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Team Report 4: The relationship between human rights, intellectual property and sustainable development: looking for integration

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1. INTRODUCTION

Human rights are fundamental to every human being and amongst other rights include, the right to life, health and food security. They are recognized internationally and procured by states in international declarations and conventions. In the current era, human rights have become an integral part of the international law making process and finds application when considering most rights, including intellectual property rights (IPRs). Developed countries lobbied for intellectual property (IP) lawmaking in the World Trade Organization (WTO), which resulted in the adoption of the Trade Related Aspects of Intellectual Property Agreement (TRIPS Agreement).\(^1\) This has fundamentally changed the nature of the debate concerning IPRs and human rights.\(^2\) Developing countries were required to enact and enforce new IP laws in order to gain access to markets in developed countries. Even though the TRIPS Agreement tried to ease developing countries conversion to greater protection, its transitional provisions proved to be largely illusory, because the time periods for compliance were too short and the promises of technology transfer and technical assistance were inadequately realized.\(^3\) Coupled with the short compliance periods, the TRIPS agreement paid little attention to the problem of providing access to training and provision of educational materials that would allow these countries to advance to the intellectual frontier.\(^4\) Moreover the TRIPS agreement did not give sufficient protection for developing countries in relation to traditional knowledge, folklore, and natural endowments that constitute much of the informational wealth of these countries.

Since the TRIPS agreement does not provide sufficiently adequate solutions to the needs of developing and developed countries and because of the continuing

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1 Agreement on Trade Related Aspects of Intellectual Property Rights, Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization, 15 April 1994 [hereinafter referred to as TRIPS Agreement].
need for IP lawmaking, developing and developed countries are looking to alternative forums and regimes.

The Commission on Human Rights and the Committee on Economic, Social and Cultural Rights has adopted number of non-binding declarations, resolutions, recommendations, and reports concerning the internationally-recognized rights of individuals and groups, including in particular those referred to in three legal instruments that together comprise the International Bill of Rights. These are the Universal Declaration of Human Rights (UDHR), the International Covenant on Civil and Political Rights (ICCPR), and the International Covenant on Economic, Social and Cultural Rights (ICESCR).\(^5\)

These regimes were used by developing countries to combat the pressure posed by developed countries in bilateral agreements and to move forward international IP lawmaking processes, which stalled under the umbrella of the WTO and the World Intellectual Property Organization (WIPO).

The term sustainable development is described as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.\(^6\) Sustainable development was recognized in the preamble of the 1994 WTO Marrakesh Agreement establishing the World Trade Organization,\(^7\) and in the Treaty of the European Union. According to Henning Grosse Ruse – Khan, the sustainable development objective should be used to enlarge domestic policy space in tailoring the IP regime to domestic needs.\(^8\) Such tailoring needs to take all interests into account and strike a balance amongst them in a manner that is not unpredictable or raises ambiguity in trade relations. Promoting creativity, innovation and competitiveness could be the means to achieve the goal of sustainable development. As such, the principles of

\(^{5}\) International Covenant on Civil and Political Rights, 19 December 1966 [hereinafter referred to as ICCPR]; International Covenant on Economic, Social and Cultural Rights, 16 December 1966 [hereinafter referred to as ICESCR]; Universal Declaration of Human Rights, 10 December 1948 [hereinafter referred to as UDHR].


integration and reconciliation are the most crucial points in order to achieve sustainable development, which should be taken into account during the negotiations of IP law making that takes place in the following new forums and regimes.

In the following chapters we present how human rights and IP affect sustainable development. The focus of the work will be on the realms of pharmaceuticals and public health; the development of biological and cultural diversity; and issues surrounding food security.

2. PHARMACEUTICALS AND PUBLIC HEALTH DEVELOPMENT

Sustainable development in the realm of public health requires promotion of the wellbeing and livelihood of all individuals through balancing access to medicines against appropriate protection incentives for innovators.

In order to meet such a balance, IPRs and the TRIPS agreement must be interpreted and utilized in such a manner that promotes public health. This analysis sets out the interaction between the need for public health and the promotion of medical patents necessary for sustainable development but finds a balance difficult to strike.

