# Collective Action and Property Rights for Sustainable Development

## Property Rights, Collective Action, and Plant Genetic Resources

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2020 VISION FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT

Focus 11 • Brief 10 of 16 • February 2004

Genetic resources are the genetic material in plants and animals that determine useful traits that people can conserve, characterize, evaluate, and use to meet their needs. These resources are not simply the genes encoded in DNA, but particular expressions of the genes that farmers, scientists, and plant breeders have recognized and selected. Research has estimated that the value of increases in crop yields derived from new genes and genetic modification since 1945 has amounted to about US$115 billion a year worldwide.

Conservation of genetic resources contributes to plant genetic diversity, which includes both the combination of species that constitutes an ecosystem (genetic diversity across species), as well as the number of different varieties within a species. Development agencies, researchers, and policymakers are growing increasingly concerned about the consequences of the current erosion of genetic diversity. The 1997 FAO (Food and Agriculture Organization of the United Nations) synthesis of around 150 country reports states that nearly all countries report that crop genetic erosion is taking place and that it is a serious problem. Loss of biodiversity in cultivated and wild species can increase plants' vulnerability to insect pests and diseases, worsen nutrition through declines in the variety of foods available, reduce the capacity of plant resources to adapt to changing conditions, and lead to loss of local knowledge about diversity. These effects can in turn reduce food security, threaten the sustainability of agricultural production systems, and jeopardize the livelihoods of rural communities today and for generations to come.

Many factors affect the conservation of biodiversity, including demographic changes, technological developments, national agricultural policies, and economic, social, and cultural factors. Institutional aspects related to property rights and collective action play a key role in local plant genetic conservation outcomes.

### PROPERTY RIGHTS TO LAND-BASED RESOURCES

Land and water are crucial "partner resources" needed for the conservation of genetic resources. In particular land tenure and water rights are likely to affect in situ conservation (that is, conservation in natural surroundings, where plants have developed their distinctive properties) for a variety of reasons:

- The type and strength of property rights arrangements affect farmers' time horizon and investment choices and, as a consequence, crop diversity.
- Stronger land use and management rights for farmers can increase their ability to grow a variety of crops. Where farmers' investments are crop specific, however, security of property rights might lead to less-diversified cropping patterns.
- Property rights, together with available genetic resources, affect people's capacity to manage variability and risk. Many traditional communities present "patchwork landscapes" with various ecological niches that favor the use of unique varieties and plant types adapted to those niches. High genetic diversity reduces risk, and access to a diverse pool of plant genetic resources improves the long-term resilience of the agricultural production system in the face of adverse shocks like drought.

Formal property rights ("laws on the books") often coexist with and differ from locally exercised property rights. The existence of different overlapping arrangements and regulatory frameworks (legal pluralism) must be taken into account in order to assess their effects on biodiversity conservation. For example, in Ethiopia sacred groves managed by the Christian Coptic churches not only provide landless people with access to nontimber forest products, but also assure protection to areas with some of the highest amounts of biodiversity in the country.

Different property rights regimes have different advantages and disadvantages for biodiversity conservation. For example, local forest and pasture resources held as common property enable farmers to avail themselves of a much wider range of resources than they could if all land were cultivated. In Kenya the plant *Amaranthus graecizans L.* is collected from the wild in communal areas along roadsides and rivers, but it is not cultivated in gardens. Common property rights provide landless poor with access and foster local conservation of this unique genetic resource. Often when access to communal areas is restricted, not only are livelihoods affected, but also species lose their value as the traditions associated with them disappear.

State imposition of new property rights regimes that fail to account for traditional rights can also affect the maintenance of local knowledge of specific varieties. For example, in 1975 a forest ecosystem in Uzbekistan was converted to a protected nature reserve. As a consequence the surrounding communities lost access rights to this land, which contains a wild plant species that had been used locally to cure heart ailments. Having lost access to this wild species, the local people over time lost the knowledge of the heart-improving properties of this plant, and with that, a low-cost health remedy.

### THE ROLE OF COLLECTIVE ACTION

Whereas state provision can often sustain ex situ conservation (collection and storage of genetic resources to ensure availability in the future), in situ conservation requires coordination by farmers and other actors. Both formal and informal networks can work to increase access to diversity and availability of genetic variation, or they can work in conflicting ways, thus reducing diversity. In marginalized and remote areas where farmers' own seed systems continue to play a major

role in meeting farmers' heterogeneous needs for seed supply, collective action is especially important.

