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Diversity, Challenges and Potentials of Enset *(Ensete ventricosum)* Production: In Case of Offa Woreda, Wolaita Zone, Southern Ethiopia

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Abstract
The main objectives of the study were to investigate the existing diversity of enset clones selected for different purposes; its challenges and contribution of enset production for sustainable livelihood security of the rural community in the study area. The result revealed that farmers were rich in diversity in that they grow various types of clones in the same farm for their intended purposes. Among diverse enset clones grown in the area, the top 5 clones which are selected for *kocho, workey* and *bulla* include *halla, falakiya, tuzuma,nakaka* and *gena*. Similarly, clones selected for *amicho* (corm) include *arkiya, nakaka, gena, chichiya* and *peluwa*; and those selected for fiber include *halla, falakiya, tuzuma, maziya,* and *argama*. Generally, clones *halla, nakaka, tuzuma, maziya* and *kekeruwa* are some of the clones of multipurpose. Enset plays a vital role in contributing food and livelihood security of majority of the society in the study area. In line with this, about 63% of the sample farmers reported that the yield of enset is higher than other major crops including root and tuber crops produced in the area. Farmers identified the major challenges and about 55% of the sample farmers indicated that land shortage was the 1st serious problem in the area followed by disease and recurrent drought which account for about 16% and 14.7%, respectively. Therefore, critical reduction of enset production and its diversity calls for future collective action to generate new technology in every aspect including production, processing and extension services to utilize the crop potential. Furthermore, clone of multipurpose such as *halla, nakaka* and *tuzuma* need to be promoted further to utilize crop potential and to contribute for sustainable livelihood security of rural people.

Keywords: enset, clone, yield, challenges, diversity, Sustainable and livelihood

1. Introduction

Enset (*Ensete ventricosum*) belongs to the order *Scitamineae*, the family *Musaceae* and the genus *Ensete*. Enset is banana like herbaceous monocarpic plant with underground corm, a bundle of leaf sheaths that form a pseudostem and a large leaves. Enset, however, is usually larger than banana, with the largest plant up to 10 m tall and with a psedostem up to one meter in diameter (Wesphal, 1975; Taye, 1984; Brandt *et al*., 1997).

Enset is a multipurpose crop of which every part is thoroughly utilized, not only for food but also for several cultural applications and livestock feed. It is primary food item for more than 5,000,000 people in the south and southwest Ethiopia (Ashegri, 1980). The parts of enset used as food vary from region to region. Enset is used as food in three or four forms: *Amicho, Kocho, Workey*, and *Bulla*. Enset is attractive to farmers because its ability to produce more food than other cultural crops on a small piece of land with minimum inputs (Stanely, 1966).

According to Stanely (1966), the cultivation of Enset in Ethiopia was estimated to spread over 67000 square kilometers. 'Enset' planting economy is one of the major activities of the agriculture in southern Nation, Nationalities and People Regional state. For many centuries enset has been cultivated in this region for its food and fiber. The area contains over 80% of enset production of the country (MOA, 2006).

Enset provides substantially more calorie than cereal, estimates ranges from double to 20 times as much. Tackson (1974) noted that one can grow 4000 calories per square meter per year. According to Olmstead (1974), enset can yield per hectare per year 66 to 230 quintals, equivalent in terms of energy to 39 to 137 quintals of grain. As the study indicated enset yields 1.3 to 3.5 times as much food energy per hectare / year as does maize grown under

peasant conditions (Alemu and Sandford, 1991).

Wolaita Zone is one of the major parts of enset production in southern Nation, Nationalities and People Regional state. As indicated in Regional Statistical Abstract (2006), the area coverage of enset production in the Zone is 5,400 hectare. The estimated annual production is 2, 032,656 quintal. The contribution of enset in the area for improvement of rural livelihood security is very great but the production pattern/system declining from time to time (Farm Africa, 1993).

Even though enset production plays major economic and social roles, it is not included widely in extension package. Little attention was given to research and extension services. Moreover, substantial research and development has not been carried out in the enset growing areas of the country for processing of enset in order to facilitate wide consumption. Assessing the extent or levels of enset in supporting rural livelihood by comparing with other major crops in the area is another concern. Thus the current study was designed with the objectives:

1. To identify the diversities and select clones of best performing on the basis of yield advantage and quality.
2. To asses challenges and potentials of enset production and productivity in the study area.