2.1 Human rights and intellectual property

2.1.1 Human rights

The right to health is crucial to the proper functioning of the human rights system and is affirmed in the preamble of the Constitution to the World Health Organization,\(^9\) Article 25(1) UDHR,\(^10\) and Article 12(1) ICESCR.\(^11\) Introduced in 2001, The Doha Declaration on the TRIPs Agreement and Public Health reaffirms patent right flexibilities in order to ensure that ‘the TRIPs Agreement does not... prevent the taking of measures to protect public health... and [that it] be

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\(^9\) ‘The highest attainable standard of health is one of the fundamental rights of every human being…’.

\(^10\) ‘Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including… medical care’.

\(^11\) ‘The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health’.
interpreted and implemented in a manner supportive of public health protection and promotion of access to medicines’ (Paragraph 4).12

Theoretically, the above basis offers incentives for the innovation of new and better medication, whilst ensuring access to medicines through flexibilities.

2.1.2 Intellectual property

Incentives provided by IP provide a window for manufacturers to recoup their sizeable investment in the drug development process, which includes a 20-year term of patent protection, patent term extensions or supplementary protection certificates (SPCs), 13 regulatory data protection (Article 39(3) TRIPS Agreement),14 and patent linkage mechanisms.15

In order to balance to the above incentives, TRIPS and the Doha Declaration have created a framework of flexibilities to patent rights. The flexibilities include amongst others, compulsory licensing (Article 31 TRIPS Agreement), 16 international exhaustion (Article 6 of TRIPS Agreement), 17 and for limited

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13 which provide an additional five years protection to innovative pharmaceutical products resulting from prolonged research, development and regulatory approval periods. (Liu, I., Mackenzie, D., Haitao, S., (2012), The lie of the land: extending exclusivity for pharmaceuticals and biotech, WIPR, http://www.worldpreview.com/article/the-lie-of-the-land-extending-exclusivity-for-pharmaceuticals-and-biotech (accessed May 2013)).
14 Protection of data, produced by expensive and extensive testing of pharmaceutical products to secure regulatory approval, from disclosure and use by subsequent applicants for marketing authorization, albeit for a limited period (5 years in the US and 8 years in the EU).
15 The practice of filling for the registration of a generic drug by using the marketing approval of the original patented drug. As such patent linkage mechanisms are put into place to ensure that a generic applicant allege that there is no relevant patent being infringed, that the patent, which the generic drug is based on, has expired or that the original patent is invalid or an infringement. This is offered to original patent holders as a compromise to limited data exclusivity (Brook, B. (2010), Overview of Data Exclusivity and Patent/Registration Linkage, UKZN IPR/A2M, http://ipatm.ukzn.ac.za/Libraries/Notes_and_Slides/ukzn_data_exclusivity_linkage_2010.sflb.ashx (accessed May 2013)).
16 Allowance by government of forced licensing of a patented invention without authorization of the rights holder, provided the use is exclusive, reasonable remuneration is made available to the patent holder and there is first an attempt to obtain the patent holders authorization, amongst others. However, the Doha Declaration reassures the waiver of such provisions in states of ‘national emergency’ (a public health crisis) and it is decided by the affected member of the WTO whether such emergency exists. (Carlos, C., Duncan, M. (2011), The Doha Declaration Ten Years on and Its Impact on Access to medicines and the Right to Health, UNDP, http://www.undp.org/content/dam/undp/library/hivaidDiscussion_Paper_Doha_Declaration_Public_Health.pdf (accessed June 2013), at 6-10.)
17 Products legitimately placed on one market can be imported into another market, without authorization of the proprietor (parallel importing), thus effectively moving more affordable products from one market to another. (Watal, J. (2000), Access to Essential medicines in Developing Countries: Does the WTO TRIPS Agreement Hinder It?, Center for International Development, Science Technology and Innovation Discussion Paper No. 8,
exceptions of the exclusive rights of patent holders (Article 30 TRIPS Agreement);\(^\text{18}\) for example the Bolar exemption.\(^\text{19}\)

