

Agricultural Biodiversity: Farmers Sustaining the Web of Life



Agricultural biodiversity is a product of human intervention in ecosystems as well as the principal input into agricultural production. It embraces the living matter that produces food and other farm products, supports production, and shapes agricultural landscapes. The variety of tastes, textures, and colors in food is a product of agricultural biodiversity. This represents the result of the interaction of indigenous peoples and women and men smallholder farmers, herders and artisanal fisherfolk with other species. The selection and management of these for local nutritional, social and economic needs has produced the agricultural biodiversity on which humanity depends. Food production systems need to be rooted in sustaining agricultural biodiversity so that farmers can continue to provide food and livelihoods and maintain life on Earth.

Strength in Diversity

Unprecedented changes in society, agricultural biodiversity population, and the environment also provide some security against future adversity (e.g., climate change, war, industrial developments, biotechnological calamities or ecosystem collapse). There is greater strength in diversity than in susceptible uniformity.



Furthermore, diversity in varieties, breeds and species ensure continuous agricultural production. Whatever the threats, hidden in the genetic code of today's crop plants and livestock are many invisible traits that may become useful in confronting future challenges.

Farmers' Agricultural Biodiversity Threatened



Agricultural biodiversity has been developed through the application of the knowledge and skills of farmers, herders and fisherfolk in a wide range of agroecosystems. The knowledge and agricultural biodiversity it has produced is key to global food security. While it originates in specific farming communities, it has been shared widely and is considered by many to be part of the much-threatened global commons.

The issue of reduced access and use of biodiversity by farmers and local communities is the focus of the debate between resource users, governments and inter-governmental bodies such as the World Intellectual Property Organizations (WIPO), Convention on Biological Diversity (CBD), World Trade Organization (WTO), Food and Agriculture Organization (FAO) and the Consultative Group on International Agricultural Research (CGIAR).

The loss of forest cover, coastal wetlands and other 'wild' uncultivated areas also lead to losses of agricultural biodiversity: the 'wild' relatives of crop plants and livestock breeds; the 'wild' foods that are essential for food provision; and the species that support production (i.e., predators, pollinators and soil biota.)


Agricultural biodiversity is also threatened by changes in production systems. More than 90 per cent of crop varieties have been lost from farmers' fields in the past century. Animal breeds are disappearing at the rate of 5 per cent per year. In place of the diversity of farmers' varieties, consumers are being provided with more homogeneous and uniform food commodities produced from a limited range of varieties developed and owned by plant breeding companies and biotechnology corporations. One potential risk is the spread of genetically modified crops that may contaminate large areas of farmland currently planted to local varieties that are genetically diverse. These farmlands have plants of questionable genetic integrity, containing genes that are owned by global corporations.

Maintaining and Developing Agricultural Biodiversity

Civil Society and farmers' groups around the world implement campaigns to keep agricultural biodiversity, its vital genetic resources and their associated knowledge in the public domain. This means keeping these resources free of patents and plant breeders' rights, and away from the control of genetic engineers, so that



farmers and other food producers can continue to have access to these resources. In this way, these resources can play an important role in providing food security and environmental integrity.



Agricultural biodiversity is the basis of the world's food supply, farm livelihoods and landscapes; and is humanity's insurance against future threats to food and farming.

Up until the 1980s, the official response to agricultural biodiversity conservation was through the collection of seed samples from farmers' fields and their storage in national and international 'gene banks.' More than half a million samples are stored in the gene banks of the International Agricultural Research Centres. The National collection in the Vavilov Institute in St Petersburg, Russian Federation maintains over 330,000

accessions of cultivated plants and their wild relatives. This response is now recognized to be a limited but important security back-up strategy so long as these seed samples can be isolated from genetic contamination such as genetically modified organisms (GMOs).

