

It is clear that farmers play a crucial role in both conserving traditional plant varieties and also in crossing traditional varieties bred by public and private institutions to improve and develop entirely new varieties. The distinction is that farmers both preserve and develop.

Given the diversity and complexity of local contexts, methods to sustain, protect and strengthen community based seed systems will have to be diverse, tailored and adaptive.

By valuing specific crops and varieties as healthy food and possibly creating a local value chain and local markets, farmers can be encouraged to add these crops and varieties to their existing portfolio, for improving family nutrition and also for income generation purposes. The use of this diversity will thus ensure that it is not lost.

Community based seed systems are a strategy for restoring, maintaining and rehabilitating agricultural biodiversity. Working in particular with women farmers to cultivate and maintain local crop and varietal diversity could be an opportunity to link agriculture with nutrition, to enhance dietary diversity in rural families and to achieve desired nutritional outcomes and the reduction of malnutrition and hidden hunger. There are a number of Indigenous communities all over the world fighting to protect their inherent rights to practice their traditions and grow their foods and seeds. They seek to draw attention to overlooked food crops in the world so that these communities, their foods and seeds are not forgotten or destroyed by genetic modification. The crops are not yet truly lost; indeed, most are well known in many areas of the world, especially among Indigenous groups, but protecting these varieties is the main focus of international scientists and people trying to protect the food.

Seeds are the first link in the food chain and the repository of life's future evolution. As such, it is our inherent duty and responsibility to protect them on to future generations.

2. The power of Agricultural biodiversity:

How traditional and biodiverse Seeds can provide better food quality healthy diets and better livelihoods for rural communities? *Understanding the power of diversity in agricultural production approaches*

The reasons for maintaining crop genetic diversity in the form of traditional varieties include: stability and risk avoidance; resilience and adaptation and adaptability to variable, difficult or marginal environments and to environmental change; provision of key ecosystem services such as pest and disease control, pollinator diversity, below ground diversity and soil health; socio-economic contributions such as meeting changing market demands, coping with distance to market and adult labour availability; dietary or nutritional value and meeting with cultural and religious needs. Often, a number of these reasons operate together and result in cultivation of traditional varieties in a significant part of a production system in combination with modern varieties.

Many farmers continually seeks to adapt their materials and access new materials that will improve their production within frameworks of risk avoidance and securing stable production. Yet traditional varieties often continue to provide a culturally desirable, risk-avoiding basis for production.

Traditional production systems often contain very large numbers of varieties of major crops. It is not unknown for Andean farmers to plant over 60 varieties of potato¹.

Seed availability can best be understood in terms of the operation of more or less complex seed systems – social institutions that mediate seed exchange and access.

Traditional, informal seed systems are not perfect. They may need improvements in terms of the phytosanitary quality of the seeds, and seed storage from season to season, or for longer periods, may

¹ Brush, 1995.

present challenges. This does not mean they should be abandoned, but rather improved from that perspective while maintaining the advantages mentioned above.

The work of the last few decades has led to the development of a number of tested practices that support the maintenance of traditional varieties and minor crops and contribute to what is also called dynamic conservation. General frameworks that can guide interventions have been developed such as the Community Biodiversity Management (CBM) approach.

National policies, programs and regulations play a key role in supporting or (more usually) limiting the ability of farmers to access or maintain their traditional varieties.

Policies related to the access to diversity of seeds:

The policy environment regarding agricultural biodiversity in general and PGRFA in particular is complex.

Until the early 1980s there were no specific policies at either international or national levels outside of plant variety protection legislation which affected only commercially bred varieties. But with the increasing privatization of PGRFA through plant variety protection laws, the imbalance between the breeder's rights and the rights of the custodians of the PGRFA—i.e., the farmers—increased significantly, and many developing countries wanted to rectify this imbalance.

This led to the negotiation and adoption in 1992 of the Convention on Biological Diversity (CBD), which recognizes the sovereign rights of states over the genetic resources (GR) within their boundaries, the need obtain prior informed consent to access GR and the sharing of benefits on mutually agreed upon terms. The importance and special nature of plant genetic resources for food and agriculture were recognized, which led to the negotiation of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA or Plant Treaty) and its adoption in 2001, which attempts to recreate a “commons” for PGRFA of the most important crops through the multilateral system of access and benefit sharing, and recognizes both breeder's rights and farmers rights.

