THEMATIC BACKGROUND STUDY

The Impact of National, Regional and Global Agricultural Policies and Agreements on Conservation and Use of Plant Genetic Resources for Food and Agriculture

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EXECUTIVE SUMMARY

This paper contributes to the second report on the State of the World's Plant Genetic Resources for Food and Agriculture by providing a macro-level perspective on the role and significance of management of plant genetic resources for food and agriculture (PGRFA) as a policy priority. Using the policy measures identified in the first State of the World report (SoW-1; FAO, 1997) as an approximate baseline, the paper reviews the actual implementation of policies and policy measures across the world. As starting point, the review accepts the key elements identified in SoW-1 that constitute an integrated approach to conservation and utilization, anchored on: a) increasing productivity through continued access to, and exchange of, the world's plant genetic resources; b) sustainability in terms of combining use with conservation through approaches that aim for high(er) levels of biodiversity based on utilization and the sharing of benefits; and c) equity through the full participation of those responsible for conserving plant genetic resources in the benefits derived from their use. The paper stresses that policies always 'come to life' through people's individual and collective actions and reactions, and through configurations of rights, rules, institutions and power relationships, which, in turn, are shaped by social actors' knowledge, points of view and interests. In this sense, policies are constantly being shaped and reshaped, which calls for a very careful assessment of how their impact comes about.

The review concludes that in the decade since the publication of SoW-1 a considerable variety of policies and policy measures addressing PGRFRA have been developed and attempts have been made to put them into practice. Most, if not all, of the subcategories of measures identified in SoW-1 can today be found in one form or another in one or more country around the world. This is a positive development. However, despite many countries having now signed on to international agreements and treaties relating to PGRFA, actual implementation of national, integrated and long-term PGRFA policies is still not common, and implementation, monitoring and enforcement processes and mechanisms are often deficient. National strategies to build or strengthen the capacities required to accomplish these tasks are also underdeveloped in many countries. The review suggests that concrete productivity and sustainability impacts are not easy to determine. A number of studies paint a rather negative picture. However, there are examples (mostly still on a small and local scale) that offer a more positive view. In terms of equity, policies and laws that recognize more strongly and support more actively the key contributions of rural people to the processes of dynamic biodiversity conservation and improvement, and rural innovation more broadly, are still very much works in progress. Although many valuable policy 'experiments' are underway at the local level, links between these initiatives and national and international policy-making arenas remain weak.

1. INTRODUCTION

1.1 The assignment

The main objective of the study is to improve the understanding of the impact of agricultural policies on PGRFA, and to identify opportunities to facilitate the integration of PGRFA and seed policies in broader agricultural policies. As such, it will contribute to the second report on the State of the World's Plant Genetic Resources for Food and Agriculture and provide a macro-level perspective on the role and significance of management of PGRFA as a policy priority. More specifically, the study:

- reviews the status of PGRFA within national, regional and global agricultural policies and the status of PGRFA;
- analyses the main benefits and challenges for conservation and use of PGRFA in policies in developing and transition countries;
- analyses the major impact of agricultural policies and incentive structures on conservation and use of PGRFA, including environmental, trade and food-security aspects;
- highlights emerging trends, key issues and future challenges arising from the changes in agriculture policies of relevance to PGRFA;
- suggests ways to strengthen capacity and raise awareness to identify and improve policy options.

1.2 A set of refined questions

In order to facilitate the search for answers to the main objective of the study, we formulated a small number of focused questions.

- Who are the key actors in the agricultural policy arena, what are their roles and how do they influence agricultural policies and agreements?
- How exactly do agricultural policies and agreements, in particular affecting the use and conservation of PGRFA, come into existence in different socio-economic, political and ecological settings? What are the local (organizational) practices, formal and informal rights, rules and institutions used by farmers, their communities and other stakeholders to gain access to, use, exchange and benefit from PGRFA?
- How can one differentiate between 'good' and 'bad' agricultural policies and agreements?
- In which practical ways can agricultural policies and agreements be made more supportive of the sustainable use and conservation of PGRFA? What local organizational forms, rules and institutions merit support?

We caution in advance that this paper does not answer these questions exhaustively. Some explanations for this are give in the next section.

1.3 Methodology and materials, challenges and limitations

This paper is based on an extensive review of global literature on policies relating to PGRFA published since 1997. In addition, IDRC's project archive was searched for relevant research project experiences, reviews and materials (reports, publications etc.).

The exercise was hampered by a number of factors. First, despite an extensive search, relatively few documents were retrieved. This is likely due to the novelty of policies relating to PGRFA. Second, there was no specific chapter on policies in SoW-1, nor was there a specific paper commissioned on the topic. We dealt with this constraint by elaborating an 'approximate baseline,' analysing policy references in the first State of the World Report (see Section 3). Third, many of the documents reviewed focused on the policy design process, and not on the implementation and impact of policies. Again, this could be explained to a large extent by the novelty of relevant policies. Fourth, there is no single analytical approach for studying policy impact, and different authors make use of different theoretical frameworks. To clarify our own perspective, we synthesized our ideas, noting that these are still a work in progress (see Section 2).

We have illustrated the review of policies with a number of case studies to enliven the reading and, hopefully, facilitate comprehension.

2. ASSESSING POLICY OUTCOMES: A CONSTRUCTIVIST PERSPECTIVE

As could be deduced from the four guiding questions that inform this paper (see Section 1), there is unlikely to be a direct causal and linear relationship between agricultural policies and the management, use and conservation of genetic resources. Agricultural policies have many faces, over time and in space: they can appear as regulations, institutional and economic measures, advice and voluntary practices, or any combination of these. Policies may or may not be accompanied by financial resources. They may be followed by laws or not. In addition, the effects of agricultural policies are confounded by those of other policies concerning, for example, markets and trade, taxation, land tenure, science and technology, farmer organization and the provision of services (e.g., credit, extension, education). Agricultural and directly related policies have strong international dimensions as well, as crops, commodities and seeds travel all over the world. Their movements are regulated (at least on paper) by a multitude of international, bilateral and regional agreements and treaties, e.g., the Convention on Biological Diversity (CBD), the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), the World Trade Organization (WTO), the International Union for the Protection of New Varieties of Plants (UPOV), the North American Free Trade Agreement (NAFTA), the Common Market of the South (MERCOSUR), the New Partnership for Africa's Development (NEPAD) and the Association of Southeast Asian Nations (ASEAN).

Policies 'come to life' through people's individual and collective actions and reactions, and through configurations of rights, rules, institutions and power relationships, which, in turn, are shaped by actors' knowledge, points of view, and interests. In this sense, policies are constantly being shaped and reshaped (Long, 2001), which calls for a very careful assessment of how their impact comes about. Translating these insights directly to the field of PGFRA requires that one starts by documenting and understanding the formal and informal property rights and forms of community collective action that determine how plant genetic resources are being deployed and maintained within agrarian landscapes and how they contribute to the livelihoods of rural people (Eyzaguirre and Dennis, 2007). This will show how different rules and institutions are (or could be) mobilized to ensure more equitable and sustainable use of PGRFA, leading, ultimately, to improved livelihoods.

