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The Ethno Botanical Study and Distribution Patterns of *Enset Landraces* (*Ensete ventricosum* (Welw) Cheesman) in Aleta Chuko District, Sidama Zone, South Nation Nationality People and Regional State, Ethiopia

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ABSTRACT

Enset (*Ensete ventricosum* (Welw) Cheesman) is the most widely used staple food crop for millions of people living in South and South western Ethiopia. The ethno botanical study and the extent of distribution such as enset at local level remain very limited. Therefore, the objective of this study is to present a comprehensive ethno botanical description and distribution pattern on enset landraces in Aleta Chuko district. Accordingly, the study was conducted on distribution patterns and ethno botanical study of enset landraces in 125 randomly selected households at five different Kebeles (the smallest administrative unit in Ethiopia) in the South nation nationality people and regional state, Aleta Chuko district of Ethiopia. Abundance and distribution patterns of enset landraces were positively correlated such that more abundant landraces were also more distributed ($r=0.7$, $p<0.01$). In addition to this, it was found that enset landraces had socioeconomic significance serving as food, source of income, medicinal value and ritual/religious significance in Aleta Chuko district. The myths and song in relation to enset plant were well investigated. The result from this study showed that distribution, composition and abundance of enset landraces varied along the study Kebeles. These variations largely depend on elevation, Climate, precipitation, availability of sucker, good management and presence of organic fertilizer (animal dung).

INTRODUCTION

Ethno botany, a recent discipline in science, is a branch of ethno biology and ethno sciences that deals with the reciprocal relationship between plants, people and the way they live or Ethno botany is the study of how people of a particular culture and religion make use of indigenous plants. Plants are invaluable and fundamental to almost all life on earth. They provide wide range of uses to human beings such as medicine, food, shelter, clothing, utensils as well as ritual and religious benefits. They also recycle essential nutrients of ecosystems, establishing soils and maintaining soil fertility in addition to protecting areas of water catchments. Moreover, they keep ecological and climatic balance, facilitate and control rainfall through the process of evaporative transpiration. Enset is one of the plants which have many uses [1-3].

Enset (*Ensete ventricosum* (Welw) Cheesman) is a perennial herbaceous, monocarpic and monocotyledonous crop that belongs to the family Musaceae and fruits only once in its life cycle (after 6–10 years) depending on climate and landrace type. Enset is related to and has physical resemblance with the banana plant and as a result, it is sometimes known as a false banana [4,5]. However, Enset belongs to the family Musaceae, and the genus Enset [6]. On the other hand, Banana is in the same family as enset, but it is classified in the genus Musa [7]. Although enset produces banana-like fruits, these fruits are not edible [8]. The underground corm and the aerial pseudo stem made up of overlapping leaf sheaths are edible after some processes. Starchy food is produced by grinding the corm or scraping the pseudo stem, followed by a short fermentation period [5].

Enset is not just a food crop, but is a multipurpose crop of which every part of the plant (except the roots) is utilized, for food or several non-food applications [8,9]. Enset leaves are used for baking bread, for wrapping, for shade or protection from heat and rain, for production of string and rope for tying, for making mats and sheets on which to sleep and sit. It is also used as a brewing pot during the preparation of the local beer [10]. The pseudostem is the most valuable, as the basal part contains the starch, and

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the remaining fiber is used for making strong ropes, twines and sacks [11]. Enset (*Ensete ventricosum* (Welw) Cheesman) is the main crop of a sustainable indigenous African system that ensures food security in a country that is food deficient [11]. Ethiopia is one of the centers of diversity and origin for various agricultural crops [12]. Enset is one of the oldest cultivated plants of Ethiopia and it seems that only in Ethiopia was it domesticated. Enset represents about 65% of the total crop production in the southern region of Ethiopia. Productivity is very high compared to other crops but varies depending on cultural practices (indigenous knowledge), edaphic factors, altitude and varietal differences [13-15].