At the international level, both the CBD and the Plant Treaty provide a supportive policy environment for the conservation and sustainable use of PGRFA and foresee the fair and equitable sharing of benefits arising from their use. Of particular relevance are the farmers' rights, (Article 9 of the Plant Treaty. See: <http://www.planttreaty.org/content/texts-treaty-official-versions>) specifically:

- (1) the right to protect traditional knowledge relevant to plant genetic resources for food and agriculture;
- (2) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture;
- (3) the right to participate in making decisions at the national level on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture; and
- (4) the right to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate.

Nevertheless, while the Plant Treaty is a legally binding agreement in international law, the responsibility for realizing farmers' rights, as they relate to plant genetic resources for food and agriculture, rests with national governments. So far, very few countries have implemented national legislation to implement farmers' rights.

At the national and regional levels, access to seeds is mainly affected by seed legislation, aiming at ensuring the agronomic value and the quality of seeds being sold, and by intellectual property protection legislation (plant breeder rights or patents) aimed at supporting crop improvement by granting breeders the exclusive right to exploit, for a number of years, the plant varieties they develop. Both types of legislation and related policies support a formal seed system for commercial varieties. These policies and legislation mostly have negative consequences for the informal seed systems which are the main source of seed for smallholder farmers in developing countries and for

farmers globally who grow traditional or heirloom varieties. Indeed, the varieties grown by these farmers are genetically diverse and do not satisfy the “uniformity” and “stability” requirements of both types of legislation. The consequence is that farmers are either forbidden to sell their seed or are allowed only to sell small quantities. Other policies that can represent obstacles to the continued use of diverse seed include subsidies for improved commercial seed, strict prescription by extension services and governmental regulations about which varieties a farmer should or can grow. Nonetheless, it should be noted that appropriate policies can also promote access to diversity through support to farmer maintained varieties, community seed banks, participatory plant breeding and seed diversity fairs. Such support may be through national legislation, regulations, guidelines, national plans, financial support, or decisions that favor the use of greater diversity by local, regional or national authorities. At the national level, the full implementation of farmers’ rights as enshrined in the Plant Treaty is perhaps the single most important step. Different countries have also taken steps to support community seed banks (e.g., Nepal, Brazil, and Mexico) embedding them into their conservation system. In the state of Paraiba in Brazil a special program allows the state government to buy seeds of local varieties and distribute them among farmers (see case studies cited in Vernooy et al., 2015; Jarvis et al., 2016 Chapter 10).

3. *Barriers and challenges:*

There are significant barriers to the deployment of increased seed diversity in production systems and a number of powerful drivers have contributed to a reduction in the diversity in production systems.

Table 1 below lists drivers affecting biodiversity that were identified in country reports prepared for the first Report on the State of the World’s Biodiversity for Food and Agriculture (SoWBFA) prepared for the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). These drivers also affect the continuing availability of seed diversity, although some have a greater effect than others. Those of particular importance to seed diversity include changes in land use, pests and diseases, markets and trade, policies, movement from rural areas to cities, changes in economic, socio-political and cultural factors, and scientific and technical advances in the form of new varieties. This last driver has been supported by the increasing privatization of plant breeding and the large investments of multinational companies in the development of a global, vertically integrated seed industry.

Table 1. Drivers of change of biodiversity for food and agriculture

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|---|
| Changes in land / water use/management |
| Pollution and external inputs |
| Over-exploitation and over-harvesting |
| Climate change |
| Natural disasters |
| Pests, diseases, and alien invasive species |
| Markets, trade, and the private sector |
| Policies |
| Population growth and urbanization |
| Changing economic, socio-political, and cultural factors |
| Advances and innovations in science and technology |

How do these drivers influence seed diversity at landscape or community levels? Bioversity International reviewed over 500 papers on the maintenance of traditional varieties and developed a framework to identify the main constraints to the continuing use of such varieties. They identified **four main limitations**:

1. Local crop genetic diversity does not exist or is not in sufficient quantities within the production system.
2. Local crop genetic diversity exists but is not accessible to farmers.
3. Farmers do not value and use local crop genetic resources.
4. Farmers do not benefit from the use of local crop genetic diversity.

The nature and role of local organizations varies. The Oxfam Novib and Hivos joint program places emphasis on Farmer Field Schools as a continuing way to bring farmers together in a community to share knowledge and address challenges. Both CBOs and FFSs support the introduction of new knowledge and materials, and the absence of effective local organizations is clearly an important constraint. **Community seed banks may need external funding for their establishment, but the different approaches that have been developed involve operating practices aimed at ensuring a rapid move towards self-sufficiency in their maintenance of operations.** Even so, participating farmers often remain linked to NGOs and national agricultural agencies which continue to provide advice and are a potential source of new materials of interest to them. (For a review of practices and experiences, see Vernooij et al., 2015).

