ISSD TIGRAY Brief

ISSD Ethiopia

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Women do important seed keeping in Ethiopia

Mekelle University

Post-Harvest Loss Reduction

Kansas State University

NMBU

IDRC CRDI

Vision Statement of ISSD Ethiopia

Through a vibrant and pluralistic seed sector, quality seed of superior varieties are available and affordable to a large number of farmers; thereby contributing to agriculture for food security and economic development in Ethiopia.

Objective of ISSD Ethiopia

To strengthen the development of a vibrant, commercial and pluralistic seed sector in Ethiopia.

Women are key as seed keepers in Ethiopia

Women constitute half of the potential innovation population pool in the world. Development planners and formal researchers have long overlooked the current and past local innovations by women, while some of their external interventions are posing major risks to women's livelihoods and their roles in farming. Women have much to offer in agricultural innovation and development, and the efficiency of external investments will depend greatly on the extent to which the planning processes learn from women's innovation.

Knowledge in varietal/seed selection

Female and male farmers prefer different crops or varieties because of specific characteristics of each crop or variety. Income, food security, productivity, consumption habits, cultural identity and medicinal values are some of the factors for their seed selection. Rural farming households in Ethiopia commonly adhere to certain social codes of behaviour concerning decision-making about seed use and exchange. These codes define the gender roles and are often expressed through sayings, songs and prayers. One social code (saying) about the role of women in seed selection and related decision-making practices is, for example, "Don't farm if you don't have a wife; don't accuse if there is no judge." According to this saying, the wife's role in seed-related decision-making practices is not a choice rather a necessity.

This is because women are knowledgeable about seed and are responsible for handling seed including the day-to-day monitoring for seed maintenance in the home, while men are usually responsible for non-domestic activities such as ploughing. If men want to make decisions on seed issues, their wives have the critical say in terms of seed selection, saving, renewal or replacement, exchange and site selection for specific types of seed. Seed issues are endowed with the same importance as pregnancy and childbirth.

Another popular saying is: "He who gives seed saves you and he who doesn't give seed destroys you". This underlines the importance of seed exchange among small-scale farmers in northern Ethiopia. Seed exchange is the bloodline of most seed-insecure households in the frequently drought-stricken rural communities in northern Ethiopia.

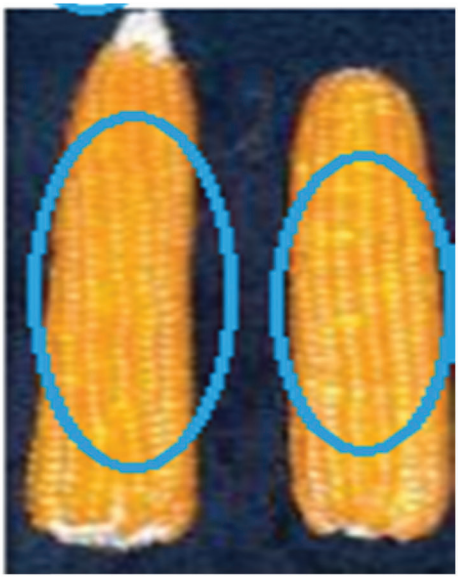
The special role of women related to seed is also reflected in the statement of a farmer in Menkere village of Tigray Region at a meeting of farmer researchers: "No wife, no seed, no life". Another farmer researcher added that "women have microscope eyes" in selecting the best seed for later production. These claims generally hold across various crops and especially for crops with special cultural significance. For example, women are said to have a special skill to determine the viability of teff seed. Women roast some

selected teff to identify a particular popping or cracking during the process. If the teff cracks uniformly and quickly, then that is regarded as the best teff for seed production.

Woman closely investigating spikes that characterise rice varieties (Photo: Birhane K, Tselemti Research Centre)

Two women farmers from each of the five regional units of the Integrated Seed Sector Development (ISSD) project in four regions of Ethiopia (Amhara, Oromiya East, Oromiya West, Southern Region and Tigray) attended the Ethiopian workshop on farmer-based informal seed systems in Mekelle in 2015. The Tigray ISSD coordinator invited all the women farmers to stay overnight in her home. During the evening of socialising, the women shared their experiences with seed. A woman from Bizra Kebelle (subdistrict) of Semen Achefer Woreda (district) in West Gojam (Amhara Region) described three steps in selecting maize seed:

1. Selection from the best cobs of a newly introduced seed variety called Zetena.
2. In the second year, selection of the well-developed seed from the central part of the cobs (see figure below), given the name Semania.



