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# The Evolution of Rights and Responsibilities over Agricultural Biodiversity

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## Food & Sustainability

The Food & Sustainability programme of the Quaker United Nations Office addresses the complex and intertwined issues of trade and innovation policy and how they relate to poverty, hunger and food insecurity. We look at these issues with a particular focus on small-scale farmers, including fisherfolk, forest dwellers and pastoralists, a critical yet largely unheard voice in trade and innovation policy-making. Our work is collaborative, providing the space where it is safe to think, share and explore creative alternatives to a food system that does not work for the majority of the world's population.

Half the world's food today is produced by 1.5 billion small-scale farmers. The figure is higher for food produced in the non-industrialized world—up to 80%. Small-scale farmers are stewards of biodiversity; they maintain, adapt, improve and distribute plant varieties. The agricultural biological diversity they enhance and develop provides a major contribution to health and nutrition. They find ways to deal with new pests and disease. They are also active players in critical ecosystem processes, developing and adapting ideas for nutrient cycling, effective water use and the maintenance of soil fertility, both traditional and from elsewhere. Who could be better placed to help the world cope with global environmental change and feed the world than over a billion small-scale farmers living, working and experimenting on the front lines of change?

Our work aims to ensure that trade and innovation policy are supportive of, and do not undermine, the critical role of small-scale farmers in providing local and global food security and the resilience we will need to facing ever-increasing environmental change.

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Cover image: Image from "World History Textbook," Map that illustrates the commodities traded during the Columbian Exchange. McDougal Little, 2007. Pg. 572. Copyright, McDougal Little, all rights reserved. Image provided here as fair use.

# Table of Contents

# Acronyms

| | |
|---|---|
| **ABS** | Access and benefit-sharing |
| **CBD** | Convention on Biological Diversity |
| **FAO** | Food and Agriculture Organization of the United Nations |
| **GATT** | General Agreement on Tariffs and Trade |
| **GRULAC** | Group of Latin American and Caribbean Countries |
| **HRC** | United Nations Human Rights Council |
| **IT** | International Treaty on Plant Genetic Resources for Food and Agriculture |
| **IU** | International Undertaking |
| **MLS** | Multilateral System |
| **NP** | Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits from their Use |
| **PGR** | Plant genetic resources |
| **PGRFA** | Plant genetic resources for food and agriculture |
| **PLT** | Patent Law Treaty |
| **PVP** | Plant Variety Protection |
| **SCP** | Standing Committee on Patents |
| **SDGs** | Sustainable Development Goals |
| **SMTA** | Standard Material Transfer Agreement |
| **TCEs** | Traditional cultural expressions |
| **TK** | Traditional knowledge |
| **TRIPS** | Agreement on Trade-related Aspects of Intellectual Property Rights |
| **UN** | United Nations |
| **UPOV** | International Union for the Protection of New Varieties of Plants |
| **WIPO** | World Intellectual Property Organization |
| **IGC** | Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore |
| **WTO** | World Trade Organization |

## Abstract

Legal regimes evolve in response to changing situations that can only be properly understood within a historical context. To increase the understanding that will be necessary to build coherence amongst legal regimes related to biological diversity, this paper provides a historical perspective on the evolution of rights and responsibilities over that diversity. Agricultural biodiversity is critical to achieve many of the Sustainable Development Goals and is therefore central to the paper's analysis. At the international level, debates around biological diversity have taken place in trade, intellectual property, environment, agriculture and sustainable development forums. While each agreement may receive attention individually, it is rare to see exposure of the connections amongst them. It is even rarer to see them analyzed from the perspective of the impact on poverty, food security, rural livelihoods, sustainable agriculture, climate change and the environment more generally. As an indivisible package, the Sustainable Development Goals call for a more integrated approach.

This paper therefore explores the concerns driving relevant international instruments with the goal of increasing the understanding needed to achieve coherence and mutual support. It notes the central role inequity plays both amongst the treaties and instruments discussed in this paper as well as in the broader international legal landscape that includes human rights and trade agreements. To achieve the Sustainable Development Goals requires understanding of the broader context within which biological diversity related agreements are situated and the real or potential impacts resulting from the different legal regimes. The paper concludes with suggestions on how to create a system that supports the critical role that agricultural biodiversity plays in achieving the Sustainable Development Goals.

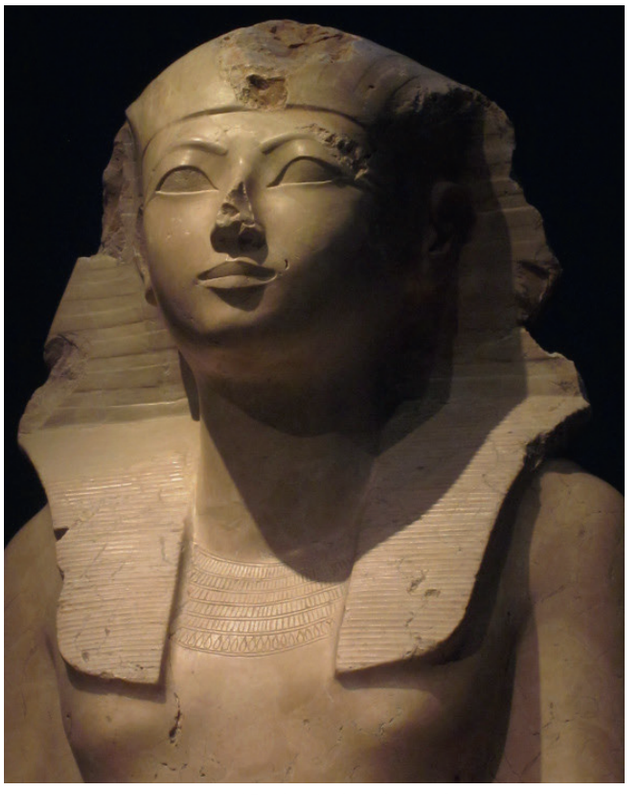
# I. Introduction

This paper provides historical perspective on the evolution of rights and responsibilities over agricultural biodiversity at the international level. Agricultural biodiversity includes diversity at the ecosystem, species and genetic level. Issues and tension about rights and responsibilities over agricultural biodiversity are most commonly about diversity at the species, variety[1] and genetic levels, and this paper uses the term plant genetic resources for food and agriculture (PGRFA) to represent all these levels. When the legal or policy issue is relevant to only one of the three levels, the paper explicitly points this out.

The Convention on Biological Diversity (CBD)[2] and its Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits from their Use (NP)[3] address biological diversity at all levels including wild and domesticated species and varieties; the World Trade Organization's Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS)[4] and the World Intellectual Property Organization's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC)[5] address genetic resources more generally (excluding human); the Union for the Protection of New Varieties of Plants (UPOV)[6] addresses plant genetic resources (PGR); the International Undertaking (IU) and the International Treaty on Plant Genetic Resources for Food and Agriculture (IT)[7] address PGRFA. In discussing the different treaties, the paper will use the terms that are appropriate to each treaty's scope of coverage.

Legal regimes evolve in response to changing situations that can only be properly understood within a historical context. Conflict over issues of sovereignty, control and ownership of PGRFA dates back hundreds, if not thousands, of years. As Falcon and Fowler (2002) note, when Egyptian Queen Hatshepsut organized a plant collecting expedition in 1482 BC, she dispatched her army for the task, anticipating perhaps, that they might encounter differences of opinion as to ownership of the resources sought.[8] Nevertheless, the scope, reach and orientation of international and national laws affecting PGRFA has changed substantially in the last thirty or so years.

*Statue of Queen Hatshepsut in the Metropolitan Museum in New York*



*(Credit: Archaeologistsdiary.wordpress.com)*

1 In botanical nomenclature, variety (abbreviated var.; in Latin: varietas) is a taxonomic rank below that of species and subspecies but above that of form. As such, it gets a three-part infraspecific name. Available from: http://herbarium.usu.edu/teaching/4420/botnom.htm (Last accessed March 16, 2017).

2 https://www.cbd.int/convention/text/ (Last accessed March 15, 2017).

3 https://www.cbd.int/abs/text/default.shtml (Last accessed March 15, 2017).

4 https://www.wto.org/english/docs_e/legal_e/27-trips.pdf (Last accessed March 16, 2017).

5 http://wipo.int/tk/en/igc/ (Last accessed March 16, 2017).

6 http://www.upov.int/upovlex/en/acts.html (Last accessed March 15, 2017).

7 http://www.fao.org/plant-treaty/overview/texts-treaty/en/ (Last accessed March 15, 2017).

8 Falcon, W.P. and Fowler, C. (2002) Carving up the Commons: the Emergence of a New International Order for Germplasm and Development and Transfer. Food Policy. 27, 197-222. *See also*, Farney, D. (June 1980). "Meet the men who risked their lives to find new plants." Smithsonian.

Conflict over issues of sovereignty, control and ownership of PGRFA dates back hundreds, if not thousands, of years…Nevertheless, the scope, reach and orientation of international and national laws affecting PGRFA has changed substantially in the last thirty or so years.

Technological advances—in particular in the field of genetic engineering and gene editing—enabled the realization of the economic value in PGRFA and catalyzed an increased interest in, and debate over, rights and responsibilities for these resources. The debates have taken place at the national level in legislatures and courts and at the international level in trade, intellectual property, environment, agriculture and sustainable development forums. While each development may receive attention individually, it is rare to see exposure of the connections amongst them and even rarer to see them analyzed from the perspective of the impact on poverty, food security, rural livelihoods, sustainable agriculture, climate change and the environment more generally.

The 17 Sustainable Development Goals (SDGs) and Agenda 2030 adopted by the global community in September 2015 are applicable to all countries with the commitment that no one is left behind.[9] The SDGs were created as a package, indivisible from one another and hence provide a framework where the connections noted above must be analyzed. One problem cannot be solved by creating another now or in the future. It will no longer be sufficient for an intergovernmental institution or treaty to state that something is not their mission if what they do negatively affects one of the SDGs. The treaties explored in this paper often have different missions and certainly have different constituencies; and of course, none would claim that their purpose is to increase hunger, or poverty. Now, however, treaties are going to have to look at their impact considering the broad objectives set out by Agenda 2030 and the SDGs. This is an opportunity to create policy coherence in the international legal architecture directly related to small-scale farmers and PGRFA, or that has a real or potential impact on them, even if they are not central to the purpose of the treaty.