The analysis of barriers and challenges emphasizes the importance of a community-level, participatory, farmer driven approach, and the need for policy and institutional frameworks that can support these, providing partnerships, benefits of scale, access to new knowledge and varieties that complement traditional knowledge, experience and materials. The analysis also emphasizes the importance of combining agricultural and biological aspects with social and economic perspectives and recognizing the potentially constraining effects of national and regional policies.

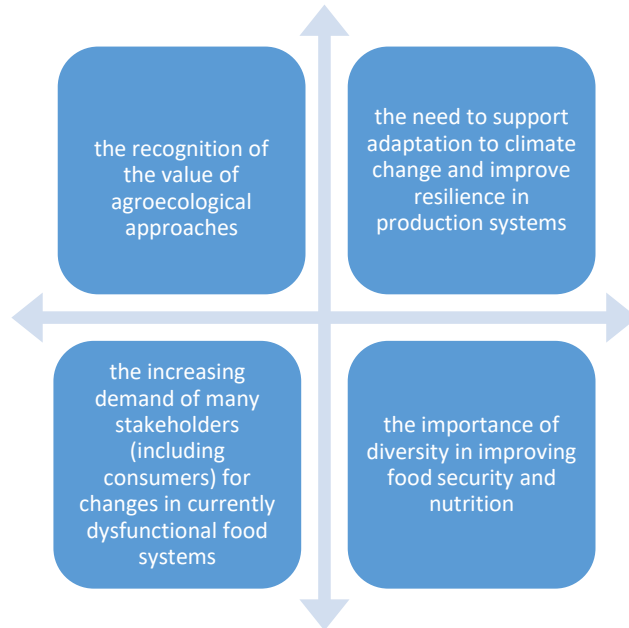
4. Strategic Opportunities:



While recent decades have revealed a continuing trend towards industrial agriculture based on simplified production systems and increasing monocultures, the value and benefits of diversity-rich production systems have also been increasingly recognized. There are good reasons to suggest that significant opportunities now exist to increase support for actions that strengthen the maintenance and use of diversity on farms.

The most important are shown as follows:

Table 2. *Main opportunities*



Underpinning these is the recognition of the need to develop more sustainable approaches to agricultural production.

4.1. Opportunities for funders:



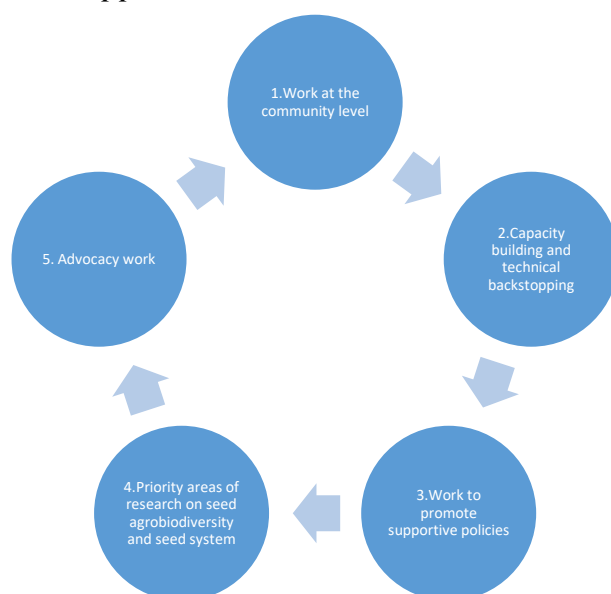
There are opportunities that could be seized to make a leap forward in scaling up and scaling out on-farm management of diversity and securing the access to the necessary seed diversity by farmers. These opportunities could be made to converge in a major international effort to incorporate diverse, thriving, agroecology-based systems into the mainstream by developing a broad strategy including the elements described below and supported by a group of funders' coordinating their efforts. **Each funder could support activities in line with the broad strategy while focusing on those most in line with their mandates and priorities.**

In each area, one important need is to create a stronger link between agro-ecology and agrobiodiversity-based approaches. This includes collaborative knowledge generation, the development of practices which build on experiences from both areas, policy links and collaboration on building capacity and advocacy.

From the consultations and analysis of the current situation, a broad consensus emerged about the areas that need support.