2. Materials and Methods

2.1. Description of the Study Area

The survey was conducted in four kebeles namely: Zamo, Ome Bolola and Woshe Aldada (from high land area) and Woshe Wocha Dakaya (from mid altitude area). The woreda is situated between 6.62 - 6.83 North degree latitude and 37.59 - 37.68 East degree longitude with altitudinal range between 2800 and 1450 meter above sea level (masl). The mean annual minimum and maximum temperature of the area is 22 and 25 ^{o}C, respectively with bi-modal annual rainfall pattern. The average annual rainfall ranges from 800 to 1200mm. To draw the study unit randomly from each category of enset producers the systematic sampling techniques was applied. Finally, 156 respondents were selected to conduct the research work, out of these 72 were selected from large producer and the rest 84 were from small producers.

2.2. Types of Data and Techniques of Data Collection

Both primary and secondary data were used in this study. Primary data collection was done with the help of structured questionnaire, personal interview, direct observation, focus group discussion and key informant interview. Published and unpublished documents from bureau of rural development and agriculture, office of finance and economic development, publication of Central Statistical Authority (CSA, 1991), the university library and Areka Agricultural Research Center were the main sources for secondary data.

2.3. Methods of Data Analysis

The data was analyzed using simple descriptive statistical methods/procedures by employing computer software package SPSS 16 version. Descriptive statistical methods like mean, variance, standard deviations, frequency distribution, and percentage, graphical and tabular analysis were used.

3. Results and Discussion

3.1. Diversity of Enset Clones

According to key informants report, enset clones are very diverse in the area ranging from 2 to more than 50 clones. Each farmer possessed various number of enset varieties in his farm. Farmers give vernacular names for each clone. They differentiated one from the other phenotypically by looking the colour of petiole, mid-rib, leaf sheath, angle of leaf orientation, size and colour of leaves and circumference & length of pseudostem. Almost all the farmers in the area produce many enset clones in mixtures that are used for different purposes. Some of them are best for *Kocho* while others are selected for *Bulla, Workey, Amicho* and fiber.

3.1.1. Clones Selected for Kocho, Workey and Bulla

It is observed that most of clone diversities are more common in high land areas than low land areas. According to survey result, clones which are selected for *Kocho* include *Halla, Falakia, Argama, Tuzuma, Maziya, Nakaka, Genna, Adinona, Kekeruwa, Woysha, Sorgiya, Lembuwa, Arkiya, Shuchafiya* and *Godariya. Halla* clone was reported to be the leading clone for *Kocho* yield follwed by *Tuzuma, Falakia, Nakaka, Genna* and *Maziya* in their respective orders (Table 1). About 37.9 % of the sample farmers selected *Halla* as the best clone for *kocho* yield.

Moreover, the data also indicated that there was slight variation in selection of clones for *Kocho* yield across agro ecology of the area. Though *Halla* is the best in general, it is more preferable in high land than mid land area. *Tuzuma* clone is equally accepted with *Halla* in mid altitudes. The others such as *Falakia, Gena* and *Maziya* are more preferred in high land whereas *Nakaka* and *Kekeruwa* are more common in mid altitude areas.The result also indicated that (Table 1) the clones selected for *workey* are more or less similar to that of *kocho*. Though there is slight variation in respondents degree of preference, those clones selected for *kocho* works similarly for *workey* as well.

Some of the clones selected for *bulla* production in the area include the followings in their order of importance. These are *Halla, Argama, Tuzuma, Kekeruwa,Nakaka,Maziya, Genna, Adinona, Godariya, Arkiya, Falakia, Woysha,* and *Shuchafiya*. According to the survey result, *Halla, Argama* and *kekeruwa* are more common in high land area than low mid altitudes while *Tuzuma* and *Nakaka* are preferred in mid altitude areas. About 37 % of the respondents selected *Halla* and 13.7 % selected *Argama* clone to be best for *bulla* production (Table 1). When clones are selected for more purposes, clones such as *Halla* and *Tuzuma* are more commonly preferred for *Kocho, Bulla* and *workey*. This is in line with that of the findings of Endale *et al*. (2003). They reported that clones *Nakaka* and *Halla* ranged first for *kocho, bulla* and *amicho* production in Kutcha woreda of Gamu Gofa zone.