The central part of maize deliberately chosen for seed (photo Fetien A)

3. In the third year, the seed was used 100% for grain and was given the name Awassa. Then the farmers have to seek new sources of seed or select again from their own sources. This is in line with findings of Abay et al (2008) where they found three stages of seed selection in the central part of Tigray in the first stage they call it Wulad means progeny, second stage they call it salisin, meaning third stage and on the third year they call it Aregit , meaning old generation, then the farmers have to use it for grain production.

While a woman from Guraghe said that seed was not exchanged but rather largely sold for cash, the women from eastern Hareghe in

Oromiya East said it is a taboo to sell seed. Farmers in their area have to share or lend to their neighbors, relatives and friends even up to 100 kg of seed, e.g. in the case of potato. The women from Tigray said that they exchanged in kind when dealing with other farmers with limited access to buy seed. A woman from western Tigray reported that farmers change or replace their seeds after three years when the plants have increased in height and lose their spikes. Also, when the "satan's weed" (zeri seytan) starts growing in the sorghum crop, it is a sign that the seed is tired and needs to be changed.

Women in post-harvest management

The level of participation of women in farming activities before and after harvest is critically important for the productivity of small-scale farms. More than 70% of farm labour is provided by women, who are engaged in all agricultural practices but especially in the post-harvest activities (see Table 1). The data are from a survey on women's role in reducing post-harvest losses in four major crops in four regional states of Ethiopia, conducted in 2015 with funds from Feed the Future (USAID) and Kansas State University.

This survey found the general consensus that women are key players in post-harvest decision-making. Farmer groups in Shehona village of Kudmi Kebelle (Amhara Region) refer to women's role in seed handing as "our storage" (gotachin) and "our key" (guaguncherachin).

Productive activities	Percentage
Land preparation	41
Sowing and cleaning seed	61
Intercultural activities (e.g. weeding, pest handling)	73
Harvesting, threshing/chipping, drying, transport, distribution, storing and processing	88

Table 1: Post harvest activities (%) performed by women
Source: Feed the Future (USAID) and Kansas State University

Post-harvest losses account for up to about 40% of all grains harvested in Ethiopia, with regional variations. These losses exacerbate food insecurity in millions of small-scale farm households. Women have dynamic indigenous knowledge that help reduce the post-harvest losses. The survey revealed that women had developed various innovations:

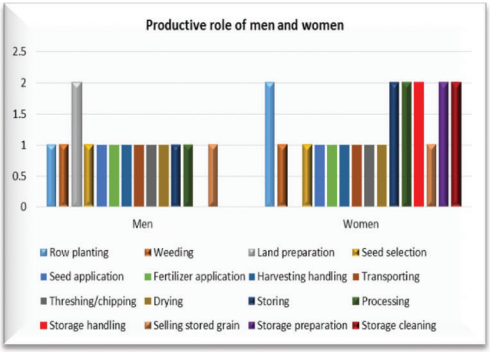


Figure 2: Share of women in agricultural practices related to grain crops (Source: own survey).

➢ Mixing seeds of other crops with teff: this is done in two ways: i) simply mixing the seeds together with teff seed and storing

them; or ii) placing teff at the bottom and top of the storage and putting the other seeds in between. Teff is not heavily attacked by weevils or other insects. According to the women farmers, teff helps in limiting oxygen movement in the storage, thus potentially killing or undermining the survival chances of storage pests.

- Smoking storage facilities with pepper: women apply pepper powder or smoke the storage material with the idea that pests will not be comfortable because of the hot property of red peppers.
- Use of pumpkin: the logic is that higher temperatures favour storage pests. Women mix pumpkin with the crop seeds because its cooling effect lowers the in-storage temperature and thus creates a less favourable environment for the hatching of weevils or other insects.
- Use of Areki (local beer): Areki is a strong alcohol prepared by women out of maize and other crops. The women believe that the high alcohol content of the local beer disturbs the life cycle of the storage pests, thus minimising potential damage to the stored grain seeds.

Little research has been done on gendered knowledge and innovation in managing post-harvest grain losses. These examples of women's innovation suggest that women have a special role in this realm and deserve support from research.

Future policy innovations should learn from existing local knowledge of women in the interest of developing sustainable technologies that minimise post-harvest grain losses.

Women's food innovation

Cereal-based local food businesses are growing in Ethiopia in the context of varying food-system governance structures. These businesses are dominated by women, whose innovations have largely sustained mass production of various cereals. Moreover, women have been able to maintain local crop-variety diversity despite a decrease in size of land holdings (now less than 0.5 ha on average in northern Ethiopia. Government policy has given little attention to local food value chains, which have therefore received very limited external support. The imminent threats posed by climate change plus external market pressures may force farmers to abandon some of their biodiversity, yet diversity will be key to climate-change adaptation.