Genetic resources are also part of diverse and changing rural livelihoods, which are conditioned both by local-level and macro-level forces. Policies play out on individual and collective property, access and use rights, local and meso-level institutions (the values, norms and rules that govern everyday life practices) and forms of (farmer) organization, all of which can be more or less formal, traditional or modern. Everyday management and use of genetic resources is interwoven in complex and changing realities made up of all these elements. From this insight, important questions emerge related to the meanings and roles of genetic resources, the access to and exchange of germplasm, the recognition and strengthening of indigenous knowledge and skills for the management and conservation of biodiversity, and the creation of an enabling policy and legal environment that encourages innovative and sustainable genetic resource use.

Agriculture is often a cause of contention, domestically and internationally, and policy changes or reforms affecting agriculture are politically very sensitive and often difficult to achieve (World Bank, 2007: 96). This suggests that policy-making processes are also best be seen as complex processes. Politics informs policy-making and policy-making and its implementation affect politics. This raises the important questions about if and how farmers and farmer organizations play a role in agricultural policy-making processes, if their voices and interests are being heard and if they are being taken into serious consideration when it comes to decision-making and actual allocation of resources.

The review that follows in the next section of this paper is informed by the perspective presented above.

3. AN APPROXIMATE BASELINE: THE FIRST REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES

SoW-1 (FAO, 1997) offers a rather sketchy picture of agricultural policies, laws and international agreements. Seventy-one pages into the report, it says "It has been proposed that agricultural and economic policies be analysed for their effect on the conservation and use of PGRFA." It seems fair to conclude that little was known about these links at that time, conceptually and, most of all, practically.

Fortunately, since SoW-1, both theory and practice in the field of policy and law have evolved, allowing us to refine our understanding of possible impact paths of policies and laws on use and conservation practice, and to trace changes and trends over time in comparison to the approximate baseline presented by SoW-1. This type of analysis remains a work in progress and conclusions are tentative.

3.1 International agreements mentioned in SoW-1

The international agreements mentioned in the SoW-1 (FAO, 1997) are:

- The FAO International Undertaking (IU) on PGR, adopted in 1983 (pages 254, 278–279)
- The Convention on Biological Diversity (CBD) (pp 255, 276–277)
- The International Plant Protection Convention (IPPC) (p. 255)
- The International Union for the Protection of New Varieties of Plants (UPOV) (p. 255)
- WTO, including a phytosanitary agreement (p. 255)

The agreements are referred to in Chapter 7 on "Access to plant genetic resources, the sharing of benefits derived from their use and the realization of Farmers' rights."

SoW-1 does not mention regional or bilateral trade-agreements, which in the last decade have come to play an increasingly prominent role.

3.2 Policies and laws in the SoW-1

Inappropriate policies and laws are mentioned as major causes of genetic erosion in 22 Country Reports prepared for SoW-1 (FAO, 1997: 34). However, detailed explanations are not presented. Only two examples are given: European legislation (of that moment) discouraging the cultivation of landraces having a negative impact on conservation, and African policy support for high-yielding varieties leading to the replacement of traditional varieties and practices (ibid: 38).

SoW-1 does, however, allude to other forces contributing to genetic erosion that may be influenced by agricultural policies: intensification of agricultural systems, lack of sustainable resource management, deforestation and land clearance, pollution, introduction of new pests and diseases, land development for tourism, urbanization, and population pressure (ibid: 36–38). Economic processes are also mentioned, including the lack of adequate valuation of maintaining genetic resources leading to lack of appropriate incentives or the presence of disincentives, but very little detail is provided (ibid: 38).

Mention is also made of a lack of coordination among domestic policies influencing use of plant genetic resources (ibid: 146), a feature that appears prominently in other studies (e.g., Nnadozie *et al*., 2003: 7–8). Key needs identified include strong coordination mechanisms (FAO, 1997: 197–198), harmonization of national legislation, "especially concerning access to genetic resources, Farmers' Rights and their relation to IPR" (ibid: 225) and appropriate division of responsibilities and labour between the public and private sectors (ibid; 184). However, simple solutions are unlikely to be found: "It is increasingly recognized that different areas require different approaches to the utilization of plant genetic resources" (ibid: 168).

Other policies identified as affecting the conservation and utilization of PGRFA include trade policies, including trade agreements (in particular, the WTO), trade-related intellectual property rights (IPR) agreements, subsidies, and phyto-sanitary measures (ibid: 222).

The Report pleads for an integrated approach to conservation and utilization of PGRFA. Such an approach should be anchored on: a) increasing productivity through continued access to, and exchange of, the world's plant genetic resources; b) sustainability in terms of combining use with conservation through approaches that aim for high(er) levels of biodiversity based on utilization and the sharing of benefits; and c) equity through the full participation of those responsible for conserving plant genetic resources in the benefits derived from their use (pp. 40–42). These three objectives give a useful normative framework for impact assessment (see also, for example, Thrupp, 1998; Crucible Group II, 2000; Claassen *et al*., 2001; OECD, 1999a, 1999b, 2001; Almekinders, 2002; Petty, 2002; Vernooy, 2003b).

3.3 Policy and legal initiatives underway or planned

Throughout SoW-1 mention is made of a variety of policy and legislative measures that were under design or in the process of being implemented. These are summarized in Table 1.

TABLE 1

Status and intended outcomes of policies and laws mentioned in SoW-1

Policy/law	Status	Country	Intended outcomes	Source(s)
Protected areas	In progress	Several	Conservation (including wild plant genetic resources)	p. 54–55, p. 354–356; Pimbert and Pretty, 1995
A system of *in situ* conservation areas (biospheres)	Proposed	By several	Conservation	p. 57, p. 357–358
Ecosystem management	Proposed	By several	Productivity, sustainability, equity	p. 58, p. 351–354
Policies and regulations for on-farm conservation	Proposed Discussed	By several By CBD By FAO	Not specified	p. 70, p. 359–360 p. 71
On-farm conservation legislation	In progress	European Union	Productivity, sustainability, equity	p. 60
On-farm conservation programmes	Proposed	By several; By Morocco	Not specified	p. 61
On-farm conservation incentives for traditional varieties/landraces	Proposed	By the Philippines By Tanzania and the EU	Productivity, sustainability, equity	p. 63, and footnote 94 p.71, and footnote 121 on Tanzania
Grants for cultivation of erosion-threatened plants	In progress	European Union	Productivity, sustainability, equity	p. 60
Participatory plant breeding	In progress	By several	Productivity, sustainability, equity	p. 170–171, and p. 383–391
Decentralized plant breeding	Proposed	By several	Productivity	p. 67, 171
Promotion of on-farm seed production and informal seed exchange mechanisms	Proposed	By several	Productivity, sustainability, equity	p. 70
Revision of variety release, seed certification and plant breeders' rights regulatory framework	Proposed	By several	Productivity, sustainability	p. 71
Provision of landrace germplasm by genebanks to NARS, NGOs and farmer organizations	Proposed	By several	Productivity, sustainability, equity	p. 69
Credit policy for the production of landraces and underutilized crops	Proposed	Not specified	Productivity	p. 71
Marketing support policy	Proposed	Not specified	Productivity	p. 71, 183
Certification of origin of selected agricultural products and foodstuffs made from landraces and old cultivars	In progress	European Union	Productivity, sustainability, equity	p. 60
Land tenure and use policies	Mentioned	Not specified		p. 71
Programmes to improve women's quality of life, support local communities, and preserve indigenous knowledge of plant genetic resources	Proposed	Not specified		p. 71
Protection of traditional resource rights of local people	Proposed	By several By the Philippines	Not specified Productivity, sustainability, equity	p. 58 p. 79-footnote 94

