Farmers' Indigenous knowledge: Cultivation, Utilization and classification, of Enset in North Omo (Ethiopia)
Kefale Alemu

Introduction

Enset (Ensete ventricosum) is a perennial herbaceous root crop with long broad leaves and bulky pseudostem. This multi-purpose root crop is widely grown in the central, south and Southeastern part of Ethiopia for its food, forage, fiber, and to some extent for medicinal uses. The corm and the leaf sheathes are the main sources of human and animal feed.

Sizes of Enset plants vary depending upon management, the Enset type/cultivar, soil type and fertility, amount and distribution of rainfall, and altitude of the area. It reaches up to 10.300m in height and the girth at the fattest point can be up to 4m (Kefale A and Sandford S. 1991). Albeit the crop is very important there is inadequate information regarding the existing production systems and distribution of different enset types across different agro-ecological zones. Moreover, the role of indigenous knowledge in cultivation, management, utilization and classification is not well studied. At present researchers' knowledge is limited probably because of two reasons. Firstly it is domesticated and cultivated as a crop only in Ethiopia. Secondly, little research is done because it takes long time (from 3 to 10 even more years) for plants to mature so it is not as easy to carry out experiments in various agro-ecological zones and various soil types as another shorter season crops.

However, farmers have amazing knowledge of Enset, which has been accumulated over many generations. As the first cultivators and experts, their knowledge will have profound importance for both the recent and the future sustainable use and conservation. As Bezuneh mentioned (1993), during the last several decades, enset cultivation has evolved as one of the most stable and sustainable agricultural development systems, because the system has been efficient in building and sustaining the fertility of the soil. It seems that it would be valuable to learn from the centuries of farmers' practical experience and benefit from their understanding. This will not only help to improve the enset dependant farmers' livelihoods and their immediate needs but also have implications for better utilization and future conservation of this promising, multipurpose and very high yielding crop.

Based on my fieldwork experience with the Farmers' Research Project of FARM Africa and other relevant literature this paper discusses the indigenous technical knowledge used by Ethiopia farmers in particular in cultivation, classification and utilization of enset.

Cultivation And Farmer Enset Interactions/ Relations

Farmers-enset interaction and relations are found to be very interesting in enset cultured areas. This reflects the indigenous knowledge of the crop, their values, folklore and culture associated with the plant. In enset growing areas traditional houses are constructed (thatched) using its dried mi-rib and pseudostem leaf sheaths. Enset is a food for humans and feed for animals. It conserves soil and moisture in and around the enset plantations, vegetables and short annual crops enjoy the always-available moisture because of its bread leaf canopy coverage. It is ornamental, a windbreak that protects the house from strong wind, giving pleasure to the household and to visitors. A farmer with large enset plantation and many mature (big) enset plants can immediately be recognized by outsiders as a rich and
respected man. Just by looking the farmer's house, his enset plantation and the vegetables in the garden one can tell whether he is food self-sufficient or not. A household's status and wealth is often assessed in terms of the number and age of enset plants, and also in terms of the size of the plants at his homestead.

According to Wolaita farmers in the past (some say even today) guests prefer to go into houses where large enset plantation with many matured enset plants are available. Therefore, as Balick and Cox (1996) emphasized, the study of the interaction of plants, and people, including the influence of plants on human culture, is the focus of the interdisciplinary field of ethno botany. Bezuneh (1993) has also suggested that in addition to regular agronomic research themes, the central focus should be the homestead environment (family decision, culture, etc.) that galvanizes enset culture and agriculture.

Enset cultivation requires careful nurturing. There is a very intimate relationship between the whole household and the enset plant in the homesteads. On his study on the Ari enset growing areas of southern Ethiopia, Shigeta (1990) mentioned farmers’ intimacy with enset through daily associations with and their proximity to enset plants. They often know not only the vernacular name but also the life history of individual enset plants. That is why in most cases it grows near the farmers house. Since farmers live near their enset gardens manure and house refuse can be applied on daily basis and plants can be protected from wild and domestic animals. If a diseased enset plant appears in the plantation the household members will immediately uproot and throw it somewhere far from the plantations (so as to protect the healthy plants).

This proximity to the house is also convenient for the day to day management, harvesting, processing, for every day preparation of food either from the corm or from the already fermented (kocho) product. As Kefale, Sandford and Kassa (1993) mentioned, women harvest and process enset in-situ in the gardens. Harvesting is usually undertaken by small working parties formed by group of female friends and close relatives. Even very small children with their parents or alone visit the homestead frequently i.e. when they harvest their daily food either from the enset or from other garden crops. They enter the plantation to take the broad leaves to make bread or to serve their daily food etc.

