFA to which the Multilateral System applies are those crops and forages which are listed in Annex I and other contributions by resource holders (Art 11(2)). This is further limited to materials ‘under the management and control of the Contracting Parties and in the public domain’ (Art. 11(2)). However, the collections of the CGIAR are expressly included in the Multilateral System (Art. 11(5)), but each Centre’s collections are to be accessed according to agreements between them and the Governing Body of the PGFRA Treaty on terms which each Centre might negotiate (Art.15(1)). The Governing Body is currently developing an MTA for PGRFA to be accessed from the Multilateral System.

The International Treaty in Article 12.3 provides that facilitated access to PGFRA is to be provided under MTAs on condition (d) that the recipients “shall not claim any intellectual property or other rights that limit the facilitated access” to PGFRA, or their “genetic parts or components”, in the form received from the Multilateral System. This, of course, does not prevent intellectual property rights being claimed in relation to germplasm which is modified by the recipient. A problematic issue is the extent of modification which must occur before it can be said that the form in which the germplasm was received has changed. In the case of intellectual property rights used in a breeding programme, this will be similar to the inquiry in UPOV-derived laws whether a new variety is “essentially derived” from an existing variety. In the case of the patenting of genetic material derived from germplasm, the question will revolve around the extent of “invention” which is involved. Given the willingness of patent offices to grant patents, merely for the isolation of useful genetic sequences, the question will arise as to whether the fact of isolation is equivalent to changing the form in which germplasm is received. If the view is taken that this isolated material is in a changed form, this will have the effect of removing useful material from the CGIAR system.

This problem could be dealt with by imposing a requirement in MTAs that the providing Centre is entitled to royalty-free use of any derived materials.

The utilisation of the MTAs which will be developed under the International Treaty for the Protection of Genetic Resources for Food and Agriculture. This will include consideration of the following questions<sup>73</sup>:

- What should be the level, form and manner of payments in line with commercial practice?

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<sup>73</sup> See C. Fowler, *The Status of Public and Proprietary Germplasm and Information: An Assessment of Recent Developments at FAO*, Ithaca, N.Y., Biodevelopments, 2003, 12.

- Whether different levels of payment should be established for various categories of recipients who commercialise such products or for different sectors and, if so, what those levels, various categories of recipients, and sectors should be?
- Whether to exempt small farmers in developing countries and in countries with economies in transition from the payments, and if so, who qualifies as a small farmer?
- What constitutes commercialisation in terms of Article 13.2d(ii) of the Treaty?
- What constitutes incorporation of material access from the Multilateral System?
- When would a product be considered to be available without restriction to others for further research and breeding?
- How will monetary and other benefits be defined for the purposes of the standard MTA?
- By what means will the MTA ensure the application of Article 12.3? (This Article spells out the conditions under which access to materials and information is to be granted.)
- What terms should be included in the MTA so that recipients are bound by it on acceptance of the material from the Multilateral System?

Article 13.1 recognises that benefits accruing from facilitated access to PGFRA shall be shared fairly and equitably under this Article. Article 13.2 envisages that this sharing of benefits include the exchange of technical information, access to technology, capacity building and the sharing of monetary benefits from commercialisation.

Article 28 provides that the Treaty enters into force, 90 days after accession by 40 countries. Until that date, the International Undertaking will remain operative.

The establishment of the Multilateral System was the principal innovation introduced by the treaty. This asserts the primacy of national sovereignty over biological resources, but in fact imposes limitations on countries on their ability to restrict access to other states. Facilitated access has to be provided to the crops listed in Annex I, which account for a significant part of human nutrition. Member states are obliged to make available all passport data and, subject to applicable law, any other associated non-confidential descriptive information. In relation to material which is under development by farmers or breeders at the time when access is requested, the Treaty gives the country of origin the right to delay access during the period of development. Two compromises were necessary to secure this right of access: first, is the limitation imposed by Article 12 upon recipients seeking intellectual property rights in material obtained under the Treaty; the second was the right of donors to receive some form of benefit sharing. Benefit sharing mechanisms under the Treaty include: the exchange of information, access to and transfer of technology, capacity building, and the sharing of the benefits arising from commercialisation.

The CGIAR Centres had signed agreements with the FAO in 1994, placing the acquisitions to their germplasm collections after that date under the trusteeship of the FAO. Under the Treaty, new agreements were invited, to determine that the access provisions of the Treaty would govern the germplasm collections of the Centres which fell within Annex I list, collected after the entry into force of the Treaty.

In our view, the design of a future system of protection of traditional knowledge and the implementation of the multilateral system instituted by the FAO International Treaty on

Plant Genetic Resources should lead to the co-existence of managed commons with private property rights such as patents and plant breeders' rights, whose scope national or regional intellectual property offices or jurisdictions might consider to reduce, even in the absence of any modification of existing treaties. Instead, the adoption of national legislations concerned with the protection of plant genetic resources by an effective *sui generis* system and with the revocation of patents for lack of evidence of prior informed consent, would contribute to the articulation of the TRIPs and the CBD and to the implementation of the FAO Treaty. Nevertheless, the application of some provisions of the FAO Treaty, such as those relating to the payments to be made to the multilateral fund, might prove thorny, as it is often almost impossible to track all the crossings that led to a given plant variety, especially when the germplasm comes from varied countries. Nevertheless, in some instances, the drafters of the FAO International Treaty took a resolutely optimistic approach, considering that non-compulsory contributions could be made.

### **(c) World Intellectual Property Organization (WIPO)**

As will be recalled from the discussion above, the first significant discussion of aspects of the international intellectual property regime, which had a bearing on food security, occurred in the discussions in the Council for TRIPs on the revision of Art.27.3(b). Following the failure of the Seattle Ministerial in November 1999, this discussion shifted to the WIPO, in the context of agitation for the inclusion of traditional knowledge within the international intellectual property regime. In a Note, dated September 14, 2000, the Permanent Mission of the Dominican Republic to the United Nations in Geneva submitted two documents on behalf of the Group of Countries of Latin America and the Caribbean (GRULAC) as part of the debate on in the WIPO General Assembly on "Matters Concerning Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore."<sup>74</sup> The central thrust of these documents was a request for the creation of a Standing Committee on access to the genetic resources and traditional knowledge of local and indigenous communities. "The work of that Standing Committee would have to be directed towards defining internationally recognized practical methods of securing adequate protection for the intellectual property rights in traditional knowledge."<sup>75</sup>

In order to clarify the future application of intellectual property to the use and exploitation of genetic resources and biodiversity and also traditional knowledge, it was suggested that the Committee could clarify: (a) the notions of public domain and private domain; (b) the appropriateness and feasibility of recognizing rights in traditional works and knowledge currently in the public domain, and investigating machinery to limit and control certain kinds of unauthorized exploitation; (c) recognition of collective rights; (d) model provisions and model contracts with which to control the use and exploitation of genetic and biological resources, and machinery for the equitable distribution of profits in the event of a patentable product or process being developed from a given resource embodying the principles of prior informed consent and equitable distribution of profits in connection with the use, development and commercial exploitation of the material transferred and the

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<sup>74</sup> WIPO Doc. WO/GA/26/9

<sup>75</sup> *Ibid.*, Annex I, 10.

inventions and technology resulting from it; (e) the protection of undisclosed traditional knowledge.

**(i) Intergovernmental Committee**

At the WIPO General Assembly the with Member States agreed the establishment of an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore. Three interrelated themes were identified to inform the deliberations of the Committee: intellectual property issues that arise in the context of (i) access to genetic resources and benefit sharing; (ii) protection of traditional knowledge, whether or not associated with those resources; and (iii) the protection of expressions of folklore.<sup>76</sup>

At the First Session of the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (“IGC”) held in Geneva from April 30 to May 3, 2001, the Member States determined the agenda of items on which work should proceed and prioritized certain tasks for the Committee. Principal among these was “the development of ‘guide contractual practices,’ guidelines, and model intellectual property clauses for contractual agreements on access to genetic resources and benefit-sharing.”<sup>77</sup>

By the Fifth Session of the IGC, which met in Geneva from July 5-15, 2003, the following resources, relevant to the issue of food security, had been developed:

- A consolidated survey of the protection of traditional knowledge through IP laws and an analysis of case studies conducted by WIPO in 1998 -99 on the use of IP to protect traditional knowledge.<sup>78</sup>
- A Draft Toolkit on Intellectual Property Management<sup>79</sup>, which identifies concerns relating to the management of IP arising in the context of documenting traditional knowledge.
- A compendium of contractual practices and clauses relating to IP, access to genetic resources and benefit-sharing.<sup>80</sup>
- *A Technical Study on Disclosure Requirements Related to Genetic Resources and Traditional Knowledge*<sup>81</sup>. This study reviewed salient aspects of the patent system and of legal mechanisms concerning access to genetic resources and associated TK, and surveyed the responses to a questionnaire circulated to WIPO Member States on patent disclosure requirements.

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<sup>76</sup> See WIPO, ‘Matters Concerning Intellectual Property Genetic Resources Traditional Knowledge and Folklore’, WIPO Doc, WO/GA/26/6, August 25, 2000.

<sup>77</sup> See WIPO Doc, WIPO/GRTKF/IC/2/3, September 10, 2001, para.1.

<sup>78</sup> See WIPO Doc., WIPO/GRTKF/IC/5/8 and WIPO/GRTKF/IC/5/7, which updates and consolidates the information received through the survey WIPO/GRTKF/IC/2/5 and the *questionnaires circulated to Member States*.

<sup>79</sup> See WIPO Doc., WIPO/GRTKF/IC/5/5.

<sup>80</sup> See WIPO Doc. WIPO/GRTKF/IC/5/9.

<sup>81</sup> See WIPO Doc. WIPO/GRTKF/IC/5/10.

- Technical proposals, submitted by the Asian group of countries on databases and registries of traditional knowledge and biological/genetic resources, which were based on the conclusions of the WIPO Asia-Pacific Regional Seminar on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, held in Cochin, India, from November 11 to 13, 2002.<sup>82</sup>

The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore met in Geneva from 15 to 19 March 2004. In relation to genetic resources it considered: (1) Draft Intellectual Property Guidelines for Access and Benefit Sharing Contracts (Doc WIPO/GRTKF/IC/6/5); (2) genetic resources and patent disclosure requirements (Doc WIPO/GRTKF/IC/6/9); (3) defensive protection measures relating to intellectual property, genetic resources and traditional knowledge (Doc WIPO/GRTKF/IC/6/8); and, the international dimension of the protection of traditional knowledge, traditional cultural expressions and genetic resources (Doc WIPO/GRTKF/IC/6/6).<sup>83</sup>

- (1) *Draft Intellectual Property Guidelines for Access and Benefit Sharing Contracts:* The guidelines sought to provide assistance in the negotiation of contracts for access to genetic resources and related information, including traditional knowledge, and for benefit-sharing arrangements.<sup>84</sup>
- (2) *Genetic Resources and Patent Disclosure Requirements:* The Committee's Draft Technical Study on patent disclosure requirements relevant to genetic resources and traditional knowledge which was transmitted for adoption by COP at its seventh meeting (9-20 February 2004) proposed a text on modalities for addressing disclosure of information about genetic resources in patent applications:
- (3) *Defensive Protection Measures Relating to Intellectual Property, Genetic Resources and Traditional Knowledge:* Matters considered under this subject included: the question of the recognition of orally disclosed traditional knowledge; measures for improving the documentation of genetic resources and traditional knowledge for use in patent procedures; and methods for improving the understanding of innovations within traditional knowledge systems for the purposes of patent search and examination. The Committee proposed in its further work to consider: (a) "the compilation of information about the criteria that apply to the determination of relevant prior art in various jurisdictions, so that where defensive publication is made for patent purposes, it would achieve the intended objectives";<sup>85</sup> and (b) the preparation of "recommendations or guidelines for national patent offices concerning searches in the area of inventions linked to TK (within specific technical fields) or genetic resources, with the goal of ensuring that patent authorities with little background in traditional knowledge systems are

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<sup>82</sup> See WIPO Doc. WIPO/GRTKF/IC/4/14.

<sup>83</sup> Draft Agenda, Doc WIPO/GRTKF/IC/6/1, 1/12/2003

<sup>84</sup> WIPO Doc WIPO/GRTKF/IC/6/INF/3, 8/12/2003

<sup>85</sup> Doc WIPO/GRTKF/IC/6/8, paragraph 23.

better equipped to base decisions on a clearer understanding of the manner in which TK is maintained and developed within the traditional context”.<sup>86</sup>

## **(ii) Substantive Patent Law Treaty**

In an endeavour to reach a consensus on substantive patent law issues a Committee of Experts and WIPO’s Standing Committee on Patents (SCP) considered a draft Patent Law Treaty (PLT), which had been prepared by the International Bureau of WIPO. The Draft PLT dealt with various procedural aspects of patenting. At the third session of the SCP in September 6 to 14, 1999, the delegation of Colombia proposed the introduction into the PLT, as a means of achieving some global harmonization of patent registration procedures, an article which provided that:

1. All industrial protection shall guarantee the protection of the country’s biological and genetic heritage. Consequently, the grant of patents or registrations that relate to elements of that heritage shall be subject to their having been acquired made legally.
2. Every document shall specify the registration number of the contract affording access to genetic resources and a copy thereof whereby the products or processes for which protection is sought have been manufactured or developed from genetic resources, or products thereof, of which one of the member countries is the country of origin.

This proposal generated a heated debate about whether, in the first instance, it raised a matter of procedural or substantive patent law. Agreement was eventually reached to defer consideration of this proposal to the occasion of the discussion of a proposed Substantive Patent Law Treaty. The SCP requested the International Bureau to include the issue of protection of biological and genetic resources on the agenda of a Working Group on Biotechnological Inventions, to be convened at WIPO in November 1999. The Working Group, at its meeting, the following month, recommended the establishment of nine projects related to the protection of inventions in the field of biotechnology. The Working Group decided to establish a questionnaire for the purpose of gathering information about the protection of biotechnological inventions, including certain aspects regarding intellectual property and genetic resources, in the Member States of WIPO.

## **(d) UNCTAD**

UNCTAD has discussed the role of traditional knowledge and biodiversity in a number of contexts. Its Biotrade Initiative has included references on the need to secure equitable benefit-sharing in the trade in biodiversity and its components. The Fifth Session of the Commission on Trade in Goods and Services, and Commodities formulated *Agreed recommendations on the sustainable use of biological resources: Systems and national experiences for the protection of traditional knowledge, innovations and practices*.<sup>87</sup> A joint UNCTAD-ICTSD Project on Intellectual Property and Sustainable Development was launched in July 2001 to facilitate the emergence of a critical mass of well-informed stakeholders in developing countries. A paper by

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<sup>86</sup> Doc WIPO/GRTKF/IC/6/8, paragraph 24.

<sup>87</sup> UNCTAD Doc., TD/B/COM.1/L.16, 27 March 2001.

Professor John Barton, published in August 2003, on *Nutrition and Technology Transfer Policies* reviewed the transfer of nutritional technologies to developing nations, seeking to identify the most important contemporary policy issues at both the national and international levels. It examined the intellectual property, competition law, biosafety, international trade, and public sector research policies affecting the transfer of technology in the nutritional area.

