Supporting Conservation of Farmers' Seed Varieties

I. What are Farmers' Seed Varieties?

Farmers' seed varieties are crop species, which are developed by natural processes, by adaptation to the natural and cultural environment in which they live. Farmers have selected, domesticated and put in use their crop varieties in a traditional way for many generations. By choosing seeds or planting materials that meet their needs, farmers have developed local varieties that suit their specific farming circumstances and preferences. Farmers, especially those engaged in traditional small-scale farming are known to be the primary custodians of the various crop varieties. They have always been - and still are - the principal managers of agro-biodiversity.

Unlike the modern/improved varieties, farmers' seed varieties are natural and are free from human manipulation of genes to suit a particular interest agro-ecological condition.

II. Significance of Farmers' Seed Varieties

In countries like Ethiopia, where small-scale traditional farming and huge diversity in agro-ecosystems characterize the farming system, availability of diversity in crop varieties that fit the range of agro-ecosystems is the primary decisive factor. Hence, farmers' varieties are the main actors to fitting such on farm diversity and the range of agro-ecosystems.

There are a number of reasons for conservation of farmers' seed varieties, especially in countries like Ethiopia where smallholder traditional farming dominate the agricultural system. Some of the major reasons are:

- Farmers' varieties are genetically diverse and well adapted to local agro-ecosystems.
- Farmers' varieties have important qualities such as pest resistance, draught and frost tolerance, and post harvest storage properties consistent with traditional technologies.
- Farmers' varieties well perform under low soil fertility systems, and without chemical fertilizers and other agro-chemical inputs.
- Farmers' varieties are the key factors that allow traditional farmers to continue to develop and maintain agro-biodiversity.
- Farmers' varieties are the main sources of germplasms that are needed for variety improvement and production of improved varieties in the formal seed

sector.

- In addition to the crops, farmers' varieties are the ones that best fit the multipurpose need of farmers such as use for animal feed, fuel and construction.
- Farmers' varieties contain the taste, nutritious and medicinal value that fit the best interest of farming communities.
- Farmers have tremendous traditional ecological knowledge associated with their local seed varieties; if the seeds are lost, the associated traditional ecological knowledge will be lost along with.
- Farmers' varieties are the potential for production of chemical free and healthy organic food.

III. Challenges Relating to Conservation of Farmers' Seed Varieties.

Farmers' varieties and the traditional agricultural systems are erroneously regarded as the cause of the poverty and the decrease in agricultural productivity in the country. There is little effort and capacity built in terms of studying and researching what the causes of the decrease in productivity are and in finding ways of enhancing the productivity of farmer's varieties. As such, there is little understanding that, farmers' varieties and related local knowledge provides an option for resilience especially under changing climatic conditions.

The knowledge of the young generation of farmers about the traditional agricultural systems and their ecological functions are declining from time to time as the traditional varieties are displaced by the newly introduced modern/high input varieties. This obviously leads to compromising the adaptive capacity of farmers in times of climate change.

The other challenge relates to human manipulation of genetic resources. Particularly in agriculture, genetic diversity has been diminished through human manipulation of gene structures resulting in elimination of the natural varieties and production of 'improved/modern' varieties. These newly produced varieties are designed to function under specific agro-ecology and satisfy the ever-growing demand for food. As the newly produced varieties tend to be mono crops, it will result in the erosion of on farm diversity.

The other challenge for conservation of farmers' variety seeds is environmental degradation resulting in climate change and associated seasonal instability. Some of the farmers' seed varieties well perform under a defined seasonal set up with

predictable rainfall amount and pattern. When there is considerable change in these aspects due to the climate change, some farmers' varieties tend to underperform and thereby cease to exist.

IV. Farmers and Farmers' Seed Varieties?

Traditional small-scale farmers in diverse agro-ecosystems like Ethiopia use a system of diversifying their farm crops as a coping strategy against natural hazards. They have developed diversity by traditional methods of maintaining different crops and their varieties through saving sufficient amounts of representative seed samples for the next planting season.