Policy/law	Status	Country	Intended outcomes	Source(s)
Environmental assessment of project impacts on genetic resources	Proposed	By several	Not specified	p. 58
Special resource mobilization and action mechanisms to respond to the effects of drought, war and other catastrophes	Proposed	By several	Not specified	p. 70

3.4 Farmers' rights, access and benefit-sharing in SoW-1

SoW-1 states that there was no harmony at that time between the IU and the CBD concerning farmers' rights (FAO, 1997: 279). The CBD, WTO-TRIPS Agreement and UPOV also lacked harmony regarding access to genetic resources. A number of macro-level data on benefit sharing are given (ibid: 287–297), but little information is provided about benefit sharing and the mechanisms used for this within countries (ibid: 295). However, the report does state that "during the preparatory process [for SoW-1], countries identified the need to develop programmes and projects that allow farmers and communities to participate more fully in the benefits derived from the conservation and use of PGRFA" (ibid: 295), According to some countries this would require development of more appropriate IPR to protect the varieties and knowledge of farmers and rural communities (ibid: 295).

3.5 National programmes in SoW-1

SoW-1 presents an overview of national PGRFA programmes existing in 1997 (Table 2).

The report observes that national programmes "are often not comprehensive in scope or structure" (ibid: 202) and that many programmes do not include *in situ* conservation or utilization (ibid: 202). Clearly, much work remained to be done to make these programmes effective in promoting conservation and use of PGRFA.

TABLE 2
Types of national PGRFA programmes documented in SoW-1

Type of programme	Description	Number of countries
Formal, centralized	One central organizations in charge of PGRFA activities	35
Formal, sectorial	One or more focal points in charge of various field	19
Coordination only	No formal programme but coordination mechanism exists	20
Under development	Type not specified	10

Source: the authors, based on FAO, 1997: 200–201

3.6 Conclusions

SoW-1 highlighted the key issues of recognition, IPR, access and benefit sharing, and called for more attention to be given to them. In Section 4 we present a selected review of policy-making since the publication of SoW-1 in 1997.

4. A REVIEW OF POLICIES IN PRACTICE SINCE SOW-1

Guided by the approximate baseline constructed in Section 2, we now review policies and policy measures. Most, but not all, of the subcategories of measures that can be found in Table 1 appear here. The ones that are missing did not appear in our search efforts, but this does necessarily mean that no advances were made in these subcategories.

4.1 Agricultural policies (trade, tenure, subsidies, credit)

The World Development Report 2008 (World Bank, 2007), which focuses on agriculture, states that recent policy reforms have improved price incentives for agricultural products in developing countries (World Bank, 2007: 116). The report also notes that agriculture is a cause of contention in international trade as well as in domestic debates on prices and subsidies. Reforms are difficult to achieve given strong vested interests (ibid: 96). There is no discussion, however, of whose vested interests are at stake, and in which ways these vested interests influence policies. The report is silent on what further liberalization might mean for the conservation of agricultural biodiversity.

Treweek *et al*. (2006), in a review of trade impacts on biodiversity, conclude that the loss of biodiversity is directly related to agricultural expansion and land-use intensification. The authors provide examples of how trade can negatively impact agriculture and thus biodiversity. These include: 1) pressure to produce more products for export can lead to intensification and increased areas of production; 2) pressure to produce more can increase natural resource use; 3) changes in the prices of agricultural inputs can make it cheaper to use fertilizers, pesticides and other agrochemicals that can damage biodiversity; and 4) pressure to grow crops for export can reduce local food security and indirectly increase pressure on local biodiversity. The authors argue that more rigorous assessments of impacts of policies on biodiversity is required to influence trade negotiations and reduce the risks to both biodiversity and people's livelihoods.

Others who have analysed agricultural trade, price and subsidy policies are less optimistic than the authors of the World Development Report 2008 (World Bank, 2007). Policies that support large-scale monocropping or the export of selected crops have done a lot of damage to agricultural biodiversity (e.g, Altieri and Rojas [1999] about Chile; Rosin [2004] about Brazil, Paraguay, Argentina and Uruguay; Aksoy [2005] about Turkey; Darkoh [2003] on dryland sub-Saharan Africa). Several studies have documented negative impacts of free trade, such as NAFTA, on particular crops and related farming systems.

For example, the Mexican government, as part of its commitment to NAFTA, waived most restrictions on maize imports, resulting in a three-fold increase in maize imports and a spectacular drop in domestic prices. Ackerman *et al*. (2003) state that the loss of a significant share of the domestic maize market in Mexico to the US threatens agrobiodiversity and present preliminary evidence on the extent to which imports and declining prices are reducing the production of native corn varieties. The authors conclude that shifting corn trade under NAFTA is having significant negative environmental effects on both sides of the border and could have even more profound impacts in the future if it results in the loss of significant agrobiodiversity in Mexico.

Wise (2007) analyses the underlying problem: low-cost monoculture maize floods the Mexican market while genetic diversity, a global public good, has little or no economic value. Thus, farmers' efforts to maintain diversity remain largely unrewarded (ibid: 2). The only way to address this situation, according to Wise is to promote new policies that sustain biodiversity.

However, Aksoy (2004), in a study of the effects of agricultural liberalization in Turkey, maintains that there is no inevitable trade-off between cultivating modern varieties and traditional varieties (ibid: 10).

4.2 Promoting agrotourism

Some countries are experimenting with policies to support agrotourism as a mechanism to add value to agrobiodiversity. Agrotourism has the potential to increase awareness about agricultural biodiversity and the farming systems that maintain it, increase communication between farmers and visitors and strengthen the links in value-chains or create new links or chains. However, much has yet to be learned. A recent review of experiences concluded that "In order to market the local attraction successfully, the involvement of other bodies may be necessary—marketing agencies for the development of tourism products and advertising strategies; tourism associations for the distribution of information, to serve as a contact point and to make arrangements with guests; and local and regional planners to ensure that the infrastructure is adapted to tourist needs" (GTZ, 2007a).