Alternative incentives for innovation and access to medicines can be sought outside of the IP realm, for example, via ‘grants, subsidies, prizes, advance market commitments, reputation gains, open source drug discovery, patent pools, public-private partnerships, or equity based systems built upon liability rules’ (Pogge 2010: 159).\(^\text{20}\) However, such alternatives are avoided in practice because of lacking protection models in international human rights instruments, as opposed to the protection modality offered by the patent system.\(^\text{21}\)

### 2.2 Practical application of incentives and flexibilities

In certain cases, developing countries overuse flexibilities and stretch them so as to benefit and solve immediate situations, which necessitate increased pharmaceutical presence, in essence trying to find a quick fix. However, this is happening at the expense of pharmaceutical companies incentives, resulting in more developed countries trying to counter the practices by reinforcing their incentive mechanisms via FTAs and at times, by introducing stricter terms.

With regard the stretching of these flexibilities, Thailand’s government in 2007, authorized compulsory licenses for the import of patented medicine and also for the generic production of these medicines, provided the companies refuse to lower their prices. This situation incited international companies to avoid marketing their products in such countries,\(^\text{22}\) and the United States Government ‘responded in the past by threatening trade sanctions on key

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\(^{18}\) provided the right holder is not unreasonably prejudiced and normal exploitation of the right is not affected.


exports of Thailand [in retaliation].

China is facing pressure from the US for their disregard of Article 39(3) of the TRIPS Agreement, by means of unauthorized disclosure of undisclosed test data for marketing approval of pharmaceuticals. This practice is leading to a situation where major pharmaceutical companies are hesitant to market products in China for fear of insufficient protection measures. Moreover, pharmaceutical companies are pushing back against Indonesia’s issuance of several “government use” type of compulsory licenses as ‘standard government practice’, rather than as a last resort or in extraordinary circumstances as is dictated by international norms.

On the other hand, the 2012 Millennium Development Goals Report provides an indication of the actions taken through FTAs. It notes that ‘TRIPS flexibilities... [are] more broadly incorporated in national laws, but that the use of these flexibilities may be hampered by bilateral and regional free trade agreements’. The FTAs try to reinstate a promise from countries that incentives for pharmaceutical companies will not be abused or disregarded and as such involves, TRIPS-Plus terms like the extension of a patent term because of time lost for patent approval and time lost for marketing approval from the applicable regulatory authority; the limitation of compulsory licenses to ‘cases of anti-trust remedies, public non-commercial use and national emergencies or other circumstances of extreme urgency; prevention of parallel imports; and the protection of undisclosed information obtained after research and development of a patented drug.

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Theoretically, the system seems balanced and the outlays of both approaches are heading in the right direction, but the examples above indicate that abuses by less developed countries of these ‘access flexibilities’, provoke more developed countries to respond with stricter FTAs and sanctions, which limit access to medicines. In addition to these circumstances, overuse of the ‘innovation incentives’ can restrict access to medicines for less developed countries and provoke them to abuse ‘access flexibilities’. There is a fear that such action is becoming standard practice, even in the absence of overzealous push from either flexibilities or flexibility-restricting practices. There is a need for legal frameworks to create more of a balance between these incentives and flexibilities and an even greater need for the actors themselves to interpret and utilize the framework in a manner appropriate to harness sustainable development.

3. BIOLOGICAL AND CULTURAL DIVERSITY: RIGHTS OF INDIGENOUS PEOPLE

Biodiversity represents one of the key factors of sustainable development and it is becoming an issue how to manage productivity and resources in a sustainable manner in order to prevent loss of such biodiversity. Sustainable use of biological diversity therefore seems to be a global concern, and as such also constitutes one of the three objectives set out in the Convention on Biological Diversity (CBD); one of the most important treaties regulating the conservation and use of biodiversity at the international level.\(^{30}\)

In conjunction with biodiversity, traditional knowledge of indigenous people plays a crucial role in promoting sustainable development. It helps preserve and maintain biological diversity over centuries and continues to contribute to sustainable development thereof. As will be analysed further, the attempts to

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\(^{30}\) The Convention on Biological Diversity, 29 December 1993. It is a legally binding international agreement, which main objectives, recognized for the first time in international law, are conservation and sustainable use of biological diversity and the fair and equitable sharing of benefits arising from the use of genetic resources. One of its key elements are provisions on respect and recognition of traditional knowledge. 193 countries are currently party to the Convention, excluding for example the United States that has signed, but not ratified the treaty.
protect traditional knowledge meets various issues that arise both from the human rights and IP perspectives.