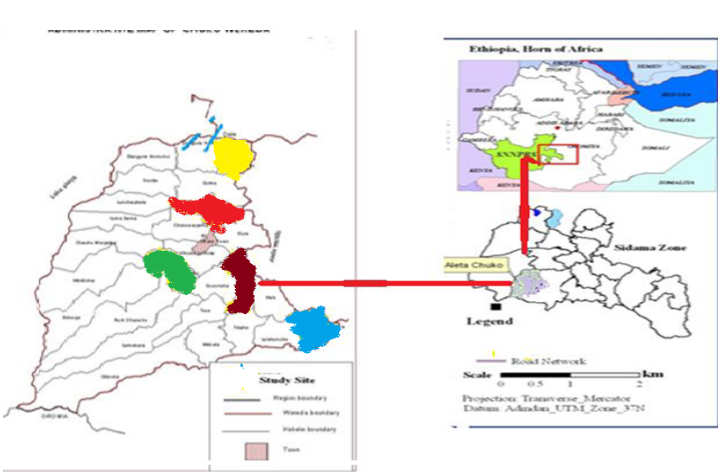
The convention on biological diversity article eight stated the need to establish mechanisms to ensure the effective participation of indigenous communities in decision-making and policy planning to respect, preserve and maintain traditional knowledge relevant to conservation and sustainable use of biodiversity. This was aimed to promote the wider application of traditional knowledge with the involvement of traditional people, and to encourage and ensure equitable sharing of benefits collected from utilization of traditional knowledge so that further ethno botanical study on enset landraces is needed in Ethiopia.

Moreover, in Ethiopia, the Studies of less known crops distribution such as enset at local level remain very limited [15,16]. Due to this it needs further studies to understand the distribution patterns of enset landraces in traditional farming societies. Variety of enset landraces exist in SNNPRS which is one of the major food crops in most part of this region. Therefore, the objective of the study was to investigate the ethno botanical knowledge and distribution patterns of enset landraces in Aleta Chuko district, Sidama Zone, SNNPR.

MATERIALS AND METHODS

Description of the Study Area

Aleta Chuko district is located in Sidama Zone, Southern Nation Nationalities people regional state(SNNPRS) within 6°27′20″E– 6°40′14″N latitude and 38°12′31″E–38°25′33″E longitude. Aleta Chuko district is situated 338 km south of Addis. The Aleta Chuko district consists of 28 Kebeles (the smallest administrative unit in Ethiopia) and has an estimated area of 32,248 hectares .The population of the study area is almost entirely of the Sidama ethnic group (91%). The altitude of the district ranges between 1,400 meters to 2,300 meter above sea level. The district has two agro-climatic zones, which are Kolla (lowland) and Weyina Dega (midland). A mean annual rainfall of the district is 11,001,400 mm. The long term annual temperature of the district ranges from 10ºC to 26ºC. Agriculture is the dominant means of livelihood for the majority of Aleta Chuko people. The common crops in the district are Enset (*Enset ventricosum*), Coffee (*Coffea arabica*), Chat (*Catha edulis*), Avocado (*Persea americana*), Mango (*Mangifera indica*) and Pineapple (*Ananas comosus*). Enset is the main staple food for rural population of the study area **(Figure 1).**



Locations of the study Kebeles on the Map.
Rufowayino, Dengorakewado, Mangudo, Gelma, Lelawomerera

Figure 1. Administrative Map of the study area.

Data collection

A reconnaissance survey was made at the beginning of the study to select rural villages (Kebeles) in Sidama Zone, Aleta Chuko district. The study Kebeles was selected purposively on the basis of the two major variables that were believed to affect distribution and socioeconomic significance of ens.et landraces. The variables are Agro climatic zones (Dega (high land), Woina-Dega (Midland) and Kolla (low land) and elevation. Two different agro climatic zones exist in Aleta Chuko district (Woina-Dega (midland) and Kola (low land).The study was conducted in Woina-Dega agro climatic zone. Because, based on the observation made during field survey, in this agro climatic zone Enset-coffee based home gardens are dominant. The Woina-Dega areas, which are situated between 1500-2300 meters elevation, are the most important in terms of agricultural productivity of enset. On the other hand Kolla' agro climatic zone is dominated by annual crops such as maize (*Zea mays*), but not favorable for enset agriculture [17]. Due to this the study was conducted in Woina-Dega agro climatic zone of Alta Chuko district. The next selection criterion was elevation of each Kebele (the smallest administrative unit in Ethiopia). This is because as altitude varies the distribution pattern

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of enset landraces also varies.