4.3 Assigning protected designations

Another way to add value to agricultural biodiversity is through assigning so-called 'protected designations'. The European Union (EU) has been at the forefront of formalizing this type of intervention. In 2006, in order to promote regional and product-specific diversification and provide better protection for distinctive cultural features, the EU introduced a series of protected designations. These include:

- protected geographical indication, a label to highlight a geographic origin of a product, although the processing could take place outside the place of origin;
- protected designation of origin, for products that are also processed in the place of origin; and
- traditional specialty, for products and foodstuffs made from raw materials or by a traditional process (GTZ, 2007b).

Non-European producers or manufacturers are also entitled to register their products under this scheme.

The GTZ review gives two examples from the South. The granting of a seal of origin to mezcal, a liquor made in Mexico from the agave plant,improved both livelihoods and biodiversity conservation. In the case of the Vietnamese rice variety called 'Tam Xoan', the results have been mixed: successful in terms of livelihoods, but detrimental in terms of biodiversity as the focus on 'Tam Xoan' led farmers to neglect or suppress other rice varieties (GTZ. 2007b). Others have reported similar results. For example, Kruijssen *et al*. (2007) reported that the links between local-level efforts and enhanced on-farm management of biodiversity may be indirect, a process taking place through a variety of relationships that differ across contexts.

Recently, some researchers have suggested using protected designations to protect farmer crop varieties, as a means of ensuring collective innovation, continuing access to relevant germplasm for farmers and fair benefit sharing (e.g. Salazar *et al*., 2007).

4.4 Access and benefit sharing (ABS) policies

In June 2004, after a lengthy process of negotiations, the ITPGRFA (IT for short; http://www.planttreaty.org), a legally binding treaty, became effective. The IT is a multilateral system of access, use and benefit-sharing concerning a limited number of crops held in *ex situ* collections. The IT aims to work in tandem with the Global Crop Diversity Trust. The core provisions of the ITPGRFA (Articles 10–12) place the resources of 36 species and genera of crops and 29 genera of forages in a multilateral system and guarantee access to these resources for breeding and research. Germplasm from the multilateral system will be available under Standard Material Transfer Agreements that may include provisions for benefit-sharing in the event of commercialization. The IT also provides for Farmers' Rights. Implicit in this multilateral approach and reminiscent of a protected commons heritage is the idea that open accessibility of crop resources has the potential to return benefits, such as improved crop varieties and scientific collaboration, that are more widely distributed and valuable than financial rewards of a contractual, bilateral approach (Brush, 2007; see also Halewood and Nnadozie, 2008 and Roa-Rodríguez, 2008).

On paper then, the IT offers the following advantages: relatively easy and facilitated access, no bilateral negotiations and payments required, the possibility of financial benefits (through the Benefit-Sharing Fund of the IT) and flexible transfer of technology and knowledge. Some studies have highlighted significant potential benefits for developing countries, but note that national capacity to effectively implement the IT remains weak (e.g., Gauchan and Upadhyay, 2006, for Nepal). Others (e.g., Chaudary, 2002) have argued that the IT should be broadened, because the Treaty exposes uncovered and unprotected plant genetic resources to exploitation, which may thereby threaten food, nutritional and health security. Others have gone even further, calling for all kinds of genetic resources to be included under the Treaty (Halewood and Nnadozie, 2008). Others have observed that the IT still allows for IPRs, which seems to contradict the very nature of the IT. To date, the IT has served as a concrete example of how an international policy instrument based on a multilateral system could operate, albeit on a limited scale. It seems too early yet to draw any sound conclusions about its impact on the larger goals.

Among the first countries that tried to develop and implement holistic ABS policies are Costa Rica, India, Peru, the Philippines and South African. Currently, more than 50 countries are developing ABS or ABS-like policies. The Genetic Resources Policy Initiative (GRPI), led by Bioversity International, is providing technical support to a number of countries around the world engaged in this process, notably Egypt, Zambia, Nepal, Vietnam, and Peru. GRPI also operates at a subregional level, in West and Central Africa, and East Africa. According to recent reports (GRPI, 2007, 2008), the five

years of support provided by GRPI has led to improved policy-making processes and outcomes in the targeted countries, assessed in terms of increased awareness, more coherent conceptual frameworks for policy development, a number of actual policy measures, and the inclusion of genetic resources policy issues in higher education curricula. At the time of finalizing this paper, detailed country reports were not yet available, making it difficult to fully assess the field-level impacts.

A limited number of studies have tried to assess the development and implementation ABS policies, for example, in terms of stakeholder participation (Swiderska, 2001) and the effectiveness of access and benefit sharing (e.g., Richerzhagen and Holm-Mueller, 2005; Miller, 2006). Richerzhagen and Holm-Mueller (2005) conclude that Costa Rica has been relatively successful in developing an ABS policy through a balanced strategy dealing with key impact factors, such as property and IPR, rules and practices of enforcement, and the bargaining among various stakeholders. The study does not specifically address the impact on PGRFA, so no conclusions can be drawn in this regard.

4.5 Landscape-level forms of protection

A variety of regulatory, economic and voluntary measures are being put in place to protect or conserve site or landscape-level agricultural biodiversity. These include protected landscapes (see, for example, Amend *et al*., 2008; Phillips and Stolton, 2008), World Heritage Sites (under the auspices of the UNESCO World Heritage Convention), Biosphere Reserves (also under the auspices of the UNESCO), Globally Important Agricultural Heritage Systems (under the auspices of FAO), Indigenous Bio-Cultural Heritage Sites (see, for example, IIED, 2006; Argumedo, 2008), and the Programme of Work on Protected Areas of the CBD (initiated at COP 7 in 2004).

These kind of policy measures move beyond a 'conventional' protected area approach, which emphasizes a natural world shaped and to be maintained without human influence.

The new landscape conservation policy measures are based on a different perspective, acknowledging that ingenious agricultural systems have shaped novel, resilient landscapes for centuries and in so doing have also sustained high levels of biodiversity. The 'traditional' practices developed to maintain these landscapes also constitute examples of unique cultural heritage.

A recent review of case studies of protected landscapes (Amend *et al*., 2008) offers a succinct synthesis of the emerging merits and challenges of this type of policy intervention. The holistic approach has many merits as it is based on an integrated and dynamic landscape perspective that aims to connect local people's efforts with larger processes and structures. The challenge, according Phillips and Stolton (2008: 19–20) is to support local efforts through a mix of policy and legal mechanisms, such as securing land tenure, critical access to inputs (e.g., water, seeds), farmer-led branding and marketing of local products and the development of value-added products (e.g., through agrotourism), and the stimulation of organic agriculture. Other studies confirm the above findings (e.g., Whittingham, 2007).

4.6 Farm and community level *in situ* conservation

In situ conservation refers to efforts to conserve plants or animals in areas where they developed their distinctive properties, i.e., in the wild or in farmers' fields. *In situ* conservation initiatives of various types have sprung up around the globe, often initiated by non-governmental organizations in cooperation with local communities, and frequently supported by scientists. Formal, government-led *in situ* conservation policies have had a much slower rate of progress, although in some countries, such as Nepal (see case study below), a deliberate attempt has been made recently to support *in situ* efforts more strongly.

