GLOBAL FOOD SECURITY AND INTELLECTUAL PROPERTY RIGHTS

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INTRODUCTION

Global food price spikes in recent years have led to food riots and government-imposed emergency price controls,[2] reminding the global community of the integral connections between food security and political and economic stability. With nearly one billion people already suffering from chronic hunger,[3] and the expected 70 percent rise in demand for food by 2050,[4] increased and sustained agricultural productivity and production will be a critical component of achieving global food security, which is integral to political stability, particularly in developing countries.

In response to this challenge, global leaders, convened at the G-8 Summit in L'Aquila, Italy in 2009, launched the L'Aquila Food Security Initiative.[5] This $20 billion pledge, contributed over three years, deepened donor governments' short-, medium-, and long-term investments in agriculture and rural development in developing countries to combat food insecurity and was designed to catalyze broader economic growth,

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2. *The 9 Billion People Question: A Special Report on Feeding the World*, THE ECONOMIST, Feb. 26, 2011, at 2.

3. *See* "L'Aquila" Joint Statement on Global Food Security: L'Aquila Food Security Initiative (AFSI), GROUP OF 8 SUMMIT 2009, http://www.g8italia2009.it/static/G8_Allegato/LAquila_Joint_Statement_on_Global_Food_Security%5B1%5D,0.pdf (last visited June 28, 2012) [hereinafter L'AQUILA].

4. FOOD & AGRIC. ORG. OF THE UNITED NATIONS, HOW TO FEED THE WORLD IN 2050 at 2, http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf.

5. L'AQUILA, *supra* note 3.

prosperity, and stability.[6] Building upon the commitments and progress from L'Aquila, in 2012, the G-8 renewed its commitment to food security through the establishment of the New Alliance for Food Security and Nutrition, with the ambitious goal of "achiev[ing] sustained and inclusive agricultural growth and rais[ing] 50 million people out of poverty over the next 10 years."[7]

One of the objectives of the New Alliance for Food Security and Nutrition is to increase agricultural yields and close the productivity gap in Sub-Saharan African countries by increasing the dissemination and adoption of improved seeds and new technologies.[8] Though the G-8 effort is focused on the transfer of technology already "on the shelf" to improve African agriculture, these efforts are inherently linked to the broader donor community's support of agricultural research. The donor community, including bilateral and multilateral donors, has increased its investments in international agricultural research in recent years, as seen in Figure 1 below.[9] This reversed a trend from previous decades and is largely due to the growing recognition that research provides the necessary pipeline of technologies and knowledge to strengthen global food security. This commitment is significant, as the donor community contributed nearly $700 million in 2010 to the Consultative Group on International Agricultural Research (CGIAR), the primary purveyor of public sector agricultural research targeted to advance agricultural productivity and production among poor, subsistence farmers in the developing world.[10]

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6. *Id.* at 1.

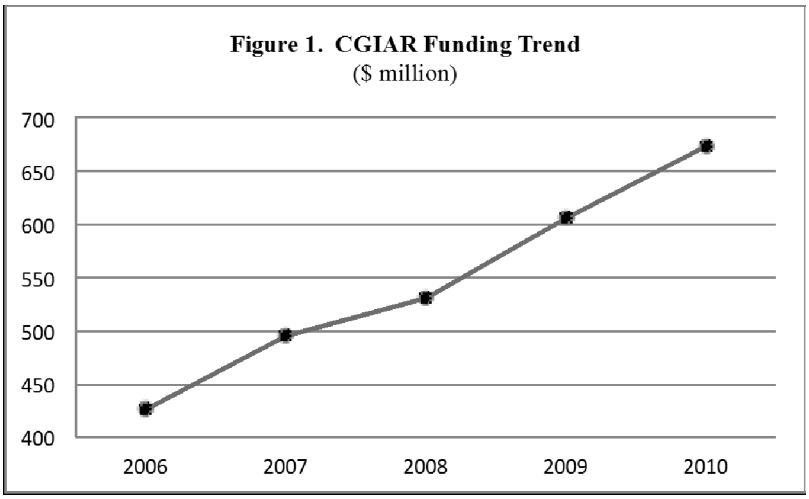
7. Fact Sheet: G-8 Action on Food Security and Nutrition, THE WHITE HOUSE (May 18, 2012), http://www.whitehouse.gov/the-press-office/2012/05/18/fact-sheet-g-8-action-food-security-and-nutrition. [hereinafter WHITE HOUSE].