Based on the above selection criteria out of 28 Kebeles, the study was conducted only on five representative Kebeles. Accordingly, Mangudo, Rufowayino, Dengorakewado, Gelima and Lelawomerera were selected to conduct this research. From each Kebele 25 households were selected randomly bringing the total number of sampled households to 125. Data was collected from primary sources. The primary data was collected through Semi-Structured interview, Group Discussion and Field observation. Secondary source of data was obtained from the agricultural office of the district, from different books, journal and research article.

Data Analysis

The collected data was analyzed by using SPSS (statistical package for social sciences). A descriptive statistical method was employed to analyze and summarize the data and to calculate percentages, means and other measures of central tendencies. The percentage of distribution and abundance/frequency of enset landraces in each Kebele (the smallest administrative unit in Ethiopia) was determined by Using Brown scheme for classifying alleles/clones. Based on Brown's scheme for classifying alleles, enset landraces have been arbitrarily grouped into two major categories on the basis of their distribution and abundance. These are (I) common (occurring with frequency greater than 10% at least in one site) and (II) rare (never occurring with frequency greater than 10%). The commonly occurring ones are further grouped into widespread (occurring at >2 sites), sporadic (occurring at 2 sites) and localized (occurring in only one site). Similarly, the rare varieties are grouped into widespread and localized.In addition the relationships between abundance and distribution of enset landrace were correlated by using Pearson correlation coefficient. The value of Pearson correlation coefficient (r) lies between -1 and +1. A value of the correlation coefficient close to +1 indicates a strong positive linear relationship (i.e. one variable increases with other) but a value close to -1, a strong negative linear relationship [18,19].

RESULTS AND DISCUSSIONS

Household's Characteristics

From the total respondents, 20.8% of the household's heads had age between20 and 35 years old, while a little below half of the household heads (42.4%) had age between36 and 50 years old, 28% and 8.8% of the households had age between 51 and 75 and above 75 years old respectively. Most of the respondents were males (83.2%) and only a few of them were females (16.8%).

As to the education status of the households, 5.6% of the respondents were uneducated, while slightly over half of the participants study primary (first cycle, 1–4) education, 28.8%, 8.8% and 4% of the household heads were educated up to primary (Second cycle, 5–8),Secondary High School(9–10) and > 11 grade respectively. Assessment in the size of the land that the respondents possessed indicated that the majority (68%) of the respondents had 1–2 hectares, where as 26.4% had less than two hectares and only 5.6% of the respondents had more than two hectares. The maximum size of land possessed by the household was three hectares while the minimum was half hectares. The sizes of enset farm are generally small and on average farmers cultivated about 1.1 hectares/farms.

Composition, Distribution and Abundance of Enset Landraces

There were variations in the composition, distribution and abundance of enset landraces in the study Kebeles. Aleta Chuko district had different enset landraces with different abundance and patterns of distribution. The study district is endowed with considerable enset landraces assemblage mainly composed of landraces such as Ado, Genticho, Midasho and Gediwocho which are common in almost all farms. Nonetheless, differences existed in the distribution of less common enset landraces. The major difference in enset landraces composition was observed on two Kebeles (Lelawomerera and Rufowayino).

The composition of Enset landraces in Kebeles with the lower altitude such as Rufowayino was low but Lelawomerera located at the highest altitude (2015 m.a.s.l) had the highest composition. On the other hand, the composition of enset landraces in Gelma, Mangudo and Dengorakewado were more or less similar. The observed variation in landrace composition between Kebeles could be due to altitude, environmental factor such as rainfall, temperature, humidity etc. In a similar study conducted on Diversity in home garden agro forestry systems of Southern Ethiopia, [17] temperature plays a significant role in the growth rate of enset. Accordingly, at the altitudinal ranges of 1500-2300 meters (Woyna - Dega areas) where mean annual temperature is 15-20ºC, enset grows fast and reaches full maturity in 5 to 7 years.