3.1.2. Clones Selected for Amicho (corm)

Some of selected clones in the area for *Amicho* production include the followings in their order of importance. These are *Arkiya, Nakaka, Genna, Halla, Chichiya, Kekeruwa, Falakia, Dokuwa, Adinona, Peluwa, Kataniya, Maziya, Argama, Bala, Sorgiya, Lembuwa, Shuchafiya, Tuzuma, Godariya*. According to the survey data, *Arkiya* (17%) is the best among the selected clones whereas *Tuzuma* (0.7%) and *Godariya* (0.7%) are the least (Table 2). Though not significant as such, there is slight variation in the preference of farmers on the basis of altitudes. *Arkiya* and *Genna* are more common in high lands whereas *Nakaka* and *Chichiya* are more common in midlands. As compared to other clones, clones selected for *amicho* are usually consumed before flowering and are more susceptible for diseases and have low drought resistance. Similar study conducted in Kucha woreda revealed that *Arkiya, Chichiya* ans *Zinkiya* are clones most commonly used for *amocho* in the area (Endale *et al*., 2003).

3.1.3. Clones Selected for Fiber

Eventhough all enset clones produce fiber, farmers give priority for some selected clones in the study area. Some of selected clones in the area for fiber production in their order of preference include: *Halla, Falakia, Tuzuma, Maziya,Argama, Kekeruwa, Kataniya, Godariya, Nakaka, Genna, Adinona, Sorgiya*, and *Chichiya* (Table 3). In this case, *Halla* and *Falakiya* are more common in high lands whereas *Tuzuma* and *Kataniya* are more common in mid altitude areas.

In case of fiber production, the strength and duration of fiber are as equally important as gross yield of fiber. Thus, farmers in the study area prefer *Halla* and *Tuzuma* clones to be the best not only in terms of yield but also in quality such as strength and durability of fiber.

3.2. Enset Propagation

Enset can be propagated both sexually and asexually. The most common and traditional method of enset propagation is vegetatively by using suckers.

3.2.1. Sucker Production

As the survey result indicated all sample farmers use vegetative propagation method in enset cultivation. Suckers produced from underground stem, corm, by dividing into two equal parts. Not all farmers get equal number of suckers from a single mother enset plant. The number of suckers (seedling) obtained from a single mother plant was determined by soil condition, types of clones, size and age of mother plant, amount of rainfall, land preparation and time of planting. Depending on these factors, farmers in the study area reported that 20 to 150 suckers will be obtained from a single mother plant of 2 to 6 years old. The data also indicated that 70.5 % of the respondents agree that on average 30 to 50 suckers will be produced from a single corm of average 3 years old (Table 4).

3.3. Enset Agronomy

3.3.1. Transplanting

Farmers do not plant suckers directly in permanent field once. According to the survey result, farmers in the study

area transplanted enset suckers from one to three times until it gets permanent field. At each stage of transplanting, enset has different local names as it indicates the growth stage of enset. The first stage *Osha*, which is a younger stage of sucker usually grow in mass (clumps) from planted half or whole corm. It takes one to two years to be transplanted to the next stage called *Hata*. *Hata* is the stage whereby separate individual sucker are planted in the field and allowed to grow for one to two or more years depending on the management, fertility status of the soil and cultural practices of the ethnic group. The third stage, *Bashashiya*, which is transplanted in to wider spacing so as to allow vigorous growth of suckers at least one year. From this onwards, the most vigorous suckers are finally transplanted in to permanent field as *Garduwa*. At each stage of transplanting it takes one to four years. Among the sampled farmers in the study area, 22.4 % transplant directly in to permanent place (only one time), 56.4 % and 20.5% transplant twice and three times ,respectively. Data indicated that more than 75% of the farmers in the area transplant enset at least twice (Table 5). Such cultural practice has double disadvantage in that it extends the time enset require to reach maturity and it causes additional labour and land wastage which would have been used for the other purposes. With regard to age of transplanting to permanent stage, about 64.7% of respondents replied that three years old age is good stage. Inversely, about 14% and 9.6% reported 4 years and one year old age, respectively are suitable times for transplanting (Table 5).

3.3.2. Spacing

Close spacing affects enset growth and development. When spaced narrow they grow thin and taller that affects the harvestable pseudostem of the plant. Farmers of the study area use narrow spacing because of land shortage and to reduce weeding frequency. However, enset highly responds to wider spacing and fertility of the soil. Besides yield increment, wider spacing also reduces duration of maturity as enset being a perennial crop. The data of sample farmers indicated that only 11.26% of the respondents use standard plant spacing (2m X 2m) whereas all the rest use below standard which affect enset production severely.