Legumes (beans, chickpea, and lentil), fenugreek and barley are the most common and highly nutritious and healthy crops used by northern Ethiopian women in food innovation. The local food market is vast and provides employment opportunities to millions of women and youth. Most local food businesses are small-scale and family-based. There are also organised medium and small enterprises run by women in the local food industry. In Tigray, for instance, The Norwegian Programme for Development, Research and Education (NUFU), NMBU, Mekelle University and IDRC (International Development Research Centre, Canada) supported five groups of women food producers in a project that sought to upgrade the local food value chain by supporting research, evidence-based advocacy, value addition and capacity building.

Sensory evaluation of Injera (Ethiopian pan cake) made from barley and tef varieties (Fetien Abay. 2012)

The cereal-based local food businesses are appealing to the culturally bound consumer groups that are conscious of health and nutrition issues. The women food producers are engaged in product and process upgrading, which led to the creation of new markets and consumer awareness. Existing and emerging markets evolved, which strengthened the motivation of many small-scale farmers to maintain their crop diversity.

Greater diversity through innovation in rice use

Sasakawa Africa and Tselemti Research Centre introduced rice to rural communities in Tselemti Woreda in Western Tigray. The rice performed well in terms of production: compared with the earlier sorghum harvests of 0.6–0.7 tons/ha, the newly introduced rice varieties produced up to 7 tons/ha. The first photo illustrates the "microscopic eye" of women in seed selection during the rice reproduction or pre-harvest stage.

However, the farmers did not know how to dehusk and use the rice, and initially complained: "Why did you bring this crop to us? We cannot satisfy our hunger with this big heap." In the midst of uncertainty and frustration over the future of rice in the area, local women came to the rescue. They devised new ways of using rice based on their traditional consumption habits for

sorghum: to make injera (pancake-like staple dish) and local beer. The women had not received any prior training in the processing and use of rice.

Their innovation led to a turnaround in local farmers' acceptance of rice. It has now become the main food-security and income-generating crop for the lowland communities of Tselemti Woreda. Rice is produced regularly during the main growing season, and has added to the nutritional diversity of the local communities. The introduction of rice also enabled crop rotation with chickpea in waterlogged areas. This contributed to maintaining and increasing agricultural biodiversity. The rice-based food and beer helped create new consumption patterns and market demand, and encouraged wider cultivation and multiplication of rice seed. The farmers are now organized in rice seed producer cooperatives.

This case shows the role of women in popularising new crops. It also shows that no crop can survive without being used, and it was the women who developed local innovations for using rice. This again justifies why the agricultural growth strategies of any country should give attention to gender issues

Tselemti researchers and ISSD-Tigray team examining the big heap of rice (Photo: Beyene Tedla)

Quality and agronomic innovations in barley

Another story worth telling is depicted in barley picture below showing a high-quality barley variety released nationally by Mekelle University from participatory plant breeding (PPB) trials.

Fetina, dehiscent type released for its quality traits: high content of beta-glucan, iron & zinc (Photo: Fetien Abay)

This variety has a special trait compared to other agronomically well-performing PPB lines: its "dehiscent" character, i.e. it withdraws its awns during the grain-filling stage. This trait was identified by a woman called Assefu, from Habes village involved in the PPB. The main advantage of the variety for the women is that it reduces the work required to remove the husks from the grains when cleaning, grading and processing the barley to make "kollo" (roasted barley commonly used as a snack) or when consuming it in a raw form during harvesting. This reduces the time women spend to process the grains and thus addresses the gendered dimensions of technology development and dissemination.

In another example, the Ethiopian Institute of Biodiversity Conservation (IBC) partnered with Bioversity International to implement a project on Seeds to the Needs of Women Farmers. The project works to ensure that farmers, particularly women, will have an assured supply of climate-tolerant seeds for food production as climatic conditions change in the future.

Under this project, durum wheat and barley were selected among 30,000 samples, being considered as having the highest potential for local adaptation. According to the project leaders (2013, personal communication), 17 variants of durum wheat were selected by farmers at Bisheftu Woreda near Addis

Women partnering in breeding: farmer Assefu (left) identified the unique trait in barley useful for addressing her work drudgery problem; collaborating barley breeder and professor Fetien Abay (right) (Photos: Mulugeta Kiros)

Ababa. Considering seed colour as a morphological marker, women selected more variants (60%) than did their male counterparts. This aligns well with the farmer's quote that women have "microscope eyes".

It is vital to draw on the rich experience of such women farmers and appreciate their great power in decision-making when strategies and activities are being developed for interventions meant to support the informal seed system.

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