Moreover, some Kebeles composed of particular landrace (endemic landraces). From the total landraces that were recorded during the survey only 14.5% were endemic. These were Biru-damalaa and Boowe were recorded only in Dengora kewado and Mangudo respectively while Dongicho, Duwancho, Gorichcho, Hansha, Hayisa and Wodero were recorded only in Lelawomerera. Lelawomerera composed of most of the endemic enset landraces (6 out of 8) which also contained the highest number of enset landraces from the selected five study Kebeles. The possible reason for the observed high number of enset landraces could be the altitude of Lelawomerera is the highest of all the selected study Kebeles (2015 m.a.s.l.).As altitude increase the composition of enset landraces also increase.

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Furthermore, 29% of enset landraces were found only at two Kebeles while 56.3% of enset landraces were found at more than two Kebeles while 23.6% of the landraces, namely Ado, Asikala, Birra, Chacho, Gedimee, Gediocho, Geena, Genticho, Gulumo, Kiticho, Midasho, Uuwisho and Gedio-ado were found at all five study Kebeles. In addition from the landraces that were found at more than two Kebeles, 7.3% of the landraces (Amboma, Dowiramo, Haaho and Heekeche) were recorded in four Kebeles whereas the remaining 25.4% of the landraces were recorded in three Kebeles each. The mean distribution of each Kebele at the household level was varying each other. Rufowayino had lowest mean distribution (5.4) while Lelawomerera with the highest mean distribution (13.2). The mean distribution range was 7.8. The mean distribution and the total number of landraces in Lelawomerera and Gelma were higher than the others Kebeles; it could be due to altitude of the two Kebeles were higher than other Kebeles.

There were also differences in the abundance of enset landraces at the household level. Hence, 9.1% of the landraces were found in a single household (Woodaro, Hayisa, Dongicho, Boowe and Biru-damala) while 7.3% of them were found in two households (Sidaancho-ado, Duwancho, Dansitee and Adami-ado) whereas 5.4% of them were found in three households (Geemechella, Godare and Hansha) each. Only Ado and Genticho were found at all 125 households. Of the total landraces that were found in the study area 3.6% were found in all sampled households. This indicated that there existed a variation in the abundance of enset landraces (between one and one hundred twenty five). The dominance of the two landraces (Ado and Genticho) is due to their wide socioeconomic and ecological roles in the enset agricultural systems of the study area.

The relationship between abundance and distribution of enset landraces was correlated by using Pearson correlation coefficient. There was a significant association between distribution and abundance of enset landraces in the study district with value of (r=0.7) which is highly significant (0.01). The value r=0.7 indicated strong positive linear relationship between the abundance and distribution of enset landraces; more widespread varieties were also typically more abundant (i.e. one variable increases with other) **(Figure 2)**.