**(e) Conference of Parties on the Convention on Biological Diversity (CBD)**

**(i) Introduction to the CBD**

The Rio Earth Summit, which was convened in June 1992, promulgated the Convention on Biological Diversity (CBD), The Rio Declaration on Environment and Development and Agenda 21. The CBD represented an attempt to establish an international programme for the conservation and utilization of the world's biological resources<sup>88</sup> and for the "fair and equitable sharing" of the benefits arising from the utilisation of genetic resources<sup>89</sup>. "The single most divisive issue in the negotiations was the relationship between intellectual property rights and access to genetic resources."<sup>90</sup> The developing countries of the South, generally speaking the most with substantial source of genetic resources, sought to use the CBD as a means of bargaining access to those resources for royalties, technology and research data. Thus the CBD contains articles on access to genetic resources (Art. 15); access to and the transfer of technology (Art.16); informed consent and the distribution of benefits of biotechnological innovations (Art.19). The industrialised group of countries, obviously the principal source of biotechnological innovation, insisted that the CBD did not conflict with intellectual property rights. Thus for example, Art. 16 (2) contains the statement that "In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights".

Reflecting the uncomfortable political deal which was struck in bringing the CBD to conclusion, the language of the Convention is unfortunately vague. The positive affirmation of principles in a number of areas is qualified by vague transcendental values. Thus the respect for intellectual property affirmed by Art. 16 (2) is counterbalanced by the phrase in the same provision that "access to and the transfer of technology...shall be provided and/or facilitated under fair and most favourable terms...". Similarly, Art. 15(4) provides that "access [to genetic resources] where granted shall be upon mutually agreed terms". Art. 19(2) provides that "access...to the results and benefits arising from biotechnologies...shall be on mutually agreed terms". Since mutuality is a precondition for an agreement of any sort, these provisions may be mere rhetoric. On the other hand, they may be a guarantee against unilateral expropriation.

**(ii) Scope of the CBD Access Regime**

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<sup>88</sup> See F.McConnell, *The Biodiversity Convention. A Negotiating History*, London, The Hague, Boston, Kluwer, 1996.

<sup>89</sup> CBD, Art.1.

<sup>90</sup> P. Chandler, 'The Biodiversity Convention: Selected Issues of Interest to the International Lawyer', (1993) 4 *Colo. J. Int'l Envl L & Policy* 141 at 161.

Article 1 of the CBD envisages "appropriate access to genetic resources" and "the fair and equitable sharing of benefits arising out of the utilization of genetic resources". "Genetic resources" are defined in Art.2 as meaning "genetic material of actual or potential value". The term "genetic material" is then defined in Art.2 to mean "any material of plant, animal, microbiological or other origin containing functional units of heredity". On a strict analysis of this definition, it is suggested that biochemical extracts which do not contain DNA or RNA would be outside the scope of the CBD.<sup>91</sup> Thus the Convention would apply to seeds and cuttings and DNA extracted from a plant, such as a chromosome, gene, plasmid or any part of these such as the promoter part of a gene.<sup>92</sup>

Article 9 deals with "the conservation of components of biological diversity outside their natural habitats", for example, in germplasm and seed banks, botanical gardens, museums, laboratories and agricultural research institutions. This article calls for national legislation to provide for the acquisition, conservation, storage and management of these *ex situ* collections. The access and benefit-sharing provisions of the CBD do not apply to the genetic resources of a country which were collected prior to the entry of the CBD into force in that country.<sup>93</sup> Thus a country with a pre-existing collection of genetic material has the sovereign right to control access to that collection, but has no legal right to insist upon a share of any benefits derived from the use of that collection. Also, the CBD applies to those genetic resources which originate in the country of a contracting party.

### **(iii) Sovereign Rights over Genetic Resources (Art 15 (1))**

Article 15(1) of the CBD affirms "the sovereign rights of States over their natural resources" and provides that "the authority to determine access to genetic resources rests with the national governments and is subject to national legislation". This provision, dealing as it does with access to genetic resources, does not refer to the question of the ownership of genetic resources. This leaves unanswered the ownership issues raised by the creation of the CGIAR germplasm collections.

### **(iv) Mutually Agreed Terms, Prior Informed Consent and Benefit Sharing**

Article 15(4) of the CBD envisages that where access is granted it will be subject to mutually agreed terms. Currently the conventional form of access agreement is the Material Transfer Agreement (MTA). A number of the provisions of the CBD refer to the equitable sharing of benefits arising from the utilisation of the genetic resources of a signatory. Article 15(7) requires each Contracting Party to "take legislative, administrative or policy measures, as appropriate" and in accordance with a number of specified provisions of the Convention, "with the aim of sharing in a fair and equitable way, the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources". Article 8(j) envisages the "equitable sharing" of benefits with indigenous and local communities, arising out of the use of the traditional

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<sup>91</sup> See L. Glowka, F. Burhenne-Guilmin and H. Synge *A Guide to the Convention on Biological Diversity*, Gland, IUCN, 1994, 3.

<sup>92</sup> See L. Glowka, *A Guide to Designing Legal Frameworks to Determine Access to Genetic Resources*, Gland, IUCN, 1998, 4.

<sup>93</sup> CBD, Art.15(3) and see Yusuf, 'International Law and Sustainable Development: The Convention on Biological Diversity' in A.A. Yusuf, (ed) *African Yearbook of International Law*, vol. 2, The Hague, Boston and London, Kluwer, 1995, 109.

knowledge, innovations and practices of those communities. Article 21 provides for the establishment of a "mechanism" for the provision of financial resources to developing country parties to the CBD.

Complementary to the equitable sharing of benefits, the CBD provides for the access of developing country signatories to technologies which may result from the utilisation of the genetic resources which they may provide. Article 16(1) recites the importance of access to biotechnologies to attain the objectives of the CBD and Art 16(2) provides for the access to technologies by developing countries on "fair and equitable terms, including on concessional and preferential terms". Article 19(1) requires parties to take appropriate measures to "provide for the effective participation in biotechnological research activities by those Contracting Parties, especially developing countries, which provide the genetic resources for such research". Article 19(2) requires parties to "take all practicable measures to promote and advance priority access on a fair and equitable basis...especially developing countries, to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties" on mutually agreed terms.

At the second Conference of the Parties (COP), held in Jakarta, from November 6 to 17, 1995, a Report including 'Possible elements of guidelines on mutually agreed terms.' was tabled.<sup>94</sup> The possible elements which were suggested to Parties for inclusion in access and benefit-sharing arrangements included, *inter alia*, "agreeing on respective *intellectual property rights* over the genetic resources and technologies developed using them." The fourth COP decided in Decision IV/8 to establish a Panel of Experts with the mandate "to draw upon all relevant sources ... in the development of a common understanding of basic concepts and to explore all options for access and benefit sharing on mutually agreed terms including guiding principles, guidelines, and codes of best practice for access and benefit-sharing arrangements."

The Panel of Experts on Access and Benefit-sharing, at its first meeting, held in San José, Costa Rica, from October 4 to 8, 1999, concluded that one of the "key lessons with respect to promoting mutually agreed terms in access and benefit-sharing arrangements" is that "Contractual agreements, for the moment, are the main mechanism for gaining access to genetic resources and delivering benefits."<sup>95</sup> Considering that transaction costs have a significant impact on actual use of genetic resources, the Panel identified "standardized Material Transfer Agreements" as one of the mechanisms to reduce transaction costs.

The fifth COP in Decision V/26 decided, *inter alia*, to establish an *Ad Hoc* Open-Ended Working Group on Access and Benefit-sharing with "the mandate to develop guidelines and other approaches for submission to the Conference of the Parties and to assist Parties and stakeholders in addressing the following elements as relevant to access to genetic resources and benefit-sharing, *inter alia*: terms for prior informed consent and mutually agreed terms; roles, responsibilities and participation of stakeholders; relevant aspects relating to *in situ* and *ex situ* conservation and sustainable use; mechanisms for benefit-sharing, for example through technology transfer and joint research and development; and means to ensure the respect, preservation and maintenance of knowledge, innovations and practices of indigenous and local

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<sup>94</sup> UNEP/CBD/COP/2/13, Section H, paras 90 to 92.

<sup>95</sup> See UNEP/CBD/COP/5/8, paras 50 and 53.

communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity, taking into account, *inter alia*, work by the World Intellectual Property Organization on intellectual property rights issues.

The second Meeting of the Panel of Experts on Access and Benefit-sharing, which met in Montreal, from March 19 to 22, 2001, considered a Note by the Executive Secretary which highlighted certain aspects of developing instruments to assist in the elaboration of fair and equitable contractual arrangements. These included:

- To reduce transaction costs, measures could include standard Material Transfer Agreements and Umbrella Agreements, under which repeat access under expedited arrangements can be made;
- Mutually agreed terms should also include provisions on user obligations;
- Different resources and uses require different contractual arrangements. Therefore, to the extent possible, commercial arrangements should be anticipated at the outset.
- Benefits are often generated from the commercialization of derivatives that use genetic resources as a source of innovation, such as synthesized products. In these instances, for fair and equitable benefit-sharing, it is important that the scope of contracts include the full range of biotechnology applications in addition to biological resources accessed;
- In order to reflect the increasing role of intermediaries in contractual arrangements and access-permitting mechanisms, a flexible and simple approach to protect the interest of all parties should be elaborated;
- Parties should be aware of relevant agreements that may pre-date an agreement under development.<sup>96</sup>

In its Report the Expert Panel noted that intellectual property clauses played a fundamental role access and benefit-sharing contracts and that there was “a need for awareness and capacity-building at all levels, as well as a need to develop up-to-date model intellectual property right clauses.” and that WIPO might assist in this regard.<sup>97</sup>

#### **(f) UPOV**

The UPOV Convention makes no specific reference to food security and UPOV is undertaking no current activities in this area. The main significance of the UPOV Convention is as a pre-existing *sui generis* instrument for countries to adopt in compliance with their obligations under Art. 27.3(b).

#### **(g) Bilateral UPOV obligations**

Compliance with the 1991 version of UPOV is imposed in a number of the bilateral free trade treaties of the USA and the EU. The 1991 US–Jordan bilateral investment treaty, which has been used as the model for other treaties obliges signatories to implement

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<sup>96</sup> UNEP/CBD/ABS-EP/2/2, para. 37(a)-(g).

<sup>97</sup> UNEP/CBD/WG-ABS/1/2, para. 77(d).

UPOV 1991. Similarly, the EU Free Trade Agreements with Algeria, Bangladesh, Lebanon, Morocco and Tunisia require accession to UPOV 1991.<sup>98</sup>

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<sup>98</sup> See G. Downes, *Implications of TRIPs for Food Security in the Majority World*, Limerick, Comhlámh Action Network, October 2003,

## 4. Key Issues Concerning IP and Food Security

### 4.1 Privatisation of germplasm

The concern has been expressed that food security is too important to be sterilised by the intervention of private intellectual property rights. A related concern is that the proprietisation of genetic resources has resulted in the concentration of proprietary biotechnologies in a few corporations.<sup>99</sup> The Nuffield Council in its report on bioethics and genetically modified crops observed that there were “six major industrial groups who between them control most of the technology which gives the freedom to undertake commercial R&D in the area of GM crops. These are: Agrevo/Plant Genetic Systems, ELM/DNAP/Asgrow/Seminis, Du Pont/Pioneer, Monsanto/Calgene/Delkalb/Agracetus/PBI/ Hybritech/Delta and Pine Lane Co., Novartis, Zeneca/Mogen/Avanta”.<sup>100</sup> In its report on *EC Regulation of Genetic Modification in Agriculture* (1998) the Select Committee of the British House of Lords also warned of the problem of cartels and monopolies in the agrochemical/seed sector, pointing out that the degree of consolidation was already much greater than in the pharmaceutical sector. A 1997 study by Krattinger on the development of insect resistance in crops indicated that the then six major company groups held about 60% of the 410 patents which related to the Bt gene and Bt pesticide technology.<sup>101</sup> The effect of this concentration of patent ownership was to enclose research on the manipulation of cry proteins, which have selective application to the various agricultural pests.

An important question, for which empirical work is required concerns the impact of oligopolisation in the biotechnology market on the capacity of international institutions to provide public goods to developing countries in the agricultural sector. Dutfield, in his historical study of pharmaceutical patenting, reports the cartelised use of patenting as a tool of competition and market protection.<sup>102</sup> Since, the modern ‘life sciences’ companies were largely spun off from the pharmaceutical patenting industry, they share a patent tradition and culture that stretches, in some cases, back to the beginning of the last century.

In addition to the possible adverse impacts this market concentration might have upon the vigour of competition, the market dominance of these private corporations also has an important influence upon the sort of biotechnological research which is undertaken. For example, to what extent will the dominance of private corporations in biomedical and agricultural research direct that research towards Northern concerns such as away from Southern health problems<sup>103</sup> and Southern food priorities<sup>104</sup>. Will the owners of IPRs in key

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<sup>99</sup> Eg see A. Wells, ‘Patenting New Life Forms: An Ecological Perspective’ (1994) 3 *European Intellectual Property Review*, 111; W. Lesser, ‘Intellectual property rights and concentration in agricultural biotechnology.’ (1998) 1(2) *AgBioForum* 56.

<sup>100</sup> Nuffield Council on Bioethics, *Genetically Modified Crops: The Ethical and Social Issues*, 1999,

para 3.36

<sup>101</sup> A.F. Krattinger, *Insect Resistance in Crops: A Case Study of Bacillus thuringiensis (Bt) and its Transfer to Developing Countries*, Ithaca, NY, ISAA Briefs No 2, 1997.

<sup>102</sup> G.M. Dutfield, *Intellectual Property Rights and the Life Science Industries: A twentieth century history*, Ashgate, Aldershot and Brookfield Vt 2002.

<sup>103</sup> J. Watal, ‘Pharmaceutical patents, prices and welfare losses: policy options for India under the WTO TRIPS Agreement.’ (2000) 23 *The World Economy* 733.

<sup>104</sup> J. Alston, G.Pardey and J. Rosenboom ‘Financing Agricultural Research: International Investment Patterns and Policy Perspectives’ (1998) 26 *World Development* 1045.

enabling technologies make them available to public research institutions on affordable terms?<sup>105</sup>

The concentration of proprietary technologies in the hands of a relatively small group of Northern life-sciences companies, has been exacerbated by the grant, by patent offices of over-broad patent claims, resulting in what Heller and Eisenberg<sup>106</sup> have described as the “biomedical anticommons tragedy”. This problem, as is mentioned above, can only to a limited extent be dealt with by policy directions to patent offices, as ultimately the interpretation of patent claims is a matter for the courts.

Article 27(3)(b) of the TRIPS Agreement permits WTO Members to exclude from patent protection, plants and animals and essentially biological processes for the production of plants and animals. Members are specifically not permitted to exclude from patent protection micro-organisms and non-biological and microbiological processes. The language used in Article 27(3)(b) implies that a clear distinction can be made between plants and animals on the one hand and micro-organisms on the other. However, there is no commonly accepted definition of “micro-organism” either in science or in patent office practice. The lack of any definition permits great variations between members in restricting this exclusion from patentability. For example, from the patent activity taking place in the United States, Europe and Japan, it has been observed that a very flexible interpretation is given to the concept of patentable subject matter, where the emphasis is on inclusion not exclusion.<sup>107</sup>

The practice of patent granting offices in developed countries suggests that there is no perceived need for a definition. The key issue for protection being whether or not the invention meets the patent granting criteria and not its subject matter. One of the reasons for reluctance to use a definition, provided by the European Patent Office (EPO) was that “it does not seem expedient to introduce such a definition as the rapid evolution in the field of microbiology would necessitate its frequent updating.”<sup>108</sup>

In scientific practice the term “micro-organism” is ill-defined, because the scientific classification is continually evolving. In patent office practice, the only debate of any kind has taken place in Europe in the context of what constitutes a plant, which is patentable, and a plant variety, which is not. The result of this has been agreement within patent granting offices that excluded material is that which is protectable by a plant variety right as determined by the UPOV Convention, anything falling outside the scope of UPOV being protectable by a patent. The result of this is that patent protection is available for groupings of plants which encompass more than one variety provided the patentee has not claimed a plant variety as such. Anything, therefore, which does not take the form of a patent variety as such is patentable. It has not been regarded as necessary to provide any further definitions. The patent laws of developed countries are predicated on a presumption of patentability and the granting criteria are given a broad interpretation. Any exclusions

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<sup>105</sup> K.M Leisinger, ‘Ethical Challenges of Agricultural biotechnology for developing Countries’. In G.J.Persley and M.M.Lantin, Eds.. *Agricultural Biotechnology and the Poor*. Proceedings of an international conference, Washington DC, 22-22 October 1999. CGIAR.