8. *Id.*

9. CONSULTATIVE GRP. OF INT'L AGRIC. RESEARCH [CGIAR], FINANCIAL REPORT 2010 6, *available at* http://library.cgiar.org/bitstream/handle/10947/5280/2010_CGIAR_Financial_Report.pdf?sequence=1 (last visited July 3, 2012).

10. *Id.*

Figure 1. Donor support to CGIAR, 2006-2012 (in millions USD)[11]



Though the donor community has funded international agricultural research for decades, issues associated with intellectual property have become an increasingly important feature in the agricultural research landscape—among both public and private sector actors.[12] While the CGIAR has managed intellectual property issues on a center-by-center basis, in March 2012, after nearly one year of negotiation, the donor community and the CGIAR adopted the "CGIAR Principles on the Management of Intellectual Assets," a system-wide policy to guide the management of intellectual assets produced or acquired by CGIAR centers.[13] Further, international agreements, such as the International Treaty on Plant Genetic Resources for Food and Agriculture[14] and the Nagoya Protocol to the Convention on Biological Diversity,[15] are being implemented to address access to and benefit-sharing from the use of genetic resources, the building blocks of agricultural research. Greater understanding of this evolving legal landscape is critical, so that researchers pursuing international agricultural research funded by the public sector can more effectively work towards improving global food security. This paper will briefly describe these international agreements and policies and how they relate to publicly-funded, agricultural research intended to increase the

11. *Id.*

12. MICHAEL BLAKENEY, INTELLECTUAL PROPERTY RIGHTS AND FOOD SECURITY 5 (2009).

13. CGIAR Fund, Update, March 2012, *available at* http://cgiarfund.org/Resourcesnew/9.

14. ITPGRFA, International Treaty of Plant Genetic Resources for Food and Agriculture website, http://planttreaty.org/.

15. CBD, Convention on Biological Diversity website, http://www.cbd.int/abs/.

availability and accessibility of innovations to enhance economically and environmentally viable smallholder agricultural production and productivity.

I. AGRICULTURAL RESEARCH & GLOBAL FOOD SECURITY

Agricultural research is a key driver for advancing agricultural productivity,[16] and as such, it is a significant component of international efforts to improve global food security. Public sector investments in agricultural research are most likely to improve food security,[17] and historically, the public sector was the key developer of Green Revolution technologies.[18] CGIAR centers were established during the 1960s and 1970s to serve as hubs of international public sector agricultural research[19], and CGIAR scientists (both before and after the centers were established) were key contributors of Green Revolution technologies, primarily improved crop genetics.[20] A synthesis by Suresh Pal[21] illustrates that CGIAR research, particularly crop genetic improvement, has had a significant positive impact on poverty reduction, agricultural growth and environmental protection. It also attributes much of the impact from crop genetic improvement on the free exchange of plant genetic resources and partnerships with national agricultural research systems (NARS).

II. AGRICULTURAL RESEARCH & ACCESS TO GENETIC RESOURCES

Given the role of agricultural research in advancing global food security goals, attention to factors that can enhance or impede research is critical. During the development of Green Revolution technologies by public sector researchers, "there was no consideration of any role that IP might play in agricultural innovation."[22] Further, researchers during this period operated in an environment of relatively free movement of genetic resources and

16. *See* PAUL HEISEY, ISSUES IN FOOD SECURITIES: AGRICULTURAL RESEARCH AND DEVELOPMENT, AGRICULTURAL PRODUCTIVITY, AND FOOD SECURITY, US DEPT. OF AGRIC (June 2001), *available at* http://www.ers.usda.gov/media/303967/aib765-10_1_.pdf.

17. *See id.*

18. BLAKENEY, *supra* note 12, at 4.

19. FAO, INTRODUCTION TO THE INT'L TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRIC 64, Rome, (February 2011), *available at* http://www.planttreaty.org/content/training-resources.