Through the variety of *in situ* conservation initiatives, our understanding of the merits and challenges of the approach has considerably increased (see, for example, Brush, 2000; Brookfield *et al*., 2003; Vernooy, 2003a; Jarvis *et al*., 2007). This has helped answer key questions, such as: What do farmers know about the properties and uses of agricultural genetic resources (including conservation and improvement) and how can we ensure that this knowledge is respected, strengthened and used appropriately and fairly for the benefits of local communities and the wider society? What are viable management practices, fair cost- and benefit-sharing mechanisms and useful incentives to strengthen *in situ* conservation and improvement of agricultural genetic resources under conditions of agro-ecological and socio-economic change?

Major research projects studying *in situ* conservation include the global Community Biodiversity Development and Conservation (known as CBDC) project; the Bioversity International-led *In situ* Conservation of Agrobiodiversity On-farm

project; the Li-Bird led *in situ* conservation project in Nepal (see case study below), the global People, Land Management and Environmental Change (PLEC) project; the Seeds of Survival Program in Ethiopia; CIP-UPWARD's efforts concerning sweet potatoes in the Philippines; and the Centre for Biodiversity and Indigenous Knowledge's efforts in Yunnan Province, China. These and other examples are documented in CIP-UPWARD (2003). The Bioversity-led project in particular merits attention as it was one of the first initiatives to develop *in situ* conservation as an integral part of National Plant Genetic Resources Programmes. As such, it aimed to contribute directly to policy formulation and implementation.

Providing economic and regulatory support to local organizations is a key part of *in situ* conservation. Farmers and other interested parties (including government officials) can mobilize local resources (land, water, labour, seeds, funds) to strengthen or build the PGRFA-access, exchange and utilization networks required for effective *in situ* conservation. Mburu and Wale (2006) highlight the importance of policies that support marketing of traditional crops, such as investments in infrastructure and awareness-building campaigns, and the removal of policy disincentives. They caution though that policies based on market access could have a negative effect on biodiversity, as farmers could be tempted to grow only crops with high market value and neglect or discard others altogether (ibid: 627).

Research carried out in north-east Zimbabwe also highlighted that too strong a marketing push can harm household food security (Cromwell and Van Oosterhout, 2000). In this study, the authors also note gender differences in policy impacts, citing the example of investment in seed processing equipment, which would lessen the labour burden on women, who are mostly responsible for this task, and free up more time to cultivate a wider variety of crops (ibid: 231). Pionetti (2005) also draws attention to gender differences in policy impacts. She found that, where commercial crops have almost completely displaced food crops, women lost their prerogative over seeds and hence their main means of ensuring mixed cropping in their fields, with adverse consequences for the land and for plant diversity (ibid: xv–xvi). Unfortunately, in our review, we have not come across many significant gender-informed policies.

4.7 Variety selection, certification, seed production, and participatory plant breeding

Globally, policies that directly support seed systems (e.g., germplasm access, exchange, trade and benefit-sharing policies, certification and marketing policies) or indirectly support them (e.g, extension policy, education policy, credit policy) seem increasingly not to be directed at meeting the needs and interests of small farmers (Hardon, 2004; Pionetti, 2005; Louwaars, 2007).

Visser (2002) argues that the genetic erosion that followed the emergence of scientific plant breeding and the changes in agricultural production are the result of globalization and cannot be attributed to seed policies and legislation in particular. However, seed regulations can have a very important and often negative impact on local seed systems and the genetic diversity they maintain. Also, seed legislation and IPR have a marked effect on both formal and participatory plant breeding programmes and on the number of varieties released to farmers. The recent developments of international regulations on intellectual property and the ongoing biotechnology revolution are likely to aggravate the current trend. Thus, policies on plant genetic resources and agrobiodiversity on the one hand and seed policies on the other hand influence each other and should be closely connected.

Almekinders *et al*. (2007) observe that the public sector in the Andean region produces small volumes of certified seeds (mostly of improved varieties, but not of local cultivars), but lacks the capacity to diffuse this seed to small-scale farmers. Cabero (2007) goes further by stating that the formal seed sector in Bolivia does not take into serious consideration the interests expressed by small farmers, but focuses strictly on seeds of crops of high commercial value, which are generally not grown by small farmers.

Pionetti (2005) stated that "The Indian seed industry is developing at a fast pace in a context of economic liberalisation and poses serious threats to the very existence of farmer-centred seed systems. Therefore, public policies need to be re-oriented towards a) providing support to the informal sector and b) building synergy with localised systems of innovation, production and exchange of seeds…",

At the time of the publication of S0W-1, participatory plant breeding (PPB) was still a new approach, with no or little formal policy recognition and support. However, PPB has since been increasingly recognized as a valuable way to contribute to the sustainable and equitable use of PGRFA (Sthapit and Jarvis, 2003; Vernooy, 2003a; Vernooy and Song, 2004; Humphries *et al*., 2005; Pionetti, 2005; Almekinders and Hardon, 2006; Almekinders *et al*., 2007). In some countries (for example, Bhutan, China [see case study below], Cuba, Ethiopia, Jordan, Laos, Mexico, Nepal, Nicaragua, Peru, the Philippines and Vietnam,), PPB is gaining some policy support. Research currently underway is focusing on key policy and legal aspects of PPB concerning recognition, access and benefit sharing (IDRC and partners, 2007; Vernooy *et al*., 2007).

However, farmers' voices and choices are often still lacking in policy-making processes. PPB practitioners have done much to bring farmers 'on-board,' but very few countries have institutionalized this approach so far.

4.8 Protecting farmers and traditional/indigenous resource rights

Designing and implementing appropriate and effective measures to protect traditional, indigenous or local rights to PGFRA has been a major challenge during the period under review. Perhaps this is because these rights, and the practices they aim to protect, are the very basis of the sustainable use and management of PGFRA. There has been and continues to be a hotly contested debate about these rights, in particular on the international scene, often, however, without the active involvement of the actual rights-holders concerned, i.e., representatives of indigenous farmer communities or organizations (Kuyek, 2002; Vernooy, 2003a; Hardon, 2004). Only a few governments, such as India (Brush, 2007) and Nepal (Sharma, 2004), have tried to design and implement meaningful policy measures that are clearly farmer-centred (instead of plant-breeder-centred).

In Africa, the African Union (AU) developed the African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources (adopted in 1998) to guide national governments in crafting national legislation (Kuyek, 2000). The AU African Model Legislation (sometimes referred to as Law) has been praised for its clear vision and strong commitment to protecting the rights of indigenous and farmer communities (Mushita and Thompson, 2002; Zerbe, 2002, Brush, 2007). As such, governments that are now trying to implement national policies based on the Model Legislation have set the stage for a more equitable distribution of benefits associated with biodiversity and biotechnology. Actual implementation remains a challenge (Zerbe, 2002: 317). While indigenous and farmer communities have an important role to play, they are often excluded from the policy implementation process (Kuyek, 2002: 18).