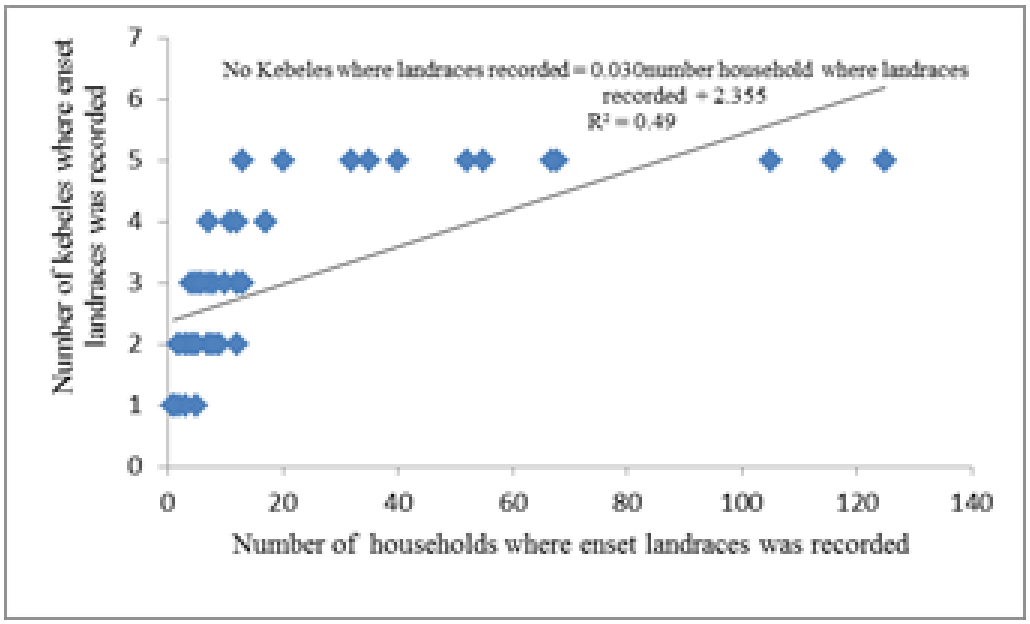

Figure 2. Relationships between abundance and distribution of enset landrace (R^2=0.49, p<0.01).

Based on Brown schemes of clone's classification (on the basis of their distribution and abundance) from the total (55) enset landraces that was recorded during the study, 76.4% were common enset landraces. From the common enset landraces, 54.5% of them were wide spread, 18.3% sporadic and only 3.6% were localized. Similar study conducted on diversity and distribution patterns of Enset landraces in Sidama, Ethiopia, [16] reported enset landraces classification Based on Brown schemes of clone's classification which are almost similar in the current study. **Table 1** summarized common enset landraces, the frequency, and percentage in the five Kebeles based on scheme of clone's classification.

From **Table 2** the most frequent enset landraces in each Kebele were Ado and Genticho with percentage of frequency 100%. Midasho and Gediwocho were the next frequent enset landraces followed by Ado and Genticho and the least frequent enset landrace was Hansha (from common enset landraces).The remaining 23.6% were rare enset landraces. Of thirteen rare enset landraces 12.7% were wide spread and 10.9% were localized. Of the rare enset landraces Biru-damala, Boowe, Dongicho, Hayisa and Woodaro were the least frequent enset landraces in the study area.

Based on Brown schemes of clone's classification a large fraction of Aleta Chuko distric enset landraces were widespread common (54.5%) and sporadic (18.2%).

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Table 1. Distribution ranges of Common enset landraces based on Brown (1978) scheme of clones' classification.

