Agro biodiversity: Global Commons or Private Property

Impacts of Plant Patents on Agriculture and Environment in Developing Countries.

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Abstract

This paper explores arguments about the impact of Intellectual Property Rights (IPRs), on traditional farming systems and agro biodiversity in developing countries. IPRs discussed will be specifically patents on plants and on the improvement of plant varieties. Farmer's access to seed for food security and conservation is at odds with strict, private sector interpretations of IPRs. Farmer's rights, traditional crop production methods, and public research projects are at risk from international and state policy that is increasingly under the influence of the private sector. Clear definitions of IPRs, as they apply to plant variety protection, must be established in many developing countries for private sector remuneration and to preserve traditional farming systems. Some of these countries are under immediate pressure to adopt legislation in order to comply with international trade agreements. Development workers need to be aware of current policies and projects that can fairly address concerns about farmer's rights, agro biodiversity, public research, and private sector profit.

Traditional Methods of Conserving Agro biodiversity

Farmers have selected and conserved food plant varieties for millennia. (Nijar 1998; Tansey 2002). Traditional knowledge of seed saving and the free exchange of plant varieties form the basis for *in situ* preservation of agro biodiversity. Non-codified law in many developing countries allows farmers free access to crop seed varieties (Louwaars 1998). Today it is estimated that only 20% of farmers worldwide purchase seed and the remaining 80% use farm saved seed (Manicad 1999). Seed saving practices are being rapidly eroded by dynamic changes such as the industrialization of agriculture and the development of global markets (Rani 2000).

Development of Global Agricultural Trade Policy

International policy developed in the past 20 years addresses farmer's rights and acknowledges their contribution to the conservation and improvement of agro biodiversity. Farmers rights formulated in 1989 by the United Nations Food and Agriculture Organization (FAO) recognize farmer contributions to the conservation and improvement of genetic resources and vest these rights in the International Community, as trustee for present and future generations (Wood 1998). The Draft UN Declaration on the Rights of Indigenous Peoples states that indigenous peoples have the right to control, develop, and protect their genetic resources (Louwaars 2000). The Convention on Biological Diversity (CBD) is a legally binding international agreement recognizing the sovereign rights of nations over their genetic resources and stipulating the need for prior informed consent for their use (Swaminathan 1998).

Developing countries that are considering joining the World Trade Organization (WTO), must sign onto The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) that establishes minimum legal standards the protection of IPRs. Signatory countries have until

2006 to come into full compliance with treaty requirements by adopting IPR legal standards. Article 67 of the TRIPS agreement obligates developed countries to provide technical assistance to developing countries for establishing IPR systems (Lehman 2002). TRIPS represents the most wide-ranging expansion of IPRs in history. TRIPS rules were developed with little public input and introduced into the WTO against strong opposition from developing countries (Tansey 2002).

Legal standards being adopted to comply with TRIPS include the 1991 Convention of the International Union Protection of New Varieties (UPOV). The UPOV convention includes a *breeders' exemption,* which allows breeders to freely use patented varieties in developing new varieties, and a *farmers' privilege,* which allows farmers to save and reuse seed of patented varieties without consent of the owner. However, these farmers must pay a royalty for re-use of the seed (Ghijsen 1998). Legislation in conformity with UPOV strengthens breeders' privileges, but restricts farmers' seed saving rights. The UPOV convention has so far been adopted by 37 countries. (Swaminathan 1998). The prevailing private sector global patent system does not recognize farmers' privileges or breeders' exemptions (Louwaars 1998).