Mushita and Thompson (2002: 80) note that southern African civil society organizations and governments are working to develop legislation that offers political and legal alternatives to WTO TRIPS. The legislative draft calls for local and national control and could be "a model for other countries to transform the incongruities between TRIPS and the CBD into complementarities."

As a contrast to these regional initiatives, a number of national and local-level policy 'experiments' (formal or less formal) have been underway across the globe that could perhaps pave the way for national level design and implementation. We review a selected number of these experiences in the case studies below.

5. CONCLUSIONS

In the decade since the publication of the SoW-1, a considerable variety of national policies and policy measures have been developed and attempts have been made to put them into practice. Most, if not all, of the subcategories of measures identified in SoW-1, used as an approximate baseline, can nowadays be found in one form or another in one or more countries. This is a positive development. Moreover, many countries have now signed on to international agreements and treaties and are trying to various degrees to 'translate' them into national policies and laws. However, actual development and implementation of integrated and long-term policies are still not very common, and implementation, monitoring and enforcement processes and mechanisms are often deficient. Sound national strategies to build or strengthen the required capacities to accomplish these tasks (e.g., knowledge and skills related to dynamic and participatory policy design, multistakeholder-based policy management, action research, impact monitoring and assessment) are also underdeveloped in many countries.

Our review suggests that policies and laws that recognize more strongly and support more actively the key contributions of rural people to the processes of dynamic biodiversity conservation and improvement, and rural innovation more broadly, are still very much a work in progress. Although at the local level many valuable policy 'experiments' are underway, links between these initiatives and national and international policy-making arenas remain weak.

There are other major challenges. The review offers a mixed picture of the impacts identified of broad agricultural policies, with both negative and positive assessments and/or predictions. A careful assessment of these policies is seriously hampered, however, by either a lack of attention to the impacts on agricultural biodiversity, and PGRFA in particular, or by a lack of a detailed analysis of how policies actually play out in the field.

What the challenges point to in the subcategories of landscape- and farm-level policy measures is the need to develop broad and coherent rural development policies, moving even beyond a landscape-level perspective to a larger area of policy and legal influence. This, of course, is easier said than done.

Access and benefit-sharing (ABS) issues, at the heart of broader genetic resources policies and laws, are still relatively new and there is little guidance at hand to help planning and implementing workable mechanisms. Other environmental issues, such as climate change, draw more attention and funding. Fragmentation and confusion seem common among those contributing to national and international ABS debates. Disputes abound. This suggests that there is scope to become knowledgeable about issues, to exchange experiences and share learning, and to examine what is actually working and what is not under current regulatory systems. The effective and fair implementation of ABS mechanisms supported by appropriate policies and laws will ultimately be the most important assessment factor of any ABS regime. Implementation is largely the responsibility of national governments. Many countries have ratified the CBD, but very few have policy and legal rules, regulations and provisions in place to make the CBD work in practice. Local-level learning examples are key input for the development of national ABS regimes, for their implementation, and for the assessment of regimes in practice.

Participatory plant breeding (PPB) raises many new challenges in terms of the recognition and monetary and non-monetary value of scientific contributions, access to knowledge and genetic resources, the sharing of benefits from collaboration (most visibly expressed in the form of improved or new varieties) and development of enabling conditions that allow joint innovation to bear fruit. PPB also requires considering impacts on biodiversity conservation and, more importantly, on rural livelihoods. It is questionable whether existing policy and legal provisions and mechanisms, such as IPR systems protecting plant breeders' rights or farmers' rights, can adequately address all these issues. There is a need to focus on recognition, protection and benefit sharing, instead of property *per se*.

The local cases studies of indigenous and farmers' rights are concrete attempts to give practical and meaningful content to the protection of traditional rights. The challenge seems to be to integrate the experiences and lessons learned or being learned in national policies. At the heart of the case studies is the struggle to value and support collective action. Supporting collective efforts of local communities and farmers, without falling in the trap of narrowly defined common property remains a major challenge (see also Brush, 2007: 1511–12).

At the heart of policies and laws should be the protection of and support for indigenous or traditional knowledge and knowledge generation and innovation practices. Several studies suggest that existing laws and mechanisms, such as IPR, are unsuitable for protecting indigenous or traditional knowledge because they protect individual rights as opposed to collective rights. These same laws and mechanisms have also a limited utility for new collaborative, multistakeholder innovation processes, such as participatory plant breeding. Indigenous and farmers' organizations and those working with them (NGOs, formal system researchers) have called for alternative systems to recognize and protect traditional knowledge and practices, and new practices that build on traditional knowledge, that are based on the customary laws and practices of communities and that are tailor-made to specific contexts.

At the level of the international policy processes, progress has been slow and few concrete, workable results have been produced. One of the challenges has been to broaden the policy and legal debates beyond the sphere of national and international policy-makers and experts, to include knowledge-holders themselves, i.e., farmers, herders or fishers, in the definition of the questions and in the formulation, testing and assessment of alternative policies. This dimension provides the link with rural innovation systems and dynamics more broadly, and the role science and technology plays in maintaining or revitalizing rural development.

To conclude, we observe that efforts are underway at local, national and international levels to give genetic resources more prominence in policy development. However, there are still very few integrated policies that put sustainable agriculture and rural development at the centre, and that balance economic, social and ecological dimensions (i.e., the criteria of productivity, equity and sustainability).

Genetic resources, biodiversity and agriculture, and related policies, are highly political, as the slow progress made in many of the international bodies indicates. Contested recognition, disputed access and benefit sharing and exclusion of key stakeholders are all common features of the panorama. Who names? Who owns? Who controls? Who benefits? Who shoulders risks? Who takes care or should take care? These are some of the key questions that have been asked and must be dealt with.

The issues at stake concern everybody on earth, but commitments to find a way ahead through cooperation are not all that convincing. The custodians of PGRFA around the world remain largely marginalized from debates.

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BOXES

BOX 1
ABS Case Study: the Philippines

The Philippines was among the first countries to develop a comprehensive ABS policy. In May 1995, then-President Ramos signed Executive Order 247, Pre-scribing guidelines and establishing a regulatory framework for the prospecting of biological and genetic resources, their by-products and derivatives, for scientific and commercial purposes, and for other purposes. The Order covers all forms of bioprospecting and hence of all kinds of biological resources, including PGRFA. The process leading to the Order was initiated and led by a group of concerned scientists who wished to ensure that the exploitation of Filipino biodiversity directly benefits the country. A national consultation process involving academics, NGOs and government agencies was carried out to draft, discuss and agree on the final text. According to Swiderska *et al*. (2001), the consultation process was generally praised for being fairly broad and comprehensive, but it had also some limitations, such as being rather ad hoc and limited to the capital, lacking in consultation with key government officials, and excluding concerns expressed by some organizations.

Andersen (2007) found that no actual or potential benefits were achieved with regard to PGRFA. She offers as possible explanations that the Order was not well known and therefore not followed in practice, and that the regulation was too demanding for the purpose of plant breeding and therefore ignored.

The strategy deployed was successful in designing and putting in place an ABS policy, but in the end was not conducive to an effective and sustained policy implementation process, largely because the views of one crucial stakeholder group (the bioprospectors themselves) were not taken into serious consideration.