Note. I-Rufowayino, II-Dengorakewado, III-Mangudo, IV-Gelma, V-Lelawomerera

No	Local name of common *Enset landraces* in each Kebele	Frequency (%) of Enset landraces in each Kebele				
		I	II	III	IV	V
1	Ado	25 (100%)	25 (100%)	25 (100%)	25 (100%)	25 (100%)
2	Agenna	0%	2 (8%)	1 (4%)	0%	9 (36%)
3	Aleticho	0%	7 (28%)	1 (4%)	4 (16%)	5 (20%)
4	Amboma	0%	7 (28%)	4 (16%)	2 (8%)	4 (16%)
5	Arrishsho	0%	0%	1 (4%)	1 (4%)	6 (24%)
6	Asikala	2 (8%)	4 (16%)	8 (32%)	10 (40%)	16 (64%)
7	Birbo	0%	5 (20%)	0%	0%	4 (16%)
8	Birra	3 (12%)	16 (64%)	7 (28%)	15 (60%)	11 (44%)
9	Borbodhicho	0%	9 (36%)	0%	2 (8%)	2 (8%)
10	Boowete-ado	0%	11 (44%)	1 (4%)	0%	0%
11	Bullo	0%	1 (4%)	0%	1 (4%)	3 (12%)
12	Chacho	2 (8%)	9 (36%)	2 (8%)	9 (36%)	10 (40%)
13	Damala	0%	1 (4%)	1 (4%)	0%	3 (12)
14	Doweramo	1 (4%)	1 (4%)	1 (4%)	1 (4%)	4 (16%)
15	Gedimee	1 (4%)	3 (12%)	2 (8%)	4 (16%)	3 (12%)
16	Gediwocho	21 (84%)	21 (84%)	19 (76%)	21 (84%)	23 (92%)
17	Gedio-ado	1 (4%)	6 (24%)	1 (4%)	7 (28%)	5 (20%)
18	Geena	6 (24%)	17 (68%)	18 (72%)	9 (36%)	5 (20%)
19	Gentichcho	25 (100%)	25 (100%)	25 (100%)	25 (100%)	25 (100%)
20	Goloma	0%	0%	0%	3 (12%)	4 (16%)
21	Goricho	0%	0%	0%	0%	5 (20%)
22	Gosalo	0%	4 (16%)	0%	3 (12%)	5 (20%)
23	Gulumo	7 (28%)	21 (84%)	11 (44%)	18 (72%)	11 (44%)
24	Haaho	0%	2 (8%)	1 (4%)	2 (8%)	6 (24%)
25	Hansha	0%	0%	0%	0%	3 (12%)
26	Heekeche	0%	3 (12%)	1 (4%)	1 (4%)	7 (28%)
27	Kanda	0%	0%	1 (4%)	1 (4%)	5 (20%)
28	Keeshe	0%	0%	0%	1 (4%)	4 (16%)
29	Kincho	0%	0%	1 (4%)	0%	6 (24%)
30	Kirre	0%	0%	0%	1 (4%)	4 (16%)
31	Kiticho	17 (68%)	16 (64%)	12 (48%)	17 (68%)	5 (20%)
32	Kuule	0%	0%	1 (4%)	1 (4%)	4 (16%)
33	Leemicho	0%	1 (4%)	0%	2 (8%)	7 (28%)
34	Maade	0%	0%	1 (4%)	1 (4%)	3 (12%)
35	Midasho	21 (84%)	25 (100%)	21 (84%)	24 (96%)	25 (100%)
36	Mundiraro	0%	1 (4%)	0%	0%	3 (12%)
37	Siriro	0%	3 (12%)	0%	0%	4 (16%)
38	Torora	0%	0%	0%	1 (4%)	4 (16%)
39	Tunnako	0%	8 (32%)	0%	3 (12%)	2 (8%)
40	Uuwisho	2 (8%)	3 (12%)	9 (36%)	9 (36%)	12 (48%)
41	Wanikore	0%	0%	1 (4%)	0%	7 (28%)
42	Adami	0%	0%	1 (4%)	0%	3 (12%)

The Socioeconomic Significances of Enset Crops

Enset is versatile crop which has many socioeconomic importances in the study district. Some of the socioeconomic importance's of enset in the study area are : as staple food, for several non-food purposes such as leaves are used for baking bread, wrapping, protection from heat and rain (for shade), as a shade tree when intercropping with coffee, for production of string and rope, tying, as fodder for cattle and as source of income.

Enset as a Source of Food in the Study Area

In Aleta Chuko district, enset is the most frequently served main meal (staple food). Enset (Kocho) is consumed in different kinds of preparation during breakfast, lunch and dinner and at the time of holly days. Depending on the wealth of the household, this diet may be supplemented with other food such as dairy products, meat and vegetables. The major foods obtained from enset in the study area are Kocho, Bulla and Amicho.

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Table 2. Distribution ranges of rare enset landraces based on Brown (1978) scheme of clones' classification.