3.3.3. Fertilizer Application

Enset grows well in fertile soils with good drainage. Farmers grow enset commonly in their homesteads so as to make it accessible for the application of animal manure and any waste products that can be used as organic source of fertilizer. The crop naturally highly responds to fertilizer application. According to focus group discussion, the crop can take more than 15 years to reach maturity if it is planted in poor soils or if no fertilizer has been applied. But in fertile soils with better agronomic management and organic fertilizer application it can reach maturity within 3 to 4 years. Though the crop responds to fertilizer applied, farmers in the study area use blanket application with the amount not specified yet. Not only the amount but also both the method and time of application are not specific in the area that critically needs further investigation.

3.4. Enset Yield

Enset can be harvested at different ages for different purposes. According to group discussion, enset is frequently consumed whenever there is food shortage. In the study area farmers harvest enset for *amicho* at earlier stages of growth whereas for *kocho* and *bulla* it is harvested at later stages nearly at maturity. Both quality and quantity of *kocho* and *bulla* increases as the plant reaches maturity (flowering) stage.

Enset yield varies depending on the type of clone, growing area, growth stage and cultural management. Most of the farmers reported that the amount of *kocho* obtained from one enset plant ranges from 15 to 61 kg. The data of the survey also indicated that about 63% of the sample farmers reported that the yield of enset is higher than other major crops including root and tuber crops produced in the area. On top of yield advantage, enset also ensures sustainability of food availability for households (Table 6). Since farmers in the area plant enset densely and on average about 10,000 plants in a hectare, the yield in hectare basis will be150, 000 to 610,000 kg. Similar study undertaken in Emdibir, Kambata and Sidama areas on enset production on-farm level indicated that the yield of *kocho* ranged from 8 to 70 kg per plant with the average of 30, 34 and 27 kg per plant for Emdibir, Kambata and Sidama areas, respectively. Similarly, the Farm Africa report on enset in Wolaita suggests a figure of 12 to 20 mature plants for an average family that gets 50% of its food intake from enset (Alemu and Sandford, 1991). Another study conducted in Kucha woreda of Gamo Gofa zone indicated that *Kocho* yield of enset plant before and after flowering was estimated to be 17.34 and 31.19 kg, respectively (Endale *et al*., 2003).

According to key informants, yield advantage of enset is by far greater than that of major crops grown in the area. Some community elders suggested that enset is a crop grown for risk avoidance. It fills food gap during seasonal

shortages in a year for human beings and also livestock as well. In addition to this, it is a crop known by its drought tolerance and hence most commonly considered as lifesaving crop for both human being and livestock as well.

3.5. The Major Challenges of Enset Production

Some of the major challenges in enset production in the study area that include land shortage, recurrent drought, disease, lack of improved clones in terms of yield, disease resistance, drought tolerance; labour shortage, lack of improved processing and storage technologies, improper or traditional agronomic practice, financial shortage, long time maturity, and food shortage/starvation (Table 7). About 55% of the sample farmers indicated that land shortage as the 1st serious problem which hinders allocation of adequate land to enset plant in the field. The land shortage affects not only the expansion of enset production but also the maturity for harvesting so as to obtain quality yield. More over land shortage is directly related to population density of the area. The higher the family size the frequent will be enset feeding that in turn results in decrease of overall enset production systems. Increase in the family size coupled with land shortage urges the house hold to feed their enset at early stages so that there is loss of enset population and diversity. The other problem associated with land shortage is the perennial nature of the crop. It stays more than 5 or 6 years in the field and hence those with very limited land holding size do not have an opportunity to diversify the crops so that they do not want to stay with a single crop for these long period of time. Next to this, disease and recurrent drought were the second major factors that affect enset production and account for about 16% and 14.7%, respectively (Table 7). The other important yet can be solved is poor agronomic practices and lack of improved varieties in the area.

Poor agronomic and traditional cultural practice such as frequency of transplanting, spacing, fertilization, pruning and so on are done blanketly that significantly affects both production and productivity of enset in the area. Once again frequent transplanting and cultivation also has direct relation to crop maturity, productivity and efficient utilization of labour, land and time as well. More over the farmers in the area do not have any know how about the amount, type and method of fertilizer application that significantly affects its production since the crop by nature highly respond to applied fertilizers be it organic or inorganic.