BOX 2
Landscape-level Protection Case Study: Peru

The Potato Park is an example of a landscape conservation model that aims at sustainably conserving and using plant genetic resources through building on traditional approaches to agrobiodiversity and landscape conservation. The Potato Park has been proposed as a *sui generis* system for the protection of traditional knowledge systems using a combination of positive and defensive protection tools (Argumedo, 2008: 45; see also, http://www.andes.org.pe).

The concept of the Bio-Cultural Heritage Site is based on the insight that biological resources cannot be separated from knowledge. Crop varieties are the embodiment of knowledge of past and current generations of farmers who have developed, conserved and improved them. Knowledge and resources are used and transmitted together, often through spiritual beliefs and rituals. Thus, areas that are losing biological wealth also loose their spiritual foundations and hence ability to impart knowledge. The maintenance and creation of knowledge depends on the customary use of biological resources and their informal exchange (including of the knowledge about them) between individuals and communities (IIED, 2009).

The Potato Park involves six indigenous communities and the International Potato Center. Based in Cusco, Peru, it recognizes the right of the communities over the unique potato strains that they have developed and grown. The legal agreement setting up the Park ensures that no one else can claim IPR over communities' potatoes or their knowledge about them (see: http://www.ipsnews.net/interna.asp?idnews=27069)

BOX 3
In situ Conservation Case Study: Nepal

The Bioversity-led project on Strengthening the Scientific Basis of *in situ* Conservation of Agricultural Biodiversity On-farm (for details, see Jarvis and Hodgkin [1998] and Jarvis *et al*. [2000]), carried out in nine countries—Burkina Faso, Ethiopia, Hungary, Mexico, Morocco, Nepal, Peru, Turkey and Vietnam—supported rigorous scientific research between researchers and farmers, strengthened institutional linkages within government agencies and between government agencies, research actors and communities, and influenced design and implementation of policy related to agricultural biodiversity (Fajber, 2007). One of the key insights gained from the project was that on-farm conservation is sustainable only when farmers perceive and receive benefits from growing local crops and cultivars. This insight should be a pillar of any policy in support of *in situ* conservation.

The *In situ* Conservation initiative, led in Nepal by the NGO Li-Bird, aimed to develop *in situ* conservation methods and models for crops in Nepal. The project team documented and assessed on-farm diversity of mango, citrus and 'minor crops' (taro, sponge gourd, finger millet), including links between farmers' descriptions and genetic distinctiveness. The team also studied key processes (seed selection, supply, exchange networks) that maintain genetic diversity on farm. The findings led to the development of a number of initiatives to enhance the value of local PGRFA, including community seed banks, market chains for high-value landraces, participatory plant breeding to improve landraces, Community Biodiversity Registers were used to develop capacity at local level to document important genetic resources for developing conservation and development plans, and also for identifying biodiversity at the local level which may be economically viable (Sthapit and Jarvis, 2003; see also Halewood *et al*., 2007).

The project noted, however, that "without political commitment and government support in the form of long-term policy guidelines and a regulatory framework as well as its enforcement by key agencies, it is highly unlikely that conservation efforts will be sustained" (IPGRI, 2006: 50).

Based on this insight and rich field-experiences, the team contributed to the drafting of a national policy on agricultural biodiversity in cooperation with other national and international partners, supported by the Genetic Resources Policy Initiative (GRPI). A national agrobiodiversity committee has been established as a result of the project efforts. Throughout this policy process, new challenges emerged, as could be expected.

As of late 2007 there have been a number of policy and legal developments, and these are outlined below.

Nepal became party to the Convention on Biological Diversity (CBD) in February 2004 and became a member of the WTO in April 2004. The government ratified the ITPGRFA in January 2007.

Nepal has initiated the process of formulating policies and laws to fulfil its commitments under the CBD and ITPGRFA and as a member of WTO. The Ministry of Forest and Soil Conservation has drafted the Access to Genetic Resources and Benefit Sharing (ABS) Bill. An access bill to facilitate implementation of provisions under ITPGRFA, i.e. access to PGRFA under the multilateral system, is under development. Similarly, the Ministry of Agriculture and Cooperatives has drafted the Plant Variety Protection and Farmers' Right (PVPFR) and Industrial Property Bill to comply with TRIPS.

The ABS Bill has recognized farmers' and community rights and made provision for access to genetic resources and sharing of benefits from their use. The PVPFR Bill has recognized farmers as breeders and granted them ownership rights over their local crop varieties. It has also given farmers the right to produce, reproduce, save, reuse, exchange and sell seed in non-branded form. The effectiveness of these provisions will only be confirmed when they are finally implemented. There was dissatisfaction among the various stakeholders for the formulation process not being adequately transparent and inclusive. Various civil society organizations, indigenous people's organizations, interest groups and farmers' organizations are actively reviewing these Bills and are making useful suggestions for improvement.

BOX 4
Participatory Plant Breeding Case Study: China

In China, new plant breeding approaches have been pioneered by a team made up of staff of the Center for Chinese Agricultural Policy (CCAP), the Institute of Crop Science (ICS) and the Guangxi Maize Research Institute (GMRI). The CCAP/ICS/GMRI research team aims to identify technological and institutional options for developing more effective linkages and mutually beneficial partnerships between the formal and farmers' seed systems. The main hypothesis is that only such new institutional development can enhance sustainable crop development and *in situ*/on-farm management of genetic resources. It also aims to strengthen farmers' capacities to maintain agrobiodiversity (Song, 2003).

Since 1999, a major participatory plant breeding (PPB) initiative has been carried out in Guangxi Province in south-west China. This initiative builds on a study by the International Maize and Wheat Improvement Centre (CIMMYT) that found that the systematic separation between the formal and the farmers' seeds systems in the Province resulted in inadequate variety development, poor adoption of formally bred modern varieties, an increasingly narrow genetic base for breeding, and a decrease in biodiversity in farmers' fields.

The PPB team supports farmers' groups through training, linkages and network building, and marketing. Policy-changes aim to bring about conceptual change among formal research and seed systems actors so that they better understand farmers' roles and enable farmers' participation (Vernooy, 2003b).

The research uses a PPB methodology adapted to the local context. Trials in six villages and on-station include both PPB and participatory variety selection experiments. The PPB field trials, in both farmers' fields and on-station, have been functioning successfully as a platform to involve the main stakeholders from both formal and farmers' systems. They have facilitated effective interaction, communication and collaboration among them. Through this platform, the approach and results have reached high-level policy-makers at the provincial and national levels (e.g., of the Ministry of Agriculture), and some inroads into the policy process have been made. Farmers, women in particular, are now speaking up in meetings and expressing their ideas, needs and interests. In a still strongly top-down research and policy environment this represents a major change. The PPB activities have also strengthened the local-level organizational and decision-making capacity of farmers. Groups of (mostly women) farmers have started to define specific support that they would like to receive from the extension service (Vernooy and Song, 2004).