Section II of this paper examines the legal characterization and treatment of PGRFA from Neolithic times to the rediscovery of the Mendelian laws of inheritance, the emergence of biotechnology and the rise of commercial agriculture. Section III categorizes the international regimes that deal in whole or in part with biological diversity by their orientation and goals. Section IV discusses the challenges to creating coherence yet the imperative established by the SDGs that international regimes do not undermine, and indeed, support, the SDGs; Section V examines history and issues that shaped the establishment of international rules on intellectual property and genetic resources and PGRFA; Section VI does the same with the treaties that deal directly with biodiversity, genetic resources and PGRFA; Section VII considers the relevance of a human-rights based approach to biodiversity and the people who conserve, manage and develop it *in situ* and on-farm; Section VIII concludes with some challenges and possible means to move forward.

## II. Historical context

In Neolithic times, about 10,000 years ago, people began to quite slowly make a transition from hunting and gathering to agriculture and in that process, began to whittle down the number of species they used for food. There was a reduction in a number of exploited species but a genetic explosion in diversity, a diversity from recombination of genes as plants were bred and crossed.

Historically, PGR were relatively freely exchanged in accordance with the idea that these resources were the

9 https://sustainabledevelopment.un.org/post2015/transformingourworld (Last accessed February 22, 2017).

common heritage of humankind.[10] Since the beginning of written history, we have records of explorers taking plant species they had discovered abroad back to their own countries as new foods and raw materials for plant propagation. Implicitly, genetic resources of plant varieties were recognized in national laws as valuable but they were not themselves explicitly recognized as independent from the physical specimen itself. Plants and their genetic codes were considered as consumptive goods only. De facto, their genetic resources were common property.

The Columbian Exchange, which began in 1492, speeded up the process of plant species exchange so greatly that by the 19th Century the Director of Kew Gardens stated that the world of plants had been thoroughly explored.[11] Although incorrect, it shows how much had been collected by that time. At this point, the locus of economic value was at the species, not the variety, level. The exchange was of crops and not varieties; for example, the British wanted rubber, not a particular landrace or variety. The locus of economic value was reflected in the mechanisms established to protect this value and control was physical, controlling access to species through guns and fences. The difficulty then - as it is today with access laws - was enforcement of the regime. Smuggling seeds, then as now, was easy. The ideology of the time was national sovereignty and ownership asserted by physical control.

In the 17th and 18th centuries, but especially in the 19th, there was a rise of commercial agriculture. Mendelian laws of inheritance were rediscovered, scientific plant breeding began to replace local breeding. Food became a commodity and was marketed. In the 19th century plant exploration was carried out for the first time to bring back material for plant breeding, and was a conscious use of plants as genetic resources.[12] The movement of PGR between Europe and its colonies supported economic expansion, further colonization and changed the cultures of civilizations.[13]

In this arc of history, one sees the origins of a paradigm shift, a general movement from the public to private sphere and from collective to private interests. With the Egyptian Pharaoh 3,500 years ago and through the Columbian Exchange, interest was in crops—in inter-species diversity—with attempts to enforce ownership, without much lasting success, through removal, isolation and defense of production sites.

The rediscovery of Mendel's principles of heredity catalyzed the modernization and commercialization of agriculture. As agriculture became commercialized, farmers began to produce varieties for a market place and there started to be a distinction between farmers and breeders. These new markets were for crop varieties with particular characteristics causing a shift in the focus of attention from the species to the variety level. New biotechnologies caused a further shift in attention by patents that are increasingly employed to cover development at the genetic level.

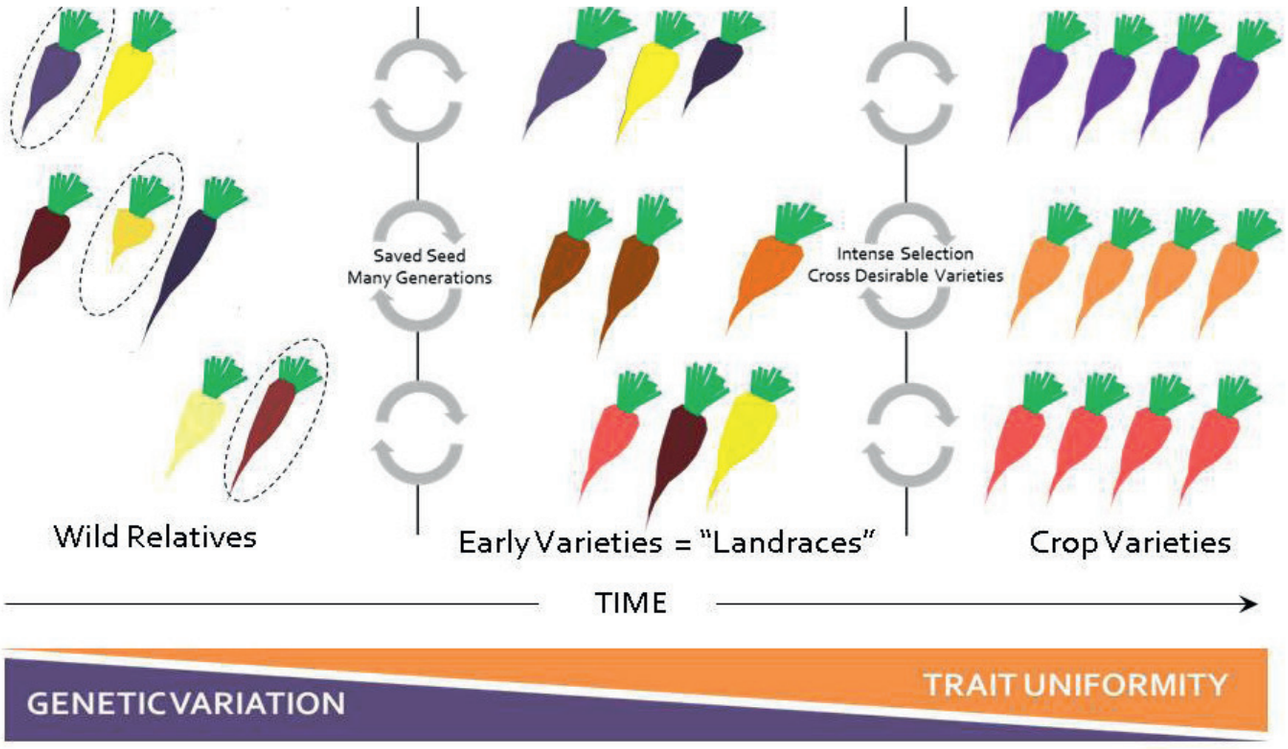
Laws and policies essentially established by physical power a few thousand years ago, gave way to more political and diplomatic forms of confrontation. Disputes remain, it is just where they take place that has changed. It is no longer among ships with cannons, it is in legislatures, courts and in intergovernmental negotiations.

10 It should be noted that there are historical examples of specific governmental rules restricting the export of certain specialized and industrial breeding materials such as pepper from India, oil palm from Malaysia, coffee from Ethiopia and tea from Sri Lanka. *See* Managing global genetic resources. Agricultural crop: issues and policies. National Research Council, Washington, DC (United States). Committee on Managing Global Genetic Resources: Agricultural Imperatives (1993). Chapter on Proprietary rights, p. 289. There was, however, no recourse when PGR was taken. *See* Resor, R. 1977. Rubber in Brazil: Dominance and Collapse, 1876-1945. Business History Review. 51(3), p. 341-366. *See* p. 121 of Bosselmann, K. 1996. Plants and Politics: The International Regime Concerning Biotechnology and Biodiversity. 7 Colo. Journal of International Law and Policy.

11 Kloppenburg, J. R. Jr. (1988). First the Seed: The Political Economy of Plant Biotechnology 1492-2000. 153-155.

12 Odek, J.O. (1999). Bio-piracy: Creating Proprietary Rights in Plant Genetic Resources, 2 Journal of Intellectual Property Law. 141. It was with the advent of the "Seed Wars" in the 1980s and the negotiation of the Convention on Biological Diversity that developing countries made clear that this practice was not acceptable and that legal mechanisms to formally support this position were sought.

13 Kloppenburg, footnote 11, *supra.*




*The origin of crop varieties. (Credit: National Academies of Sciences, Engineering, Medicine)*

## III. Typography of legal instruments of relevance to small-scale farmers and PGRFA

Before turning to the evolution of legal instruments concerned fully or in part with biological diversity, it is useful to consider the orientation of the instruments by putting them into three categories: 1) treaties that establish minimum standards and harmonization for intellectual property over PGR; 2) treaties that, in part, try to establish means for the custodians of biological diversity *in situ* and on-farm to reap benefits from their role in the conservation, use and development of these resources; and 3) human rights instruments that relate in particular to the human rights of people conserving, sustainably using and developing biological diversity *in situ* and on-farm, including, for example, Indigenous and local communities, smallholder farmers and landless agricultural peasants.

The first category of instruments—"PGR as Intellectual Property," discussed further in Section V,—includes UPOV and TRIPS. Both establish minimum standards for intellectual property protection with the aim of providing and promoting an "effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society"[14] and of incentivizing and facilitating the flow of results of innovation (UPOV and TRIPS respectively).[15] Neither UPOV nor TRIPS were created with food security in mind, but their advocates would argue that standardized and strengthened intellectual property rights are good for food security.

UPOV establishes a system that rewards professional breeders but provides no incentives to the kind of innovation and breeding typically undertaken by small-scale farmer-breeders. TRIPS also creates incentives for professional breeders, scientists and biotechnologists who innovate with PGR and does not offer incentives to the type of innovation and development undertaken by small-scale farmers.

14 http://www.upov.int/about/en/mission.html (Last accessed March 16, 2017).

15 WTO TRIPS Agreement available from: https://www.wto.org/english/tratop_e/trips_e/trips_e.htm. (Last accessed March 16, 2017).

Instruments of this category are reaching ever more into national spheres of policy-making. Furthermore, as intellectual property regimes are getting stronger so is the scope they are covering. However, considering the state of world food security and in the context of Agenda 2030 and the globally agreed SDGs, critical questions need to be addressed including:

- Are such rules limiting our ability to provide global food security?
- How do these rules relate to other international instruments directly related to the conservation and use of PGRFA, and benefit-sharing arising from its use?
- Are these instruments impeding the necessary policy measures to promote food security?
- If we look at food and nutrition security worldwide, how are our intellectual property rules working to support food and nutrition security and, in particular, small-scale farmers and the PGRFA they manage *in situ* and on-farm?
- What are the impediments to making the instruments in the three categories complementary and all working towards achieving the SDGs and the goals of Agenda 2030?