Men prepare the land, split and bury corms for vegetative propagation of suckers, plant and replant enset plants of different ages, so they usually decide which area of land is to be used as an enset plantation. They will also have a strong say as to which varieties are to be planted, although women do offer their opinion (Sandford and Kassa. 1993). The corm is split into two or four parts and buried in the ground at about a 30 degrees angle. The management of the suckers is different from the management of other enset plants that are found at different growing stage. When splitting and burying the corm they not only consider the season (usually dry season) but also the movement of the moon (chegena). Farmers strictly believe that the movement of the moon not only affects enset harvesting and propagation but also other crops and plant species.

During planting the male wants to plant the male enset and the female wants to plant the female enset plants. The female farmer makes the decisions and is responsible during the harvest as she has the strongest interest in getting something to be harvested and cooked. On the other hand the male farmer does not want enset plants to be harvested at their earlier (immature stage), even if he knows that the product will be consumed by themselves and their families. Fearing the long-term effect on the age and sex structure of the plantation and the consequence of food shortage, they will not always be comfortable during the harvesting of immature enset plants.
The males prefer male enset plants because there is less temptation for the women to harvest the plant before maturity for the sake of eating the delicious boiled corm of the female plant (Kefale and Sandford 1991). However, farmers always (except the poorest) combine and, row various types of male and female enset plants. On the other hand it was disclosed by the farmers that even though the corm of the male enset plant is sour and unpalatable, during critical food shortage times it could be uprooted and consumed at its earlier stage.

Farmers’ store an enset products (e.g. Bula) by wrapping them and by covering them in deep pits. The use of indigenous knowledge in propagation, transplanting, inter-cropping, harvesting/processing, protection from pests and diseases are valuable. In general it seems that for the small-scale, resource poor farmers and crops such as enset the utilization of the existing ITK or its further development considering the local situation have tremendous importance and implications. Farmers cannot travel long distances and buy expensive exotic technologies for their small patches of farms. One of the good examples is the trap invented and used by most of the North Omo farmers (Aressawum 1993) against mole rate, which is one of the notorious pests of enset and other root crop. Even though there is a need to upgrade it, the technology is still appropriate in the area and has an important role in controlling the mole rates.
Figure 1. Causes and Effects of Enset Crisis

Poor Performance of Enset

Land Shortage

Population Growth

Source: Authors own drawing based upon unpublished fieldwork notes and farmers' views.
Indigenous Technical knowledge is environmentally friendly, easily available, can be maintained at low cost at local level, and is simple enough for resource poor farmers.

**Products, utilization and Classification**

As has been mentioned earlier in the Southern part of Ethiopia enset growing farmers usually grow a mixture of various enset types. Farmers distinguish and classify enset plants based on their morphology and type of use, quality (taste, palatability colour etc.) and quantity of each distinctive product.

Enset use and classification are very closely related. They not only identify a particular landrace and give it a unique place in their homestead but also tell us about its morphological and phenological characteristics, its maturity time, its use for food and various other purposes. Besides that they indicate its cookability, quality of its different products, taste, medicinal value and fiber quality (strength length and colour).

The cultivars have names and are distinguished by their appearance and use. The phenotype is distinguished by its height, the shape of the inflorescence, the colour of the leaf-sheaths and the mid-rib, appearance of strips or spots on the petiole, the width of the leaves, the length of the leaf-sheaths and the colour of the corm. (Zipel K. and Kefale A. 1995).

The uses are known by boiling the corm and testing its cookability, fermenting of leaf-sheaths and corm for human conception, by feeding animals as a fodder in the household, by using for construction, and by its medicinal values.

The corm, the pseudostem and the stalk of the inflorescence are the most important sources of human food (Kefale and Sandford, 1991).

**Products of Enset**

There are mainly four different products of Enset:

1. **Kocho (Wol. Uncha)** is the decorticated (scraped-off) mass of the leaf-sheaths, which collectively make up the pseudostem of the enset plant.

2. **Bulla (Wel. Itima)** is the paste or powder formed after precipitation and dehydration, from the liquid, which was drained of from kocho and from the stalk of the inflorescence.

3. **Workay (Wel. Godeta)** is part of the corm, which is pounded up by a harvesting/processing pestle with teeth.

4. **Amicho (Wel. Doysetida utta)** is the boiled up corm, which has not been pounded but has been cut up into large chunks. Amicho is usually made from immature or matured female enset plants.