20. Suresh Pal, *Impacts of CGIAR Crop Improvement and Natural Resource Management Research: A Review of Evidence*, 24 AGRIC. ECON. RES. REV. 185, 187 (2001).

21. *See id.*

22. BLAKENEY, *supra* note 12, at 5.

improved crop varieties resulting from their use.[23] As noted above, the free exchange of plant genetic resources was identified as a key factor underlying the impacts from CGIAR research on crop genetic improvement.[24] Access to a variety of genetic resources is critical in agricultural research, particularly for crop genetic improvement. There are generally two parts to the issue of access for crop genetic improvement. First, a wide variety of genetic resources, which can originate from anywhere, are necessary to screen for potentially valuable traits. Once a trait is identified, it would then be integrated into crops grown in a particular area. Thus, access to genetic resources from the target region (e.g., local crop varieties) is necessary to ensure that the new trait is introduced into crops already known to perform well under local farming conditions. Access to genetic resources is critical for both identifying important new traits as well as ensuring the relevance of emerging technologies to target beneficiaries, such as smallholder farmers in developing countries. However, currently emerging systems for managing access to and benefit-sharing from the use of genetic resources are being implemented at the national level and could restrict access to the range of genetic resources needed for agricultural research.[25]

The Nagoya Protocol (NP) was adopted in 2010 under the Convention on Biological Diversity.[26] The objective of the Nagoya Protocol is to provide a "transparent legal framework for the effective implementation of . . . fair and equitable sharing of benefits arising out of the utilization of genetic resources."[27] Further, contracting parties to the Nagoya Protocol are obligated to "take measures in relation to access to genetic resources, benefit-sharing and compliance."[28] As the Nagoya Protocol is implemented at the national level— and this process is only just beginning— it is unclear how implementation will affect international research collaborations. Some have voiced concern that the Nagoya Protocol could stifle academic

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23. *See* Kelly Day Rubenstein and Melinda Smale, International Exchange of Genetic Resources: The role of information and implications for ownership: the Case of the U.S. National Plant Germplasm System, 2, EPTD Discussion Paper 119 (July 2004).

24. *See PAL*, *supra* note 20.

25. Commission on Genetic Resources for Food and Agriculture. Background Study paper No. 42. "Framework study on food security and access and Benefit-sharing for genetic resources for food and Agriculture" (September 2009) http://www.fao.org/nr/cgrfa/cgrfa-back/en/?no_cache=1.

26. See CONVENTION ON BIOLOGICAL DIVERSITY (CBD), *Status of Signature, and ratification, acceptance, approval or accession*, http://www.cbd.int/abs/nagoya-protocol/signatories/ (last visited Sept. 22, 2011) for a list of countries that have signed and/or ratified the Nagoya Protocol. All countries, except the U.S., Andorra, South Sudan and the Holy See, have ratified the Convention on Biological Diversity (CBD), though the U.S. has signed the Convention. *Id.*

27. *About the Nagoya Protocol*, CONVENTION ON BIOLOGICAL DIVERSITY, http://www.cbd.int/abs/about/#objective (last visited Aug. 19, 2012).

28. *Id.*

research through the limitations on sharing of genetic resources.[29] Given the collaborative, multi-national nature of public sector international agricultural research, developed and developing country researchers alike must be educated about the Nagoya Protocol and their rights and responsibilities when conducting collaborative research.

The International Treaty on Plant Genetic Resources for Food and Agriculture ("Treaty") entered into force in 2004.[30] This Treaty establishes a global system to provide farmers, plant breeders and scientists with access to plant genetic materials and provides for terms and conditions on benefit-sharing from the use of plant genetic resources.[31] The Treaty is a separate instrument from the Nagoya Protocol and is considered a specialized instrument for a specific category of genetic resources as described in Article 4 of the Nagoya Protocol.[32] The Treaty's multilateral system of access and benefit-sharing was developed in response to the way in which plant genetic resources are used to develop new materials.[33] That is, a number of plant genetic resources may be used to develop a single final variety and attributing the value of the final variety to any single parental genetic resource would be challenging. Through the Multilateral System, parties to the Treaty make plant genetic resources under national jurisdiction (e.g., national seed banks) available to others for research and breeding.