<sup>106</sup> M.A. Heller and R. S. Eisenburg ‘Can patents deter innovation? The anticommons in biomedical research.’ (1998) 280(1 May) *Science* 698.

<sup>107</sup> See M. Adcock and M. Llewelyn. *Micro-organisms, Definitions and Options under TRIPS*. Quaker United Nations Office Programme, Occasional Paper 2, 2000.

<sup>108</sup> Quoted *Ibid*.

are, therefore, given a restriction application. Thus where a country has adopted specific categories of excluded material, these exclusions are likely to be the subject of rigorous scrutiny particularly where the categories could be said to go beyond that which is permitted under the TRIPs Agreement.

Given the difficulties inherent in attempting a definition of micro-organism, it may be more advisable for member states to introduce a higher threshold for patent protection in respect of living material. For example, Adcock and Llewelyn suggest that an invention involving biological material may not be regarded as novel: (a) if the information is already in the public domain; and/or b) the invention merely replicates biological material, or the function of biological material, which already occurs naturally.<sup>109</sup>

An invention involving biological material will be regarded as lacking an inventive step if it: (a) merely identifies the biological material; and/or (b) merely identifies the natural function of the biological material. An invention will demonstrate an inventive step if it takes the form of a significant technical application of an identified function of the biological material. This technical application must go beyond a mere simple replication of the natural function of the biological material, and the technical application must represent a significant technical advance on the prior art.

An invention involving biological material will be regarded as being capable of industrial application if it can be shown that it is capable of being used in a manner which provides a demonstrable public benefit. Public benefit means that the invention must be capable of being used in a manner conducive to public health and to social, environmental and economic welfare.

The current low thresholds for protection applied by the US and the European patent offices means that the courts are becoming the arbiters of patentability, as the revocation of the Neem and Turmeric patents demonstrate. The argument for raising the threshold for protection can be justified on the basis that it will result in greater predictability and certainty for the bioscience industry, ensuring that those inventions which deserve protection are protected and that this protection is less likely to be subsequently challenged in court. The re-opening of the Neem and Turmeric patents are cited as examples of courts being forced to reconsider the liberality of patent offices.<sup>110</sup> On the other hand, they may be considered to be examples of the necessity for patent offices to have access to data on traditional knowledge as part of the state of the art.

It is not possible to make blanket recommendations for all developing countries in the field of patenting biotechnological inventions. The UK Intellectual Property Commission in its Final Report on *Integrating Intellectual Property Rights and Development Policy*, concluded that “at present there appears to be little evidence that providing patent protection for biotechnology-related inventions is really in the interests of the majority of developing countries which have little or no capability in this technology. We would therefore recommend that maximum use be made of the possibilities under TRIPS of excluding such inventions from patent protection.”<sup>111</sup> On the other hand those countries that have, or wish to develop, biotechnology-related industries could provide for certain

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<sup>109</sup> *Ibid.*

<sup>110</sup> See O. Das ‘Patenting and the Ownership of Genes and Life Forms. The Indian Experience’. (2000) 3 *The Journal of World Intellectual Property* 577; R. Prakash, ‘WTO Rules. Do They Conserve or Threaten Biodiversity’. (2000) 3 *The Journal of World Intellectual Property*.155.

<sup>111</sup> Final Report, London, September 2002, 76.

types of patent protection, with specific exceptions, for plant breeding and research and a clear exception provided for farmers to reuse seeds.<sup>112</sup>

## 4.2 IP and agricultural research

The proprietisation of enabling technologies, as well as genetic resources raises concerns about the capacity of the public agricultural research system to fulfil its public good mission in contributing to the elimination of food insecurity. As Drahos observed, “in biotechnology and agriculture it is likely that much research will end up as an international rather than public good and that it will be distributed according to complex licensing structures.”<sup>113</sup>

Many resource-poor farmers cultivate minor food crops that enable them to meet the nutritional needs of rural communities much better than if major crops such as wheat, rice and maize alone are cultivated. In the hills and valleys of Nepal, for example, villages may grow more than 150 crop species and cultivated varieties.<sup>114</sup> However, plant variety protection (PVP) generally does not encourage breeding related to minor crops with small markets. This is because the returns on breeders’ research investment will be quite small. Rather, they encourage breeding targeted at major crops with significant commercial potential. Moreover, protected varieties of plants may not even be food crops. In Kenya, for example, until very recently, about half the protected new varieties were foreign-bred roses cultivated for export.

It is conceivable, then, that PVP may contribute to a trend whereby traditional diverse agro-ecosystems, containing a wide range of traditional crop varieties, are replaced with monocultures of single agrochemical-dependent varieties, with the result that the range of nutritious foods available in local markets becomes narrower. Admittedly this trend is a global phenomenon whose beginning predates the introduction of PVP systems. Nevertheless it is one that the existence and increasingly widespread use of PVP may indirectly encourage. On the other hand, there is nothing to stop developing countries from encouraging research on such minor crops that are important for local communities, either by providing strengthened IPR protection for such species, or through non-IPR-related measures such as public subsidies.

With the introduction of a PVP system into developing countries, there is a concern that food security crops might be displaced by high value crops, such as flowers. The consequential shift of research priorities will bring a problem in technology development and transfer for resolving food shortage problems and hence may stabilize food security. While the export performance in the food and agriculture sectors is likely to improve, the land left for cultivation of lower export-value native crops will shrink. This may have negative implications for food security. On the other hand, if income from the sale of higher value crops benefits the poor, the system may nonetheless be beneficial on balance even for the poor.

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<sup>112</sup> *Ibid.*

<sup>113</sup> P.Drahos, The Rights to Food and Health and Intellectual Property in the era of ‘Biogopolies’ [2002] European Intellectual Property Review

<sup>114</sup> See A. Kothari, and R.V. Anuradha, Biodiversity, intellectual property rights, and GATT Agreement: how to address the conflicts? (1997) 32 *Economic and Political Weekly*, 2814-282.

### 4.3 IP Protection of Plants and Seeds in Developing Countries

This discussion on how PVP affects food security and nutrition in developing countries leads one to consider in more general terms the applicability of such an IPR to these countries. Unfortunately, we have very few empirical studies to go on. One of the few was a joint project of the Anti-American Institute for Cooperation in Agriculture and the University of Amsterdam carried out in 1994, which examined ‘the (expected) impact of plant breeders’ rights (PBR) on developing countries with respect to: private investment in plant breeding, breeding policies of public institutes, transfer of foreign germplasm, and diffusion of seed among farmers’.<sup>115</sup>

Five countries were used as case studies of which three (Argentina, Chile and Uruguay) had PVP systems already in place, and two (Colombia and Mexico) were about to introduce them. These countries are similar in the sense that there are basically two seed markets. The hybrid seed market is controlled by transnational corporations, whereas the seed market for self-pollinating varieties is dominated by domestic firms.

However, Argentina differs from the others in that it is the only country in which PVP right owners have successfully enforced their rights to the extent that their control over seed supply for wheat and soya is comparable to that of their counterparts in the United States. This leads the authors of the study report to conclude that in all probability, PVP in that country has ‘prevented the local wheat companies from reducing or even terminating their breeding activities and triggered the reactivation of some soya bean breeding programmes’.

With respect to exotic germplasm, there is little evidence to show that PVP has led to any significantly improved access for domestic seed companies to modern cultivars, special genetic stocks and genomic material from abroad. Moreover, companies with licences from overseas breeders to use proprietary varieties may sometimes have to contend with restrictions on where they can export to. For example, in 1994 Argentinean strawberry plant growers were prevented from exporting their plantlets to Europe because the United States breeder and the European licensees did not want these plantlets to compete with those that were already produced in Europe.

In Argentina and Chile public agricultural research centres are using PVP to secure income and collaborate with companies. According to the report, this is shifting the orientation of public research and reduces the public availability of their germplasm.

How are farmers affected? First, Argentinean seed dealers must now pay royalties and taxes on the seed they trade. So far these costs have not been passed on to the farmers. Second, PVP legislation in the three countries where it is well established has not prevented the replanting of farm-saved seed. Third, as the report indicates, ‘since many modern plant varieties are not appropriate for resource-poor farmers, PBR predominantly favour plant breeding for those farmers who operate under relatively prosperous conditions’.

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<sup>115</sup> W. Jaffé and J. van Wijk, *The Impact of Plant Breeders’ Rights in Developing Countries: Debate and Experience in Argentina, Chile, Colombia, Mexico and Uruguay*, Directorate General International Cooperation, Ministry of Foreign Affairs, The Hague, 1995.

Kenya provides another interesting case. Kenya became one of the first developing countries to have PVP legislation when it passed the Seeds and Plant Varieties Act, which entered into force in 1975. There was little demand from domestic breeders for such legislation, which suggests that external pressure, mainly from foreign firms whose horticultural varieties were being planted in the country, played a large role in persuading policymakers of the need for such a law. The Act, which is largely modelled on the UPOV Convention (and on the counterpart UK legislation, requires protected varieties to be sufficiently distinguishable; sufficiently varietal pure; sufficiently uniform or homogenous; and stable in their essential characteristics. In addition to these requirements, ‘the agro-ecological value [of the variety] must surpass, in one or more characteristics, that of existing varieties according to results obtained in official tests.’

However, the PVP section of the act could not be implemented until the 1990s when the Seeds and Plant Varieties (Plant Breeders’ Rights) Regulations were passed (in 1994), and the Plant Breeders’ Rights Office was established (in March 1997).

According to the Registrar of the Plant Breeders’ Rights Office, in the first few years most of the 200 plus applications came from foreigners,<sup>116</sup> and were mostly for horticultural varieties with roses constituting about half the total. The public sector, which produces most new varieties bred in Kenya, has only just begun to show interest in seeking protection. Its applications are now on the rise. While new firms are starting up, given the amount of time it takes to breed new varieties it is likely to be several more years until any increased private sector breeding activity is reflected in a rise in the number of applications.

It is probably too early to say whether the system is has positive or negative effects on food security, or how far the Kenyan experience would be repeated in other developing countries. At the present time, the most useful role the PVP system plays is probably that of encouraging the transfer of foreign-bred varieties to Kenya. This is necessary for those products heavily dependent on foreign breeding material and which are cultivated largely for export. Perhaps the most important of these are cut flowers.

Elsewhere, developing countries have little experience with plant variety protection. Apart from UPOV, few alternative models even exist. One of these is the African Model legislation for the Protection of the Rights of Local communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources, which was adopted by the OAU, Heads of States Summit at Ouagadougou in June 1998, which adopts a sui generis regime based on UPOV 1991, but incorporates Farmers’ Rights and combines these with some of the access principles of the CBD.

One of the most influential developing country PVP laws is likely to be India’s Protection of Plant Varieties and Farmers’ Rights Act, 2001. The main objectives of the Act are: (i) to stimulate investments for research and development both in the public and the private sectors for the development of new plant varieties by ensuring appropriate returns on such investments; (ii) to facilitate the growth of the seed industry in the country through domestic and foreign investment which will ensure the availability of high quality seeds and planting material to Indian farmers; and (iii) to recognise the role of farmers as cultivators and conservors and the contribution of traditional, rural and tribal communities

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<sup>116</sup> According to Cullet (2001), foreigners submitted 91 percent of the applications from 1997-1999.

to the country's agrobiodiversity by rewarding them for their contribution through benefit sharing and protecting the traditional rights of farmers.

While sharing similarities with UPOV 1978, additional provisions are included to protect the interests of public sector breeding institutions and the farmers. For example, the Act upholds 'the right of a farmer to save, use, exchange, share *or sell* his farm produce of a [protected] variety' except 'in case where the sale is for the purpose of reproduction under a commercial marketing arrangement'. Another interesting provision is that those applications for PVP "must be accompanied by an affidavit sworn by the applicant that such variety does not contain any gene or gene sequence involving terminator technology."

The Act appears to reflect a genuine attempt to implement TRIPS in a way that supports the specific socio-economic interests of all the various producer groups in India, from private sector seed companies to public corporations and research institutions, and resource poor farmers. However, India is in the process of joining UPOV under its 1978 Act, and it seems certain that the 2001 legislation will need to be modified.

There is scant evidence on the extent of the patenting in industrialised countries of germplasm and other genetic resources coming from developing countries, as well as the patenting in developing countries of this material. Our sample study of the patenting of genetic resources from the Asian region<sup>117</sup> in the USPTO and EPO identifies 400 patents, which have been cited to those offices. This represents a significant exploitation of developing country resources and counsels the urgent establishment of modalities for the securing of the informed consent of source countries and commensurate schemes for the sharing of benefits.

There is no equivalent evidence yet on the extent of patenting of germplasm in developing countries. It would be unrealistic to expect that this would happen, since the likelihood of developing countries being the markets for products which incorporate the patented material would be unlikely.

An interesting use of the patenting system to keep genetic material in the public domain is through "defensive patenting". Patenting, or even just the filing of provisional patent applications concerning genetic material will have the effect of placing the information concerning that material into the public domain in those countries which apply a global test of novelty. This will be a problem however in relation to the USA which applies a test of national novelty.

#### **4.4 Plant Variety Rights Protection and the Interests of Poor Farmers**

The question of seed-saving is of major concern to farmers in developing countries, where, a large proportion of the population depends on agriculture for employment and income. Many of these farmers are small-holders for who the saving of seed from harvests for replanting and across-the-fence exchange are common practices. This is especially in countries where neither the public nor private sectors play a significant role in producing or distributing seed. Although the UPOV system allows on-farm replanting, its rules, after the 1991 revision, restrict farmers' freedom to buy seed from sources other than the original breeders or their licensees.

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<sup>117</sup> See Plant patents annexes 1 and 2.

The following countries permit farmers to save seed (only if the seed is from their own harvest and is for replanting on their own farm and if not a fruit, tree or ornamental species<sup>118</sup>:

### Africa & Middle East

Benin  
Burkina Faso  
Cameroon  
Chad  
Central African Republic  
Congo  
Cote D'ivoire  
Egypt  
Equatorial Guinea  
Gabon  
Guinea  
Guinea-Bissau  
Mali  
Mauritania  
Morocco  
Niger  
Senegal  
Togo

In the case South Africa seed may be saved only if the original seed was legally acquired (i.e. from a source authorised by the breeder) and it is resown on the farmer's own land (no sharing, exchange or selling)

### Asia

China  
only if the seed is from their own harvest and is replanted on their own farm.

India  
only without packaging and selling the farm-saved seed as a protected variety

Republic of Korea  
only if the seed is from their own harvest and is replanted on their own farm, only up to the amount of seed needed to replant own farm

Philippines

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<sup>118</sup> See TITLE: Farmers' privilege under attack  
AUTHOR: Genetic Resources Action International (GRAIN)  
DATE: June 2003  
URL: [www.grain.org/publications/bio-ipr-fp-june-2003-en.cfm](http://www.grain.org/publications/bio-ipr-fp-june-2003-en.cfm)

only for and among small farmers, any exchange or sale must be for reproduction or replanting on own land, selling the variety under the trade mark or name associated with it is expressly prohibited and subject to further conditions and guidelines to be issued

#### Thailand

only if the seed is from their own harvest and for replanting on their own farm and if the variety is published as a "promoted" plant variety, then its "cultivation or propagation by a farmer may be made in the quantity not exceeding three times the quantity obtained"

#### Vietnam

provided the farm-saved seed is not sold.