**Uses of Enset**

**Food for Human:** Kocho (Wol. Uncha), Bulla (Wel. Itima), Workay (Wel.Godeta) and Amicho (Wel. Doysetida utta) are eaten by humans.

**Enset as an animal feed:** all parts of enset are good sources for animal feed. Especially during the dry season the domestic livestock are fed on remnants of enset parts, which are not normally eaten by humans.

**Fibre use:** the fibre (Wel.golla) from enset is used in the weaving of products such as shopping bags, handbags, suitcases, sieves, pouches and mats. The variety, the age of the plant, and the way in which the fiber is extracted and stored all determine its length and
quality (Kefale and Sandford, 1991). Farmers strongly believe that fibre extracted from the male is of a very high quality and strength.

**Medicinal uses**: some enset cultivars are believed to have medicinal value. Farmers use enset plants as medicines not only for human beings but also for their animals.

**House construction and fencing**: the moderately dried enset leafsheaths and midribs (which are locally called SUSA) are used for local house in enset growing areas. Farmers say susa is the most important raw material obtained from an enset and indispensable for fencing, wrapping and packing of every material and product and for tying and keeping animals in and around the house.

**Enset is a decorative plant** that gives grace to the homesteads and is used as a shade for humans and domestic animals. It is also a good windbreak to protect the small grass roofed farmers’ houses from strong wind, conserves soil and moisture.

**Other uses**: leafs can be used as an umbrella during rains, for serving oily food, for rapping butter, and spices, for sleeping and sitting. Stores water for Small domestic animals like chicken at the bottom part of the loose leaf sheathes.

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**Classifying Enset plants**

Based upon the morphology and the type of use, farmers in North Omo tend to put enset plants into two categories, "male" and "female". Usually all the enset plants within a particular variety (as classified by farmers) are put into a single "sex" category, i.e. a variety is either male or female (Kefale and Sandford 1991). This division has nothing to do with reproduction but it is according to perceived characteristics of strength (male) and tenderness (female) (Kefale and Sandford). However some varieties seem to be neutral or can display mainly "male" characteristics and also display some "female" characteristics.

Because of their dual characteristics and purposes it is some times difficult even for the farmers to put them in one of these two categories. For example during a field survey farmers in Wolaita argued amongst themselves about one of the cultivars (Gefeteno) and finally agreed that there are some cultivars (in the third group) that shows some female and some male characteristics. However, one particular cultivar cannot fulfill both criteria at the same time.

Interestingly Wolaita farmers not only classify enset plants into male and female but also other crop species.

As a botanist divides plants and each subdivision is further divided, the male and female enset cultivars within each of the category have their own vernacular names. To date in north Omo alone about 156 enset cultivars are listed (Kefale and Sandford 1992/3). It is least probable that these are not distinctive cultivars, i.e. are not significantly different genetically, but merely represent a list of local names and many of the names represent cultivars, which are not distinctive (Kefale and Sandford 1991). People always refer to the vernacular name when planting, transplanting, managing, utilizing, giving and exchanging enset (Shigeta 1990).
Table - Differences Between Male and Female enset plants based on Farmers perceptions

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>Maturity</td>
<td>Late maturing</td>
<td>Early maturing</td>
</tr>
<tr>
<td>Fibrosity</td>
<td>Strong, high in quality and quantity</td>
<td>Low strength, low in quality and in quantity</td>
</tr>
<tr>
<td>Size</td>
<td>Big</td>
<td>Smaller</td>
</tr>
<tr>
<td>Susceptibility to diseases and pests</td>
<td>Resistance</td>
<td>Susceptible</td>
</tr>
<tr>
<td>Corm</td>
<td>Fibrous (unpalatable)</td>
<td>Delicious, low fibre</td>
</tr>
<tr>
<td>Kocho</td>
<td>Ferments slowly</td>
<td>Ferments quickly</td>
</tr>
<tr>
<td>Leaves</td>
<td>Hard and stiff</td>
<td>Soft</td>
</tr>
<tr>
<td>Pseudostem and leafsheaths</td>
<td>Hard and stiff</td>
<td>Soft</td>
</tr>
<tr>
<td>Susa*</td>
<td>Hard and stiff</td>
<td>Soft and fragile</td>
</tr>
<tr>
<td>Average yield</td>
<td>High</td>
<td>Lower</td>
</tr>
</tbody>
</table>

Source: Taken from Kefale Alemu and S. Sandford (1991), and further developed by the author