Public -Vs-Private Sector Plant Variety Research and Development

Public sector international agricultural research institutes face declining budgets and increasing privatization of research (Manicad 1999). Reduced investment is likely to force public breeders to focus on breeding for commercial farmers, at the cost of agro biodiversity (Louwaars 1998). The Consultative Group on International Agricultural Research (CGIAR) has endorsed further collaboration with the private sector in hopes of transferring new and superior technologies to developing countries (Manicad 1999). Private sector crop breeding has generated varieties suitable for high-production, resource rich environments. Private sector crop breeding is not

conducive to production in marginal environments where farmers maintain a large number of varietal landraces. Private sector breeding has not adequately addressed the needs of marginal farmers and their crop development processes, nor recognized the value of local landraces in the improvement of food crops (Sthapit 2000). Private sector breeders are often not interested in small farmers due to their remoteness, or their diverse and variable seed demand (Atlin et al. 2000). Low crop genetic diversity results from a policy of promoting few varieties (Louwaars 1998; Witcombe et al. 2000). In many cases, no credit is given to local farming communities when the private sector utilizes their plant varieties (Rani 2000).

Arguments in favor of adopting IPR's as part of international trade agreements

According to the TRIPS agreement, the objective of IPRs is to balance rights and obligations and contribute to promoting technological innovation and the transfer and dissemination of technology. TRIPS is welcomed by those seeking to curb declining financial support for public sector plant breeding (Louwaars 1998). Private sector plant breeding companies are seeking stronger IPRs to protect their own inventions; and weak or no protection of their raw materials, including plant varieties that have been selected and conserved by farmers (Wood 1998). Developing countries have played a limited role in past agricultural trade negotiations, but have recently taken an active role seeking greater market access and equality.

Arguments against Adoption of IPRs

Developing countries have concerns that trade commitments could hamper efforts to pursue food security and rural development policies, and that trade liberalization will expose their markets to volatile world prices and threaten their domestic food security (Matthews 2001). Some argue that IPR's promoted by current global trade policy devalues the contributions of indigenous people

(Nijar 1998) and threatens farmer's rights to continue age-old practices that preserve biodiversity (Louwaars 1998). India's Research Foundation for Science, Technology and Ecology, as well as the Rural Advancement Foundation International are both against the patenting of genetic resources, as they believe that it will be detrimental for resource poor farmers in developing countries (Balakrishna 1998). The UN Sub-Commission on the Promotion and Protection of Human Rights unanimously challenged TRIPS for having negative impacts on the rights of poor people (RAFI 2000).

The British Secretary of State for International Development set up the Commission on Intellectual Property Rights (CIPR) in 2001. The CIPR looked at how IPR's may best work for poor people in developing countries, and published a report in Sept. 2002 entitled "Integrating Intellectual Property Rights and Development Policy". One of the main findings of the report was that poor countries should not commit to IPR protocols established by developed countries, unless these systems of protection were deemed beneficial to their needs. The CIPR report recommended that poorer countries should be able to set up their own appropriate levels of IPR. The British Society of Plant Breeders found the CIPR report unconvincing and even flawed in regard to plant variety rights, and they stated that the CIPR report undervalued plant variety rights; and that such broad attacks on intellectual property may slow development in developing countries (Turner 2002).

Establishment of IPR rules can be expensive for developing countries. The World Bank estimates that it costs at least $1.5 million to set up a patent office, and establish judicial, customs and competition authorities to enforce IPR rules. Patent registration costs at least $4,000 to secure in the US and it may cost millions to defend one in court (The Economist 2002, 1).

Another criticism is the lack of literature about gender and IPR, and how policies may seriously affect women as small farmers, plant breeders, and conservationists. Gender division of labor has implications for conservation of plant genetic resources and gender perspectives need to be integrated into programs if they are to succeed (Howard-Borjas 1999).