4. Summary and Conclusion

There were more than fifty five enset clones observed in the area. The diversity of enset clones in the area may be due to their variation in utilization of these clones for intended specific purposes. Clone selection for specific purpose also shows slight variation based on agroecology of the area. Some are more preferred in high land while others are more adapted to low lands. In this line, *Halla, Argama* and *kekeruwa* are more common in high land area than low or mid altitudes while *Tuzuma* and *Nakaka* are preferred in mid altitude areas.

Enset is commonly propagated vegetatively by using suckers though it can be propagated sexually by seeds. As far as agronomic practices of enset are concerned, producers of area used traditional method of multiple transplanting frequency (three times), spacing, weeding (cultivation), fertilization, harvesting and processing, storage methods which are by far different from the research recommendations that need serious attention to boost production and productivity in the area.

Farmers of the study area confirmed that the crop is a lifesaving crop for both human being and livestock. It is advantageous in terms of yield as compared to other crops including even root and tuber crops cultivated in the area. The unique features of the crop among others include its ability to be harvested at any stage of growth and at any time of year; ability to tolerate unexpected drought where by other crops cannot exist. In such harsh situations enset sometimes becomes the only source of food for human beings and feed for livestock-so plays a pivotal role in life saving.

Therefore, the current status of enset crop of the area calls for the involvement of government officials, research professionals from universities and research centers, development organizations (GOs and NGOs), development agents and farmers collective actions to save gene erosion (loss of diversity), exploit the crop potential and to extend its production to other non-producing areas.

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Table 1: *Enset* **cloned selected for** *kocho, workey* **and** *bulla,* **2011.**

	Clones selected for *kocho*							Clones selected for *workey*						Clones selected for *Bulla*					
SNo	Clone (Local Name)	High Land (*Dega*)		Mid Land (*Woina Dega*)		Total		High Land (*Dega*)		Mid Land (*Woina Dega*)		Total		High Land (*Dega*)		Mid Land (*Woina Dega*)		Total	
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
1	*Halla*	43	28.1	15	11.1	58	37.9	41	26.8	7	4.6	48	31.4	38	26.03	16	11.0	54	36.98
2	*Falakia*	11	7.2	4	2.6	15	9.8	4	2.6	4	2.6	8	5.2	3	2.1	1	0.7	4	2.74
3	*Argama*	7	4.6	0	-	7	4.6	9	5.9	4	2.6	13	9.3	18	12.33	2	1.4	20	13.7
4	*Tuzuma*	1	0.7	15	9.8	16	10.5	0	-	18	12.9	18	12.9	0	-	19	13	19	13.0
5	*Maziya*	8	5.2	2	1.3	10	6.5	7	4.6	0	-	7	4.6	6	4.1	1	0.7	7	4.8
6	*Nakaka*	6	3.9	8	5.2	14	9.2	5	3.2	7	4.6	12	7.8	3	2.1	5	3.4	8	5.5
7	*Genna*	9	5.9	2	1.3	11	7.2	1	0.7	6	3.9	7	4.6	3	2.1	3	2.1	6	4.1
8	*Adinona*	2	1.3	1	0.7	3	2.0	5	3.2	1	0.7	6	3.9	4	2.74	1	0.7	5	3.4
9	*Kekeruwa*	3	2.0	5	3.2	8	5.2	4	2.6	5	3.2	9	5.9	7	4.8	2	1.2	9	6.2
10	*Weysha*	1	0.7	2	1.3	3	2.0	1	0.7	0	-	1	0.7	1	0.7	1	0.7	2	1.4
11	*Sorgiya*	1	0.7	0	-	1	0.7	0	-	1	0.7	1	0.7	0	-	1	0.7	1	0.7
12	*Lembuwa*	0	-	2	1.3	2	1.3	0	-	4	2.6	4	2.6	0	-	1	0.7	1	0.7
13	*Arkiya*	1	0.7	0	-	1	0.7	1	0.7	0	-	1	0.7	3	2.1	0	-	3	2.1
14	*Shuchafiya*	0	-	3	2.0	3	2.0	2	1.3	2	1.3	4	2.6	0	-	2	1.2	2	1.4
15	*Godariya*	0	-	1	0.7	1	0.7	1	0.7	0	-	1	0.7	2	1.2	3	2.1	5	3.4
	Total	**79**	**58.96**	**55**	**41.04**	**134**	**100**	**79**	**58.96**	**55**	**41.04**	**134**	**100**	**79**	**58.96**	**55**	**41.04**	**134**	**100**

Table 2: Clones selected for *Amicho* (corm), 2011.