For the purposes of this article, two main perspectives of biodiversity will be addressed, generally understood as variety of living things: firstly, the issue of traditional knowledge of indigenous people in general, as these communities are considered to be protectors of biodiversity, and secondly, particular problems of protection of genetic resources oriented towards guaranteeing the variety of species and bio-piracy.

3.1 Traditional knowledge and indigenous communities

Traditional knowledge can be understood as ‘knowledge, know-how, skills, innovations or practices that are passed between generations in a traditional context and that form part of the traditional lifestyle of indigenous and local communities who act as their guardian or custodian’. It therefore covers a broad range of subject matter like traditional agricultural, medicinal and biodiversity-related knowledge and cultural expressions that should be perceived together in the sense of the “heritage” of indigenous people.

As to the protection of knowledge holders’ rights from the human rights perspective, reference must be made to Article 15 ICESCR. Under Article 15(1)(c), ‘any scientific, literary or artistic production’ shall be protected, including knowledge, innovations, and practices of indigenous and local communities. Furthermore, under Article 15(2), the conservation and the diffusion of the culture is one of the ends to be achieved. When reporting on realization of the rights under Article 15, states are among others asked to provide information about measures taken to further enjoyment of the cultural

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32 Art. 15 ICESCR:
1. The States Parties to the present Covenant recognize the right of everyone:
a) To take part in cultural life;
b) To enjoy the benefits of scientific progress and its applications;
c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.
2. The steps to be taken by State Parties to the present Covenant to achieve full realization of this right shall include those necessary for the conservation, the development and the diffusion of the science and culture.
heritage of indigenous peoples, the preservation of mankind’s cultural heritage and other measures taken for the conservation and development of culture”. The protection of knowledge holders therefore shall fall primarily within this cultural human right. The general problem of human rights conventions is that not all the states consider them as self-executing and equal to their constitutional rights. Owing to that, adequate protection on national level is required as well.

Article 15 CESC presents the same provision under which IPRs tend to be recognized as cultural rights and the conceptual issue which arises here is whether it is possible ‘to fit traditional knowledge within existing categories of IPRs’. In order to protect traditional knowledge, first of all, its holistic context must be respected: for indigenous people, traditional knowledge covers more than what can be traditionally protected by IP law. Current IP systems do not always fit the evolving nature of traditional knowledge, not alone forgetting the fact that the knowledge is often held collectively, and transmitted over generations. As a consequence, traditional knowledge is not always able to fulfil existing IP requirements for protection, like novelty, originality or creativity, and cannot be valued only through an economical perspective. Moreover, IP systems are costly and therefore may not be affordable for indigenous people, especially in case of potential disputes.

Regardless of the difficulties, there are various legal tools that can be used in order to protect traditional knowledge; these tools may be in general approached as defensive protection and as positive protection. These two approaches should not represent different options; but on the contrary, should be undertaken in a complementary way.

Defensive protection means safeguarding against unauthorized acquisition by third parties of IP rights over traditional knowledge. A typical example of

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35 IPRs are individual rights. In order to allow traditional knowledge holders to obtain these rights, national legislation must recognize the possibility to form associations, community corporations or other similar legal bodies to act on behalf of the community.
36 Traditional knowledge has a longer duration than most IPRs. Nevertheless, there are some IPRs that can exist indefinitely and therefore can suit the needs of indigenous communities.
37 In order to make the IP systems more affordable and reachable for indigenous communities, national legislations can present for example alternative dispute resolutions. Additionally, more active roles can be undertaken by various government agencies in helping indigenous people.
defensive protection is publishing – creating databases of traditional knowledge as evidence of prior art in order to block others from patenting.\textsuperscript{38} On the other hand, disclosing the knowledge puts it in the public domain, where it can be used or exploited by others. For that reason, safeguarding represents just one side of protection and has to be completed by positive protection.\textsuperscript{39}

*Positive protection* has as its objective the acknowledgement of the rights of traditional knowledge holders, to protect and promote traditional knowledge and repress its misappropriation and other unfair uses.\textsuperscript{40} In general three options are available in order to reach these goals: to use existing IP law systems, to extend or adapt IP rights or to use sui generis systems which give rights in traditional knowledge as such. There is no one-size-fits-all system that could suit various legal environments and indigenous communities – the key is to provide traditional knowledge holders with a choice that would address their interests.