Adoption of Plant Variety Protection Legislation in Developing Countries

Several developing countries have adopted legislation necessary for complying with the TRIPS agreement that also provides legal mechanisms for protecting farmers' rights and breeders' privileges. The EU has implemented a provision similar to UPOV, but does not require small farmers to pay royalties for re-use of seed. The US has implemented UPOV in a way that restricts the trade of seed, but allows farmers to re-use seed without paying royalties (Ghijsen 1998). Eight Latin American countries are members of the 1978 UPOV convention, and some have incorporated elements of UPOV 1991. Mexico and Argentina exclude patentability of wild plants. Brazil further excludes the patentability of germplasm isolated from wild plants (Correa 2000). Ecuador passed legislation stipulating that Plant Breeders Rights cannot be claimed for wild species uncultivated and unimproved by human selection.

Thailand has a 'Plant Variety Protection Bill' under development that will provide compensation to communities for the use of local plant varieties developed into commercial varieties, for a 15 to 25 year period, unless they are bred for the benefit of small farmers or the general public. The Plant Variety Protection Bill will establish a foundation to channel compensation income to small farmers for the conservation and development of plant varieties in local communities (Lianchamroon 1998). India has developed draft legislation for a Plant Variety

Protection and Farmers' Rights Act and a Biodiversity Act which may make India the first country to give a legal status to 'farmer's rights' as part of a distinct system of property rights (Rani 2000).

Community Gene Banks to Conserve Agro biodiversity in Developing Countries

Community Gene Banks (CBGs) have been proposed to provide back up storage of crop seed to increase community food security, preserve agro biodiversity, and to promote farmers' rights.

Information contained in CBGs can help identify plant varieties so that particular communities can be remunerated for their conservation efforts and protected from misappropriation. Remuneration can be a vehicle for funding of plant conservation. Interest in CBGs has grown rapidly in recent years, and they have been established in India, and Indonesia, and several are planned for Ethiopia[i] (Rani 2000).

Participatory Plant Breeding to Conserve Agro biodiversity in Developing Countries

Participatory Plant Breeding (PPB) is crop varietal selection resulting from the segregation of cultivars by farmers in the local environment. PPB can address the needs of people living in marginal environments, and provide crops that relate to their socio-cultural identity (Sthapit and Subedi 2000). PPB has been used successfully to increase biodiversity for difficult environments, thereby increasing the stability of production (Witcombe et al. 2000). PBB helps farmers to inform and influence breeding programs, gain access to new genetic diversity, and to preserve essential

aspects of their genetic resource management. A challenge to scaling up the use of PPB is development of ways to respect farmer and community intellectual property rights (Smith and Weltzien 2000). PPB projects sponsored by CGIAR and other groups have been launched in Rwanda and Malawi (Howard-Borjas 1999).

Case Study: Participatory Plant Breeding in Nepal

Background

Nepal has about 2.6 million people and a 2.08% annual growth rate (Chaudhary 2000, 1238). Nepal is an agricultural country with 80% of the population engaged in farming. More than 95% of farmers rely on seed that is selected, stored, and exchanged within the traditional agronomic and socio-cultural practices of farming communities. About 85% of Nepalese farmers own less than two hectares of land, and about 63% do not have economically viable land holdings (Joshi 2000, p 15). Nearly 45% of the population lives below the poverty line. Poor natural resource management and improper farming practices have led to deforestation, accelerated soil erosion; and adversely affected crop yields. Addressing the poverty in Nepal is vital to preserving biodiversity (Chaudhary 2000, 1238).

Rice Crop Biodiversity in Nepal

Nepal is home to more than 2,500 landraces of rice. Only 43 improved varieties of rice have been released, and their adoption has been poor by farmers in marginal environments. Only 2 of the 43 varieties released are recommended for high altitudes. High altitude rice is grown at elevations from 1500 to 2000m, and it covers 26% of the 1.5 million ha of rice land. Limitations to high

altitude rice culture in Nepal are chilling injury and sheath brown rot[ii] (Sthapit and Subedi 2000, 183-184). There is also a lack of information on factors threatening the existence of endemic plants. Kapilvastu district has wild rice species Oryzae rufipogon, O. officinalis and O. nivara.