No	Local name of rare *Enset landraces* in each Kebele	Frequency (%) enset landraces in each Kebele				
		I	II	III	IV	V
1	Adami-ado	0%	0%	1 (4%)	1 (4%)	0%
2	Ayidara	0%	0%	1 (4%)	1 (4%)	2 (8%)
3	Biru-damala	0%	1 (4%)	0%	0%	0%
4	Boowe	0%	0%	1 (4%)	0%	0%
5	Dansitee	0%	1 (4%)	0%	0%	1 (4%)
6	Dongicho	0%	0%	0%	0%	1 (4%)
7	Duwancho	0%	0%	0%	0%	2 (8%)
8	Geemechella	0%	2 (8%)	0%	0%	1 (4%)
9	Godare	0%	0%	0%	1 (4%)	2 (8%)
10	Hayisa	0%	0%	0%	0%	1 (4%)
11	Sidanchi-ado	0%	0%	0%	1 (4%)	1 (4%)
12	Siricho	0%	2 (8%)	2 (8%)	2 (8%)	0%
13	Woodaro	0%	0%	0%	0%	1 (4%)

Note. I- Rufowayino, II- Dengorakewado, III- Mangudo, IV- Gelma, V-Lelawomerera.

Kocho is the mass or bulky, chewy, fermented starch which is made from mixture of the decorticated leaf sheaths and grated corm (underground stem base) which can be stored for long periods of time without spoiling. There are different factors that affect the value of Kocho in the study district. Some of these factors are: the age of the harvested enset plant, the type of landraces, the harvesting season and the duration of the fermentation period. Based on fermentation period or the duration in which the Kocho stayed in the pit, it can be classified as; (1) Udae, (2) Wassa, (3) Delekee and (4) Hokedo. People in the study area believed that the longer the fermentation period, the higher the quality of Kocho. The people in the study area considered Hokede, as the best of all types of Kocho listed above because the fermentation period is greater than the others (more than 1 year). The other (Udae, Wassa and Deleke) stayed in pit for less than one year.

Many different dishes are prepared from Kocho in Aleta Chuko district. These are; Bursamee, Chukamee, Omolicho (kita/ tima) or pancake-like bread are the most common. Bulla is the small water-soluble starchy product that may be separated from Kocho during processing by squeezing and decanting the liquid. The clear solution on the Bulla sediments usually discarded. The remaining thick sticky white substance, Bulla is wrapped with fresh enset leaves and tied with woficho / string in order to be fermented. If the Bulla is exposed to air and light its color is changed or become non-white bulla. This causes reduction in market value because white Bulla has more market value than non-white bulla. In the study district Bulla is known as the Kings or (locally Moticha) of all enset products. It is considered as the best quality enset food and is obtained mainly from fully matured enset plants. Bulla can be prepared as a pancake and porridge.

Amicho is the fleshly inner portion of the enset corm, which may be cooked and eaten separately, tasting similar to potato. The preparation method of amicho is similar to other root and tuber crops in which its corm is boiled and consumed. Certain landraces such as Asikala, Ayidara, Hekechee and Birra are selected for their amicho production in Aleta Chuko district. The study that had been conducted by Shigeta (1991) reported almost similar result to the current study.

Enset as a Source of Income

In the study area, most of the time the product obtained from enset is used for consumption. The people sell the Kocho/ Bulla when there is lack of other cash crops such as coffee (Coffea arabica) and chat (Catha edulis). The selling of enset products is women initiative, un- like cash crops such as Coffee (Coffea arabica) and Chat (Catha edulis). Women can take a portion of fermented Kocho or Bulla from the storage pit for sale to the nearby markets to fulfill household needs at any time **(Figure 3A)**. According to the current market situation the prices of Bulla and Kocho increase just like the other crops.

The other product of enset for market demand is the sucker or locally called Funta. Especially the suckers/Funta was carried by truck or by horse from high land area and sell to lowland area. Usually people in the study area takes care (multiply) seedling of enset in the nursery bed for the purpose of selling rather than for transplanting because they believe that if the sucker/Funta transplant to the same soil, it is not good and sucker from Dega (high land) is good for Woinadega (midland) **(Figure 3B)**. The selling of suckers takes place at particular season or during the start of the rainy season (March-April). Because transplanting of

Figure 3A. Women sell the kocho in the market.

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Figure 3B. Sucker for sale at the market (Photo by: Amare Seifu).

the sucker/Funta accomplish during this season(rainy season). The result of the study by Shigeta [10] and Temesgen et al. [11] are almost similar to the current study.