The on-farm conservation of agricultural biodiversity and on-going development of varieties and breeds by farmers and resource users are being prioritized and supported by UN resolutions and programs. In particular, the FAO International Seed Treaty -- the International Treaty on Plant Genetic Resources for Food and Agriculture (IT-PGRFA) -- provides a governance framework for crop biodiversity. This strategy is also promoted by Civil Society Organizations (CSOs), which support many initiatives rooted in local communities. Likewise, CSOs popularize and protect diversity in more affluent countries whose citizens wish to safeguard the diversity of local animal breeds and vegetable varieties.

Seed Fairs in Kenya

Communities organize many local Seed Fairs each harvest time. In Tharaka, Kenya, 46 farmers came together and displayed 206 different varieties of local crops including cowpeas, millet, sorghum, and squash. These events foster the exchange of seeds and related information among farmers and maintain local agricultural biodiversity. These show the richness and availability of local crop varieties. (Ref: ITDG East Africa)



Community Seed Banks in Paraíba, Brazil

In Paraíba, a state in the northeastern region of Brazil, diversity is synonymous with food security. However, diversity suffers from long periods of drought reducing farmers' access to seeds. In order to address problems of poor rains and the replacement of traditional varieties by modern commercial varieties, community seed banks have been built. These have increased farmers' autonomy through the provision of seeds and conservation of agricultural biodiversity. (Ref: AS/PTA, Brazil)

Domestic Animal Diversity - The Re-Introduction of Polish Red Cattle

Animals with supposedly higher genetic potential have replaced local breeds in Poland. However, these turned out to be unsuitable for local conditions. To remedy this trend, a local non-government organization (NGO) working with the community of Zegocina has revitalized and increased the population of Polish Red Cattle. This is a traditional local

cattle breed that is valued because of its high productivity and resistance to various diseases. Likewise, this breed is very productive in hilly and mountainous regions where, using controlled grazing, slopes are protected against erosion. As a result, Zegocina has retained its beautiful landscape that attracts many visitors, supporting agro-tourism development. (Ref: Heifer International, Poland)

Preserving our Future Food Supplies



In order to survive, humankind needs to ensure that the genes of crops, livestock, other food species, and the agricultural biodiversity, of which they are a part, should be continuously under development in farmers' fields. Backup storage (frozen in time in international gene and semen banks and free of the threat

of patenting), can store a limited slice of the diversity but this must be kept in the public domain so that it is accessible to all farmers and growers. However, vigilance is required to safeguard these resources from contamination by GMOs, especially in the centers of origin and diversity of the world's crops and livestock.

The following provide opportunities and incentives for a more secure food future:

- farmers' actions on conserving and using diversity;
- publicly-funded genebanks;
- the FAO International Treaty on Plant Genetic Resources for Food and Agriculture; and
- consumer choice for diversity in their food and farm production.

With farmers' actions and Civil Society and official support, through a virtuous circle of consumers supporting farmers to produce the diversity of foods, nutrients, textures and tastes that consumers want and need, agricultural biodiversity will thrive.

References:

FAO. 1999. Sustaining Agricultural Biodiversity and Agro-Ecosystem Functions: Opportunities, Incentives and Approaches for the Conservation and Sustainable Use of Agricultural Biodiversity in Agro-Ecosystems and Production Systems.

ITDG, ETC Group and GRAIN. 2002. Sustaining Agricultural Biodiversity and the Integrity and Free Flow of Genetic Resources for Food and Agriculture.

Mulvany, P. 1996. Dynamic Diversity. Paper presented during the 5th Global Biodiversity Forum, Buenos Aires.

For further information on agricultural biodiversity issues, see:

- The UK agricultural biodiversity coalition (UKabc) <www.ukabc.org>
- CGIAR agricultural biodiversity research centre <www.cgiar.org/ipgri>

Key links to organizations and papers on agricultural biodiversity:
<<http://dmoz.org/Science/Environment/Biodiversity/Agricultural/>>

ITDG (Intermediate Technology Development Group) <www.itdg.org> and Farmers' World Network <www.fwn.org.uk> collaborated on the original work for this paper.

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Sourcebook produced by CIP-UPWARD,
in partnership with GTZ GmbH, IDRC of
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