As already noted, existing IP law systems might not always provide satisfactory protection of traditional knowledge, patent laws or protection of plant varieties represent systems where most collision can be found. On the other hand, distinctive signs and in particular geographical indications seem to fit the concept of an appropriate protection framework for traditional knowledge, as associations on an indefinite basis can hold them.

All of the above mentioned possible contradictions between traditional knowledge and IP rights can also be reflected in the light of the relationship between CBD and the TRIPS agreement. Under article 8(j) of the CBD, states shall ‘respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity’. However, the strong

\textsuperscript{38} This protection is mainly focused on patent systems, as its target is for traditional knowledge to be taken into account when a patent is examined for novelty and inventiveness.

\textsuperscript{39} For mutual relationship between the safeguarding of the traditional knowledge, which is an approach promoted by UNESCO (Convention for the Safeguarding of Intangible Cultural Heritage, 17 October 2003.) and its protection, objective emphasized by WIPO.

formal, market-driven and individualistic orientation of the TRIPS agreement, makes it difficult for collectively held, non-codified and non-'novel' traditional knowledge to fit within its provisions. As a matter of fact, traditional knowledge holders are on many occasions excluded from protection and as a result thereof are often subjected to bio-piracy.

3.2 Genetic resources and bio-piracy

Genetic resources are made up of the genetic materials of plants, animals or microbial origin of actual or potential value, that are capable of reproducing or being reproduced and as such, are essential to ensure biodiversity on Earth. As is being used and preserved through generations, genetic resources are closely linked to traditional knowledge and constitute valuable element in conservation and promotion of sustainable use.

The protection of genetic resources is even more complicated than traditional knowledge. Genetic resources are not creations of human minds and therefore, cannot be covered by most IP rights. Moreover, seemingly opposing rights are at stake: the protection of the environment and indigenous peoples’ sovereign right over natural resources on one hand and common interest of humankind in the access to and utilization of genetic resources on the other.

Concerning the protection of genetic resources within the indigenous communities (as these communities are the ones who genuinely keep preserving them), there are additional legal concepts that should be taken into account: some of the most important ones are offered by the CBD and include the principle of prior informed consent and equitable benefit-sharing.

Article 3 of the CBD declares sovereign rights over genetic resources within the states’ jurisdiction, but the Convention also requires fair and equitable sharing of profits arising from commercial and other utilization. The benefits derived from the exploitation of resources shall be fairly and equitably shared.

42 WIPO (2012), Intellectual Property and Genetic Resources, Traditional Knowledge and Traditional Cultural Expressions, at 12.
43 The protection of genetic resources by plant breeders’ rights and problems related to patenting of genetic materials will be discussed in the chapter concerning food security.
44 Art. 8(j) and 15(7) CBD.
with the provider of the resources (i.e. for example knowledge holders), on mutually agreed terms. Moreover, in accordance with the principle of prior informed consent, knowledge holders should be fully consulted before their knowledge or genetic resources are accessed or used. They should be informed about the consequences of the intended use and should agree on appropriate terms of use.

The problem closely connected with the protection of genetic resources and traditional knowledge is its misappropriation or illicit commercial benefiting from it – i.e. bio-piracy.\(^{45}\) The core existence of bio-piracy proves that there is a strong need for the protection of traditional knowledge and genetic resources. 'Imprudent bio-piracy by the developed world purely for economic benefits may result in deterioration of biodiversity and infringe on indigenous peoples' rights'.\(^{46}\) Indigenous people should therefore be compensated for their supplies of biological resources. The CBD is one of the instruments that can help, but more improvements both at the national and international level are needed to avoid bio-piracy. States should adopt principles of the CBD and the Nagoya Protocol,\(^{47}\) and furthermore introduce in their national legislations other mechanisms, for example the disclosure of the source and origin of genetic resources and associated traditional knowledge.\(^{48}\) This way, the rights of indigenous communities over genetic resources can be ensured and through this sustainable development can be protected.