**Indigenous knowledge and biodiversity/sustainability**

Beyond its direct consumption value (source of food forage construction materials, row materials for local manufacturers, medicine potions, genetic resources etc.) enset has indirect values (leisure pursuit, ecosystem function, and ethical, moral and aesthetic values) values. Among herbaceous plants enset has the biggest leaves (both in length and width). The nature of the leaf and its pseudostem helps it not only to cover the ground and protect the soil from direct rain damage, detachment and transportation of topsoil, but also it enables it to harvest water in its loose leaf sheath (pseudostem) pockets. Enset protects the soil from both wind and rain erosion throughout the year. The broad and long leaves of enset intercept the kinetic energy of raindrops and absorb it harmoniously into the pseudostem and the surface of the earth. Kena (1993) also indicated that enset fields when compared to other crop fields are less subject to erosion.

In addition it protects the soil from direct sun's heat and decreases evapotranspiration both from the plants and from the land surface. It also has profound importance as a windbreak by decreasing the velocity of the wind (evapotranspiration will be considerably decreased). As a homestead plant it protects the farmers local houses from strong wind destruction. It is also the guardian of small coffee seedlings, vegetables, medicinal, and other useful plant species in homesteads. As its pseudo-stem is large and has a big corm and well-established strong roots it controls runoff and conserves soil and moisture.

But today land scarcity caused by population growth and the consequent food shortage has threatened this valuable plant. Shack (1963) has also mentioned that population density in enset growing areas of Ethiopia is exceptionally high. The average density in the enset growing areas as a whole is over 200 persons/ha, more than six times the national average (Pankrust 1993). As population growth is fast so the amount of cultivable land per capita will continue to fall. (Carrying capacity ... the infinite human resources?)

According to the farmers there are some indications of the loss of the late maturing (male) enset plants because of the farmers immediate need to plant the female varieties, which are
early, maturing and more palatable at their earlier stage. At maturity the total yield obtained from the male enset plant exceeds considerably the total yield obtain from the matured female enset plant.

*Because of food shortage, farmers will be forced to consume the immature enset plants which has already seen as a threat to the sustained enset based farming systems. A threat to enset plants means a threat to the knowledge about enset that has been accumulated over time.*

Loss of some plants and their habitat will ultimately cause loss of some of the above uses, services and cultural values. It seems that we are not only loosing the variety and the variability of living things and the complex ecosystems in which they occur but also the knowledge that has been gathered over time. One good example is obtained from Wolaita area. When farmers were asked how long enset products can be stored most of the middle-aged people said that they didn't know. At present because of food shortage enset products will be consumed immediately after harvest i.e. they do not store enset products for many years as they did in the past. It is only when we talked to old people that they told us it can be stored up to eight years. From this we can learn that enset production was good in the past (because of low population density) and people could produce enough food and used to store it for some years.

The present generation does not store because of food shortage and as a result lost knowledge of storage techniques. Balick and Cox (1996) have also mentioned the many challenges facing ethno botanists in future years, particularly the rapid loss of biodiversity and the concomitant loss of indigenous knowledge systems.

Enset farmers repeatedly report that enset plants per capita are falling from year to year. The causes according to them are population growth and the subsequent land scarcity, which again leads the area's people to food shortage. Fighting for their existence farmers always prioritize their immediate coping needs, which can change the whole farming/land use systems. They may tend to grow early maturing and short season crops. FARM Africa's survey at Bolosso Sorie district of Wolaita has revealed the replacement of some of the homesteads by banana plants and the expansion of sweet potato farms from year to year. These are good examples. But why do farmers replace their fields by the above crops understanding the importance of enset and the bad consequence? The answer is that they are forced by food shortage to do and have no choice.

**Glossary**

<table>
<thead>
<tr>
<th>Term</th>
<th>Origin/language</th>
<th>Meaning</th>
</tr>
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<tbody>
<tr>
<td>Cultivars (Cultivated Varieties)</td>
<td>English</td>
<td>Plants that can be propagated not from seed but rather vegetative e.g. by stem and corm</td>
</tr>
<tr>
<td>Chegena</td>
<td>Ethiopia/Wolaita</td>
<td>The movement of the moon in a month</td>
</tr>
<tr>
<td>ITK</td>
<td>English acronym</td>
<td>Indigenous Technical Knowledge</td>
</tr>
<tr>
<td>Homestead</td>
<td>English</td>
<td>A farmhouse, with adjoining garden and crop</td>
</tr>
<tr>
<td>Wolaita</td>
<td>Ethiopia/Wolaita</td>
<td>A district in the Northern part of Ethiopia</td>
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References