Germplasm information is composed of both scientific and local knowledge. Because the state is often ineffective at acquiring, documenting, and retaining local knowledge, collective action can provide the means to facilitate the maintenance of local knowledge. Farmers' organizations for seed management, local seed exchange networks, and seed fairs increase the information available about plant genetic resources, contribute to local capacity to conserve local crop varieties, and increase the possibilities for improving local varieties.

Finally, a group of farmers should be able to maintain more diversity with a higher chance of accessing new populations and a lower probability of loss of populations than any individual. Strengthening local capacity to undertake collective action may thus allow farmers and communities to maintain greater genetic resource diversity.

## FARMERS' AND INDIGENOUS RIGHTS TO GENETIC RESOURCES

Local conservation efforts are also affected by international policies guiding the development of intellectual property rights for genetic resources. Intellectual property rights, like all other property rights, provide the rights to the stream of benefits (including income) from the resource in question. Article 8(j) of the Convention on Biological Diversity affirms the rights of local indigenous communities to access and benefit from local genetic resources. The recently signed International Treaty on Plant Genetic Resources for Food and Agriculture also affects local rights.

Tracing the contribution of conservation practices to germplasm development is difficult, a situation that complicates the assignment of intellectual property rights and affects the equity of outcomes:

- Who is eligible to claim rights over a specific type of seed?
- When can innovation in genetic resources be considered the product of an individual or a firm, and when is it a product of a collective effort by many individuals?
- If many individuals are involved, is it possible and effective to define and assign collective rights to plant genetic resources?

Although society has paid significant attention to the private actions and ownership (mainly by firms) that underpin genetic resource innovation using biotechnology, it has paid less attention to property rights of agrarian communities and cultures for whom genetic resources are essential livelihood assets.

In the case of biotechnology, genetic resource innovations are treated as individual property. On the other hand, farming communities use genetic resources to meet a variety of livelihood, environmental, and cultural needs, and innovations in genetic resources over time are often the product of long-term collective efforts, such that no single individual can claim to be owner or originator of the innovation process and the resulting genetic resources.

The rules assigning property rights over genetic resources to individuals or groups of users will affect people's livelihoods. One risk of failing to recognize local indigenous rights is that external actors might appropriate exclusive rights over genetic resources they did not, in fact, "innovate."

Given the neglect of property rights of agrarian communities and cultures, collective action can help empower farmers to demand that government bodies guarantee rights to local genetic diversity to farmers. The other side of the coin is that collective action can also be used to limit use of germplasm by others, thereby worsening access and benefits to society as a whole.

## RISKS AND PROBLEMS OF EXCLUSIVE PROPERTY RIGHTS TO GENETIC RESOURCES

Even if local indigenous groups have legally recognized rights to genetic resources, privatization itself (or the assignment of exclusive rights) can lead to reduced availability of germplasm. In particular, assigning exclusive property rights to germplasm might reduce access to plant genetic material for everyone, and particularly for poorer farmers, given that often less-informed, less-educated, and marginalized rural populations are at a disadvantage in claiming ownership

Policymakers should be aware of the links between property rights, collective action, and local conservation of local plant genetic diversity. It is important to take into account local regulatory frameworks as well as the existence and overlap of multiple legal systems, try to build on these, and avoid policies that might in fact reduce access to genetic diversity for local populations, in order to avoid eroding genetic diversity and increasing the vulnerability of the poor. ■

**For further reading see S. Brush, ed., *Genes in the Field: On-Farm Conservation of Crop Diversity* (Ottawa, Canada: International Development Research Centre, 2000); International Potato Center (CIP)–Users' Perspectives with Agricultural Research and Development (UPWARD), *Conservation and Sustainable Use of Agricultural Biodiversity* (Manila, 2003), http://www.eseap.cipotato.org/upward/Abstract/Agrobio-sourcebook.htm; FAO, *The State of the World's Plant Genetic Resources for Food and Agriculture* (Rome, 1997), http://www.fao.org/WAICENT/FaoInfo/Agricult/AGP/AGPS/pgrfa/pdf/swrfull.pdf; J. W. Watson, and P. B. Eyzaguirre, eds., *Proceedings of the Second International Home Gardens Workshop: Contribution of Home Gardens to In Situ Conservation of Plant Genetic Resources in Farming Systems, 17–19 July 2001, Witzenhausen, Germany* (Rome: IPGRI, 2002), http://www.ipgri.cgiar.org/publications/pdf/753.pdf.**

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