Seeds for Needs Policy brief no.1

Adaptation to Climate Change

Innovative tools to match seeds to the needs of women farmers in Ethiopia

As climate change continues to drastically affect food security around the world, many farmers are in need of new crops and crop varieties that can be grown in the changed environment of their farms. Adaptation options to climate change already exist in genebanks and other farmers' fields in the form of germplasm and seeds, but the challenge is to identify them and then disseminate them in the right environments and under the right conditions, and in ways that satisfy the needs of farmers and increase the resilience of the productive systems.

There is a general consensus among farmers interviewed in household survey and focus group discussion that there is an increased temperature and decreased rainfall; in addition, rainfall is also perceived to be more erratic and the rainy season shorter, thus there is a decline in the length of growing period. This is affecting the productivity of two major cereals in smallholder farmers' production system: barley and durum wheat. One possible answer to this is to provide farmers with varieties that are better adapted to the existing climatic conditions. Ethiopia is endowed with a large amount of the needed diversity conserved in the national gene bank at the Institute of Biodiversity Conservation (IBC).

In collaboration with IBC, this project tried to address the following questions:

- How can the thousands of accessions conserved in the gene bank be screened in order to identify those that are better adapted to the different climatic conditions?
- Are these varieties really adapted to the environment they are supposed be useful for?
- Do they have the traits that make them not only adapted to climate change but also to farmers' needs? This requires a better understanding of the socio-economic context of the different sites.
- If the answer is yes to all of above, how they can be made available to farmers?

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Bioversity International

Photo: Farmers participating in field trials, Ethiopia
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The project

Seeds for Needs, a global initiative led by Bioversity International, tried to provide solutions to those questions using modern Geographic Information Systems (GIS) technology to identify gene bank accessions that have the higher potential to be adapted to current and future climatic conditions.
The selected accessions were tested in the field to better characterize them under the present conditions. Women farmers were asked to evaluate the accessions to select those which better meets their needs. Researchers developed a mechanism based on community genebanks to ensure availability of the preferred accessions to farmers, and raised awareness among local farmers and decision makers about the risks posed by climate change, sharing information about how the use of better-adapted varieties can support vulnerable farmers to protect livelihoods and ensure food security.

Major results

- The creation of an atlas with the accessions suitability for present and future conditions
- Characterization of the accessions to different climatic conditions in two subsequent years
- Understanding of the socio-economic context of the sites and farmers' criteria to select accessions
- Agreement signed with community gene banks managers for making accessions available to farmers.

Policy recommendations

1. The need to develop and adaptation strategy for major crops based on local genetic diversity conserved either on farm or in the gene bank. The tested material can be used as the basis of innovative breeding programs.
2. The need to provide farmers with more adapted accessions to manage the existing risks posed by climate change.

The project was implemented in the sites of K'ok'a (1,604 m asl), Ejere (2,221 m asl)and Ch'efe Donsa (2,421 m asl). The three sites were selected because they are based at different altitudes and therefore they represent different

agro ecological zones. However, in the future they can transform one into the other because of climate change, thus Ch'efe Donsa will become progressively more similar to Ejere and Ejere more similar to K'ok'a.

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