### Latin America & Caribbean

#### Argentina

only if the seed is from their own harvest for replanting on their own farm and is neither a fruit species nor an ornamental plant.

#### Bolivia

only if it is for their own use and if it is not a fruit, ornamental or forest species and only for farmers with a landholding of 200 ha or less under cultivation, of which a maximum allowance per crop within that area is as follows: 100 ha for soybean, wheat, maize, sorghum, sunflower or cotton; 50 ha for rice; 20 ha for all other crops

#### Brazil

only small farmers, and no exchange of seeds except if it's on a non-commercial basis with other small farmers and not if it's sugar cane

#### Chile

only if the variety was legally acquired (i.e. a royalty was paid) and only to replant it on their own farm.

#### Colombia, Ecuador, Peru and Venezuela

only if it is for their own use and if it is not a fruit, ornamental or forest species

#### Nicaragua

only if it is for their own use

#### Panama

only if the variety was legally acquired to be replanted on their own farm

#### Trinidad & Tobago

not for commercial marketing or sale

#### Uruguay

only if the seed was legally acquired (i.e. royalties were paid to the breeder) and resown on the farmer's land and if the seed is kept segregated from other seed at all stages

(harvest, cleaning, conditioning, etc.). The free exchange and the commercialisation of farm-saved seed is expressly prohibited and any volume of seed retained on the farm that appears unreasonably large given the size of the farm serves as basis for presumed breach of the law.

No country has yet introduced food security concerns as a factor in implementing plant variety rights protection.

The argument of seed companies is that farmers are not obliged to purchase PVP-protected seed, since farmers are free to continue cultivating non plant variety-protected seed, including traditional local varieties, if they so wish. Moreover, in many developing countries, government support for farmers including credit is sometimes conditioned on the sowing of particular crops and types of seed, such as hybrids. Also seed aid is often used by providers as a way to promote the use of particular crops and seeds.

It should be noted here that seed saving is not always a cost-effective option for farmers. According to van Wijk, et al “the cost advantage of saving seed is eroded by the deterioration of saved seed, causing yield losses over time. Deterioration is especially rapid with hybrids, but even here, the wide gap between new seed prices and the cost of seed-saving has encouraged some farmers in Latin America to save hybrid maize for a second generation”.<sup>119</sup> It must be borne in mind, though, that the purchase of seed is one among several agricultural inputs that must be paid for, and even poor farmers may decide to pay a higher price for better quality seed if they expect a bigger harvest to result.

Wherever the exact truth lies, the ‘*sui generis*’ clause in TRIPS does give governments a certain amount of freedom to tailor their PVP systems to address such concerns. Thus, while an increasing number of developing countries are joining UPOV, some countries are devising alternative PVP systems that aim in part to strengthen food security. They do this, for example, by allowing farmers to acquire protected seed from any source and/or requiring protected varieties to display qualities that are genuinely superior to existing varieties.

The Indian parliament has passed legislation that would maintain farmers’ freedom to save, sell and exchange all produce of a protected variety, and the African Union (formerly the Organization of African Unity) has developed a model law for the consideration of member governments, known as the African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources. In both cases, as much importance is attached to the interests of farmers as to those of breeders.

#### **4.5 Plant Variety Rights Protection and the Availability of Genetic Resources for Breeding**

Plant breeders have tended to stress the necessity of being able to freely access genetic material including that which is IPR protected. This is why the UPOV Convention contains

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<sup>119</sup> J. van Wijk, J., J. Cohen and J. Komen. *Intellectual Property Rights for Agricultural Biotechnology: Options and Implications for Developing Countries*. ISNAR Research Report 3. The Hague, ISNAR, 1993.

a broad breeders' exemption. Patent law tends to have a much narrower research exemption which is often limited to non-commercial scientific or experimental use.

The narrowness of the research exception in patents law is illustrated by the recent US decision in *Madey v Duke University*<sup>120</sup> which held that a university which undertook commercial research contracts, could not avail itself of the defence. The ambit of the experimental research exception in patents law in the UK was examined in *Monsanto v Stauffer*<sup>121</sup> In that case, Stauffer had developed a market variant 'Touchdown' of Monsanto's successful patented weed-killer 'Roundup' for which they had obtained provisional clearance from relevant authorities. In order to obtain final clearances, Stauffer had established tests at their own research farm and also organised a series of tests outside their research farm where interested parties could observe the results. Monsanto moved for an interlocutory injunction the grounds of patent infringement, which was granted by the Patents court, negating the ground that tests done outside the research farm to check their product in different soil and climatic conditions, amounts to an experimental use. The Court of Appeal, although it agreed that tests done outside could not qualify for an experimental use exception, it exempted all trials carried out at Stauffer's research farm and at laboratories and greenhouses in the UK. The Court limited the interpretation of the word 'experimental' in accordance to its size, scale, recipient and methodology. This case has raised an uncertainty as to how far university researchers could apply the experimental use exception to field trials.<sup>122</sup>

Another aspect of the relative narrowness of the experimental use exception in patents law, compared with plant variety rights protection laws, is that while a protected plant variety is covered by a single title, plant-related biotechnological inventions are likely to be protected by a patent and in some cases several patents. The patents may cover not just plants, but also seeds, genes and DNA sequences. The effect of patents is to restrict access to the patented 'products'. It has been argued that 'locking up' genetic resources with patents is a bad thing because innovation in plant breeding is cumulative and depends on being able to use as wide a stock of material as possible. It was to deal with this concern that the FAO International Treaty introduced a number of provisions as were laid out above.

However, apart from patents, the restrictions on access to breeding material may have other causes than IPRs. For one thing, some countries have chosen to except certain categories of plant genetic resources they consider to be strategically important from the multilateral system to be set up under the International Treaty. Also, some developing countries have been exercising their rights under the CBD to regulate access to their genetic resources and in doing so have restricted their free flow. This may well be detrimental to long-term food security even in their own countries.<sup>123</sup>

But beyond these issues about how specific intellectual property rights privatise genetic material needed for breeding is the association of IPRs with the privatisation of agricultural research, the shrinkage of non-proprietary public sector research, and the increased concentration of ownership of breeding material, research tools and technologies in the

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<sup>120</sup> 307 F.3d 1351 (Fed. Cir. 2002).

<sup>121</sup> [1985] RPC 515 CA.

<sup>122</sup> See P. Loughan, 'Intellectual property, research workers and universities' [1996] 6 *European Intellectual Property Review* 351

<sup>123</sup> C. Fowler, 'Sharing agriculture's genetic bounty' (2002) 297 *Science* 157.

hands of a small number of giant corporations.<sup>124</sup> Not only does this trend reduce the free circulation of breeding material, but it can also make public policy making aimed at enhancing food security harder to put into practice. This is because it is much more difficult for governments to influence companies than the public institutions they partly or wholly fund.

#### 4.6 Farmers Rights and Traditional Knowledge

A significant contribution has been made by the knowledge of indigenous peoples and traditional farmers in the development of new crop types and biodiversity conservation. These groups have been an important agency in the conservation of plant genetic resources and the transmission of these resources to seed companies, plant breeders and research institutions. They have not typically been paid for the value they have delivered, whereas breeders and seed companies have resorted to intellectual property rights to recover their development expenditures. On the other hand, farmers who utilize improved varieties are obliged to pay for them.

The economic value of biological diversity conserved by traditional farmers for agriculture is difficult to quantify. It has recently been suggested that “the value of farmers’ varieties is not directly dependent on their current use in conventional breeding, since the gene flow from landraces to privately marketed cultivars of major crops is very modest”<sup>125</sup> because “conventional breeding increasingly focuses on crosses among elite materials from the breeders own collections and advanced lines developed in public institutions.” On the other hand, those collections and advanced breeding lines are often derived from germplasm contributed by traditional groups.

An increasingly significant economic value of biodiversity is the extent to which it provides a reservoir of species available for domestication, as well as genetic resources available for the enhancement of domestic species. The modern biotechnological revolution has enabled the engineering of desirable genetic traits from useful local species. It is estimated that about 6.5% of all genetic research undertaken in agriculture is focussed upon germplasm derived from wild species and land races.<sup>126</sup>

Traditional knowledge is particularly important in the development of farming systems adapted to the local conditions, and farming practices. This may enable the utilisation marginal lands, contributing to food security in enabling access to food in remote areas, as in contributing to the management of the environment by, preventing erosion, maintaining soil fertility, and agrobiodiversity.

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<sup>124</sup> See R.W Herdt, ‘Enclosing the global plant genetic commons’. Paper prepared for delivery at the China Center for Economic Research, May 24,1997.

<sup>125</sup> C. Correa, *Options For The Implementation of Farmers’ Rights at The National Level*, South Centre, Trade-Related Agenda, Development And Equity Working Papers, No. 8, December 2000, citing Wright, ‘Intellectual Property and Farmers’ Rights’ in R. Evenson, D. Gollin and V. Santaniello, Eds., *Agricultural Values of Plant Genetic Resources*, Wallingford, FAO/CEIS/CABI, 1998, 228.

<sup>126</sup> McNeely, ‘Biodiversity and Agricultural Development: The Crucial Institutional Issues’ in D.R.Lee and C.B.Barrett, Eds, *Tradeoffs or Synergies? Agricultural Intensification, Economic Development and the Environment*, Wallingford, CABI, 2001., 399 at 404.

An illustration of the inter-relationship between traditional knowledge, farmers' rights and food security is the so-called Basmati affair. This commenced when RiceTec, an American company based in Alvin, Texas, was granted a patent by the USPTO in September 1997 for "Basmati rice lines and grains".<sup>127</sup> This was perceived as another example of so called "biopiracy" of Indian genetic resources, stretching back to the Neem controversy.<sup>128</sup> The "novel rice lines" were described in the patent as "lines whose plants are semi-dwarf in stature, substantially photoperiod insensitive and high yielding" and which "produce rice grains having characteristics similar or superior to those of good quality basmati rice". The crossing involved any of 22 cited basmati known lines and at least two of the 15 known semi-dwarf long grain varieties, and "[a]ny selection and propagation method or scheme known in the art may be used" (p. 16 line 4). In March 1998 a NGO, the Research Foundation for Science, Technology and Ecology, petitioned India Supreme Court to direct the government to challenge the controversial patent, or to lodge an action to the Dispute Settlement Body of the WTO. The Indian Government finally introduced an action to the USPTO reportedly in April 2000, challenging three claims, namely claims 15 to 17, which consisted of a large definition of the rice grains concerned. The outcome was that RiceTec withdrew four claims, one of which was not being challenged, and the USPTO repealed in August 2001 claims 15-17 as well as several others which were not being challenged either (in particular those dealing with the process), leaving solely those relating to the rice lines effectively bred by RiceTec.

In parallel, the Research Foundation for Science, Technology and Ecology, together with two American, Washington-based NGOs, filed a petition to the US Federal Trade Commission, on the ground of the right to petition Government provided for in the First Amendment of the United States Constitution and of the FTC's implementing regulations. The petition claimed that in a previous affair (namely the "New River" case), a FTC's cease and desist order affirmed that "Where a geographical origin has acquired a peculiar trade significance the use of a term descriptive of such article cannot be applied to a product of a different origin, even though such a product may be of identical quality (...)". However, in its response dated May 9, 2001, the FTC reminded that its "efforts are focused on those areas which may affect the greatest number of consumers, may pose a risk to consumers' health or safety, or may cause significant economic harm to consumers... we do not have reason to believe that significant consumer injury is likely to arise from current rice marketing. Under United States Department of Agriculture regulations, basmati and jasmine rice are included as examples of 'aromatic rough rice' and are not limited to rice grown in any particular country. Thus, there is no specific statutory or regulatory limitation on references to U.S. grown rice as 'basmati' or 'jasmine'."

In the meantime, the Indian Government had prepared two bills, one implementing the Convention on Biodiversity (CBD), namely the Biological Diversity Act passed on December 11, 2002 and the Protection of Plant Varieties and Farmers' Rights Act 53 of 30 October 2001. However, as long as the rice lines referred to in RiceTec's patent were not protected before the application, there would have been no possibility to

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<sup>127</sup> Patent 5,663,484 (USPTO).

<sup>128</sup> European patent EP0436257 was granted on a method to obtain a herbicide and fungicide derived from a neem seed extract to the American company W.R.Grace and Co and the US Department of Agriculture, subsequently revoked by the European Patent Office (EPO) for lack of inventive step.

invalidate the patent on the ground that it was anticipated by an Indian plant variety rights (PVR) certificate. This would have been all the more unlikely as the American patent law requires a foreign prior title or publication to have been released at least one year prior to the application made to the USPTO to be considered an anticipation. Thus, these laws aim to reduce the need for future actions of invalidation of foreign patents, as well as to bring Indian laws in compliance with international conventions ratified by India.

Article 9.2 of the FAO International Treaty on PGRFA envisages that “the responsibility for realizing Farmers’ Rights, as they relate to Plant Genetic Resources for Food and Agriculture, rests with national governments” and that national legislation should include measures relating to: “(a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture”. Traditional knowledge has played an important role in assuring food security for subsistence communities. Farmers in subsistence systems have tended to utilise a diverse selection of crop species in order to assure their annual harvests and thus to guarantee a minimal level of production and to prevent food shortage. Seed production in many instances has been on the collection of and domestication of locally known, wild varieties. Modern agricultural practices depend on crop species that promote productivity and resistance to disease that can only be maintained with the continuous input of new germplasm. The diversity of landraces and the associated information on their specific qualities contribute invaluable information to formal breeding processes. It has been noted that the loss of biological diversity is paralleled by the loss of traditional knowledge. Where a plant variety becomes extinct, then the entire body of knowledge about its properties is condemned to irrelevancy.

Article 9.2 of the WTO International Treaty on PGRFA envisages that “the responsibility for realizing Farmers’ Rights, as they relate to Plant Genetic Resources for Food and Agriculture, rests with national governments” and that national legislation should include measures relating to:

- (a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture;
- (b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture;
- (c) the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.

Finally, Article 9.3 provides that the Article shall not be interpreted “to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material”.

An assumption of Art. 9.1 is that the landraces used by traditional farmers are a dynamic genetic reservoir for the development of new varieties and for the transmission of desirable genetic traits. The traditional knowledge of local and indigenous communities is similarly perceived. As a means of remunerating these groups for their past contributions to the development of plant genetic resources for food and agriculture production, there can be little argument, except about the quantum and distribution of this remuneration.

Inevitably, any calculation of the equitable share, which traditional farmers and indigenous communities might enjoy under a Farmers' Rights, or Traditional Knowledge regime will

be arbitrary. However the intellectual property system is no stranger to arbitrary calculations, thus the 20 year length of a patent term is intended to provide an opportunity for the compensation of all inventors, whatever the area of technology. Similarly the 25 years exclusivity which the UPOV Convention provides for new varieties of trees and vines, takes no account of variations in R & D costs between the different varieties.

The principal ways in which plant genetic resources are translated into food and agriculture production is through plant breeding and plant patenting. Standing at the heart of a Farmers' Rights regime is the concept of the equitable benefit sharing of benefits with farmers for their contribution to innovations in plant breeding and plant patenting. It is estimated that about 6.5% of all genetic research undertaken in agriculture is focussed upon germplasm derived from wild species and land races.<sup>129</sup>

Article 9.2 obliges the Contracting Parties to the Plant Genetic Resources Treaty "to take measures", subject to their national legislation to protect and promote Farmers' Rights. The content of these rights is defined in the balance of that provision and embraces the protection of traditional knowledge, equitable benefit sharing and the right to participate in decision making. The Treaty leaves open the legal context within which Farmers' Rights are to be enacted.