The second category of instruments or provisions within instruments are those that establish a means to reap benefits and allow economic and other support for the people and communities conserving and sustainably using genetic resources. Technological advances in the 1970s, particularly involving molecular biology and genetic engineering, led to an expansion of the scope, breadth and international cooperation in the recognition of plant-related intellectual property rights. The desire for equity—for a means to reward the custodians and developers of biological diversity—permeated the negotiations of the CBD. These instruments all establish forms of access and benefit-sharing (ABS) as the mechanism to stimulate a flow of economic and other resources to the custodians and developers of biological diversity.[16] The IGC is unusual in being the first negotiating body to consider how intellectual property can be supportive of ABS systems that have been established by other instruments. Its mandate is to ensure the balanced and effective protection of genetic resources, traditional knowledge (TK) and traditional cultural expressions (TCEs).[17]

This category of instruments—"The Biological Diversity Regimes"—is discussed further in Section VI. All address aspects of biological diversity directly; are, in part, a response to the intellectual property rules that enabled a professional class of "users" to gain economic benefits from genetic resources with no corresponding mechanism for gain for the *in situ* and on-farm custodians of these resources; and finally, are each responding to correct or support the others.

Finally, the third category of instruments and their provisions are the ones that were established to secure human rights, such as the UN Declaration on the Rights of Indigenous Peoples and Article 9 of the IT on Farmers' Rights.[18] However, Article 9 of the IT only relates to PGRFA and does not consider the protection of related rights to secure access to land, water, and seed. Therefore, when implementing Article 9 of the IT, it is important to look at the broader context of human rights rather than just plant genetic resources for food and agriculture. By bringing in the wider human-rights context, questions related to the needs and challenges of supporting small-scale farmers that go beyond genetic

16 *See* Article 15 of the CBD: https://www.cbd.int/convention/articles/default.shtml?a=cbd-15 (Last accessed March 16, 2017); Articles 10—13 of the CBD: http://www.fao.org/3/a-i0510e.pdf (Last accessed March 16, 2017); and the Nagoya Protocol: https://www.cbd.int/abs/ (Last accessed March 16, 2017).

17 Assemblies of member States of WIPO Fifty-Fifth Session October 5 to 14, 2015. Agenda Item 17: *Matters Concerning the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore* http://www.wipo.int/export/sites/www/tk/en/igc/pdf/igc_mandate_1617.pdf (Last accessed March 13, 2017).

18 UN Declaration on the Rights of Indigenous Peoples (DRIPS). Available from: http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf (Last accessed March 16, 2017); IT. Available from: http://www.fao.org/3/a-i0510e.pdf (Last accessed March 16, 2017).

resources can be addressed.[19] This category, "Human rights instruments," is examined in Section VII.

This paper will focus on the first and second categories; and in particular on the intellectual property regimes and the biodiversity-treaty responses to these. We also recognize the importance of a human-rights based approach as a means to create more coherence across instruments, but consider this in less depth.

## IV. Creating coherence and the SDG imperative

There have been repeated attempts to create coherence and support between international regimes set up for very different purposes. In TRIPS, for example, the majority of State Parties support amending the agreement to be in line with and supportive of the CBD, in particular its ABS provisions.

While the purpose and desired outcome of the IGC remain subject to debate (see section VI.E below); the impetus for the IGC was in part to support the ABS provisions of treaties that have the conservation, sustainable use and benefit-sharing as their core objectives. This motivation is similar to that behind the attempts to amend TRIPS.

In the human rights sphere, the Human Rights Council (HRC) has Special Rapporteurs on the Right to Food[20] and on Human Rights and the Environment.[21] The former has issued thematic reports on intellectual property and its relationship to the right to food and

Attempts at creating coherence have been met with limited success and the legal landscape remains disjointed at best and arguably, at times, working at cross purposes

on the importance of diversity;[22] the current Special Rapporteur later has issued a report on biological diversity and the environment which includes a section on agricultural biodiversity and food security.[23]

These attempts at creating coherence have been met with limited success and the legal landscape remains disjointed at best and arguably, at times, working at cross purposes. Those who desire consistent international norms on the conservation and sustainable use of biological diversity and benefit-sharing are in a delicate position. With parallel negotiations, there is not only the challenge of trying to achieve consistency but also simply ensuring that discussions within one body do not interfere with progress in others.

Another difficulty is that calls for coherence are often met with arguments that what is addressed in one forum should not be addressed in another. So, for example, during NP negotiations, some developed countries interpreted the mandate at WIPO as reason to prevent further discussions of intellectual property and related issues within the context of the CBD protocol, despite the CBD having a mandate to discuss intellectual property and biological diversity.

19 *See* summary report of the stakeholder consultation on implementation of Farmers' Rights. QUNO and IT. Available from: http://www.quno.org/sites/default/files/resources/Farmers'%20Rights%20Consultation%20-%20Summary%20Report%20submitted.pdf. (Last accessed March 16, 2017).

20 *See*: http://www.ohchr.org/EN/Issues/Food/Pages/FoodIndex.aspx (Last accessed March 13, 2017).

21 *See*: http://www.ohchr.org/EN/Issues/Environment/SREnvironment/Pages/SRenvironmentIndex.aspx (Last accessed March 13, 2017).

22 Seed policies and the right to food: Enhancing agrobiodiversity, encouraging innovation Background document to the report (A/64/170) presented by prof. Olivier De Schutter, Special Rapporteur on the right to food, at the 64th session of the UN General Assembly (October 2009). *See* also: http://www.srfood.org/en/current-intellectual-property-rights-regime-suboptimal-for-global-food-security (Last accessed March 13, 2017).

23 Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment presented to the 34th Session of the Human Rights Council, 27 February-24 March 2017. A/HRC/34/49 (19 January, 2017). Available from: http://ap.ohchr.org/documents/dpage_e.aspx?si=A/HRC/34/49 (Last accessed March 13, 2017).

Coherence and mutual support amongst instruments or provisions within instruments that relate to biodiversity and genetic resources that address biodiversity is not sufficient to achieve the vision of Agenda 2030 and the SDGs. It is necessary to also build coherence with economic instruments, such as the WTO Agreement on Agriculture and other trade agreements, which while not addressing PGRFA directly, can have a powerful impact on its conservation, sustainable use and on the custodians who have been conserving and developing it for thousands of years.

In the IGC, some developed countries have argued that the IGC should not duplicate work already carried out in other organizations, noting that the NP is already addressing many concerns on ABS.[24]

As discussed in Section VI. C below, the proposal to add a disclosure of origin of genetic resources to the Patent Law Treaty (PLT) negotiated by the WIPO Standing Committee on Patents (SCP) was rejected because it was not "the right forum for such discussions" and some members stated they did not fully understand the intent and purpose of the proposal.[25]

Another issue is that countries' stated positions on the need for international standards for intellectual property change depending on the subject matter. Traditionally, developed countries have argued in international forums for strong, harmonized intellectual property standards as a key way to preserve innovation. This was the driving force behind the TRIPS Agreement. But on the issue of intellectual property provisions over genetic resources and TK, some developed countries have reversed this position out of a preference to leave decisions to the national level. For example, at the WTO and WIPO, one developed country has argued that the CBD's objectives on ABS are best achieved through national legislation and contractual arrangements based on the legislation, which could include commitments on disclosing any commercial application of genetic resources or TK.

With the global commitment to Agenda 2030 and the SDG's vision of ending poverty, protecting the planet, and ensuring prosperity for all[26] the challenge of mandates—"we cannot talk about this here, it is being talked about over there"—is no longer tenable. Target 17.14 of the SDGs commits all UN Member States to "pursue policy coherence and an enabling environment for sustainable development at all levels and by all actors."[27] All treaty bodies, negotiating bodies and multilateral institutions will therefore need to assess not only how well they are achieving their own stated goals, but what impact they may have on the goals of the other treaties and regimes.

Finally, coherence and mutual support amongst instruments or provisions within instruments that relate to biodiversity and genetic resources that address biodiversity is not sufficient to achieve the vision of Agenda 2030 and the SDGs. It is necessary to also build coherence with economic instruments, such as the WTO Agreement on Agriculture[28] and other

24 WIPO Delegates Seek Convergence on Protection of Genetic Resources This Week. By Catherin Saez, Intellectual Property Rights Watch 30/05/2016. Available from: https://www.ip-watch.org/2016/05/30/wipo-delegates-seek-convergence-on-protection-of-genetic-resources-this-week/ (Last accessed March 13, 2017).

25 Vivas-Eugui, D. (2012). Bridging the gap on intellectual property and genetic resources in WIPO's Intergovernmental Committee (IGC). ICTSD Programme on Innovation, Technology, and Intellectual Property Issue Paper No. 34. Geneva: International Centre for Trade and Sustainable Development. Available from: http://www.ictsd.org/down- loads/2012/02/bridging-the-gap-on-intellectual-property-and-genetic-resources-in- wipos-intergovernmental-committee-igc.pdf (Last accessed February 23, 2017).

26 *See* http://www.un.org/sustainabledevelopment/sustainable-development-goals/ (Last accessed March 13, 2017).

27 http://indicators.report/targets/17-14/ (Last accessed March 17,2017).

28 The Agreement on Agriculture came into force in 1995

trade agreements, which while not addressing PGRFA directly, can have a powerful impact on its conservation, sustainable use and on the custodians who have been conserving and developing it for thousands of years.[29] The Agreement on Agriculture, like TRIPS, has a legally, binding dispute resolution mechanism with the possibility of trade sanctions making it, in practice, stronger than treaties without such a mechanism.

By examining the history, motivation and constituencies of the treaties directly or indirectly affecting biodiversity and the management, control, and use of genetic resources, this paper wishes to contribute to increased understanding, hopefully leading to bridge building, and ultimately increased coherence.

# V. PGR as Intellectual Property

## A. UPOV

In the 19th century, plant varieties were not considered suitable for patent protection.[30] With the rediscovery of Mendel's principles of heredity at the turn of the 20th century a professional class of plant breeders emerged who sold varieties to farmers.[31] For the first time, there was a distinction between breeders and farmer-breeders and with that distinction came a desire to incentivize research and the creation of new varieties. Throughout Europe in the early 20th century, there was much debate about the appropriateness of plant variety protection (PVP).[32] The growth of commercial agriculture, including the development of the seed industry, the advent of scientific plant breeding, and the expansion of the market economy, were key factors compelling the development of PVP. By the 1960s and 1970s most industrialized countries had adopted some form of PVP.

The growth of commercial agriculture, including the development of the seed industry, the advent of scientific plant breeding, and the expansion of the market economy, were key factors compelling the development of PVP.