Those who access genetic materials through the Multilateral System agree that they will freely share any new developments with others for further research or, if they want to keep the developments to themselves, they agree to pay a percentage of any commercial benefits they derive from their research into a common fund to support conservation and further development of agriculture in the developing world.[34]

Through the establishment of a benefit-sharing fund, the Treaty Secretariat facilitates the distribution of resources to advance goals of conservation of plant genetic resources for agriculture and building capacity in developing countries to conserve and conduct research with these genetic resources.[35]

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29. Sikina Jinnah & Stefan Jungcurt, Global Biological Resources: Could Access Requirements Stifle Your Research? 323 SCI 464, 464-65 (2009).

30. *See* ITPGRFA, *supra* note 14.

31. *Id.*

32. Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, art. 4, Oct. 29, 2010, *available at* http://www.cbd.int/abs/text/articles/?sec=abs-04 [hereinafter Nagoya Protocol].

33. *See* FAO, 19, *supra* note 19.

34. *What is the Multilateral System?*, INT'L TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRIC., http://www.planttreaty.org/content/what-multilateral-system (last visited Aug. 19, 2012).

35. *See* ITPGRFA, *supra* note 14.

Plant genetics resource collections held by the CGIAR research centers represent the largest collection of these resources for food and agriculture.[36] These plant germplasm collections have been entered into the Multilateral System (MLS) to enable researchers globally to have access to these unique collections.[37] Thus, the Treaty has direct relevance to agricultural research carried out to advance the goals of global food security, especially as the CGIAR and collaborating scientists use these genetic resources to improve crop varieties produced by smallholder farmers in developing countries. As the Nagoya Protocol has not yet entered into force,[38] implementation of the Treaty is more advanced than implementation of the Nagoya Protocol, leaving some researchers to find that they can only obtain some of the genetic resources they need to pursue their work. For example, a plant breeder may be able to obtain unique plant germplasm from the CGIAR, but may not be able to obtain a wide variety of plant pathogens used to evaluate plant resistance to a new disease. Plant pathogens would fall under the purview of the Nagoya Protocol,[39] and until governments have systems in place to enable the movement of the genetic resources, research in some areas may be significantly delayed. This could have significant consequences for food security. In the event of an emerging plant health threat, like Ug99, a virulent wheat stem rust to which roughly 80% of the wheat crop in Africa and Asia was susceptible when it appeared,[40] consequences can be significant if access to the genetic resource is encumbered. In this case, had Ug99 spread to these susceptible regions before researchers and governments had had a chance to identify and disseminate resistant wheat varieties, wheat-dependent populations in these regions could have faced serious food insecurity.[41] Given the importance of access to genetic resources for international agricultural research, the implementation of international agreements governing access to and benefit-sharing from the use of genetic resources can have significant consequences for global food security.

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36. Carlos Perez del Castillo, Genetic Resources Scoping Study Report, 1, (February 2011) *See* http://library.cgiar.org/bitstream/handle/10947/2701/CGIAR_Consortium_Board-Commissioned_Genetic_Resources_Scoping_Study.pdf?sequence=1.

37. *See* FAO, *supra* note 19.

38. *See* CBD, *supra* note 26.

39. *See* Article 3, Scope, Nagoya Protocol, CBD, www.cbd.int/abs/text/articles/?sec=abs-03.

40. *Introduction*, CIMMYT INT'L MAIZE AND WHEAT IMPROVEMENT CENTER, http://apps.cimmyt.org/gis/rustmapper/index.htm (last modified June 9, 2010).

41. *See* FAO wheat rust disease global programme, www.fao.org/agriculture/crops/core-themes/theme/pests/wrdgp/en/.