National legislation on Farmers' Rights tends to combine one of the versions of UPOV with some of the access principles of the CBD. The African Model legislation for the Protection of the Rights of Local communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources, which was adopted by the OAU, Heads of States Summit at Ouagadougou in June 1998, adopts a sui generis regime based on UPOV 1991. However, most national statutes prefer access legislation combined with UPOV 1978 (eg Andean Community's Common System on Access to Genetic Resources, 1996; Costa Rica- Biodiversity Law 1998; India- Community Intellectual Property Rights Act 1999; Kenya- Seeds and Plant Varieties Act 1975;).

#### **4.7 Conservation of Biological Diversity and Food Security**

It has been suggested that IPRs provide perverse incentives which encourage activities that are prejudicial to biodiversity and as a consequence are prejudicial to food security. This is raised in the context of three sets of questions:

1. Do intellectual property rights encourage the spread of monocultural agriculture? And if so, does this cause erosion of biodiversity?
2. Do plant variety rights encourage the breeding of genetically uniform varieties and the use of a relatively small pool of genetic material? And if either of these is the case, is it prejudicial to biodiversity?
3. Is the increasing production and sale of seed-agrochemical 'packages' (such as transgenic crops sold with pesticides and/or herbicides for which they have built-in resistance) harmful to biodiversity? And if so, are IPRs an inducement for

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<sup>129</sup> See R. McNeely, 'Biodiversity and Agricultural Development: The Crucial Institutional Issues'. In D.R.Lee and C.B.Barrett, Eds. *Tradeoffs or Synergies? Agricultural Intensification, Economic Development and the Environment*. Wallingford, CABI, 2001, 399-408.

companies to produce these kinds of ‘package’? In other words, is this an IPR issue?

With respect to the first set of questions, one of the most plausible critiques of IPRs is by Reid<sup>130</sup>, who identifies a strong connection between IPRs and a bias towards centralised research, and believes that this has an impact on agro-biodiversity. He finds that the prevailing policy framework for the use of genetic resources for food and agriculture favours ‘centralised crop breeding and the creation of uniform environmental conditions, and discourages agro-ecological research or local breeding tailored to local conditions.’ IPRs enhance incentives to develop seeds that will have a large potential demand. To ensure maximum demand for their products, the seed companies will tend to focus their research on commonly utilised high-value crops and develop varieties that can be cultivated as widely as possible. To do so means either breeding through selection of genes for maximum adaptability, or introducing the new seeds while also promoting farming practices that reduce environmental heterogeneity. The biodiversity-erosive effects of this IPR-supported bias towards centralised crop breeding programmes are: (i) decreased crop diversity; (ii) decreased spatial genetic diversity; (iii) increased temporal genetic diversity due to the need to replace cultivars with new ones every few years; and (iv) increased use of external inputs.

It is important to point out that monocultural agricultural systems are not inherently biodiversity-erosive. It is true that they may cause biodiversity loss if they replace more biologically-diverse ecosystems. But *if* a monocultural system produces higher yields per harvest and/or more harvests per year compared to a more polycultural agro-ecosystem it replaced, pressure to open up biologically-diverse ecosystems to cultivation *may* be reduced as a consequence.

Kothari and Anuradha<sup>131</sup> conclude that IPRs alone cannot be held responsible for the loss of agro-biodiversity, but that IPRs are bound to encourage the displacement of a wide diversity of traditional local varieties in favour of a small number of widely adapted hybrids and homogeneous modern varieties. Moreover, they point out that one of the lessons of the Green Revolution is that the development of new varieties by the seed industry is unlikely to match the loss of traditional varieties after these new varieties are introduced.

However, the erosion of biodiversity will not necessarily result from the spread of monocultural systems. If a monocultural system produces higher yields per harvest and/or more harvests per year compared to a more polycultural agro-ecosystem it replaced, pressure to open up biodiverse ecosystems to cultivation *may* be reduced as a consequence (though the opposite result is also possible). It is important also to point out though that this trend in crop breeding dates back to when the Green Revolution began, and earlier still in some countries. The varieties most commonly associated with the Green Revolution were

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<sup>130</sup> W.V. Reid, *Genetic Resources and Sustainable Agriculture: Creating Incentives for Local Innovation and Adaptation*. Biopolicy Series No. 2. African Centre for Technology Studies, Nairobi, 1992.

<sup>131</sup> A. Kothari and R V Anuradha, Biodiversity, intellectual property rights, and GATT Agreement: how to address the conflicts? (1997) 32 *Economic and Political Weekly* 2814.

developed by public crop breeding institutions, not corporations. On the face of it, this suggests that this may not be an IPR-related problem at all.

According to a preliminary study produced for the Secretariat of the CBD for consideration of the 3<sup>rd</sup> meeting of the COP<sup>132</sup>, other policies that might encourage the use of new crop varieties and the loss of landraces include: (a) government farm credits and subsidies, and extension services; (b) the policies and programmes of international agencies and donor institutions; (c) the marketing and research and development policies and programmes of transnational corporations; and (d) the increasingly concentrated corporate control of pesticide and agro-biotechnology research and distribution.

The Leipzig Declaration on conservation and sustainable utilisation of plant genetic resources for food and agriculture, adopted by the International Technical Conference on Plant Genetic Resources on 23 June 1996 stated that plant genetic resources for food and agriculture (PGRFA) should be conserved as “the basis of natural and directed evolution in the plant species most critical to the survival and well being of human beings. All countries require plant genetic resources if they are to increase food supplies and agricultural production sustainably and meet the related challenges of changes in the environment, including climate change”

Rangnekar has argued that PVP encourages plant breeding based upon existing material already in scientific use, while providing ‘juridical legitimization to the breeding of genetically uniform varieties’.<sup>133</sup> It is argued that the breeders’ exemption which permits free use of plant genetic resources already in circulation, does little to encourage the discovery and input of resources that may exist in the fields of traditional cultivators and other types of ecosystem characterised by relatively high levels of biodiversity. Defenders of PVP may counter that the number of varieties introduced into European and Northern markets is probably greater than it would have been without the incentive of a PVP system. On the other hand, an increased quantity of plant varieties being cultivated does not necessarily mean that agro-biodiversity is greater than would otherwise exist in farmers’ fields. This is because new varieties tend to be based on the recombination of genes acquired from a fairly limited gene pool shared by plant breeders, who generally do not claim exclusionary rights over discovered genes or plants into which they are inserted. Furthermore, Rangnekar claims that PVP rights encourage breeders to adopt strategies of planned obsolescence ‘to reduce the durability of plant varieties so as to induce regular replacement purchases by farmers’. He claims some empirical evidence that UK wheat breeders do adopt such strategies.

One of the principal causes which has been identified for the loss of diversity in crops is the replacement of local varieties by improved varieties and species, which do not contain the diverse genetic endowment of the traditional farmers’ varieties. Genetic erosion has been reported in both developing and developed countries. For example the FAO reports that only 20 % of the local Mexican maize varieties 1930 are now known,

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<sup>132</sup> Convention on Biological Diversity Secretariat, *The impact of intellectual property right systems on the conservation and sustainable use of biological diversity and on the equitable sharing of benefits from its use. A preliminary study. Note by the Executive Secretary* [(1996) UNEP/CBD/COP/3/22.

<sup>133</sup> D. Rangnekar, ‘R&D appropriability and planned obsolescence: empirical evidence from wheat breeding in the UK (1960-1995)’ (2000) 11(5) *Industrial and Corporate Change* 1011.

similarly, in China, wheat varieties have decreased by a factor of 10 between 1949 and 1970.<sup>134</sup>

Another significant impact upon conservation is the modern tendency for seed companies to develop hybrids and other modern varieties that depend upon applications of agrochemicals (such as fertilisers, herbicides and insecticides) to achieve high yields. A common accusation is that excessive use of these chemicals is encouraged and other plants growing nearby are killed as a result. However, IPRs are unlikely to be directly responsible for this trend in crop breeding, which dates back to the time when the Green Revolution began, and earlier still in some countries. The Green Revolution is frequently blamed for the development and spread during the 1950s and 1960s of high-yielding wheat and rice varieties requiring heavy applications of agrochemicals, but the varieties most commonly associated with the Green Revolution were developed by public crop breeding institutions and were not IPR protected.

However, the IPR link appears stronger in the case of genetically modified crops. In recent years, life-science corporations (often originally chemical companies that have bought seed companies) have increasingly been creating transgenic plants with built-in resistance either to herbicides marketed by the same company<sup>135</sup> or to insect pests. In the former case, both the herbicide and the seed for which it is designed are likely to be patent-protected. For example, Monsanto had made significant profits from one of its patented agrochemicals, a glyphosate-based herbicide marketed under the name of *Roundup*, and was concerned to ensure that once the patent expired, it would not face too drastic a shortfall in revenues as competing producers of the same herbicide entered the market. Monsanto turned to biotechnology for a solution. The company developed and patented transgenic soybeans, canola, cotton and corn containing a gene providing resistance to its Roundup. Monsanto's patents protect the gene for Roundup resistance and all plants containing it, and these have several more years to run. As farmers who buy these 'Roundup Ready' seeds are contractually obliged to purchase Monsanto's patented herbicides, sales of the seeds are good for sales of the herbicides and vice versa. It is unclear, however, that this strategy will work in the long term. Roundup Ultra went off patent in 2000 and farmers may well turn to cheaper versions sold by competitors.

An example of a crop with built-in resistance to a pest (rather than a herbicide or pesticide) is Monsanto's NewLeaf potato, which claims to provide *total* protection against the Colorado beetle. Another is Novartis' patented Bt corn, which is designed to resist the European corn borer pest.

The position of the large life-science corporations such as Monsanto and Novartis is that genetic engineering can reduce or even obviate pesticide use. Monsanto's claim is that when they produce packages of herbicides and plants resistant to these herbicides, their aim is not to ensure that farmers will need to increase herbicide use. Their main interest is to ensure that farmers use *their* herbicides. If these are more effective than alternative

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<sup>134</sup> FAO, *The State of the World's Plant Genetic Resources for Food and Agriculture*, Rome, FAO 1998, 35.

<sup>135</sup> See J. Bell 'Genetic engineering and biotechnology in industry'. In: Baumann, M, Bell, J, Koechlin, F and Pimbert, M (eds) *The Life Industry: Biodiversity, People and Profits*. Intermediate Technology Publications, London, 1996, 31 -52; Kloppenburg Jr., J (1988) *First the Seed: The Political Economy of Plant Biotechnology*, Cambridge University Press, Cambridge.

products, overall herbicide use may decrease. According to the company, 'Roundup herbicide can reduce the number of weed treatments and can also help reduce tillage to conserve soil moisture and reduce erosion of valuable topsoil'.<sup>136</sup>

Environmentalists and some scientists counter that genetically-engineered herbicide resistance has negative environmental effects.<sup>137</sup> Among the claims commonly made are that use of herbicide-resistant transgenic plants may: (a) encourage excessive use of herbicides which may kill other plant varieties and species; (b) accelerate the development of resistance among pests; and (c) create the possibility of herbicide resistant genes crossing over to other plants including the weeds being targeted. This could create 'superweeds' which would render the herbicide ineffective in the long term, and cause ecological impacts that cannot easily be predicted. It may also be possible that transgenic plants themselves could become 'weeds' if the added characteristic gives them a competitive advantage over neighbouring wild species, though this is unlikely in the case of the most highly domesticated crop species.

Concerns are also expressed that increased use of hybrids and other modern varieties specifically designed for use with other proprietary agricultural inputs such as fertilisers and pesticides may have serious social impacts, especially in developing countries. These crop-herbicide-pesticide linkages can be considered to represent a shift towards capital intensive agriculture that increases the costs of farming and may therefore be detrimental to small farmers. Consequently, critics maintain that farmers must have the right to choose whether or not to accept these packages and should not be subjected to aggressive sales promotion campaigns.

Even if we accept that these concerns are well-founded, are IPRs implicated just because plants (where transgenic or not), herbicides and pesticides can be patented? Corporations in these technological fields tend to claim that without IPR protection they would have no incentive to invent or to innovate. This suggests that these products would not exist without IPRs. But this does not mean that the national patent office is the appropriate place to deal with marketing approval for such products. Most countries have an agency with jurisdiction over such matters, and such a body is probably much better placed than the patent office to decide whether plant-herbicide-pesticide packages are in the public interest or not.

In conclusion, there is a dearth of reliable empirical evidence on the IPR-genetic erosion connection. What can be presumed with some certainty is that the loss of agro-biodiversity cannot be attributed to a single cause. One study of the relationships between biodiversity erosion and agriculture came up with numerous proximate and underlying causes, but IPRs were not mentioned (see Table 1).

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<sup>136</sup> Monsanto World Wide Web site (<http://www.monsanto.com>).

<sup>137</sup> For excellent assessments of the environmental impacts of agricultural biotechnology see Lappé and Bailey (1999) and Krimsky and Wrubel (1996).

**Table 1: Addressing causes of biodiversity losses linked to agriculture** (derived from Thrupp 1997 [with changes suggested by Takase 1998])

<i>Problems</i>	<b>Proximate Causes</b>	<b>Underlying Causes (for all problems)</b>
Erosion of genetic resources (livestock and plants) <ul style="list-style-type: none"> <li>• Leads to disease/insect pests</li> <li>• Loss of insect diversity</li> </ul>	Spread of High Yielding Varieties (HYVs) and monocultures Biases in breeding methods Weak conservation methods	Demographic changes Industrial/Green Revolution Model that stresses uniformity Disparities in resource distribution and in control of land Pressures and influences of seed/agrochemical companies Policies that support HYVs, uniformity and chemicals (subsidies, credit, market standards) Producers/companies focus on short-term returns to neglect of longer-term social factors Disrespect for local knowledge and structural inequities
Erosion of insect diversity	Heavy use of pesticides Use of monocultures Loss of organic material	Policies that support HYVs, uniformity and chemicals (subsidies, credit, market standards) Demographic changes
Erosion of soil diversity <ul style="list-style-type: none"> <li>• Leads to fertility loss</li> <li>• Productivity decline</li> </ul>	Heavy use of agrochemicals Poor tillage practices Use of monocultures	Policies that support HYVs, uniformity and chemicals (subsidies, credit, market standards) Demographic changes
Erosion of habitat diversity (social and private costs)	Extensification in marginal land Drift/spillover from chemicals	Demographic changes
Erosion of indigenous methods for using agrodiversity	Replacement by uniform species	Disrespect for local knowledge and structural inequities

#### 4.8 Technology Transfer and Food Security

A number of developing countries had noted the tension between the development and technology transfer objectives of the TRIPS Agreement and the way in which the Agreement made it possible for rights owners to impose unreasonable terms for technologies.

The objectives of the TRIPS Agreement are stated in Art. 7 in the following terms:

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.

The relationship between the TRIPS Agreement and development has been raised narrowly in the contexts of the implementation of the Agreement and more transcendently in the context of the human rights to health and nutrition. Capacity building is required in developing countries to enable them to deal with the impacts of IPRs upon biotechnological research. Jackson proposes the establishment, in Geneva, of a Genetic Resource and International Trade Institute “to provide technical assistance training and research on genetic resources management and the rapidly changing policy environment to developing countries”.<sup>138</sup>

The Convention on Biological Diversity (CBD) in Article 16 provides for access to and transfer of biotechnology. In the case of developing countries, Art.16.2 provides that this access to and transfer of technology shall be provided and/or facilitated under fair and most favorable terms, including on concessional and preferential terms where mutually agreed. Each Contracting Party agrees in Art. 16.4 to “take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of technology...for the benefit of both governmental institutions and the private sector of developing countries”.