It should be pointed out that the TRIPs agreement does not appropriately deal with the CBD objectives of equitable benefit-sharing and combating of bio-


\(^{47}\) Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, 29 October 2010.

\(^{48}\) The requirement to disclose the origin of genetic resources and associated traditional knowledge is also included in the new European Union Regulation Proposal on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union [COM (2012) 576 final]. The proposal suggests to also insert this requirement under a new article 29bis in the TRIPs Agreement.
piracy.\textsuperscript{49} However, it does not exclude the possibility to share benefits accruing from the use of genetic resources with the indigenous communities. There have been requests to change the TRIPS agreement primarily based on the fact that it has a strong and effective enforcement and settlement system. It is for this reason,\textsuperscript{50} that states are asking to include, in the TRIPS agreement, provisions guaranteeing the protection of traditional knowledge and its holders’ rights. In fact, there already exists a proposal from developing countries for the insertion of a new article 29bis on the ‘disclosure of origin of genetic resources and/or associated traditional knowledge’ into the TRIPS agreement. Including these principles of the Nagoya Protocol into the TRIPS agreement might be one of the most effective ways to fight bio-piracy.

3.3 Consequences of divergent tools of protection

Fundamental cultural rights covered by Article 15 CESCR provides protection for both individuals and communities and applies to the conservation and promotion of cultural heritage and as such, shall not be limited to its economic aspect and to what we generally understand as protectable subject matter under IP law systems. Contrary to this, principles of existing IP regimes (emerging from the same provision of CESCR) fail to provide adequate protection for traditional knowledge, particularly as a result of a failure to fulfil the requirements on novelty and individual ownership. This situation may result in a lack of legal tools to ensure conservation and sustainable use of biological diversity.

The TRIPS agreement is silent on knowledge holders’ rights and even if other instruments like the CBD and Nagoya protocol exists, none of them have such strong enforcement system as can be found in the TRIPS agreement. It would therefore be recommendable that future TRIPS agreement negotiations take into

\textsuperscript{49} See for example Dutfield, G. (2006), Protecting Traditional Knowledge: Pathways to the Future.
\textsuperscript{50} There are various opinions about the relationship between the TRIPS agreement and the CBD, ranging from their incompatibility to their peaceful coexistence: some of them require the alteration of TRIPS provisions based on its contradictoriness with CBD, but the call for change of TRIPS provisions also comes from those who think that both agreements are compatible. In the second case, the need for change is seen in what is considered to be a huge TRIPS agreement advantage – its enforcement mechanism that would provide for rights of knowledge holders much more effectively than the CBD can do at present. Although the CBD contains provisions intended to prevent bio-piracy, it does not have an effective enforcement system to ensure that agreements on benefit sharing between the provider of genetic resources (usually from developing countries) and their users (mostly coming from developed countries) are upheld.
consideration the issue of protection of indigenous knowledge and include this in the agreement in order for it to be more flexible and approachable for all, including indigenous communities. This approach could as a result lead to the effective promotion of sustainable development.

4. FOOD INSECURITY

In the World Food Summit of 1996, it was held that food security will have been realized “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. The right to food has been recognized as one of the fundamental human rights from the commencement of the UDHR in 1948. As declared at the G8 Meeting in June 2010, the food insecurity problem has been targeted as a very serious, increasing, and urgent problem, exacerbated by climate change, and as a result thereof, is an area in need of sustainable development promotion.

Sustainable development of agricultural products is considered to be key to the food insecurity problem. A non-sustainable development of agriculture would decrease the overall necessary amount or quality of food and therefore increase the food insecurity problem, giving rise to the violation of human rights.

On the other hand, there are several IP rights that protect food varieties and these rights are often accused of adversely affecting sustainable development, monopolizing the right to food, thereby causing food insecurity and being contrary to human rights. This statement will be discussed below.