This innovative work in the field is now serving to engage more fully with national policy-makers and influencing key policies and laws. CCAP (2007) notes that "In general, policies and legislation in China lag far behind the rapid development of the country's market economy. In particular, there is a need to protecting farmers' right and interests in the market development process… A brief review of the state's policies and regulations concerning IPRs (and related mechanisms) indicate that China is extremely weak in terms of farmers' right protection. The current IPR regulations are not sufficiently well developed; traditional knowledge protection and farmers' rights in genetic resources, for example, are not included at all." It goes on to state an interest in exploring how farmers can "join together and act collectively in terms of protecting their own resources and knowledge, and how farmer organizations can obtain the formal recognition and political status from the central government, when taking into account their resources and knowledge and related legal issues, such as (the role of) IPRs."

BOX 5
Farmer-centred policy case study: India: *The Protection of Plant Varieties and Farmers' Rights Act*

The Protection of Plant Varieties and Farmers' Rights Act (PPVFR), approved in 2001, relates both to the protection of farmers' varieties of seed via the *sui generis* option outlined in TRIPS, and to other international agreements and treaties, such as the ITPGRFA. The objective of the PPVFR is to establish "an effective system for the protection of plant varieties, the rights of farmers and plant breeders, [and] to encourage the development of new varieties of plants." The PPVFR attempts to strike a balance between the concerns of farmers regarding their ability to save, acquire and sell seed, and the concerns of breeders who desire adequate protection for their research and resultant technologies (Ghose, 2003; Gene Campaign, 2007: 122–134; Dutfield, 2008: 46). According to Gene Campaign (2007), the PPVFR is the first legislation in the world to grant farmers formal rights without jeopardizing their self-reliance. With regards to the sharing of financial resources that either result from the successful commercialization of local knowledge or the transfer of local varieties to state or private parties for breeding, the PPVFR introduces a National Gene Fund. The purpose of the Fund is to collect funds for original holders of the genetic resource. Unfortunately, our review has not been able to determine what the Fund has achieved so far (see also Dutta, 2005).

India has also applied for accession to UPOV. According to Ghose (2003), this move seems to contradict the very essence of the PPVFR, in particular, concerning Farmers' Rights. "Given that the only version of UPOV that potential members can be party to is the 1991 version, and that this version has made 'plant back rights' an exception, it is unlikely that the two can coexist with respect to Farmers' Rights" (Ghose, 2003).

BOX 6
Case studies: local alternatives for the protection of traditional rights

Peru: Inter-Community Agreement for Equitable Benefit-Sharing

The Association for Nature and Sustainable Development (ANDES), a civil society group based in Cusco, Peru, is working on the development of an Inter-Community Agreement for Equitable Benefit-Sharing based on customary laws. This is in response to the threats posed by commercial contracts, monopolistic IPRs and positive law in general and the gaps in national and international law with respect to how indigenous communities should share the benefits equitably. The intercommunity agreement is based on the use of traditional systems of fair and equitable benefit-sharing founded on Andean principles of reciprocity and balance. It also aims to protect traditional knowledge, innovations and practices.

Customary laws are not yet codified and hence respond to dynamic local processes, facilitating the development of flexible instruments that can adapt to the diverse pressures and threats that communities face. However, the agreement also responds to the need to make links with the principles and applicability of positive law, particularly law related to human rights, and maintain interrelations between this and customary law to strengthen the defence of local rights. To achieve this objective the agreement seeks to integrate the signatory communities and their links as a group with the laws which are already developed.

The implementation of the agreement provides the basis for:

- regulating the equitable sharing of benefits generated through the conservation and sustainable use of biocultural resources of the Potato Park, particularly those related to traditional knowledge, genetic resources and landscapes;
- maintaining the free flow of biocultural resources between members of the communities of the Park, as well as between other 'sister' communities. To counter the current tendency to privatize genetic resources and indigenous knowledge, the ICA encourages free exchange of genetic materials amongst communities, on the condition that the innovations and their derivatives are also freely exchanged.

At local level the agreement obliges its parties to create instruments that help communities to continue managing their resources and strengthen systems to maintain equity and sustainability. At international and national levels, the aim is to promote recognition and acceptance of these tools. The main objective is to create a tool for equitable benefit sharing that at the same time protects traditional knowledge systems in their entirety, including their cultural, biological and landscape components. The concept of 'collective biocultural heritage'—which encompasses the material, spiritual and cultural as well as intellectual components of knowledge systems as the basis for protecting and safeguarding traditional knowledge—is fundamental to the Inter-Community Agreement. The implementation of the agreement requires a process of consultations with the population to negotiate and agree its final content.

China and India: Local registers and marketing traditional products

In China, a team led by the Center for Chinese Agricultural Policy (see the China case study earlier in this report) is encouraging and supporting the efforts of farmers from four communities to register, collect and exchange traditional knowledge and genetic resources and to build their own seed banks within the communities. In India, an Eastern Himalayan project is preparing to document traditional rice varieties and establish a rice park similar to the Peruvian potato park. It also plans to prepare plant breeders rights for fodder species, an additional need identified by the communities. The study has found that self-help groups need support for packaging, labelling and marketing their traditional rice varieties as a special brand.

The women members of the self-help groups are also selling an indigenous health product through a local outlet.

The women could add value to the product by getting it certified as organic or 'Fair Trade', given that the product de facto already meets the requirements of these labels and certifications. The project also investigated the possibility of applying for IPR on these traditional products, but the concept of IPR is alien to the local culture. The project therefore plans to explore the possibility of obtaining 'soft IPR', in the form of a collective trademark (as has been done in the Peruvian potato park). They are also looking for a person to help with the process of registering two traditional varieties following the procedure of the Protection for Plant Varieties and Farmers Rights Act.

Panama: Protocol for research on indigenous territories

A research team in Panama is developing a protocol is to regulate investigations on biodiversity in indigenous territories, in order to protect the intellectual property of indigenous peoples and to share in any benefits derived from such investigations. Much of the research to develop the protocol was conducted with the Kuna people, and the results were then discussed with the Embera and Wounaan peoples. The findings were used to develop a general community protocol as a framework for all indigenous peoples in Panama.

The protocol defines procedures for investigators requesting permission to study local biodiversity and requires prior informed consent from key stakeholders (e.g., traditional healers) before being approved by recognized bodies of the indigenous peoples concerned. Community authorities have the right to participate in the formulation of the research agreement and in the research. Associations of traditional doctors also have the right to participate from the formulation, execution and evaluation of the investigation. It also requires that the investigators train indigenous people who are going to participate as assistants and local researchers, and give them the same benefits and renumeration as the other researchers get, according to the role and functions they carry out. The indigenous peoples' authorities have the right to establish what information must be kept confidential. The study must recognize traditional knowledge relating to the use of biodiversity and the intellectual property of indigenous people who participate in the study. The protocol also defines the requirements for benefit sharing, which includes not only economic benefits but all the benefits derived from the research including those concerning intellectual property.

(Source: adapted from IIED, 2009)

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