Article 17.1 of the CBD requires the Contracting Parties to facilitate “the exchange of information, from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries” and specifies in Art. 17.2 that this exchange of information shall include “exchange of results of technical, scientific and socio-economic research, as well as information on training and surveying programs, specialized knowledge, indigenous and traditional knowledge as such”.

Article 18 of the CBD provides that the Contracting Parties shall “promote international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity, where necessary, through the appropriate international and national institutions.” In promoting such cooperation, Article 18.2 requires that “special attention should be given to the development and strengthening of national capabilities, by means of human resources development and institution building” and Article 18.4 envisages the promotion of cooperation in the training of personnel and exchange of experts and Article 18.5, the “establishment of joint research programs and joint ventures for the development of technologies” relevant to the objectives of the CBD.

There is not much evidence that these provisions have been implemented by developed countries in any systematic way. However, in a number of developing countries, these technology transfer obligations are tied in to the conditions for the grant of bioprospecting licences. In Costa Rica “InBio” has been set up as a public entity to allow Costa Rica to gain access to biotechnology assets in the form of technology licenses, while providing

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<sup>138</sup> L. Jackson, ‘Agricultural Biotechnology and the Privatization of Genetic Information. Implications for Innovation and Equity’. (2000) 3 *The Journal of World Intellectual Property*, 825-848.

access to Costa Rica's biotechnology assets and genetic resources, for commercial interest. This provides a first model of a method to utilize biotechnology intellectual property assets in a fair, comprehensive, and consultative manner. A number of universities and public research institutes in both developing countries and in more technically advanced countries have established technology transfer units to disseminate research results.<sup>139</sup> Very often the focus of the technology transfer office is to evaluate the research efforts of the institution and to identify commercial partners that will license the technology and assist in the commercialization of research findings.

#### 4.9 Geographical Indications for Agricultural Products

Mention has been made above of the debate in the TRIPS Council of the WTO about the possibility of extending the proposed system for the multilateral registration of wines, to other products. If the European experience is any guide, this will be of particular significance for the protection of agricultural products.

As was indicated above<sup>140</sup>, The EC has promulgated a series of regulations dealing with designations for wines and spirits.<sup>141</sup> The most important of these is the Council Regulation 2081/92 on the protection of geographical indications and designations for agricultural products and foodstuffs<sup>142</sup> and Council Regulation 2082/92 on certificates of specific character for agricultural products and foodstuffs.<sup>143</sup> These Regulations prescribe rules on the protection of designations of origin and geographical indications of agricultural products intended for human consumption. They draw a distinction between Protected Designations of Origin (PDO) and Protected Geographic Indications (PGI). A designation of origin is defined as "the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or a foodstuff originating in that region, specific place or country, and -- the quality or characteristics of which are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors, and the production, processing and preparation of which take place in the defined geographical area".

To be eligible to use a protected designation of origin (PDO) an agricultural product or foodstuff must comply with a specification, which includes:

- (a) the name of the agricultural product or foodstuffs, including the designation of origin;
- (b) a description of the agricultural product or foodstuff including the raw materials, if appropriate, and principal physical, chemical, microbiological and/or organoleptic characteristics of the product or the foodstuff;
- (c) the definition of the geographical area;
- (d) evidence that the agricultural product or the foodstuff originates in the geographical area;

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<sup>139</sup> See M. Blakeney, 'Intellectual property, biological diversity and agricultural research in Australia' (2002) 53 *Australian J. of Agricultural Research* 127-148.

<sup>140</sup> See 4.1 (c).

<sup>141</sup> The Council Regulations which are still in force are: 1493/1999 of 17 May 1999 on the common organization of the market in wine, *OJL* 179, 14 July 1999, p.16; 1576/89 of 29 May 1989 laying down general rules on the definition, description and presentation of spirit drinks, *OJL* 275, 25 April 1989, p.1.

<sup>142</sup> *OJL* 208, 24 July 1992, p.1, as amended by 535/97 of 17 March 1997, *OJL* 83, 25 March 1997, p.3.

<sup>143</sup> *OJL* 208, 24 July 1992, p.9.

- (e) a description of the method of obtaining the agricultural product or foodstuff and, if appropriate, the authentic and unvarying local methods;
- (f) the details bearing out the link with the geographical environment or the geographical origin;
- (g) details of the inspection structures;
- (h) the specific labelling details relating to the indication PDO or the equivalent traditional national indications;

The question of what is a registrable PDO was addressed by the European Court of Justice (ECJ) in Case 12-74, *Commission of the European Communities v the Federal Republic of Germany*<sup>144</sup> which concerned an application by the Federal Republic of Germany reserving the appellations 'Sekt' and 'Weinbrand' to the domestic product and the appellation 'Praedikatssekt' to wines produced in Germany from a fixed minimum proportion of German grapes. The Commission argued that the appellations 'Sekt' and 'Weinbrand' were generic appellations which the German legislature has attempted, by means of a legislative measure, to transform into indirect indications of origin as German consumers and other interested parties did not understand the appellation 'Praedikatssekt' to describe a wine produced from a fixed minimum proportion of German grapes, but merely 'Sekt' of a particular quality. It also submitted that by imposing a requirement of use of a minimum proportion of German grapes for these appellations, the legislation comprised measures having an effect equivalent to quantitative restrictions, contrary to the requirements of Article 30 of the EC Treaty.

The Court noted that the German legislation on vine products provides that the appellations 'Sekt' and 'Weinbrand' should describe products originating in the Federal Republic of Germany or coming from other countries throughout the whole of which German is an official language. It ruled that “an area of origin which is defined on the basis either of the extent of national territory or a linguistic criterion cannot constitute a geographical area capable of justifying an indication of origin”, particularly as the products in question could be produced from grapes of indeterminate origin. In the case of vine products, the Court observed that the natural features of the area of origin, such as the grape from which these products were obtained, played an important role in determining their quality and their characteristics and that although the method of production used for such products may play some part in determining their characteristics, it was not alone decisive, independently of the quality of the grape used, in determining its origin.

Thus the Court concluded that it could not be shown that the products in question had a quality and characteristics peculiar to them which rendered them typically German products.

The defendant had submitted opinion polls in order to show that German consumers considered the appellations 'Sekt' and 'Weinbrand' to refer to domestic German wines. The Court rejected this as the protection accorded by the indication of origin was only justifiable if the product concerned actually possesses characteristics which are capable of distinguishing it from the point of view of its geographical origin. In the absence of such a condition this protection could not be justified on the basis of the opinion of consumers such as may result from polls carried out on the basis of statistical criteria.

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<sup>144</sup> Judgement, 20 February 1975.

The Court concluded that the German legislation on vine products involved measures having an effect equivalent to quantitative restrictions on imports contrary to Article 12(2)(b) of Regulation No 816/70.

A “protected geographic indication” (PGI) is defined as “the name of a region, a specific place or, in exceptional cases, a country, used to describe an agricultural product or a foodstuff

-- originating in that region, specific place or country, and  
-- which possesses a specific quality, reputation or other characteristics attributable to that geographical origin and the production and/or processing and/or preparation of which take place in the defined geographical area.

The question of PGIs was considered in Case C-269/99<sup>145</sup>, which concerned an application under Article 17 of Regulation No 2081/92 from the German Government on 26 January 1994 for gherkins originating in the geographical area defined as 'the glacial valley of the Spree between the northern edge of the town of Cottbus and the Neuendorfer See, north of the town of Lübben'. A number of interested third parties raised objections to the application for registration of the designation 'Spreewälder Gurken. They claimed that the special geographical and climatic conditions referred to in the application applied at most to the Spreewald, in the strict sense of the inland delta region, and not to the entire Wirtschaftsraum Spreewald, and that the processed product should not contain any raw materials from other production areas.

The ECJ ruled that it was for the national courts to rule on the lawfulness of an application for registration of a designation. Similarly as the national court had made its own assessment, which was not tainted by a manifest error, the Commission could properly register the designation 'Spreewälder Gurken under the simplified procedure. The registration of the designation 'Spreewälder Gurken as a PGI, was because a foodstuff may be treated as originating from the geographical area concerned if it is processed or produced in that area, even if the raw materials are produced in another region. The same principle applied to the registration of the designation 'Spreewälder Gurken for the geographical area defined in the amended specification.

The EU Regulations provide that names that have become generic may not be registered. In establishing whether or not a name has become generic, account has to be taken of all factors, in particular:

- the existing situation in the Member State in which the name originates and in areas of consumption,
- the existing situation in other Member States,
- the relevant national or Community laws.

Because of the general unfamiliarity of agricultural communities in developing countries with the concept of geographical indications, many of the products which they produce will have become generic. This was arguably the case in Europe, for example with the name Feta for cheese. Greece had sought the registration of 'Feta' as a PDO for “salted white cheese traditionally produced in Greece, from sheep's milk or a mixture of sheep's milk and goats' milk coming exclusively from the regions of Macedonia, Thrace, Epirus, Thessaly, Central Greece, Peloponnese and Lesbos”. Although a majority of the Member

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<sup>145</sup> Judgement, 6 December 2001.

States had asked the Commission to include the name 'Feta on the list of generic names which it was preparing. The Commission had taken the view that 'Feta' was not disqualified from registration on this ground. It had relied on a market survey conducted in Greece, which concluded that Feta was recognised as a geographical indication in that country.

The ECJ ruled that it was not permissible for the Commission to minimise the importance to be attached to the situation existing in the Member States other than the State of origin and that account must be taken of the existence of products which are legally on the market and have therefore been legally marketed under that name in Member States other than the State of origin by which registration is applied for. Thus as the Commission did not take due account of all the factors which the Article 3(1) of the basic regulation required it to take into consideration., the ECJ ruled that the contested regulation had to be annulled to the extent to which it registered the name 'Feta' as a PDO.

This sort of case illustrates the importance for states in developing distinctive geographical indications, to assist the marketing of their agricultural products in order to avoid genericity. Where generic terms have become customary, these can be associated with distinctive geographical indications, for example, Macedonian Rakia, or Bulgarian Rakia would differentiate between producers of the spirit drink which is produced throughout the Balkans.

A number of recent ECJ cases have addressed food processing and packaging as part of a PDO under Regulation No 2081/92.

Case C-47/90 concerned the PDO "Rioja". Under Article 84 et seq. of Law No 25/70, wine produced in the La Rioja region was granted a 'denominación de origen. At that time, a Governing Council for the designation of origin Rioja was set up. By order of the Spanish Minister for Agriculture, Fisheries and Food of 3 April 1991<sup>146</sup> the rules applicable to that designation and the Rioja were approved. Article 32 of the Rioja Rules provided that wine protected by the denominación de origen calificada Rioja shall be bottled exclusively in the registered cellars authorised by the Governing Council, failing which the wine may not bear that designation and that wines protected by the denominación de origen calificada Rioja may be put into circulation and be despatched solely from registered cellars, in special bottles which do not detract from their quality or prestige and have been approved by the Governing Council. The bottles must be of glass and of a capacity authorised by the European Economic Community with the exception of one-litre bottles.

The Spanish, Italian and Portuguese Governments and the Commission adduced new information to demonstrate that the reasons underlying the contested requirement were capable of justifying it. They argued that particularly in the wines sector, Community legislation displays a general tendency to enhance the quality of products within the framework of the common agricultural policy, in order to promote the reputation of those products through, *inter alia*, the use of designations of origin which enjoy special protection. In relation to Rioja wine, the Court accepted that its particular qualities and characteristics, result from a combination of natural and human factors that are linked to its geographical area of origin and that vigilance must be exercised and efforts made in order for them to be maintained. It accepted that the rules governing the Rioja 'denominación de

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<sup>146</sup> BOE No 85 of 9 April 1991, p. 10675.

origen calificada were designed to uphold those qualities and characteristics. The control over bottling was accepted as being in pursuit of the aim of better safeguarding the quality of the product and, consequently, the reputation of the designation. The Spanish Government, supported by the Italian and Portuguese Governments, and by the Commission, submits that, without this requirement, the reputation of the Rioja 'denominación de origen calificada might in fact be undermined. Transport and bottling outside the region of production would, in its view, put the quality of the wine at risk.

The court accepted that the bottling of wine is an important operation which, if not carried out in accordance with strict requirements, could seriously impair the quality of the product. Bottling does not involve merely filling empty containers but normally entails, before filling, a series of complex oenological operations (filtering, clarifying, cooling, and so on) which, if not carried out in accordance with the prescribed rules of the trade, may adversely affect the quality and alter the characteristics of the wine. It was not contested that bulk transport of wine could seriously impair its quality if not undertaken under optimum conditions. Although the Court accepted that, in the best conditions, a wine's characteristics and quality may indeed be maintained when it has been transported in bulk and bottled outside the region of production, it observed that in the case of bottling, the best conditions are more certain to be assured if bottling is done by undertakings established in the region of those entitled to use the designation and operating under their direct control, since they have specialised experience and, what is more, thorough knowledge of the specific characteristics of the wine in question which must not be impaired or lost at the time of bottling.

The Court noted that for Rioja wines transported and bottled in the region of production, the controls were far-reaching and systematic and were the responsibility of the totality of the producers themselves, who have a fundamental interest in preserving the reputation acquired and that it could be inferred that the risk to which the quality of the product finally offered to consumers is exposed was greater where it has been transported and bottled outside the region of production than when those operations have taken place within the region. Accordingly, it ruled that the requirement at issue, whose aim was to preserve the considerable reputation of Rioja wine by strengthening control over its particular characteristics and its quality, was justified as a measure protecting the 'denominación de origen calificada which may be used by all the producers concerned and is of decisive importance to them.

Case C-108/01<sup>147</sup> concerned the Italian Law No 26 on protection of the designation of origin 'Prosciutto di Parma' of 13 February 1990, which reserved the designation 'Prosciutto di Parma' ('Parma ham') exclusively to ham marked with a distinguishing mark allowing it to be identified at any time, obtained from fresh legs of pigs raised and slaughtered in mainland Italy, produced in accordance with provisions laid down in the law. The Law prescribed that the slicing and packaging of Parma ham must take place at plants in the typical production area which are approved by the Consorzio, responsible for monitoring Parma ham production. The case concerned the sale by Asda Stores Ltd, which operated a chain of supermarkets in the United Kingdom, of ham bearing the description 'Parma ham', purchased pre-sliced from Hygrade Foods Ltd, which itself purchases the ham boned but not sliced from an Italian producer who was a member of the Consorzio. The ham was sliced and hermetically sealed by Hygrade in packets bearing the wording

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<sup>147</sup> 20 May 2003.

'ASDA A taste of Italy PARMA HAM Genuine Italian Parma Ham'. The Consorzio brought proceedings by writ in the United Kingdom against Asda and Hygrade seeking various injunctions against them, essentially requiring them to cease their activities, on the ground that they were contrary to the rules applicable to Parma ham.

The House of Lords sought a ruling from the ECJ as to whether the Italian legislation read with Commission Regulation (EC) No 1107/96 and the specification for the PDO Prosciutto di Parma created a valid Community right, directly enforceable in the court of a Member State, to restrain the retail sale as Parma ham of sliced and packaged ham derived from hams duly exported from Parma in compliance with the conditions of the PDO but which have not been thereafter sliced, packaged and labelled in accordance with the specification.