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4.1 Farmers' rights versus breeders' rights

4.1.1 Plant variety protection

According to Article 27(3)(b) of the TRIPS agreement,\textsuperscript{56} plant varieties can be protected ‘either by patents or by an effective \textit{sui generis} system or by any combination thereof’

The International Union for the Protection of New Varieties of Plants (UPOV) provides a \textit{sui generis} system meeting this requirement of the TRIPS agreement and has been ratified by 71 countries up to date;\textsuperscript{57} of which all developed countries are members of, irrespective of whether those countries allow for plant varieties protection through patents.

The patent system however is stricter: there is no farmer's privilege, i.e. it is impossible for a farmer, via a patented plant variety, to re-use the seeds obtained from his crops without paying royalties for such re-use. Moreover, there is no ‘research exemption’, meaning that farmers will not be allowed to freely and openly use a patented plant variety as a genetic resource to create new varieties, even if it is exceptionally different from the patented one. Therefore breeders generally choose patent systems for protection, if it is available.

However from revision to revision, UPOV could not avoid modifying its system of protection of IPRs to increasingly become closer to the patent system. Therefore, the latest revision of UPOV (1991) puts limits on the farmer’s privilege by making this an optional exception.

Moreover, it recognizes the dual protection of plant variety rights (PVRs) and patents: a breeder cannot any more freely use a variety for research if it contains patented genes - even if that variety itself is not patented but simply protected by PVRs - which is the case, for example, for the new transgenic seeds market.

Thus although the PVR system provides less strict protection than patents, due to its exceptions, it is an additional \textit{sui generis} right for protecting plant varieties.

\textsuperscript{56} Art. 27(3)(b) TRIPS agreement:
‘plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes’. However, Members shall provide for the protection of plant varieties either by patents or by an effective \textit{sui generis} system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement.’

\textsuperscript{57} Sixteen States initiated an adhesion procedure.
4.2 Patents on agricultural products and their effects on sustainable development

The TRIPS agreement in Article 27(1) extended patent protection to inventions in all fields of technology, including agriculture. According to judicial determinations in the USA,\(^{58}\) and legislation in Europe,\(^{59}\) modified genetic material and enabling technologies thereof are accepted as patentable inventions.

These developments in the IP arena were accompanied by a significant amount of research and development opportunities, especially on genetically modified crops. Today, transgenic (genetically modified) seeds are made in order to obtain more nutritious, high-yielding and durable crops than organic crops.\(^{60}\)

Such crops are the norm rather than the exception in the US,\(^{61}\) as the overwhelming majority of crops are genetically engineered.\(^{62}\)

In a situation of food insecurity, as described above, the developments in the biotechnology arena might be directed to, or result in genetically modified crops which are far higher yielding and nutritious. These developments might be considered to be a solution to the food insecurity problem, however a cluster of multinational companies, which also hold patents on the resulting crops, develops these genetically modified crops. Hence, even though the genetically modified crops are more nutritious or higher yielding, they do not serve as a solution to food insecurity problem and actually have the potential to cause further curtailment to sustainable agriculture. Therefore the effect of monopolization of genetically modified crops is often highly controversial.

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\(^{58}\) Diamond v. Chakrabarty 447 U.S. 303 (1980), the U.S Supreme Court, for the first time, accepted a patent on a living organisms; J.E.M. Ag Supply, Inc. V. Pioneer Hi-Bred International Inc. 534 U.S. 124 (2001), it was explicitly held that genetically modified plants are within the broad scope of patentable subject matter.

\(^{59}\) EC Directive 98/44, Art. 3(2); ‘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’. Also, it has been confirmed by two decisions of the Enlarged Board of Appeal (EBoA) of the European Patent Office regarding patenting of tomato and broccoli, that patenting is permitted where a patent claim is not confined to a particular plant variety.


\(^{61}\) According to ISAAA, of the four most commonly planted biotech crops, a rising percentage of the total of all plantings are biotechnology. In 2010, 81% of all soybeans, 64% of cotton, 29% of corn and 23% of canola globally were from biotechnology seeds.