III. AGRICULTURAL RESEARCH & INTELLECTUAL PROPERTY RIGHTS

Though as noted earlier, researchers developing the Green Revolution technologies may not have considered intellectual property rights,[42] public sector agricultural researchers must consider these issues given the current legal landscape. Recognition of the links between intellectual property rights issues and food security is increasing, as evidenced by the negotiation of a new IP policy for the CGIAR in 2012 and the recognition by the G-8 New Alliance for Food Security and Nutrition to "[e]xplore opportunities for applying the non-profit model licensing approach that could expand African access to food and nutritional technologies developed by national research institutions."[43] Part of the emphasis on intellectual property rights issues comes from increasing engagement of the private sector by the traditional donor community in international development efforts. Though the private sector has participated in many, often less visible, ways in past development efforts, international development donors increasingly recognize the role the private sector can play in both focusing private sector investment on agricultural research for smallholder producers in developing countries as well as facilitating the deployment of technologies developed by public sector investments to poor smallholder producers in developing countries.[44] Naseem and his colleagues reviewed policy options that could cultivate private sector investment in research and development (R&D) for agriculture in developing countries, and indicated that intellectual property rights are one important incentive to stimulate private investment in agricultural research, though the impacts on pro-poor agriculture are variable depending on a number of factors.[45] Public sector research, especially that being undertaken by the CGIAR's new research programs, contributes to the development of pro-poor technologies to improve the productivity of smallholder agriculture and/or reduce the vulnerability associated with agricultural production among poor smallholder producers.[46] Through strategic engagement with the private sector, the outputs of research, both in terms of technology and knowledge, (e.g., greater understanding of factors to increase technology adoption among smallholders) can potentially reach greater numbers of target beneficiaries.

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42. *See* BLAKENEY, *supra* note 12.

43. WHITE HOUSE, *supra* note 7.

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44. Reuters, describes pledge announced at May 2012 G-8 discussion of global hunger and food security, http://www.reuters.com/article/2012/05/18/us-g8-food-idUSBRE84H0O920120518, (last visited Dec 11, 2012).

45. *See* Anwar Naseem, David J. Spielman & Steven W. Omamo, Private-Sector Investment in R&D: A Review of Policy Options to Promote its Growth in Developing-Country Agriculture, 26(1) AGRIBUSINESS 143 (2010), *available at* http://siteresources.worldbank.org/CFPEXT/Resources/NaseemetalPrivateRDAgribusiness10.pdf.

46. *See* CGIAR Strategic Results Framework, http://www.cgiarfund.org/strategy_results_framework.

Further, engagment with the private sector could potentially improve the sustainability of availability of technologies, through steady demand for pro-poor technologies, when priced and available in ways accessible to poor smallholders. To harness these opportunities available through the private sector, intellectual proprety rights are an important tool. Thus, donors have taken steps to address how and in what context intellectual property rights are asserted over publicly funded international agricultural research outputs through the negotiation of the CGIAR *Principles on the Management of Intellectual Assets*.

During the recent reform process of the CGIAR system, intellectual property issues were raised, as individual CGIAR centers had, over time, established their own policies and procedures for managing intellectual assets and engaging with the private sector. The Principles were drafted to ensure that under the new CGIAR system, all CGIAR centers were guided by the same principles to manage their intellectual assets as these assets exist largely from decades of public sector funding. These Principles commit the CGIAR to "prudent and strategic use of intellectual property rights," such as patents or plant variety protection, that are only to be pursued in situations necessary to improve the asset or "to enhance the scale or scope of impact on target beneficiaries."[47] The provisions also address exclusivity agreements that the CGIAR may undertake with third parties, to ensure there is a careful review of how and under what circumstances agreements are developed. This is a living document, subject to review and revision in two years from the adoption by the Fund Council in March 2012. The review will enable donors to learn how intellectual assets management is faring under these principles, and what new or unexpected impacts this has for how the CGIAR engages with partners, and most importantly, to examine how these evolving principles can best be structured to increase the impacts of public sector funded research on smallholder producers in the developing world.

LOOKING FORWARD

Intellectual property issues are increasingly relevant to the public-sector international agricultural research landscape. Given the expected significant increases in public sector funding in the coming years to address global food security issues, and the increasing role of public-private sector engagement, intellectual property rights may be an increasingly important tool to help achieve impacts from these investments. Additional research on how and in what contexts to best use intellectual property tools to achieve the intended impacts from this expansion in international agricultural research funding will be critical for the international donor community as it strives to meets its commitment to addressing global food security.

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47. *See* CGIAR 7th Fund Council Meeting documents Agenda Item 9, www.cgiarfund.org/7th_fund_council_meeting.