The Court, applying the “Rioja” case, ruled that Regulation No 2081/92 must be interpreted as not precluding the use of a PDO from being subject to the condition that operations such as the slicing and packaging of the product take place in the region of production, where such a condition was laid down in the specification. Although this was a measure having equivalent effect to a quantitative restriction on exports, the Court accepted that it was justified for the purpose of guaranteeing the authenticity and quality of the product, noting that Community legislation displayed a general tendency to enhance the quality of products within the framework of the common agricultural policy, in order to promote the reputation of those products through *inter alia* the use of designations of origin which enjoy special protection. Designations of origin, as industrial and commercial property rights, protected those entitled to use them against improper use of those designations by third parties seeking to profit from the reputation which they have acquired. It ruled that the specification of the PDO 'Prosciutto di Parma', by requiring the slicing and packaging to be carried out in the region of production, was intended to allow the persons entitled to use the PDO to keep under their control one of the ways in which the product appears on the market. This condition was justified as safeguarding the quality and authenticity of the product, and consequently the reputation of the PDO, for which those who are entitled to use it.

The Court noted that the slicing and packaging of Parma ham constituted important operations which may harm the quality and hence the reputation of the PDO if they were carried out in conditions that result in a product not possessing the organoleptic qualities expected. Those operations may also compromise the guarantee of the product's authenticity, because they necessarily involve removal of the mark of origin of the whole hams used. Consequently, the Court ruled that the condition of slicing and packaging in the region of production, whose aim was to preserve the reputation of Parma ham by strengthening control over its particular characteristics and its quality, may be regarded as justified as a measure protecting the PDO which may be used by all the operators concerned and is of decisive importance to them. The resulting restriction was therefore regarded as necessary for attaining the objective pursued, in that there were no alternative less restrictive measures capable of attaining it.

Finally, it concluded that the PDO 'Prosciutto di Parma' would not receive comparable protection from an obligation imposed on operators established outside the region of production to inform consumers, by means of appropriate labelling, that the slicing and packaging has taken place outside that region. Therefore, any deterioration in the quality or

authenticity of ham sliced and packaged outside the region of production, resulting from materialisation of the risks associated with slicing and packaging, might harm the reputation of all ham marketed under the PDO, including that sliced and packaged in the region of production under the control of the group of producers entitled to use the PDO

As a matter of general practice, infringement actions in relation to geographical indications concern either: (a) wrongful use of a PGI or a PDO, in which case an action will be brought by the entity responsible for preserving the integrity of the geographical indication; or (b) in relation to a misleading use of a geographical indication.

A developing country which has indicated geographical indications protection as a means of protecting its agricultural products is India, which adopted the Geographical Indications of Goods (Registration and Protection) Act in 1999. In the Act, “goods” shall be construed as “any agricultural, natural or manufactured goods or any goods of handicraft or of industry and [it] includes foodstuff” (Art. 2 (1) f). The Act provides that any name which, although it is not the designation of a geographical area, is used in relation to particular goods originating from a particular area can also be considered a geographical indication, so long as such name is not generic or descriptive of the product (as to the kind, nature, type... of the product). Such a definition was meant to protect denominations like “Basmati”.

The Act assimilates to infringement and prevents the registration of indications which, although literally true as to the territory, region or locality in which the goods originate, falsely represents to the public that the goods originate in another territory - this reproduces *verbatim* TRIPs Art. 22 (4). More generally, geographical indications which are misleading insofar as they suggest that the goods originate in a geographical area other than the true place of origin are infringing. Likewise, are deemed to constitute infringements uses of geographical indications in a manner which constitutes an act of unfair competition, i.e. any act constitutive of disparagement or tarnishment of a competitor. The registration is granted to any association of persons or of producers entered in the register as proprietor of the geographical indication for 10 years, renewable, after an opposition period.

This scheme of protection is similar to that defined for trademarks, all the more as it is open to foreign associations. However, it presents some features specific to geographical indications regimes, such as the control exercised by the Registrar of the industry standards as regards the production, manufacture, exploitation of the goods having specific quality, reputation or other characteristic that is essentially attributable to their “geographical origin with the detailed description of the human creativity involved”. The mechanism to ensure that the standards are maintained by the producers is another feature typical of a regime of protection of geographical indications.

Complementarily, the Indian Trade Marks Act 47 of 1999 provides for collective and certification trademarks. A certification trade mark must be “capable of distinguishing the goods or services in connection with which it is used in the course of trade which are certified by the proprietor of the mark in respect of origin, material, mode of manufacture of goods or performance of services quality (...)”. A collective mark “means a trade mark distinguishing the goods or services of members of an association of persons (...) which is the proprietor of the mark from those of others”. An

application for a collective trademark must be accompanied by the regulations governing the use of such collective mark. These regulations must specify the conditions of membership of the association, the persons authorised to use the mark and the conditions of use of the mark. “A collective mark shall not be registered if it is likely to deceive or cause confusion on the part of the public in particular if it is likely to be taken for something other than a collective mark (...)”. An application for a certification trademark shall be accompanied by a draft of the regulations governing the use thereof. The registration can be opposed, revoked or modified, notably where the proprietor is no longer competent to certify the goods or services concerned, or where “it is no longer in the public advantage that the mark should remain registered”.

#### **4.10 Terminator Technology**

Terminator technology, as its name suggests, was coined not by proponents but by a Canadian activist, Pat Mooney, who was seeking to direct negative publicity towards it. In this he was highly successful. Terminator first came to Mooney’s attention in 1998 when he saw an announcement that a patent<sup>148</sup> had been granted jointly to the United States Department of Agriculture and Delta and Pine Land, a major American cotton seed company, describing molecular biological techniques for controlling gene expression in plants, plant parts or seeds so that traits can be switched on and off between generations. Conceivably, farmers could benefit from these techniques, depending upon the traits in question whose expression or non-expression may help determine the success of the harvest. But among the claims is a method for producing seed that is incapable of germination, or to be more specific, a technology that would render harvested seed sterile. On the face of it, it seems extraordinary to invest so much effort and expense in developing a means to produce sterile seed. But despite the involvement of a public sector institution, this is strictly business. The purpose is to prevent farmers from replanting saved seed and thereby undercut seed company monopolies. In doing so, it provides a means not only of preventing the infringement of intellectual property protection but of ensuring the continuation of the monopoly beyond the life of any patent or plant variety certificate, assuming such activities require the authorisation of the right holder in question. Not only this, but terminator technology has grave implications for the activity of breeding, which requires unrestricted access to plant varieties to be used as sources of initial variation.

The development of this technology seems to reflect the increased determination of the private sector (in this case, and in common with hybrids as we will see below, with the assistance of a public agency) to eliminate the replanting of proprietary seeds, which is also reflected in the increasing use of licensing agreements stipulating that customer-farmers must not replant their patent-protected seeds. Such agreements would of course become unnecessary if this technology became widely used.

Genetic use restriction technologies (GURTs), of which terminator is just one, are not new. In the early twentieth century, a US public sector plant scientist called George Shull discovered the phenomenon of (what he called) ‘heterosis’ in the corn plants resulting from his cross-breeding of inbred pure lines. This phenomenon, commonly referred to as ‘hybrid vigour’, is manifested in heightened yields. But because they are hybrids, the offspring cannot breed true and the yield enhancements thus last only for a single generation. So while farmers stand to benefit from seeds providing this hybrid vigour, they need to buy

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<sup>148</sup> US Patent No. 5,723,765 (issued March 3, 1998) (‘Control of plant gene expression’).

seeds at the beginning of every planting season to enjoy equally productive future harvests. This necessity was and continues to be a boon for the seed companies. As long as the cost of seed purchases is exceeded by additional revenues obtained through the hybrid vigour, farmers will continue to use hybrids in place of their open pollinating counterparts. In a discussion on private appropriation in the business of plant breeding, Rangnekar identifies four methods employed. These are (i) IPRs and seed market regulation; (ii) organisational solutions; (iii) discontinuous heritability; and (iv) planned obsolescence. He classes hybrid and terminator technologies as methods of discontinuous heritability.<sup>149</sup>

The hybrid route to the breeding of better seeds is generally assumed to be a very good thing for the development of the seed industry, and in the opinion of many, but not all people, also for farmers. In fact, several of the world's major twentieth-century seed companies first came to prominence through their successful breeding of hybrid corn varieties. These include Pioneer Hi-Bred, DeKalb, Pfister and Funk. But sceptics argue that the massive investments in the development of hybrid varieties that were made in the 1920s and 1930s could have been allocated to breeding based on more conventional techniques that would have achieved similar yield increases but without preventing farmers from being able to replant their harvested seeds. Berlan and Lewontin argue that hybridization is a kind of 'deterioration technique' that not only enables seed companies to eradicate on-farm saving and exchange but actually eliminates all opportunities to improve crops through selective breeding.<sup>150</sup> Farmers may gain in the short term, but widespread adoption of hybrid varieties may not necessarily best favour their long term interests.

In the early days hybrid productivity was not much greater than their conventionally-bred counterparts.<sup>151</sup> However, from the middle of the century, increased private investment was considerably improving the yields of hybrid corn. Unfortunately for breeders, hybridization does not work so easily for some of the most widely cultivated crops like wheat and rice, and is consequently less commercially viable. With no law to prevent it, there was nothing to stop farmers from replanting harvested grain as seed, or even multiplying seed for the purpose of selling it in competition with the breeder (assuming this would be more profitable for them than selling harvested produce). Terminator technology appears to provide the solution to the problem. But unlike this earlier biotechnology protection system and other GURTs under development that seek merely to control the expression of specific traits, terminator, which uses seed sterility as the basis of its use restriction, provides no productivity or agronomic benefits to the farmer who buys the seed. Worse still, it is actually a net loss, since it removes a freedom but offers no compensating gains as did hybrid corn and as the so-called trait-specific GURTs promise to provide. This point gives rise to some important questions. The most basic one is that of whether the terminator controversy affects the future of agriculture or is much ado about nothing. Second, if patenting is about promoting inventive activity for the benefit of the public, is terminator the kind of invention we should be encouraging in this way? Third, if not, are there sufficient legal grounds for preventing its legal protection through the patent system.

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<sup>149</sup> D. Rangnekar, 'Planned Obsolescence and Plant Breeding: Empirical Evidence from Wheat Breeding in the UK (1965-1995)'. Economics Discussion Paper 00/8, Kingston University - Faculty of Human Sciences, Kingston upon Thames, 2000.

<sup>150</sup> Berlan, J-P and Lewontin, R C (1998) Cashing in on life - operation terminator. *Le Monde Diplomatique*, December (<http://www.monde-diplomatique.fr/inside/1998/12/02gen.html>).

<sup>151</sup> G E Bugos and D J Kevles, 'Plants as intellectual property: American practice, law, and policy in a world context' (1992) 7 *Osiris* 75-104.

Finally, if these grounds are lacking, ought countries to expand the applicability of the ordre public and morality exclusions available to World Trade Organization member states by virtue of Article 27.2 of TRIPS, and which is construed rather narrowly in Europe, so that such technologies can no longer be protected?

Perhaps the main indicator of terminator's importance lies in the fact that the United States Department of Agriculture has been developing GURTs with the private sector as part of the US government's wider and long term effort to protect the intellectual property of its businesses in overseas markets including developing countries. Indeed, according to a spokesman from the USDA, the aim is for the technology to be 'widely licensed and made expeditiously available to many seed companies' in order 'to increase the value of proprietary seed owned by US seed companies and to open up markets in Second and Third World countries'.<sup>152</sup>

Terminator has some potential benefits. For one thing, it could allay one of the concerns of some opponents of genetically-modified crops, which is the risk that genes from these plants may cross over to other species, a phenomenon called horizontal gene transfer that, ironically, many advocates of GM agriculture dismiss as being nothing to worry about anyway. In addition, secure protection might encourage further investment in agricultural biotechnology and plant breeding including in directions that benefit small farmers. The former is plausible, while the latter is completely speculative.

Perhaps the main problem with terminator, if we suppose for a moment that the technology *will* encourage small farmer-oriented research, is its restriction on seed replanting, exchange, diffusion and on-farm breeding activities. To explain why, it is important to understand that developing country subsistence farmers generally acquire their seeds from their own farms or those of neighbours. Maintaining the freedom to do this is very important for two reasons. First, subsistence farmers often lack funds or credit to buy seed at the start of each planting season. For them, buying seed is a considerable investment. If it turns out that the benefits of terminator-protected seed are insufficient to compensate for its higher price, farming may become even more risky for the poor. Admittedly, farmers can presumably return to their traditional varieties, but one poor harvest accompanied by increased debt may be enough to cause destitution. Second, many developing country small-scale farmers do much more than simply grow seed produced elsewhere. Indeed, local varieties are themselves the result of generations of improvement through on-farm selection and experimentation, and nowadays such practices can involve modern varieties which may need to be adapted to suit local conditions. Turning such farmers into mere customers of companies selling terminator-protected seed will halt such practices. This may not only be detrimental to local food security but, if it became a global phenomenon, could weaken plant breeding efforts worldwide by reducing the variety of germplasm available.

For these reasons, subsistence farmers are unlikely to be sympathetic to, or gain much comfort from, Collins' assertion that 'the centuries-old practice of farmer saved seed is really a gross disadvantage to Third World farmers who inadvertently become locked into

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<sup>152</sup> Quoted in Rural Advancement Foundation International, 'US patent on new genetic technology will prevent farmers from saving seed' RAFI press release, 11 March, 1998.

obsolete varieties because of their taking the “easy road” and not planting newer, more productive varieties’. If yields from GURT-protected seed prove to be disappointing, and if such seed is more dependent on inputs like agrochemicals than traditional varieties (which is often the case with modern varieties), then farming communities could suffer destitution. Defenders will no doubt argue that farmers still have a choice. But in reality they may not.

For many critics, being able to patent such a technology is an indictment of the patent system. One may indeed reasonably question whether or not society should be encouraging such research through the promise of a patent monopoly. Moreover, it is legitimate to be concerned that protecting seeds through both patents and GURTs is overprotective in a similar way that support for encryption through copyright law in the form of banning circumvention devices is overly generous to owners.<sup>153</sup> In addition, countries might well consider such inventions to be immoral or contrary to ordre public, and this is a decision that deserves to be respected. Legally, they are on secure ground since they have the right to determine their own criteria for what is immoral or contrary to ordre public. India has already banned terminator and one can easily envisage other developing countries following suit. For such countries, terminator is clearly not the sort of technology they want their patent systems to encourage.

However, one can argue that there is no particular need to respond to terminator-type patents by broadening the application of these exceptions. In fact, if terminator could not be patented on these or other grounds, this might encourage research in this area even more. After all, GURTs would appear to be especially useful in jurisdictions where IPR protection is weak. Besides, the patent itself is not a right to commercially exploit. The freedom to use such technologies should not be automatic but subjected to an approval process founded on sound science, socio-economic and environmental assessments of its impacts and, arguably, the precautionary principle. Patent granting authorities might not be qualified to do all of this.

There are two main issues highlighted by the terminator patent, even though these have often been ignored in the sound and fury. First, terminator technology exemplifies the way agricultural research is more and more expensive, commercially-oriented and technologically advanced. The consequence of this is that the sector is becoming one in which an ever smaller number of companies is able to enter it, while those that are already in it and can compete come to dominate it. In fact, terminator may accelerate this process of corporate concentration, which is already quite noticeable, while further undermining public sector research. It may do this by tightening the locks on plant genetic resources so others must either do without them or pay license fees that might prove too financially burdensome for competitors or potential competitors and public sector institutions.<sup>154</sup> If so, countries need to adopt competition regulations that ensure that farmers and consumers continue to have a choice and which maintain the public sector’s freedom to operate in agricultural research.