S/No	Clone type (Local Name)	High Land (*Dega)*		Mid Land (*Woina Dega*)		Total	
		No	%	No	%	No	%
1	*Halla*	9	6.67	1	0.7	10	7.4
2	*Falakia*	4	2.96	3	2.2	7	5.2
3	*Argama*	2	1.48	1	0.7	3	2.2
4	*Tuzuma*	0	-	1	0.7	1	0.7
5	*Maziya*	4	2.96	0	-	4	2.96
6	*Nakaka*	7	5.2	14	10.37	21	15.4
7	*Genna*	13	9.6	2	1.48	15	11.0
8	*Adinona*	3	2.2	3	2.2	6	4.44
9	*Kekeruwa*	4	2.96	5	3.7	9	6.67
10	*Peluwa*	4	2.96	1	0.7	5	3.7
11	*Sorgiya*	2	1.48	1	0.7	3	2.2
12	*Lembuwa*	0	-	2	1.48	2	1.48
13	*Arkiya*	17	12.6	6	4.44	23	17.0
14	*Shuchafiya*	0	-	2	1.48	2	1.48
15	*Godariya*	1	0.7	0	-	1	0.7
16	*Bala*	3	2.2	0	-	3	2.2
17	*Chichiya*	4	3.0	5	3.7	9	6.7
18	*Dokuwa*	3	2.2	4	3.0	7	5.2
19	*Kataniya*	0	-	4	3.0	4	3.0
	Total	**80**	**59.26**	**55**	**40.74**	**135**	**100**

Table 3: Enset clones selected for fiber, 2011.

S/No	Clone type (Local Name)	High Land (*Dega)*		Mid Land (*Woina Dega*)		Total	
		No	%	No	%	No	%
1	*Halla*	35	26.1	14	10.4	49	36.6
2	*Falakiya*	24	17.9	6	44.8	30	22.4
3	*Argama*	3	2.2	1	0.7	4	3.0
4	*Tuzuma*	2	1.5	26	19.4	28	20.9
5	*Maziya*	8	6.0	2	1.5	10	7.5
6	*Nakaka*	0	-	1	0.7	1	0.7
7	*Genna*	1	0.7	0	-	1	0.7
8	*Adinona*	1	0.7	0	-	1	0.7
9	*Kekeruwa*	2	1.5	1	0.7	3	2.2
10	*Sorgiya*	1	0.7	0	-	1	0.7
11	*Chichiya*	0	-	1	0.7	1	0.7
12	*Kataniya*	0	-	3	2.2	3	2.2
13	*Godariya*	2	1.5	0	-	2	1.5
	Total	**79**	**58.96**	**55**	**41.04**	**134**	**100**

Table 4: The number of suckers produced from a single mother plan, 2011.

Range	Large producers		Small producers		Total	
	N	%	N	%	N	%
10-20	6	3.8	4	2.7	10	6.4
20-30	18	11.5	26	16.6	44	28.1
30-40	18	11.5	20	12.8	38	24.3
40-50	12	7.7	16	10.3	28	18
50-60	8	5.1	10	6.4	18	11.5
60-70	4	2.7	1	0.6	5	3.2
70-100	6	3.8	5	3.2	11	7
More than 100			2	1.9	2	1.9
Total	72	46.2	84	53.8	156	100

Table 5: Age and transplanting frequency of enset suckers until it reaches permanent field, 2011.

Item	Frequency	Percent
Frequency of transplanting		
One time	35	22.58
Two time	88	56.77
Three time	32	20.65
Total	155	100
Age of transplant to permanent place		
One year age	15	10.27
Two year age	8	5.48
Three year age	101	69.18
Four year age	22	15.07
Total	146	100

Table 6: Comparing the yield of major crops with that of enset, 2011.

Farmers response	Frequency (N)	Percent
Enset yield is higher than other crops	92	63.00
Enset yield is less than other crops	54	37.00
Total	146	100

Table 7: Some major challenges of enset production, 2011.

Items	drought	disease	Land shortage	Processing	Lack of improved clone	Poor agronomic practice	Labor shortage	Financial shortage	Hunger
Total	121	111	132	55	84	66	9	1	11
%	78	71	84.6	35	53.8	42.3	5.8	0.6	7.1