In 1961, representatives of six European nations created UPOV. Not surprisingly, the original impetus for creating UPOV came from three organizations; a commercial plant breeders' trade association formed to promote PVP, an organization with a mandate to promote industrial patents, and the International Chamber of Commerce.[33] UPOV created a new kind of intellectual property protection for new plant varieties called breeders' rights. The protection gave plant

Available from: https://www.wto.org/english/docs_e/legal_e/14-ag_01_e.htm (Last accessed March 16, 2017).

29 Under the WTO Agreement on Agriculture, agriculture in developed countries remains heavily subsidized, which has artificially depressed food prices on global markets. Low prices can benefit the urban poor but disenfranchise producers. *See* Olivier de Schutter, The World Trade Organization and the Post-Global Food Crisis Agenda: Putting Food Security First in the International Trade System (2011). Trade liberalization is also associated with a nutrition transition characterized by dietary simplification with a significant impact on the prevalence of chronic non-communicable diseases such as obesity and diabetes. See, Bishwajit, G. et al. (2014). Trade Liberalization, Urbanization and Nutrition Transition in Asian Countries. Journal of Nutritional Health and Food Science. Trade liberalization can also lead to irreversible changes in modes of agricultural production, in particular the introduction of industrial agriculture. This form of agriculture is a major driver of biodiversity loss, the accelerates climate change, erodes soil, pollutes of water systems and is major driver of biodiversity loss. Industrial agriculture therefore threatens the ability to achieve the SDGs. *See* See Foley et al. (2011). Solutions for a cultivated planet. *Nature* 478, 337-342. Available from: http:// www.nature.com.proxy.lib.pdx.edu/nature/journal/ v478/n7369/pdf/nature10452.pdf (last accessed February 22, 2017).

30 Bosselmann, K. (1996). Plants and Politics: The International Regime Concerning Biotechnology and Biodiversity, 7 Colo. Journal of International Law & Policy, p. 111-122.

31 Gregor Johann Mendel's 1865 work was at first largely ignored or not understood. It was fully rediscovered and its essence understood in 1900, 34 years after it was first published. Smykal, P., K. Varshney, R., K. Singh, V. et al. (2016). Theoretical and Applied Genetics. 29: 2267. Doi:10.1007/s00122-016-2803-2

32 Fowler's chapters on the adoption of the United States Plant Patent Act of 1930 and the Plant Variety Protection Act in Fowler, C. (1994). Unnatural Selection: Technology, Politics and Plant Evolution. Switzerland: Gordon and Breach Science Publishers. Provides insight into the relationships between small and large seed companies, seed companies and farmers, and private and public plant breeders and how these catalyzed and influenced the development of these new property laws concerned with plant genetic resources.

33 Fowler, supra 104.

UPOV has contributed to the creation of a mechanism that rewards plant breeders as opposed to supporting farmer-breeders who are managing these resources.

breeders exclusive rights to sell invented, novel, and distinct, varieties for a specified period of time.[34] This was the first formal recognition that plants had value beyond being physical commodities, and recognized the product of breeders as valuable.[35]

Since then, UPOV has been harmonising standards for PVP among its member states which increasingly include developing countries.[36] In fact, joining UPOV is a condition of getting funding from the G8 Alliance on Food Security and Nutrition and is often a requirement of bilateral and regional trade agreements.[37] Two substantive revisions of the UPOV Convention 1961, in 1978 and 1991,[38] have strengthened the rights of breeders and have led to a decrease in recognition of farmers' privilege, which is one of the exceptions to plant breeders' rights. Farmers' privilege allows farmers to save seed of protected varieties for their own use.[39]

In the 1978 UPOV Convention, there is no reference to farmers' privilege. In the UPOV Convention of 1991, the provision on farmers' privilege is an optional benefit-sharing mechanism, under which UPOV 1991 members may permit farmers, on their own farms, to use part of their harvest of a protected variety for the planting of a further crop.[40] The 1991 revision of the Convention is characterised by a widening of the scope of rights granted to breeders, a narrowing of the breeders' exemption and a lengthening of the duration of plant variety protection. Article 14.1 expands the scope of the breeders' right to cover any form of "production or reproduction (multiplication), conditioning for the purpose of propagation, offering for sale, selling or marketing, exporting, importing, or stocking for any of the above purposes."[41] In other words, the scope of the right under UPOV 1991 extends to include any use of the protected variety for propagation purposes. With regard to duration of plant variety protection, the right conferred was lengthened from a period of 15 years under Article 8 of UPOV to a minimum period of 20 years.[42]

Hence, while the original idea of allowing farmers to continue using, saving, and exchanging their own seeds has persisted, that intention has changed greatly over time.[43] In fact, the PVP system under UPOV

34 *See also* UPOV 1961: http://www.upov.int/upovlex/en/conventions/1961/content.html (Last accessed March 16, 2017).

35 Kerry, T.K. and Laird, S. (1991). The Commercial Use of Biodiversity. London: Earthscan Publications, 131.

36 *See* UPOV Publication No. 437(EN) (October 31, 2016). Available from: http://www.upov.int/export/sites/upov/about/en/pdf/pub437.pdf (Last accessed March 16, 2017). See also The Relationship between Regional Trade Agreements and the Multilateral Trading System: Intellectual Property Rights. (2002). Working Party of the Trade Committee. Organisation for Economic Cooperation and Development. TD/TC/WP(2002)28/FINAL. Available from: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=td/tc/wp(2002)28/final (Last accessed March 16, 2017).

37 *See* Owning Seeds, Accessing Foods—A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru, and the Philippines. (2014). The Berne Declaration. Available from: https://www.publiceye.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf (Last accessed March 16, 2017).

38 *See* UPOV LEX http://www.upov.int/upovlex/en/upov_convention.html (Last accessed March 16, 2017).

39 The UPOV Convention came into force in 1968 and has been revised in 1972, 1978, and 1991 in order to reflect technological developments in plant breeding and experience acquired with the application of the UPOV Convention. *See also* UPOV Lex: http://www.upov.int/upovlex/en/upov_convention.html (Last accessed March 16, 2017). As of April 15, 2016, UPOV counts 74 member states. While the UPOV Convention conferred a plant breeder's rights, it also allowed the protected product of the plant breeder to be available for more research and use. *See also* https://www.wto.org/english/tratop_e/trips_e/trips_e.htm (Last accessed March 16, 2017).

40 Netnou-Nkoana, N.C., Jaftha, J. B., Dibiloane, M. A., Eloff, J. (2015). Understanding of the farmers' privilege concept by smallholder farmers in South Africa. South African Journal of Science. 111(1/2): 1-5.

41 *See* http://www.upov.int/upovlex/en conventions/1991/w_up911_.html#_14 (Last accessed March 16, 2017).

42 https://ipkenya.wordpress.com/2016/05/16/upov-1991-enters-into-force-in-kenya-farmers-vs-plant-breeders-rights/ (Last accessed March 16, 2017).

43 Some have coined this trend in intellectual property as a 'second enclosure' of the public domain, which in turn refers to the 'first enclosure' of the 18th and 19th Century in England and the privatization of public lands. Boyle, J. (2003). The second enclosure movement and the construction of the public domain.

*Breeding soy beans. (Credit: SEVITA International)*

has contributed to the creation of a mechanism that rewards plant breeders as opposed to supporting farmer-breeders who are managing these resources.

## B. TRIPS

In 1973, Stanley Cohen and Herbert Boyer were able to transfer the genes from fruit flies and frogs to *E. Coli*. The process of gene transfer was granted a patent in 1980 and demonstrated that intellectual processes were eligible for patenting and hence of value.[44] Once rights were established over bundles of genes and over a process to create new bundles of genes, it was only a short step to privatize the starting raw materials, the genes.

The high risk and investment involved in research and development in biotechnology, combined with the ease with which a product could potentially be copied, led industry to seek stronger protection for innovations in the development of PGR than was available under plant variety legislation.[45] The original objective of the patent system was to balance providing incentives to innovators with making useful products available to society. Hence, largely as a result of the initiative of the private sector, patent protection in industrialized countries has been steadily extended over biomaterials both in what can be protected and how broadly.[46] Nonetheless, the limits and application of intellectual property law at the national level are unclear in most developed countries.[47] In the United States it is possible to obtain a patent on a gene; its application;

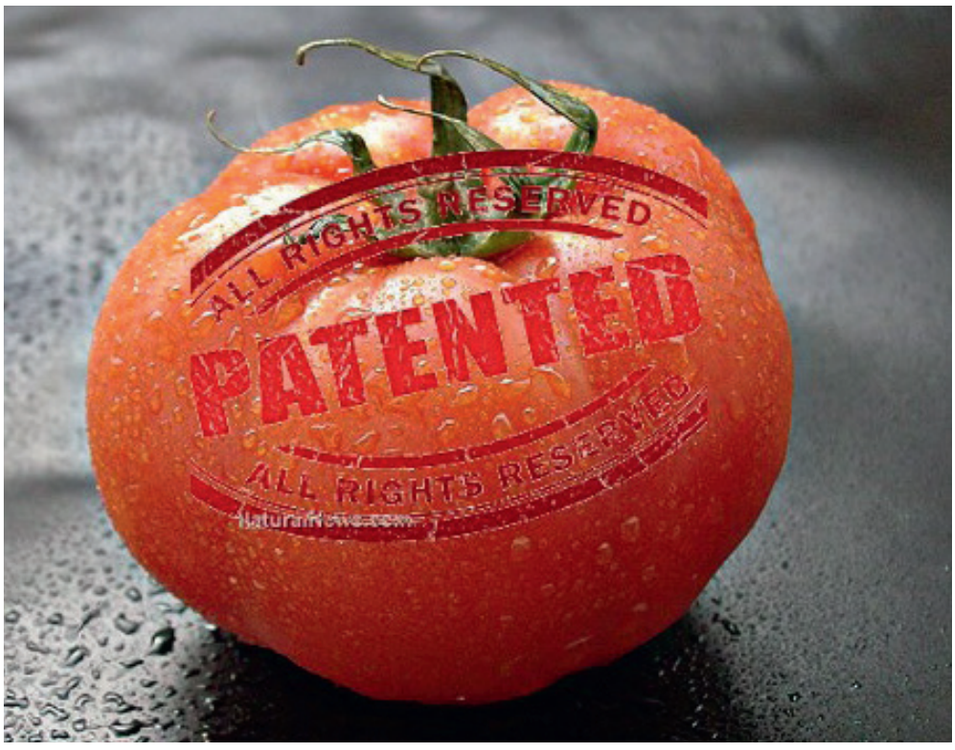
Law and Contemporary Problems. 66:33, p.33-74.

