

# Supporting Agricultural Biodiversity Conservation: Key Questions



**S**ustainable use of biological resources is a global concern. Distinct types and varieties of plants, animals and micro-organisms are vital for food and health security. Diverse biological ecosystems provide essential – but often poorly appreciated – environmental services that make life possible. Variety among species is crucial for agricultural, pharmaceutical, and technological development.

In particular, Chapter 14 of Agenda 21 — the program that emerged from the 1992 United Nations Conference on Environment and Development (UNCED, also known as Earth Summit) — deals with “the conservation and sustainable utilization of plant genetic resources for food and sustainable agriculture.” To understand the meaning of conservation and sustainable use (and to put both in practice), we need to look at the interplay of biological and agro-ecological forces, and socio-economic, policy, and legal forces.



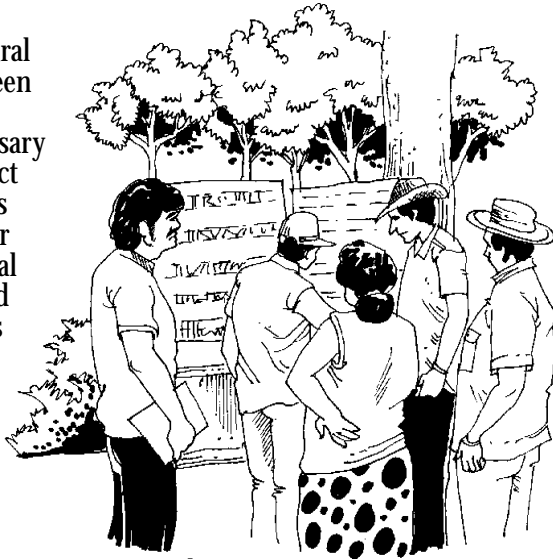
This paper identifies questions dealing with crop conservation and improvement, with participation, and with access, ownership and compensation. Examples of research projects supported by the International Development Research Centre (IDRC) illustrate how these questions are dealt with in practice.

## Why Diversity Matters

### Biological and Ecological Resilience and Durability

From an ecological perspective, agricultural biodiversity can be seen as a function of an agroecosystem necessary to support and protect human lives as well as provide the inputs for evolution. Agricultural biodiversity is a broad concept that includes various biodiversity components from agroecosystems to crop varieties to genes in plant and animal species.

Stakeholders in agricultural biodiversity assign several values to the concept including ecological, economic, socio-cultural, and political ones. It is important to note that these values are not set in stone, time nor space. Loss of agricultural biodiversity leads to a reduced capacity of ecosystems to continue producing ecological services and renewable natural resources. It also lessens the capacity of the system to deal with change (i.e., decreased resilience), which directly affect farmers' management of the system.



## Cultural Diversity, Local Knowledge and Flexible Social Organizations

The loss of agricultural biodiversity often, if not always, results in reduced spaces to create and recreate farmer knowledge and experimentation — constituting elements of cultural and social diversity — essential to agricultural biodiversity conservation, evolution and improvement. Hence, the key role of farmers, farmers' knowledge and social organization in managing and sustaining biodiversity must be recognized including their critical role in providing food and livelihood security.

## Adaptive, Decentralized, Dynamic Research

Understanding and supporting biological/ecological diversity and its cultural/social expressions, requires a research approach capable of “reflecting” or “absorbing” the key features of its subject. Thus, research concepts, their methodologies and organizations should be adaptive (flexible), locally grounded (decentralized, open to explore, assess and respect expressions of local knowledge) and dynamic (participatory).

## Key Questions to Understand Use and Conservation of Agricultural Biodiversity

### Questions Dealing with (*in situ*) Crop Conservation, and with Crop Improvement

- What is women and men farmers' knowledge about the properties and uses of agricultural genetic resources, and how can ways be developed to guarantee that this knowledge be respected and used appropriately and fairly for the benefit of local communities and the wider society?



- What are viable practices, mechanisms or incentives to strengthen *in situ* conservation under conditions of agro-ecological and socio-economic change?
- How to encourage new participatory paradigms in genetic improvement, which balance diversity with productivity; develop approaches for *in-situ* conservation and improve linkages between formal sector breeding and farmer breeding?

### Questions Dealing with Participation

- How could we stimulate a more meaningful participation of agricultural biodiversity users in research, development and policy-making, particularly by men and women farmers in marginalized agro-ecosystem?
- What are the enabling political and legal conditions or changes necessary to make this happen?

### Questions Dealing with Access, Ownership and Compensation

- What kind of policy changes (regulations, incentives, laws) are required to achieve more equitable access by (marginalized) women and men farmers to information and resources pertaining to the conservation and improvement of agricultural genetic resources?
- How do Intellectual Property Rights (IPRs) on living organisms impact on farmers' experimentation and innovation, and on the fair access to and distribution of the benefits derived from these processes?
- How can, prior to actual interventions, fair access and compensation arrangements be worked out between stakeholders in order to conserve or improve agricultural genetic resources?

The following are some examples of the agricultural biodiversity research projects that address one or more of the key questions:

#### **Understanding farmers' knowledge and practices: maintaining sorghum landrace diversity in Ethiopia**

This study, first done in 1992-1993 and further expanded in 2000-2001, documented the vast taxonomical knowledge of Ethiopian farmers. It confirmed their roles in the maintenance of sorghum landrace diversity in the north Shewa and south Welo regions, as a means to reduce the risk of homogenization. In addition, the study documented farmers' knowledge about storage conditions and duration of sorghum landraces and the action to be taken to reduce losses due to pests. The research focused on:

- the dynamics and trends over time and in space of crop diversity;
- farmers' selection criteria at field, community and agroecosystem level (from a gender perspective); and
- the biotic, abiotic and societal variables that influence diversity use and management.

#### **Stimulating more meaningful participation: participatory barley improvement in North Africa and the Middle East**

ICARDA pioneered a research effort in Morocco, Syria and Tunisia, experimenting with a novel breeding approach for barley improvement in the low potential, marginal rainfall environments of these three countries. The project brought together breeders, women and men farmers to work side by side, to learn from each other, and to join efforts aimed at fulfilling the needs of poor farmers living and working under harsh conditions.

#### **Major Findings and Results**

- Selections on stations, even when made by farmers, are very different from those made in farmers' fields as a consequence of large Genotype x Environment interactions.
- Farmers use selection criteria not previously acknowledged nor used by national breeding programs.
- It is important to identify women's selection criteria (and see when and why they differ from men's criteria)
- Farmers warmly welcome the possibility to select among a large number of lines; some farmers have started to increase selected seed varieties.
- Farmer participation can be introduced successfully in reluctant research environments.
- Breeders working together with farmers have adopted new ideas and attitudes; they became supporters of a participatory approach that has been integrated in the national breeding program.



## References:

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