4.3 Effect of climate change on food security

According to current projections by the United Nations, the world population is projected to grow from 6.5 billion to nearly 9.6 billion by 2050. Thus global food production must nearly double by 2050. On the other hand, climate change is expected to cause a decline in yields and a higher occurrence of extreme climate events. There are a number of studies, discussing the influence of climate change upon the development of weeds, insect pests and crop diseases, as well as the ways in which plants can be engineered to withstand salinity and aridity.

To have similar or more yields in a world that is becoming warmer and drier, it will be necessary to change the farming practices. There is continued research on genetic engineering of plants and seeds for this purpose. On the other hand, patent systems, which as described above are one of the major driving forces to research, are used to protect inventions relating to crops that are engineered to be resistant to climate change.

At this point, the monetization of genetically engineered crops might be more problematic. As the climate on the earth changes, as discussed above, the overall yield of agricultural products will decrease, which will adversely affect sustainable development and give rise to a food insecurity problem. If the crops and plants, which are genetically engineered to resist climate change, are patented by a small number of companies, these companies will be monopolizing the high yielding crops on earth. This in turn might result in high dependency on these companies.

A 2008 study by the ETC group, an international organization dedicated to the conservation and sustainable advancement of cultural and ecological diversity and human rights, identified 55 patent families that were applied for and/or granted to a number of biotechnology companies on a so called “climate ready” gene, at patent offices around the world. In an update of the same study in

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2010, it was shown that the patents containing claims concerning abiotic stress tolerance, i.e. traits tolerant to environmental changes, increased dramatically.\textsuperscript{66} Blakeney, had estimated that the current research into the influence of climate change upon the development of weeds, insect pests, crop diseases and the ways in which plants can be engineered to withstand salinity and aridity, will in the future increasingly be undertaken in a political context.\textsuperscript{67}

We might take this estimation one step further, by estimating possible compulsory license issues in the field of genetically modified seeds in the future. Especially on patents relating to climate ready genes, to overcome problems relating to food insecurity, which is expected to affect the world population more and more in the following years.

Taking into account the situation described above, it can be right to conclude that in an environment with a different climate, genetically modified crops and the IP right owners of these crops will monopolize the food market. This monopolization, if not controlled or regulated might result in dependence on these companies, who successfully develop genetically modified seeds, which might adversely affect sustainable development, increasing the already existing human rights problem relating to lack of food.

It is proposed that, in this probable situation, the importance of technology transfer and, in case of emergency situations, compulsory licences will increase to make use of important inventions relating to high yielding genetically engineered crops and serve to solve the food insecurity problem. However it is important that such flexibilities are not abused and implemented in a manner that negatively impacts current patent holders. From this point of view, the TRIPS agreement and its implications will be important for the promotion of sustainable development.


5. CONCLUSION

Sustainable development necessitates harmonious interaction between the regimes found in human rights law and those regimes promoted by IP law.

In the field of pharmaceuticals and public health, there is a theoretical basis for a fair and equitable balance between IPRs holders and the promotion of sustainable development, however continued abuse of flexibilities and incentives to IPRs are hampering the potential for sustainable development.

The protection of indigenous peoples’ rights and biodiversity is present in the CBD and Nagoya Protocol, however, there is a need for a more effective enforcement system to ensure the advancement of sustainable development. This promotion could possibly be found in TRIPs, through the addition of additional protective measures.

In the realm of food insecurity, sustainable development is dependent on mechanisms like technology transfer and compulsory licenses, in order to curb monopolies held by patent holder companies, for genetically modified crops under patent and PVP laws. In addition to this, climate change is having a negative impact on the promotion of sustainable development. The future solution of solving the food insecurity problem is reliant on the TRIPs clauses and its implications evolving to cater for these needs.

Sustainable development implies that a permanent solution needs to be found in order to ensure a prospering future. It is therefore important that the TRIPS agreement be interpreted and that it evolves through future modification, in light of human rights, IP and the need to encourage sustainable development. There is a call for a change of viewing the future of TRIPs, from one of finding a “quick fix”, to one of “promoting sustainable development” and a need for it be answered.
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