These have been grouped into five categories:

Table 3. Areas where support is needed



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4.2. *Assessment of donor’s investment in the area of Plant Genetic Resources in the last five years:*

| Principal donors interested to invest on Plant Genetic Resources in the last Five years | Channels of investment |
|---|--|
| Major donors | |
| Canada | NGOs based in their country: USC for Canada |
| Norway | NGOs based in their country: Norwegian Development Fund for Norway |
| Switzerland | Bioversity International, Research Institute of Organic Agriculture (FiBL), the Berne Convention, the African Centre for Biodiversity and BioVision |
| Other donors (current past and current situation) | |
| Belgium (Belgian Development Cooperation) | -Recently shifted the emphasis of its support in Central and West Africa away from formal, commercial seed systems to informal seed systems, farmer field schools and agroecology. |
| Germany, through GTZ (now GIZ) | -Has invested significantly in seed systems and agrobiodiversity in the past, but this is no longer a priority in the German development cooperation agenda. |
| Foundations: | |

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| <ul style="list-style-type: none"> -The Christensen Fund, -Agropolis Foundation, -the Kalliopeia Foundation, -the New Field Foundation, -the Swift Foundation -The Tudor Trust. ---The McKnight Foundation, -The Heinrich Böll Foundation, -Fondation Daniel & Nina Carasso | <p>A number of donors have been supporting projects on relevant areas, either directly or through general support to community based organizations.</p> |
| <p>Other Private Foundations</p> | |
| | <p>Among other private foundations, the topics of informal seed systems, on-farm management of agrobiodiversity and agroecology have also gained greater interest in recent years</p> |
| <ul style="list-style-type: none"> -The Fondation Charles Léopold May pour le Progrès de l'Homme | <p>- is supporting significant informal seed system work in France.</p> |
| <ul style="list-style-type: none"> -the W. Garfield Weston Foundation | <p>-Is supporting work in Canada through USC Canada.</p> |
| <ul style="list-style-type: none"> -A German foundation call Welthungerhilfe (WHH) | <p>-Is also supporting work in Cuba through USC.</p> |
| <p>Additional Foundations with modest support</p> | <p>-Directly or indirectly through support to NGOs.</p> |
| <ul style="list-style-type: none"> -Bread for All, Switzerland; -Brot für die Welt, Germany; -Lillian Goldman Charitable Trust, United States; -CS Fund, U.S.; -Misereor/KZE, Germany; -Swissaid, Switzerland; -La Fondation Léa Nature, France; -Fondation de France, France; -Fondation Un Monde par Tous, France; -La Fondation Terra Symbiosis, France; -Fondation Nature et Découvertes, France; -Petzl Foundation, France; and -The Salvia Foundation, Switzerland. | |
| <p>Global mechanisms</p> | |

| | |
|---|---|
| ITPGRFA BSF | Includes on-farm conservation of PGRFA; a number of projects have been funded since its creation. |
| UNEP-GEF program | Investments in agrobiodiversity conservation and the GEF 6 Strategy for instance included a new program called "Securing Agriculture's Future: Sustainable Use of Plant and Animal Genetic Resources," which aimed to support in situ conservation by local communities. It focused on farmer management, support for livelihoods and food, and nutrition security through community based management of crop and animal diversity (GEF-6 Programming Document paras. 71-72). |
| UNDP-GEF small grants program | - The UNDP-GEF small grants program has consulted with countries in Latin America which have expressed a strong interest in applying for small grants to support work on on-farm management of agrobiodiversity and implementation of farmers' rights. Similar consultations took place in Asia and Africa. |
| Donors from the Global South | - Have started to invest in programs that support farmer managed seed systems and on-farm management of agrobiodiversity. |
| Asia: India, Nepal, and Sri Lanka. | |
| Africa: Ethiopia, South Africa and Zimbabwe. | |
| Latin America: Brazil and Peru. | |

4.2. Funding streams

Funding for informal seed systems and on-farm management of agrobiodiversity has so far been limited and very dispersed when compared with investments in ex situ conservation. It involves many isolated actors, including NGOs, foundations, international organizations and bilateral donors. In recent years, this area of work has been receiving more attention, and both the **Commission on Genetic Resources for Food and Agriculture** and the governing body of the **International Treaty on Plant Genetic Resources for Food and Agriculture** have asked for more investment to be made in this area; however, these recommendations have not yet been translated into significant investments. In general, the main donors in this area have funded a mix of activities which includes action research, support for farmer managed systems and advocacy. Early **development aid donors** focused more on research and community based support, while NGOs included support for advocacy.