44 United States Patent Office, "Patent 4,237,224: Process of Producing Biologically Functional Molecular Chimeras." Washington: U.S. Patent Office, 1980.

45 Two of the most common theories put forward to justify intellectual property rights are the incentive to invent theory and the incentive to invest theory (which includes the idea of providing incentive to put the invention to practical use). *See* Machlup. F. An Economic Review of the Patent System. Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, Study No 15, 85th Congress 2d. Sess., 36-38, 56, 58-59 (GPO, 1958). *See* also Eisenberg (1989) for an excellent discussion of relationship of the theoretical justifications for patent law and scientific developments.

46 In developing countries, laws are emerging governing ownership, access and benefit-sharing. These may be seen as efforts to right the imbalance between the growing assertion of proprietary rights in "improved" genetic resources in industrialized countries with the lack of mechanisms to recognize the stewardship, development and conservations of PGR in developing countries.

47 *See* for example, Heller, M.A & Eisenberg, R.S. (1998). Upstream Patents and Downstream Products: A Tragedy of the Anticommons? Barton, J.H. (1997). Patents and Antitrust: A Rethinking in Light of Patent Breadth and Sequential Innovation. Antitrust Law Journal. 65, 449; Sturges, M. (1997). Who Should Own Property Rights to the Human Genome? An Application of the Common Heritage of Mankind, International Law Review. 13, 219; Scalise, D.G. and Nugent, D. (1992/1993). Patenting Living Matter in the European Community, Fordham International Law Journal. 16, 990; Eisenberg, R.S. (1989). Patents and the Progress of Science: Exclusive Rights and Experimental Use, The University of Chicago Law Review. 56, 1017; Sease, E.J. (1988/1989). From Microbes, to Corn Seeds, to Oysters, to Mice: Patentability of New Life Forms, Drake Law Review. 38, 551.




*All rights reserved. (Credit: Nauzero.com)*

in a plant; on a plant itself; and on basic processes and inventions, each of which has different implications.[48]

TRIPS[49] was one of the agreements of the WTO adopted in 1994 at the close of the Uruguay Round of negotiations under the General Agreement on Tariffs and Trade (GATT) and was catalyzed particularly by one developed country wanting to impose minimum standards of intellectual property on all members of the WTO. TRIPS and other WTO agreements are binding on the 164 countries that are members of the WTO.[50] It is important to note that this agreement is an intellectual property agreement in a trade agreement, which was novel in 1994. The adoption of the TRIPS meant that if a state wanted to be a part of the trade regime, it also had to be part of the intellectual property regime. In short, anybody who wanted to join the WTO also had to become part of TRIPS. TRIPS was also innovative from both trade and intellectual property rights' perspectives and embodied the notion that trade restrictions, such as embargoes on "counterfeit" goods, are necessary to promote trade liberalization.[51] As desired by its promoters, it requires all parties meet certain minimum standards for protecting intellectual property rights.

TRIPS states that "patents shall be available for any inventions, whether products or processes, in all fields of technology.[52] Under Article 27.3(b), the agreement exempts PGR from patent requirements: "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

48 Barton, J. (1998). The Impact of Contemporary Patent Law on Plant Biotechnology Research. Intellectual Property Rights III Global Genetic Resources: Access and Property Rights.

49 *Ibid supra.*

50 Cooper, D. (1993). The international Undertaking on Plant Genetic Resources. RECIEL 2:2, 158-166; Bordwin, H.J. (1985).The Legal and Political Implications of the International Undertaking on Plant Genetic Resources. Ecology Law Quarterly. 12, 1053. *See* also Members and Observers of the WTO as of July 29, 2016. Available from: https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm. (Last accessed March 16, 2017).

51 Downes, D. (1997). Using Intellectual Property as a Tool to Protect Traditional Knowledge: Recommendations for Next Steps. CIEL Discussion Paper prepared for the Convention on Biological Diversity Workshop on Traditional Knowledge, Madrid, November 1997. Center for International Environmental Law, Washington. Discussion Draft. p. 6.

52 Members do, however, retain the power to "exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect the *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law." Article 27, paragraph 2 of the TRIPS agreement. The scope of this power, and the meaning of the terms such as "morality," have not yet been defined. *See* Sterckx, S. (ed.). (1997). Biotechnology, Patents and Morality. Ashgate Publishing.

patents or by an effective *sui generis* system or by any combination thereof."[53]

The Latin term *sui generis* means 'of its own kind'. However, as TRIPS does not define what an effective *sui generis* system is, nor does it refer to any specific existing rights regime or treaty, providing the minimum requirements established by TRIPS are met, a State member will be in compliance.[54] There is nothing to stop members from going beyond the narrow confines of *sui generis* required.[55] Under TRIPS, a country could include Indigenous knowledge as a subject matter to be covered by the *sui generis* system. Significantly from the perspective of implementation flexibility, the TRIPS does not define what a plant variety is, nor the requirements for protection such as novelty, distinctness, uniformity and stability, nor the scope of protection (i.e. whether a right should extend to vegetative, reproductive, harvested material, or to the export of the protected material), nor the duration of the right, nor the relationship between a *sui generis* right and other intellectual property rights, such as patents. It is therefore not surprising that TRIPS initially generated more controversy than UPOV. The controversy has kept the TRIPS Council relatively stagnant and critical attention has increasingly turned to UPOV.[56]

53 https://www.wto.org/english/docs_e/legal_e/27-trips_04c_e.htm (Last accessed March 16, 2017).

54 Two of the most notable of these are the national treatment (Article 3) and most favoured national requirements (Article 4). For compliance with Article 27.3(b) of the TRIPS Agreement, this means Members have to ensure that: 1) nationals of other member States have the same rights as those granted to nationals of the country concerned; and 2) any advantage, favour, privilege or immunity granted to nationals of any other country has to be granted immediately and unconditionally to nationals of all other member States i.e. most-favoured-nation treatment.

55 QUNO Briefing Papers No. 3 & 4. (2014). Food, biological diversity and intellectual property. Thailand's *sui generis* system of plant variety protection. India's *sui generis* system of plant variety protection. Available from: http://www.quno.org/sites/default/files/resources/QUNO%20Thailand%20-%20plant%20variety%20protection%20-%202014%20(1).pdf and http://www.quno.org/sites/default/files/resources/QUNO%20India%20-%20plant%20variety%20protection%20-%202014.pdf. (Last accessed March 16, 2017).

56 See Owning Seeds, Accessing Foods—A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru, and the Philippines. (2014). *Supra*. See also, Plant Variety Protection in Developing Countries: A Tool for Designing a Sui Generis Plant Variety Protection System: An Alternative to UPOV 1991. (2015). APBREBES. Available from http://www.apbrebes.org/files/seeds/ToolEnglishcompleteDez15.pdf. (Last accessed March 16, 2017).

The high risk and investment involved in research and development in biotechnology, combined with the ease with which a product could potentially be copied, led industry to seek stronger protection for innovations in the development of PGR than was available under plant variety legislation.

TRIPS requires a review of Article 27.3(b).[57] Paragraph 19 of the 2001 Doha Declaration broadened the discussion.[58] It says the TRIPS Council should also look at the relationship between TRIPS, the CBD, and the protection of TK and folklore.

It adds that the TRIPS Council's work on these topics is to be guided by TRIPS' objectives (Article 7) and principles (Article 8), and must take development issues fully into account. Article 7 requires that intellectual property protection and enforcement promote social and economic welfare, achieve a balance of rights and obligations and be advantageous to both producers and users of technological knowledge. Article 8.1 acknowledges that member States may need to 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."[59] Slade (2011) observes "by transcending treaty and forum boundaries, these provisions not only influence interpretative practice, they also encourage a convergence of policy objectives that facilitates greater coherency within the international system, and

57 *See* https://www.wto.org/english/tratop_e/trips_e/art27_3b_e.htm. (Last accessed March 16, 2017).

58 *See* https://www.wto.org/english/res_e/booksp_e/ddec_e.pdf. (Last accessed March 16, 2017).

59 *See* https://www.wto.org/english/docs_e/legal_e/27-trips_03_e.htm (Last accessed March 17. 2017).

Despite the regular examination of the relationship between the TRIPS and the CBD, no clear consensus has yet emerged. Indeed, a majority of WTO members support the move to negotiate on proposed changes to TRIPS to bring it into line with, and be supportive of, the CBD.

links intellectual property with other areas of socio-economic importance."[60]

Since 2001, there has been ongoing discussion at the TRIPS Council of codifying some CBD-related language into the TRIPS agreement, such as by amending TRIPS with a requirement to disclose the origin of any genetic resources used in patent applications. Some 70 countries supported the initiative independently, plus an additional several dozen in a strategic alliance uniting the drive to discuss other TRIPS-related issues. [61] [62]

Despite the regular examination of the relationship between the TRIPS and the CBD, no clear consensus has yet emerged. Indeed, a majority of WTO members support the move to negotiate on proposed changes to TRIPS to bring it into line with, and be supportive of, the CBD. Yet getting a mandate to for such negotiations is unlikely, with no resolution on the horizon after the Nairobi Ministerial in 2016 and uncertainty about the status of the development issues contained in the Doha Round of trade liberalization talks.

## VI. The Biological Diversity Regimes

### A. The International Undertaking (1983)

In the late 1970s and early 1980s developing countries became concerned over the actions by the plant breeding, and later the biotechnology, industries in industrialized countries, and in particular about the free flow of germplasm from developing to industrialized countries. At the same time, efforts to collect and conserve PGRFA in gene banks heightened[63] resulting in even greater attention being paid to questions of PGR ownership.[64]

In 1979 the book "Seeds of the Earth" was released and provoked bitter debate with its accusation that the North was robbing the South of its genetic resources and making huge profits from the theft of this property.[65] As a result of this and other developments noted above,

60 Slade, A. (2011). Articles 7 and 8 of the TRIPS Agreement: A Force for Convergence within the International intellectual property System. The Journal of World Intellectual Property. 14(6), pp. 413–440 doi: 10.1111/j.1747-1796.2011.00429.x Available from: http://onlinelibrary.wiley.com/store/10.1111/j.1747-1796.2011.00429.x/asset/jwip429.pdf;jsessionid=D5DECBF3C79F83E83C9C6B9AF4A0DC3C.f01t01?v=1&t=j0dp4xfi&s=60c7015eeec37eaa88819a61b1eca9f25188af29 (Last accessed March 17, 2017).