In the Ethiopian context, subsistence farmers practice complex patterns of farming which may involve the cultivation of many crops and varieties on the available land. This practice has the primary objective of meeting household food requirements throughout the year while still having some marketable surplus, if possible, to meet additional expenditures. The main aim is to maximize the use of land and available resources for better returns and security. In addition it is meant to minimize the risks associated with farming.

Diversification of crops and varieties is the main way in which farmers attempt to stabilize their production and income. Smallholder farmers' perception of varieties is different from that of many plant breeders and commercial farmers. Besides yield, factors like grain quality for local food/beverages, storability, suitability for intercropping and the use and value of crop residues may all influence farmers' varietal choices. Small farmers perceive that local varieties are more adaptable to their agro-ecology, give stable yields and good grain quality, perform better under low input and poor soil conditions, and are suitable for the preparation of traditional foods. In most of the cases, local varieties are highly intertwined with the culture and tradition of the local community that can hardly be replaced by modern varieties.

So we have to question why local varieties have not been given due attention, although they are available in huge diversity in Ethiopia. Ethiopia is known to be a center of diversity especially for crops like sorghum and teff, and a secondary centre of diversity for crops like barley and durum wheat.

The stable production of farmers' varieties and the increased grain yields of certain crops in marginal lands have not been fully researched and recognized; nor has their use in the agricultural extension system been supported. Hence importance of farmers' varieties for food security needs to be further researched and recognized.

Along with this, conservation incentives, which bring about fair return, like international marketing opportunities need to be further explored to reach at a concerted effort for conservation of farmers' seed varieties and diversity on farm.

V. Major Conservation Strategies

In-situ Conservation: This is a conservation of plant species in their natural surroundings. In the case of domesticated and cultivated crop species, it is conservation of the crops in the surroundings where they have developed their distinctive characterstics. Genetic scientists and plant breeders assert that it is the best way of conservation as it aims at leaving species in their natural habitat, allowing adaptation and evolution to continue.

In-situ conservation of crops has been a practice of farmers' for time immemorial. Farmers manage genetic resources, particularly crops, by way of maintenance of crop varieties or cropping systems within the local agricultural systems. On many farms, especially in marginal production environments, local varieties are sown and harvested; each season the farmers keep some of the harvested seed for re-sowing. Thus the local variety is continuously grown in the specific production environment of the farmers. It is highly adapted to the local environment and is likely to contain locally adapted characteristics. So, it is a continuous and dynamic process in which farmers manage crop diversity within specific agro-ecological and socio-economic environments.

Community Seed Banks (CSBs): A community seed bank is a structure at community level and operated by the community as a collective seed store. It is considered an 'organized seed bank' as it primarily serves as a source of seed for the purpose of crop production. They are generally constructed with the objectives of safe seed storage, seed supply, seed processing, farmers training and the creation of office and meeting space for the curators.

Secondly, community seed banks provide a framework for bringing together the members of a local community who share common problems in safeguarding their local diversity and accessing adequate supplies of seeds for their needs. Generally, once a farmer has substituted a local variety in his/her field it often becomes difficult to retrieve it if no action has been taken to conserve the variety. In most cases, such conservation actions are undertaken by national plant genetic resources program, and materials are stored in ex-situ gene banks, usually operated by the formal public sector in a given country. In such cases, the material is often not easily accessible to farmers. Hence establishing an institution at local level facilitates access to local

germplasms that farmers do not have at hand.

Thirdly, community seed banks can serve as an interface between farmers' efforts to conserve their local varieties on-farm and the formal ex-situ conservation facilities. The responsibility of realizing a reliable and continuous on-farm conservation should not only be allotted to farmers' communities but also to the formal sector. Community seed banks can provide the platform for interaction between plant genetic resources, professionals and farmers to exchange information about on-farm conservation processes, including traditional knowledge in the cultivation of local varieties.

Generally, community seed banks have several functions at the community level. These functions can be summarized as providing a framework for community organization, safeguarding against crop failure and local variety seed loss, contributing to on-farm conservation, documenting information on genetic resource at local level and providing a linkage to market and consumer preferences.