Figure 1: Nepal is in a region with wild rice species and many landraces of cultivated rice

Biodiversity Research and Policy in Nepal

Nepal is signatory of the CBD, which was ratified by the Nepalese Parliament in November 1993 and entered into force in February 1994. A gap exists in the conservation of landraces and genetic resources of agricultural importance, which has not been addressed by any responsible organization.

At this time, no collection of plant material or biodiversity research shall be undertaken without prior approval.[iii] There is a dire need for guidelines for organism collection and biodiversity research consistent with Articles 15 to 17 of the CBD. There is also a need to implement international obligations by transforming them into legally binding regulations. However, in Nepal there is reported to be an excessive delay in the translation of policies into legislation (Chaudhary 2000). According to (Joshi 2000), there is no regulation of plant variety protection in Nepal due to limited private sector breeding and limited seed trade outside of the country.

Origins of PPB in Nepal

In 1992 women farmers asked breeders from the Local Initiatives for Biodiversity, Research and Development (LI-BIRD) to improve grain color and quality of a recently introduced improved variety of rice called *Chhomrong Dhan*. In a radical departure from conventional breeding practice, Nepali breeders realized the importance of community participation in setting crop development goals. As a result of subsequent work in this area, LI-BIRD has institutionalized PPB under different agro-climatic conditions and in different institutional settings.

Projects

In order to address community requests for improved grain color and quality in *Chhomrong Dhan* rice, LI-BIRD breeders crossed it with Fuji 102 and gave farmers bulk quantities of fifth generation seed that was still not stabilized or homogenous enough for public release. Farmers grew out this seed and selected it for desired characteristics. Their resulting selections outperformed those developed from the conventional breeding program. New selections replaced only a third of the traditional landraces, and so did not totally replace the local landrace gene pool.

PPB was also tested in high-production rice cultivation systems where there was a lack of genetic diversity due to the use of only a few improved varieties. This approach in 18 villages in the Chitwan and Nawalparasi districts resulted in an initial increased yield of 20-25%, and also resulted in an increase of varietal diversity. Despite success in various PPB projects in Nepal, few breeders have been exposed to these new methods. There is a need for wider testing and more farmers need to be trained and reached by the benefits of this work (Sthapit and Subedi 2000, 187).

Conclusions and Discussion

While there are reasons for and against strict IPR rules, it is clear that such rules benefit the private sector in developed countries more than small farmers in developing countries. Numerous reasons have also been presented concerning the negative impacts of global IPR legislation on agro biodiversity. Small farmers in developing countries and the agro biodiversity which they conserve for their food security represent traditional farming systems. Such age old systems are at risk from globalization in general, and specifically by industrial private sector economic development policy and production strategy. As summarized by (Pistorius and van Wijk 2000), on-farm conservation should be approached through a broader political context to ease pressure on traditional farming systems by industrialized agricultural production systems. However, these authors also caution against projections of conservation strategies that fail to acknowledge the risk aversion strategies of small farmers which may cause them to abandon particular varieties that do not meet their specific needs. Abandonment of landraces is against globally oriented conservation strategies; and so there needs be collaboration between local and global efforts to conserve biodiversity for it to remain part of the global commons.

There is a need for policy to be set up by participating countries to protect farmers and to create mechanisms for perpetuation of plant variety development for the public good, including community gene banks, participatory plant breeding; and remuneration that supports further conservation of agro-biodiversity and the traditional farming systems it is essential to. Through these policy and project mechanisms, development workers have tools to empower farmers in developing countries to preserve traditional farming systems and farmers' rights.

Endnotes

[i] With funding from the Global Environment Facility in collaboration with the Ethiopian Biodiversity Institute and the Plant Genetic Resources Centre in Ethiopia.
[ii] Sheath Brown Rot disease is caused by *Pseudomonas fuscovagainae*.
[iii] According to Environment Protection Act Regulations, 1997 (Chapter 5, clause 31 and 32).

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