61 Available from https://www.wto.org/english/tratop_e/trips_e/art27_3b_background_e.htm (Last accessed March 12, 2017).

62 On April 19, 2011 Draft Decision was submitted to the TRIPS Council by Brazil, China, Colombia, Ecuador, India, Indonesia, Kenya (on behalf of the African Group), Mauritius (on behalf of the ACP Group), Peru, and Thailand. Noting that CBD Article 16.5 requires that intellectual property be implemented in a manner which is mutually supportive and does not run counter to its objectives and Article 4 and 17 of the NP, the draft decision proposes a new Article 29bis entitled *Disclosure of Origin of Genetic Resources and/or Associated Traditional Knowledge.* Available from: https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=100386&CurrentCatalogueIdIndex=0&FullTextHash=371857150&HasEnglishRecord=True&HasFrenchRecord=True&HasSpanishRecord=True (Last accessed March 13, 2017).

63 In 1967, an FAO technical conference proposed the creation of a global network of gene banks, to store representative collections of the main varieties of food. The FAO, the World Bank and the United Nations Development Programme founded the Consultative Group on International Agricultural Research (CGIAR) in 1971 to assist in the coordination of PGR. Frankel, O.H. (1986). Genetic Resources: The founding years. II. The movement's constituent assembly. Diversity, 9: 30-32. Wilkes, H.G. (1988). Plant Genetic Resources Over Ten Thousand Years: From a Handful of Seed to the Crop-Specific Mega-Genebanks, Seeds and Sovereignty: The Use and Control of Plant Genetic Resources. 67, 79 (Jack R. Kloppenburg ed.).

64 Tilford, D.S. (1998). Saving the Blueprints: The International Legal Regime for Plant Resources. Case Western Reserve Journal of International Law. 30, 373-409.

65 Mooney, P. (1979). Seeds of the Earth – A Private or Public Resource? Ottawa: Inter Pares. Frankel, O. (1988). "Genetic Resources: Evolutionary and Social Responsibility" in Seeds and Sovereignty: the use and control of plant genetic resources. 19, 40-4.

developing countries forced the issue of ownership and use of PGR onto the international agenda. The Food and Agriculture Organization of the United Nations (FAO) responded in 1983 by establishing the Global System for the Conservation and Utilization of Plant Genetic Resources. A Commission on Plant Genetic Resources was created to oversee the Global System. The Commission's first major action was the negotiation of an IU, where non-binding resolutions were drawn up. Governments debated the ownership and control of PGR in a highly-politicized environment concerned with intellectual property rights being granted for plant breeders and national germplasm embargoes.[66] The acrimonious debate on the access, ownership and control of PGR that ensued during the adoption of the IU and its further refinement was dubbed the "seed wars" by the Wall Street Journal.[67]

During these negotiations, developing countries succeeded in reflecting in the IU a broader view of the common heritage concept. This would apply not just to the PGR situated in developing countries but to the PGR subject to plant breeders' rights owned primarily by industry in developed countries. In the resolution by which the IU was adopted, Member States recognized that "plant genetic resources are a heritage of mankind to be preserved, and to be freely available for use, for the benefit of present and future generations" and was intended to facilitate the conservation and sustainable use of PGR. The IU made clear that this open availability was to apply to all PGR, including "special genetic stocks" which were interpreted broadly to include the specially bred proprietary lines of seed breeders. Developing countries perceived that they could accumulate maximum benefits through sharing PGR in an open network.[68]

The rejection of plant-related intellectual property rights regimes made the IU controversial to seed industry and hence to governments of the industrialized world. The American Seed Trade Association declared that the IU "strikes at the very heart of free enterprise and intellectual property rights."[69] Nevertheless, Denmark, Finland, France, New Zealand, Norway, Sweden, the United Kingdom and the United States officially indicated their willingness to support the IU.[70]

The IU continued to evolve after its adoption through interpretive resolutions to reflect the growing acceptance of the need to accommodate plant breeders' rights so as to attract developed country interest. It also took into account a shift on in the context of the CBD (see IV. B) concerning national sovereignty over PGR as a preferable mechanism through which developing countries could correct the asymmetry of benefits accruing from biological diversity. Interpretive resolutions to the IU were adopted in 1989, one of which recognized that plant breeders' rights were not necessarily inconsistent with the IU.[71] Another resolution defined and recognized Farmers' Rights as "rights arising from past, present and future contributions of farmers in conserving, improving and making available plant genetic resources, particularly those in the centres of origin/diversity."[72] In total, 160 countries agreed to the new interpretations and they were adopted in 1989 and 1991.[73] Although the IU is non-binding, negotiations continued to bring together stakeholders over the issue of patenting novel PGR.

66 Mooney, P.R. (1983). The law of the seed: another development and plant genetic resources. Development Dialogue 1-2: 7-172.

67 Kloppenburg, J.R. Jr. and Kleinman, D.L. (1988). Plant Genetic Resources: The Common Bowl, 1-2. In Kloppenburg, J.R. Jr. (ed.). Seeds and sovereignty: the use and control of plant genetic resources. London (UK), Duke Univ. Press.

68 Cooper, D.H. (2002). The International Treaty on Plant Genetic Resources for Food and Agriculture. Review of European Community and International Environmental Law (RECIEL). 11(1), iii-iv, 1-114.

69 Tilford, D.S. (1998). Saving the Blueprints: The International Legal Regime for Plant Resources, Case Western Reserve Journal of International Law. 30, 373, 379, 412 (citing John Willoughby, Seed Wars, San Fran. Chronical, June 2, 1991, 14).

70 Tilford, D.S. (1998). Saving the Blueprints: The International Legal Regime for Plant Resources, Case Western Reserve Journal of International Law. 30, 373, 379, 251.

71 FAO Conference Resolution C4/89, 1989.

72 FAO Conference Resolution C5/89, 1989.

73 FAO. Negotiations on the revised international undertaking on plant genetic resources, in harmony with the convention on biological diversity. Report by the chairman for the commission on genetic resources for food and agriculture. Hundred and Twentieth Session, Rome 18-23, June 2001.

*Biological diversity in the jungle. (Credit: pixabay)*

## B. The Convention on Biological Diversity (1993)

The negotiations for the CBD were convened by the United Nations Environment Programme and the treaty entered into force in 1993.The impetus for the CBD first came from the United States. They were concerned about the number of existing instruments dealing with biological diversity[74] and wanted some coherence around these conservation-oriented treaties. However, it quickly became apparent, even before negotiations started, that the CBD was not going to be solely about conservation. Developing countries made it clear that they were unwilling to consider the conservation aspects of biodiversity in isolation. With the development of PVP and the application of patent protection to living materials in the developed world, the world had experienced a one-sided contraction of the common heritage principle set forth by the IU. In this context, developing countries argued that they could exert sovereignty over their biological resources under the same "product principle" that the companies in the United States could patent living organisms and they demanded mechanisms to correct the imbalance and thereby establish greater economic equity.[75] The CBD response was the creation of a new corresponding tool: ABS contracts. This tool was designed to allow "provider" countries—in particular, the custodians and developers of those resources—to capture the economic value of their diversity. Article 15, the ABS provision of the CBD, asserts a country's national sovereignty over its natural resources and hence its ability to regulate access to genetic resources under its jurisdiction. The treaty article uses terms such as "prior informed consent" and "mutually agreed terms" that imply a bilateral negotiation between a user and a provider, whereby contractual arrangements are made for access and benefit-sharing.[76]

In practical effect, the CBD approved the creation of a market in genetic resources. Source countries essentially had a limited[77] property right to accept or reject requests for access depending upon whether mutually agreed terms for access could be found.[78]

74 E.g. the Ramsar Convention 1971 available from: https://treaties.un.org/doc/Publication/UNTS/Volume%20996/volume-996-I-14583-English.pdf (Last accessed March 16, 2017); the Convention on Migratory Species available from: http://www.cms.int/en/convention-text (Last accessed March 16, 2017); and the CITES Convention available from: https://cites.org/sites/default/files/eng/disc/CITES-Convention-EN.pdf (Last accessed March 16, 2017).

75 The observations and analysis on the CBD provisions are based on the notes taken by Susan Bragdon during the negotiating process and from memos sent from her to the Executive Director of the United Nations Environment Programme at the end of each day of the negotiating sessions summarizing key positions and bottlenecks.

76 *See* www.cbd.int/convention/text/. (Last accessed February 22, 2017).

77 Article 15.2 of the CBD restricts a Parties ability to limit access.

78 Carlson, J. C. (1996). Strengthening the Property Rights Regime for Plant Genetic Resources: The Role of the World Bank, Transnational Law & Contemporary Problems. 6:91. Article 15 maintains the overall focus of the Convention on national action and through reference to "mutually agreed terms" and "prior informed consent" in the exchange of genetic resources. It implies a negotiation between source countries and recipients for access to genetic resources, hence emphasizing a bilateral approach in this exchange.

Article 16 in the CBD, Access to and Transfer of Technology, has the only explicit reference to intellectual property rights. The final paragraph of the Article makes clear that the negotiators of the treaty were unable to reach consensus on the role of intellectual property rights in the conservation and use of biodiversity. The gist of the provision is that Parties are to make sure that intellectual property rights are supportive of the treaty's objectives.[79]

As opposed to the IU, convened by FAO, the environmental ministries, not the agricultural ministries, were the constituents of the CBD. The CBD covered all genetic resources (except human) including PGRFA, yet the negotiators had very limited knowledge of what made PGRFA unique and different from other genetic resources. This lack of understanding was noted in a resolution (when the CBD was adopted) asking FAO to consider outstanding issues like the status of *ex situ* collections of PGRFA and Farmers' Rights.[80]

## C. The International Treaty on Plant Genetic Resources for Food and Agriculture (2004)

A major concern presented by the CBD, in particular for FAO, was the impact that ABS regimes potentially had on the exchange and use of PGRFA that underpins food security for all countries.[81] As noted above, based on this concern, the IU of 1983 was renegotiated to be aligned with the CBD, to consider PGRFA, and to discuss the need for facilitating rather than stymieing exchange through over-regulation. But the IU was not a legally binding instrument and the multiple interpretations had made it difficult to understand.

> With the development of PVP and the application of patent protection to living materials in the developed world, the world had experienced a one-sided contraction of the common heritage principle set forth by the IU.