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<sup>153</sup> Article 8 of the 1996 WIPO Copyright Treaty and Articles 10 and 14 of the 1996 WIPO Performances and Phonograms Treaty.

<sup>154</sup> T. M. Swanson and T. Goeschl, ‘The impact of GURTs: agricultural R&D and appropriation mechanisms’ in Swanson, T M (ed) *Biotechnology, Agriculture and the Developing World: The Distributional Implications of Technological Change*, Edward Elgar, Cheltenham, 60-61.

Second, we allow the private sector to monopolise agricultural research at our peril, and the peril especially of developing country farmers, who are bound to be ignored in the same way that drug companies ignore the diseases of the poor for sound economic reasons. Terminator could even make the situation worse for the poor because even if GURT-protected seeds are developed for the use of poor farmers, this may backfire on them because the scope for on-farm breeder experimentation, which is often necessary to adapt varieties so they better meet the specific needs of farmers, will be reduced. It is also a very bad thing if public sector researchers in other countries have the same motivations as the USDA in supporting terminator. Public sector agricultural research is declining world wide (Knight 2003). Yet research targeted at poor farmers is as necessary as it has ever been. Not all public sector research does this, as the terminator research amply demonstrates, but we can be sure that even less will be done if business is left to conduct all the research. Indeed, the termination of public sector research may be a bigger problem for poor farmers than terminator technology.

## 5 Assessment of the Relationship between IP and Food Security

The role of intellectual property in eliminating food insecurity has to be placed in its proper policy perspective. Development experience over the last 50 years attributes rural poverty and food insecurity in developing countries to development strategies that overlooked the importance of the development of the agricultural sector, particularly the production of staple foods.<sup>155</sup> Thus the enhancement of food security in developing countries requires a package of policies that address the supply, distribution and consumption aspects of the food chain. The FAO has noted that the policy options which are available to poor countries are constrained by a number of factors including: (a) limited resources for public spending programmes; (b) the dilemma between remunerative prices for producers and prices that a large number of poor households can afford, thus making the option of border protection less attractive, despite high bound tariffs; (c) major constraints on foreign exchange availability leading to pressure to boost production of export crops.<sup>156</sup>

Where intellectual property could make its greatest contribution is in the incentivisation of beneficial agricultural innovations. Historically, the strongest incentives have been those arising from the marketing of hybrid seeds, which provide higher yields, with the commercial benefit to the seed marketer that the seeds of the offspring cannot be used by the farmer because these seeds do not breed true-to-type. As is discussed above, the evidence for incentives to breeding research for crop plants is limited and in developing countries, it is even more questionable, whether PVP and patenting will be useful in encouraging a national seed industry. Barton suggests that a developing country “is probably best-off adopting minimum compliance with TRIPS, which requires at least some form of *sui generis* protection for plants – although there is the possibility that a number of nations with similar agricultural conditions could combine their markets in some way that encouraged private investment. Moreover, use of UPOV-style laws might help in commercializing varieties developed by the public sector.”<sup>157</sup>

The question of whether a developing country will adopt a *sui generis* PVP system or a patent-based system, to comply with Article 27.3(b) of the TRIPS Agreement (unless that Agreement is amended along the lines suggested in the communication to the TRIPS Council of the African Group)<sup>158</sup> will depend upon the technological sophistication of agricultural research in that country. Where agricultural research involves classical plant breeding, PVP would be the likely route. Where, however a country has developed a capacity for microbiological research, then patenting becomes an option. In both countries the form of protection which is adopted will depend upon the nature of the registration facilities which are available. For a PVP system, facilities for test breeding are required. For patenting appropriate examination facilities will be required. In both cases there is the possibility for regional co-operation. This is probably more advanced in relation to patenting where there are regional patent offices, or the availability of international searching for PCT members. The EU provides an example of the regionalisation of PVP, through the Community Plant Variety Rights Office.

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<sup>155</sup> The State of Food and Agriculture: Lessons from the Past 50 Years, FAO, Rome, 2000.

<sup>156</sup> FAO, *Incorporating food security concerns in a revised Agreement on Agriculture*, FAO Round Table on Food Security in the Context of The WTO Negotiations on Agriculture, 20 July 2001, Discussion paper no. 2.

<sup>157</sup> J. Barton, *Nutrition and Technology Transfer Policies*, Geneva, UNCTAD/ICTSD, Aug. 2003, 11.

<sup>158</sup> WTO Doc., 1P/C/W/404, 20 June, 2003.

## **6 Recommendations for Action**

### **(a) Policy Capacity Building**

The TRIPS Agreement recognises in its preamble “the underlying policy objectives of national systems for the protection of intellectual property, including developmental and technological objectives” and the “special needs of the least-developed country Members in respect of maximum flexibility in the domestic implementation of laws and regulations in order to enable them to create a sound and viable technological base”. The TRIPS Agreement in Article 7 declares that 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”. The TRIPS review processes in general require the development of an IP policy capacity on the part of developing and least-developed Members of the WTO. The food technology debate and the question of access to new technologies is a complex and multi-dimensional issue in which IP is usually a vital component. It is recommended that the EC addresses assistance to developing countries in the construction of IP policy capacity.

Article 8.1 of the TRIPS Agreement indicates that “Members may, in formulating or amending their law and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with this Agreement.” The scope of this provision remains to be charted and it counsels a multi-disciplinary approach. Indeed, in addition to law, the formulation of IP and food security policy has now to accommodate considerations of economics and finance, science and technology, ethics and philosophy, medicine, agriculture and culture. As IP policies are currently being formulated by international and inter-governmental organizations as diverse as the WTO, WIPO, FAO, WHO, CBD, UNCTAD, UNEP, UNESCO and WHO, developing and least-developed countries which have to engage with this process have to construct IP policy capacity in the areas of: public health (patenting, confidential information, compulsory licensing, parallel importation); food security (patenting and plant variety protection); agricultural research (access to proprietary enabling technologies, development of IP assets; genomics and bio-informatics, bio-prospecting and access to genetic resources); agricultural trade (patenting, plant variety protection, geographical indications); general trade (trademark protection, piracy and counterfeiting, border control of IP rights); technology transfer (approval of technology transactions, technology packaging, control of restrictive licences, remuneration); the impact of digital technologies (copyright and computer programs, software patenting, communication technologies, domain names, ecommerce, encryption and technological controls, reprographic technologies, electronic rights management); enforcement of IP rights (civil litigation, judicial adjudication, criminal enforcement, alternative dispute resolution, jurisdictional issues); traditional knowledge and folklore; establishment and management of IPRs (patent examination and searching, registration of rights, compulsory licensing).

In all countries there is a plethora of government ministries and public institutions that have to deal with public policy issues raised by different parts of IP. However, in developing and least-developed countries, experience in the formulation and implementation of IP policy is scanty. The construction of IP policy capacity in

developing and least-developed countries so that they can engage more effectively in IP dialogues in the various national, regional and international for a is imperative. The focus of this initiative would be not on fostering knowledge on intellectual property as the end, but on advancing approaches to IP that can serve central public policy ends such as food security, fostering innovation, creativity, development, and the public diffusion of knowledge and ideas.

This initiative would support the emergence of IP policy leaders in developing and least-developed countries committed to poverty reduction, equity and fairness to engage in the (1) design and implementation of appropriate domestic policies; and (2) process of international IP standard-setting.

The EC can assist in this capacity-building in a number of ways. In its simplest for this would consist of training courses for those concerned in policy formulation and implementation in developing countries. These courses could be run either at appropriate institutions in the EU, or through regional training courses in developing countries. In its most elaborated form, this capacity building initiative could be through the establishment of a global, self-sustaining network of developing country experts, policymakers and scholars who would engage at the national and international level in IP agricultural policy debates with an eye to advancing the public policy interests of developing and least-developed countries, and in particular the interests of the poor, ethical considerations and development in those countries.

This network could be envisaged as a twinning arrangement between institutions in developing countries and LDCs which would help develop an approach to training and leadership development that provides an alternative to existing capacity building efforts. The initiative would not be focused simply on legal understanding and implementation of existing IP laws, but on evaluating them, formulating food security policies relevant to national and local circumstances. The network would:

- ❑ facilitate the establishment of regional and national IP-agri policy networks in the South;
- ❑ Identify the substantive and policy priorities of different regions and potential participants.
- ❑ Develop criteria to guide a needs assessment, both of potential trainers and beneficiaries, for each of aspect of capacity building in IP and food security policy;
- ❑ Develop criteria for use in identifying beneficiaries, mentors, beneficiaries and partners that have a record of commitment to the public interest and the desired commitment to engaging in IP and food security policy debates from a public interest perspective;
- ❑ Become an international medium for the effective exchange of information in the rapidly developing IP food security policy world;
- ❑ Provide effective mentoring for IP food security policy experts in the South

Intermediate forms of assistance which the EC can provide, which is also discussed below, is in providing assistance with legislative drafting to deal with the regulation of IP aspects of food security. For example the EU expertise in geographical indications and food security, the Community Plant Variety Rights Regulation and its work under the Biotechnology Directive could be usefully applied.

**(b) Implementation of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture**

The EC should encourage the ratification of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture and, in particular, the implementation of the Treaty's provisions relating to the refusal of intellectual property protection of any material transferred in the framework of the multilateral system, together with the implementation of Farmers' Rights at the national level.

A number of Material Transfer Agreements (MTAs) may ultimately come to be associated with the Treaty and its implementation. These include: (i) the MTA used by the CGIAR Centres to distribute designated germplasm; (ii) the standard MTA for the Treaty; (iii) the MTA to be used by Centres for "in trust" materials of crops/species that are not part of the Multilateral System and (iv) MTAs used by the CGIAR Centres and others for the transfer of improved germplasm that may incorporate materials from but not itself be part of the germplasm covered by the Multilateral System.

The EC could usefully provide expert assistance to developing countries and LDCs in the use of these MTAs and in contributing to policy formulation by the Treaty's Governing Body.

**(c) Implementation of the Informed Consent and Benefit Sharing Principles of the Convention on Biological Diversity**

The EC should support the establishment of principle of informed consent in relation to the bioprospecting activities of European enterprises, as well as the sharing of benefits resulting from the exploitation of those resources with source communities. This support should be manifested: (i) in the negotiations within the TRIPS Council concerning the renegotiation of Article 27.3(b) of the TRIPS Agreement; (ii) within the COP of the CBD; (iii) in the discussions within WIPO on the Substantive Patent Law Treaty and (iv) as an obligation of national legislation within the EC and elsewhere.

This question closely overlaps the work which is being undertaken in various fora on the question of disclosure of origin in patenting and PVP. In the case of plants and plant derivatives, genetic material may come from numerous sources some of which may no longer be identifiable because of the lack of documentation and the length of time between its acquisition and its use in breeding programmes. The EC can provide assistance to developing countries and LDCs in producing a workable county of origin system. To this end it would be useful to investigate the extent to which the relevant industrial sectors use biogenetic resources, and also to survey the views of IP practitioners and businesses as to the workability of disclosure of origin and on how its implementation would affect how they do their research and development.

**(d) Recognition of the Protection of Traditional Agricultural Knowledge**

The EC should lend its support to the recognition of traditional agricultural knowledge as a category of protectable intellectual property. This support could be manifested: (i) in the

discussions within WIPO for a convention concerning the protection of intellectual property; as part of the implementation of the FAO Treaty on the Protection of Plant Genetic Resources for Food and Agriculture; (iii) as part of the discussions within WIPO on the Substantive Patent Law Treaty; (iv) as an obligation of national legislation within the EC and elsewhere.

**(e) Extension of the Multilateral System of Registration of Geographical Indications for Wines to Agricultural Products**

It has been suggested that geographical indications may be of particular interest to those developing countries which have, or might be able to achieve, a comparative advantage in agricultural products and processed foods and beverages. Of course, these benefits have to be weighed against the expense of enforcement actions, as well as the expense of protecting the geographical indication in the country of origin. The EC can usefully assist in the preparation of case studies and cost analyses of the likely impact of introducing a European style registration system.

EC assistance would also be useful in exploring with developing countries and LDCs the way in which a policy on geographical indications could be integrated with the formulation of rural policy in the context of sustainable food security.

The EC could also lend its support the proposal to extend the multilateral register for the geographical indication of wines envisaged within the context of the negotiations under Article 24 of the TRIPS Agreement, to agricultural and other products.

**(f) Technology Transfer in Support of Food Security**

The EC should lend its support to technology transfer for the conservation of land races and traditional food crops both *in situ* and *ex situ* in developing countries and LDCs. The EC should encourage respect for the obligations in Articles 16-18 of the Convention on Biological Diversity, which link access to the genetic resources of countries to access to information, technologies and capacity building related to the exploitation of those resources. This technology transfer could be focussed upon the food security requirements of developing countries.

Obviously, the EC already contributes to the *in situ* conservation efforts of the CGIAR. There is much work to be done in the area of *ex situ* conservation of genetic resources for food and agriculture.

A particular area of assistance could be in the development of industry standards for bioprospecting, in which technology transfer is built into technology transfer licences as a condition of access to genetic resources.

**(g) Implementation of UPOV**

As part of countries' obligations to introduce plant variety rights protection, whether as a UPOV-style statute, or as *sui generis* legislation, the EC should support the preservation of the right of farmers to save and exchange seed. At the same time, the

EC should support the maintenance of the exception from liability of research utilising protected varieties.

#### **(h) Compatibility of PVP and Patenting**

The EC should support the compatibility between the systems for the protection of plant varieties and patents, by ensuring that the patenting of the genetic components of plants, does not extend to the patenting of plants themselves, thereby compromising food security and undermining the research exception in PVP laws.

#### **(i) Clearing House Mechanism**

The EC should support the establishment of the Clearing House Mechanism within the CBD as an initiative for the provision of information about intellectual property applications concerning plant genetic resources for food and agriculture worldwide. The development of a global mechanism for exchanging and integrating information on plant genetic resources would have the effect of reducing the loss of biodiversity and promoting the fair and equitable sharing of benefits. This would also facilitate the exploitation of genetic resources by developing countries and dealing directly with a traditional knowledge stakeholders and source countries through the mechanism would lower transaction costs.

The mechanism would perform a number of useful functions: (i) a the repository for national and community registers of indigenous knowledge, which would be maintained under strict obligations of confidentiality; (ii) a catalogue of knowledge and innovations which are available for sale or licensing, as well as identifying that traditional knowledge which is unavailable; (iii) a register of legal experts who are available to assist indigenous and traditional communities in such negotiations and in evaluating research proposals; (iv) representing the stakeholders in national government and intergovernmental negotiations; (v) monitoring the use, eg patenting of traditional knowledge; (vi) a dispute resolution facility between stakeholders; (vii) promulgating industry bioprospecting standards, and contract terms; and (viii) engaging in awareness-raising activities.

As to whether the clearing house mechanism should function as a private organization or be part of a government or intergovernmental structure, it has been urged that a private global bio-collecting society should be established to keep it outside inter-governmental politics.<sup>159</sup> The EC should support research into whether the Clearing House Mechanism should require government and public sector participation in the clearing house mechanism.<sup>160</sup>

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<sup>159</sup> See P. Drahos, 'Indigenous Knowledge, Intellectual Property and Biopiracy: Is a Global Bio-Collecting Society the Answer?' (2000) 22 *European Intellectual Property Review*, 248.

<sup>160</sup> See G. Graff, and D. Zilberman, D. (2001) Towards an Intellectual Property Clearinghouse for Agricultural Biotechnology, (2001) 3 *IP Strategy today*, <http://www.nature.com/cgitaf/dynapage.taf?file=/nbt/journal/v19/n12/index.html>.