The IT establishes a Multilateral System (MLS) for ABS for 64 forage and food crops contained in its Annex I. The goal of the MLS is to facilitate access to these crops through Standard Material Transfer Agreement (SMTA) which would prevent the recipient from taking out intellectual property rights on the PGRFA "in the form received."[82] However, most importantly, the MLS tried to get back the balance in the international system through a benefit-sharing fund.[83] According to the principles of this fund, if a

79 Article 16.5 of the Convention of Biological Diversity states "The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives." *See* https://www.cbd.int/convention/articles/default.shtml?a=cbd-16 (Last accessed March 16, 2017).

80 *See* https://www.cbd.int/doc/handbook/cbd-hb-09-en.pdf (Last accessed February 22, 2017).

81 *See* Susan H. Bragdon (2017), *Foundations of Food Security: Ensuring support to small-scale farmers managing agricultural biodiversity* Geneva. Quaker United Nations Office.

82 Article 12.3 d) of the IT states: "Recipients shall not claim any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts or components, in the form received from the Multilateral System." Available from: http://www.fao.org/3/a-i0510e.pdf (page 18). (Last accessed March 15, 2017).

83 Organizations eligible to apply for project funds include governmental, non-governmental, regional and international organizations; farmers and farmer organizations; gene banks; and research institutions. Pre-proposals are submitted through national authorities of a country that is a Contracting Party to the IT, and selected organizations are subsequently invited to submit full proposals by an Independent Panel of Experts. Selection criteria include geographical representation, relevance to the IT's objectives and technical merit. The list of projects invited to submit full proposals for the 2014 third Call for Funding is available at http://www.fao.org/3/a-bb151e.pdf (last accessed February 22, 2017). The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is a supplementary agreement to the CBD. It provides a legal framework for the implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The Nagoya Protocol on ABS was adopted on 29 October 2010 in Nagoya, Japan and entered into force on 12 October 2014. For the full text *see* https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf (Last accessed February 23, 2017).

A major concern presented by the CBD, in particular for FAO, was the impact that ABS regimes potentially had on the exchange and use of PGRFA that underpins food security for all countries.

Party takes out resources as a recipient from the MLS and creates a new PGRFA, but does not hinder the use of that resource in any way for future research and development, the Party is only encouraged but not required to contribute to the benefit sharing fund. However, if a Party takes out a patent on this new PGRFA, then it would have a compulsory obligation to contribute to the fund. The establishment of this fund was an attempt to ameliorate the apparently unintended consequences for food security that arose from the CBD and its access regimes.[84]

The most recent development of the MLS is a review that is taking place in 2017 by an Ad Hoc Open-ended Working Group to Enhance the Functioning of the Multilateral System of Access and Benefit-Sharing. The Working Group is to make recommendations to the 7th meeting of the Governing Body of the IT when it meets in Rwanda in the final quarter of 2017.[85] The MLS has not generated benefits from acts of access to the IT, all funding has come from voluntary contributions of member States. Since its establishment over a decade ago, the IT's Benefit-sharing Fund has accumulated only US$22 million in the form of voluntary contributions from Norway, Australia, Spain, Italy, Switzerland and the United Nations Development

*(Credit: Climate and Agriculture Network for Africa)*

*Tanzanian smallholder farmer.*

Programme.[86] This compares to the annual fund-raising target of US$23 million established by the Governing Body of the Benefit-sharing Fund. Since currently, there is no sharing of the benefits, one of the things this group will be talking about is having a subscription system rather than waiting and having something go into the Benefit-sharing Fund from single acts of access.

## D. Nagoya Protocol (2014)

The NP entered into force in 2014. It is a supplemental agreement to the CBD aimed at providing more clarity on ABS. All PGRFA not listed under Annex 1 of the IT fall under the ABS regimes of the CBD and NP which continue with a bilateral orientation between a user and provider. Article 10 of the NP does call for Parties to consider the need for modalities of a global multilateral benefit-sharing mechanism in transboundary situations where it is not possible to grant or obtain prior informed consent. The benefits generated from access are to be used to support the conservation of biological diversity and the sustainable use of its components globally. It is not clear if or how this article will be used and interpreted. It

84 With both the CBD and the IT, the real struggle appears to be that there is an underlying assumption that genetic resources themselves should pay for their own conservation. There are numerous studies commissioned by the Secretariat to the IT that are very clear that the MLS cannot be the sole source of support and the funding strategy for the treaty needs to account for this. *See* Bragdon, footnote 81, supra.

85 *See* http://www.fao.org/plant-treaty/areas-of-work/the-multilateral-system/policy-guidance/en/. (Last accessed March 16, 2017).

86 *See* the Benefit-sharing Fund of the Funding Strategy at http://www.planttreaty.org/sites/default/files/edm3_l2.pdf (Last accessed February 22, 2017).

addresses issues that could not be resolved during the negotiations and for which further discussion was required. This discussion is happening via online conversations mediated by the Secretariat. Nevertheless, ABS remains the basis for the generation of benefits.

Article 17 of the Nagoya Protocol establishes that Parties shall take measures, as appropriate, to monitor and to enhance transparency about the utilization of genetic resources, including designating effective check-points to collect or receive, as appropriate, relevant information regarding the utilization of genetic resources at, *inter alia*, any stage of research, development, innovation, pre-commercialization or commercialization. One type of measure that could be used to enhance monitoring and transparency is through intellectual property regimes. As noted in Section V.B. above, the majority of member States to the TRIPS Council, and of State negotiators at the IGC, support some form of a requirement to disclose the origin of genetic resources in intellectual property regimes to do this.

## E. The WIPO IGC (2000—onwards)

While the rights protected and the benefits claimed under TRIPS and UPOV can be readily applied by inventors and breeders, there are few intellectual property rights tools that address benefit-sharing with respect to the knowledge and resources maintained and developed by small-scale farmers and local and Indigenous communities.[87] As noted above, efforts to amend TRIPS to bring it explicitly in line with the CBD and to provide support to ABS regimes have not, yet, been successful.

The origin of the IGC was a political trade off that began with the negotiations and diplomatic conference that led to the adoption of the Patent Law Treaty in 2000.[88] Looking to prevent the theft of genetic resources, TK and TCE and to create mutual support and coherence with the CBD and its ABS requirements, Colombia presented a submission,[89] later supported by various members of the Group of Latin American and Caribbean Countries (GRULAC), in WIPO's SCP seeking to ensure that industrial property protection guaranteed the protection of the country's biological and genetic heritage. This was first time the idea that intellectual property regimes could play a role in ensuring the legal acquisition of genetic resources was raised at WIPO; something that has now occupied 16 years of WIPO and IGC attention.[90] Similar to proposals to amend TRIPS noted above, agreement at the IGC remains elusive.

The proposal from Colombia called for patent applications to mention the registration number of the contract allowing access to genetic resources by the country of origin. Several developed country members rejected that proposal in the SCP arguing that it was not the appropriate forum to consider the issue.

A compromise was reached by which Colombia withdrew its proposal in exchange for the creation of an inter-governmental body in WIPO that would broadly address intellectual property issues that arise in the context of access to genetic resources and benefit-sharing. The diplomatic conference that adopted the Patent Law Treaty did not contain any

87 Busch, L. et. al. (1991). Plants, Power and Profit: Social, Economic and Ethical Consequences of the New Biotechnologies. 59, 66.

88 Discussions were initiated at the third session of the Standing Committee on the Law of Patents (SCP) in September 1999. See Genetic Resources: Factual Update of International Developments, document WIPO/GRTKF/IC/11/8 (b). Available from: http://www.wipo.int/meetings/zh/doc_details.jsp?doc_id=79193 (Last accessed March 16, 2017).

89 Submission by Colombia to the SCP, 6-14 September 1999. The text of the proposals indicated the following: "All industrial property protection shall guarantee the protection of the country's biological and genetic heritage. Consequently, the grant of patents or registrations18 that relate to elements of that heritage shall be subject to their having been acquired legally. [...] Every document shall specify the registration number of the contract affording access to genetic resources and a copy thereof where the goods or services 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." Vivas-Eugui, D. (2012). Bridging the gap on intellectual property and genetic resources in WIPO's Intergovernmental Committee (IGC). ICTSD's Programme on Innovation, Technology and Intellectual Property. Issue Paper No. 34. International Centre for Trade and Sustainable Development. Geneva Switzerland.

90 For a comprehensive analysis *see* Vivas-Eugui, D. (2012).

*WIPO IGC Meeting. (Credit: IP Watch)*

language related to genetic resources. At twenty-sixth session of the WIPO General Assembly of 2000, the mandate of a newly created body, the IGC, was adopted covering genetic resources as well as the protection of TK and TCE, formerly folklore.[91] Each of the three categories has a separate draft text and is considered at separate sessions of the IGC.

Unlike a standing committee of WIPO, the IGC must have its mandate reviewed and renewed every two years by the General Assembly (the highest Member state body in WIPO) in order to continue its work. This has been a source of contention in the IGC which reached its high point in 2015 when the General Assembly could not agree on a mandate to renew the IGC, causing a one year hiatus (see below). This will likely be an issue in the fall of 2017 when the IGC's mandate will again be reviewed by the WIPO General Assembly.[92] This is why many developing countries want the IGC to be converted into a WIPO Standing Committee. Since 2000, with the exception of 2015, the IGC has met regularly and its mandate renewed or enhanced every two years. Significant research and analysis has been undertaken by the IGC but it has not yet been successful in international norm setting because significant disagreements persist on fundamental issues among user and provider countries, businesses and Indigenous Peoples.[93]

Generally speaking, positions at the IGC have been clear and consistent over the years.[94] Developing countries in general want an international binding instruments with strict compliance measures, including a mandatory disclosure of the origin of genetic resources in patent applications. Some developed countries are supportive of an international solution to the issue of genetic resources misappropriation; others have been reluctant to agree to an international protection of genetic resources.[95] Those reluctant have made statements reflecting concern that such an international instrument could impede innovation and should not place an additional burden on patent applicants and patent offices that are already overloaded.

Of the three negotiating sections of the IGC; genetic resources is where the gaps in positions remains the widest. Opposing positions on a mandatory disclosure requirement of the origin genetic resources in patent

91 *See* http://www.wipo.int/edocs/mdocs/govbody/en/wo_ga_26/wo_ga_26_6.pdf. (Last accessed March 16, 2017). http://www.wipo.int/meetings/en/details.jsp?meeting_id=4146 (Last accessed March 17, 2017).

92 http://www.wipo.int/meetings/en/details.jsp?meeting_id=4146 (Last accessed March 17, 2017).

93 *See* Muñoz Tellez, V. (2015). The WIPO Negotiations on Intellectual Property, Genetic Resources and Traditional Knowledge: Can It Deliver? South Centre Policy Brief No. 22. Available from: https://www.southcentre.int/wp-content/uploads/2015/10/PB22_The-WIPO-Negotiations-on-IP-Genetic-Resources-and-Traditional-Knowledge-Can-It-Deliver_EN_rev.pdf (Last accessed March 13, 2017).

94 Saez, C. (June 6, 2016). Intellectual Property Rights Watch. WIPO Members Agree New Text on IP And Genetic Resources; Move Talks Forward. Available from: https://www.ip-watch.org/2016/06/06/wipo-members-agree-new-text-on-ip-and-genetic-resources-move-talks-forward/ (Last accessed March 13, 2017).

95 Notably, Switzerland and Norway have legislation requesting disclosure of genetic resources.

This was first time the idea that intellectual property regimes could play a role in ensuring the legal acquisition of genetic resources was raised at WIPO; something that has now occupied 16 years of WIPO and IGC attention. Similar to proposals to amend TRIPS noted above, agreement at the IGC remains elusive.

applications as well as other relevant modalities and mechanisms for protection, such as databases remain unresolved. Another divisive issue is the nature of the international instrument or instruments being developed by the committee and if it should be legally binding or not.

At the 30th Session of the IGC an agreed text[96] was approved to move forward for further discussion. The text is described by Intellectual Property Rights Watch's Catherine Saez as "more representative of *differences* in goals for protecting genetic resources than *consensus*…" [emphasis added.][97]

Interviews of negotiators by Saez also indicated that many felt the draft forwarded to the next session discussing GRs gave clearer options and therefore helped to clarify the differences in positions.[98] Whether or not this helps bring the negotiators together remains to be seen.

## VII. Human Rights Instruments

Human rights are universal legal guarantees protecting individuals and groups against actions and omissions that interfere with fundamental freedoms, entitlements and human dignity.[99] There are two stakeholder groups in rights-based development—the rights holders and the duty bearers (the institutions, mostly governments, obligated to fulfill the holders' rights). Rights-based approaches aim to strengthen the capacity of duty bearers and empower the rights holders.[100]

Their meaning is also elaborated by individuals and expert bodies appointed by the United Nations Human Rights Council (HRC). The HRC is made up of 47 United Nations Member States which are elected by the UN General Assembly. The HRC is responsible for strengthening the promotion and protection of human rights around the globe, for addressing situations of human rights violations and making recommendations on them, and it has the ability to discuss all thematic human rights issues and situations.[101] As noted in Section IV above, two Special Rapporteurs, one on the Right to Food and the other on Human Rights and the Environment have issued thematic reports of direct relevance to the governance of PGRFA.

One focus of a human-rights based approach to the conservation and sustainable use of biological diversity, and benefit-sharing would obviously be the people managing and developing these resources. In the case of PGRFA, these are largely small-scale farmers some of whom are Indigenous and the majority of whom are women.

96 Available from: http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=339836 (Last accessed March 13, 2017).

97 Saez, C. (June 6, 2016). Intellectual Property Rights Watch. WIPO Members Agree New Text on IP And Genetic Resources; Move Talks Forward. Available from: https://www.ip-watch.org/2016/06/06/wipo-members-agree-new-text-on-ip-and-genetic-resources-move-talks-forward/ (Last accessed March 13, 2017).

98 *Ibid.*

99 Frequently Asked Questions about a Human-Rights Based Approach to Development. United Nations, New York and Geneva (2006) HR/PUB/06/8 Available from: http://www.ohchr.org/Documents/Publications/FAQen.pdf (Last accessed March 13, 2017).

100 Gneiting, U., Van Vijfeijken, B.T., Schmitz, H.P. (2009). Setting Higher Goals: Rights and Development. Monday Development. 27 (12): 19–20. (Last accessed March 12, 2017).

101 http://www.ohchr.org/EN/HRBodies/HRC/Pages/AboutCouncil.aspx (Last accessed March 15, 2017).

As noted earlier, the 2030 Agenda for Sustainable Development and the 17 SDGs it covers should serve as a unifying framework when it comes to the conservation and management of biodiversity. Human rights principles and standards are now strongly reflected in both Agenda 2030 and the SDGs. As an agenda for "people, planet, prosperity, peace and partnership", the 2030 Agenda provides a vision for people and planet-centered, human rights-based, and gender-sensitive sustainable development. It promises "more peaceful, just and inclusive societies which are free from fear and violence" with attention to democratic governance, rule of law, access to justice and personal security (in Goal 16), as well as an enabling international environment (in Goal 17 and throughout the framework).

Most importantly, aware that countries have progress to make in the path towards sustainable development, the SDGs are a universal framework and applicable to all countries. Governments must therefore look at all their international legal obligations (as well as national actions) in terms of their impact on the SDGs. International trade and intellectual property regimes must therefore be evaluated in light of real or potential consequences on issues like hunger, poverty, and environment.

*Agricultural biodiversity in a Peruvian market.*

*(Credit: Bioversity International)*

## VIII. Conclusion

The piecemeal and reactive development of the international legal architecture as it relates to biological diversity raises significant questions in terms of ensuring 'coherence' and 'mutual supportiveness' between processes responding to different mandates. Furthermore, with growing global interdependence, the likelihood that decisions taken in one forum will have consequences for others, has increased dramatically. The more complex the system, the greater the need for understanding relationships and effects as well as for coordination and collaboration.

While the treaties discussed in this paper may have different ideas as to how to achieve the SDGs, all would claim they contribute, each in its own way, to the vision of ending poverty, protecting the planet, and ensuring prosperity for all.[102] Hence, the SDGs provide a reference point by which to analyse and judge not only the legal and policy impacts of the instruments but also their interrelationships.

There is a need to build awareness of the inter-relationships both amongst the treaties that in whole or in part address biodiversity, such as the IT, the CBD, the NP, UPOV, TRIPS and the IGC. It is also critical to understand the central role inequity played, and continues to play, both amongst the treaties and instruments discussed in this paper as well as in the broader international legal landscape that includes trade agreements. Inequity breeds mistrust hindering collaboration and coherence across instruments.

While understanding and collaboration has increased between the CBD and IT Secretariats, the

102 For instance, the World Intellectual Property Organization's (WIPO) mandate is to provide for balanced and effective intellectual property systems that enable innovation and creativity for the benefits of others (WIPO http://www.wipo.int/about-wipo/en/) and the mission for the International Union for the Protection of New Varieties of Plants (UPOV) is to "provide and promote and effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society" (UPOV). Available from: http://www.upov.int/about/en/mission.html). (Last accessed March 16, 2017).

understanding of the inter-relationship at the national level and amongst negotiators is often lacking. This gap in knowledge—both at the international and national level—is greater in the case of the biodiversity-focused treaties and TRIPS, UPOV and the IGC. And even more challenging, the SDGs require a broader scope of analysis, including binding and non-binding agreements like the UN Declaration on the Rights of Indigenous Peoples as well as the WTO Agreement on Agriculture. With WTO instruments, such as the Agreement on Agriculture, all of which are part of a binding enforcement mechanism, it will be particularly important to understand the relationship to the SDGs, including unintended consequences on biodiversity and PGRFA in particular.

*Tackling inequality. (Credit: Clinks.org)*

While not without its problems, an example of trying to move away from the current piecemeal approach is the Trilateral Cooperation on Public Health, intellectual property and Trade amongst the WTO, the World Health Organization, and WIPO. These three organizations are working together towards strengthening their cooperation and practical coordination on issues around public health, intellectual property, and trade.[103] A similar forum among UPOV, WIPO, WTO, FAO, the IT, the CBD and relevant Special Rapporteurs of the Human Rights Council to discuss issues around biological diversity and PGRFA in particular as they relate to achieving the SDGs might prove helpful.[104]

The SDGs, because they are applicable to all States, also provide an opportunity to address the issue of power relationships both within and between agreements. Some of these agreements—trade ones in particular—can have far reaching impacts on global issues identified by the SDGs including, for example, poverty eradication, ending hunger and climate resilience. Unlike the IT and the CBD, trade agreements have binding enforceable compliance mechanismss that create an imbalance with the international legal instruments that directly deal with biological diversity. Trade agreements also reach into the domestic sphere and can be interpreted as narrowing flexibility or choice of policy options when it relates to big global problems. Member States should make use of the general exceptions established under the WTO. These include the right to take measures necessary to protect human, animal or plant life or health, which may restrict trade in goods.[105]

Related to power imbalance is the role of agribusinesses in influencing trade and intellectual property regimes. This concern is growing as corporate consolidation increases. In addition, while all the treaties discussed are agreements between States, the ABS systems established by the CBD and the

103 "The three organizations meet regularly, exchange information on their respective work programs and discuss and plan, within the possibilities of their respective mandates and budgets, common activities. The trilateral cooperation is intended to contribute to enhancing the empirical and factual information basis for policy makers and supporting them in addressing public health in relation to intellectual property and trade (WIPO). Available from: http://www.wipo.int/policy/en/global_health/trilateral_cooperation.html). (Last accessed March 16, 2017).

104 The Human Rights Council attends to the issues of small-scale farmers including Indigenous and local communities, fisherfolk, pastoralists, landless agricultural workers including migrant workers.

105 Such measures cannot constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade. Threats of a dispute being brought has limited the use of the general exceptions. *See* https://ecampus.wto.org/admin/files/Course_382/Module_537/ModuleDocuments/eWTO-M8-R1-E.pdf (Last accessed March 15, 2017).

IT also envision some transactions that will involve the corporate private sector. In both these instances, the public sector at the international and national levels needs to ensure that the rules created and their implementation do not harm the public interest; instead, they should support it.

In sum, the following recommendations may help bring the treaties discussed in this paper in line with one another and most importantly, in line with the requirements of Agenda 2030 and the SDGs.

1. Expand consideration to treaties and instruments not directly related to addressing biological diversity but nevertheless that have a real or potential impact on it. This would include economic instruments, such as the WTO Agreement on Agriculture.

2. Look beyond objectives and beneficiaries instrument by instrument to the effect of the instruments on one another.

3. Find better means to raise understanding and coordination amongst instruments. These could include a forum convened by an organization that has no interest or control of any "territory" in the international legal architecture.

4. Generate empirical evidence of the effect of different regimes on one another and in particular on the SDGs.

5. Understand power imbalances and empower the public sector internationally and nationally to regulate private industry so that it does not act contrary to the public interest. Industry could receive incentives to contribute to the SDGs in ways which reflect the public interest.

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