Non-food Uses of Ensets

Enset is not just a food crop, but is a multi-use crop of which every part of the plant used for food or several non-food functions. Generally enset leaves are used for baking bread, wrapping, shade or protection from heat and rain, production of string and rope, tying, making mats and sheets on which to sleep, sits, house construction and mattress production. During enset harvesting, enset leaves are used to line the ground where processing and fermentation take place or pit liners to store Kocho for fermentation and future use **(Figure 4)**.

Figure 4. Enset leaves used as pit liner to store kocho (Photo by: Amare Seifu).

Fresh enset leaves are very important to place cooked foods and used as feeding material for the cooked food (Bursamee and Chukamee) in the study area **(Figure 5A)**. Guests are presented fresh enset leave mat to sit on the ground. Merchants in the market always sit on the enset leaves, especially after the rain. Particularly enset leaves are used as a sit during funeral and dating for wedding ceremony **(Figure 5B)**. In addition the leaves of enset are used to cover enset seedlings to prevent them from too much drying in the heavy dry season and to wrap the mouth of the cooking pot tightly.

Dried leaf sheaths are used as wrappers for butter, Kocho, and other items to transport to local markets. Leaves are also essential for women in the local market in order to wrap up the commercial goods such as fermented enset, butter, coffee and several other agricultural products. Sun-shading shelter is temporarily made of leaves of enset when women processed/ harvested enset **(Figure 6A)**. Enset fibers used to make sacks, bags, ropes, mats, construction materials, sheet and sieves. The strings or ropes made of enset fibers are very strong **(Figure 6B).**

Figure 5A. Enset leaves used as eating material.

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Figure 5B. Enset leaves used as a sit.

Figure 6A. A shelter made of leaves of enset.

In addition enset leaves are an important cattle feed, especially in the dry season when grasses are scarce **(Figure 7)**.

Medicinal and Ritual Significance of Enset

Based on the interview verities of enset landraces have medicinal and religious (ritual) significances or as protection against evil spirits (buda). Some examples of enset landraces that has medicinal and ritual importance are: - The boiled Amicho and Bulla of Ado, Gentichcho, Midashsho, Gediwocho and Kitichcho are eaten with milk to cure ailments such as broken bones and joint displacement. Ado is milky colored enset selected specifically for its medicinal values for the treatments many human ailments.

Asikala is a landrace with a deep red color. Its pseudo stem, midrib and leaf are deep red in color. This landrace has medicinal value to both humans and animals (cow).The Amicho of this enset is boiled and eaten with butter and milk by women who have just delivered babies and whose discharge of the placenta is delayed. It is believed that the Amicho stimulates the placental discharge following delivery. In the case of animal (dairy cows), the Amicho and leaves are given with salt for similar purposes. This landrace also has a ritual significance. Farmer's plant Askikala in front of their home and enset land as a safe guard of the

Figure 6B. Enset Fibers (Kancha).

children and other enset plant against devils' and all evil spirit attacks (buda).The people in the study area believed that since Asikala is deep red in color, whose color grabs the powerful attention of those individuals with the evil eye. Asikala is also selected for its drought resistant characteristics.

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Figure 7. The leaves of enset used as food for cattle (Photo by: Amare Seifu).

Chachcho is also red colored enset which require more time range for growth than other varieties and selected for cultural value. The local people think as washing with the juice of Chachcho would cleanse everyone who breaks the cultural rule called Budenna Seera Saatenni. Meaning, if a person kills someone, the people in the study area believed that the cultural rule is not working. At this time the elder persons negotiate between the assassin and the killed parents' by spraying the juice extracted from Amicho of Chachcho and washing with the juice of it. In addition to this Chachcho has medicinal value. The medicinal value of Chachcho is for the treatment of cough. The people in the study area believed that drinking the juice of Chachcho cures from cough. The dosage taken is one cup per day for consecutive five days.

Genna, Arrishsho and Agana with their colorful leaves and pseudo stems are also planted near the farmstead and along the peripheries of the garden to decorate the compound and protect the other enset plants from evil eyes (Buda). A few households in Gelma and Lelawomerera Kebele reported that Genna also helped to stimulates the placental discharge of cow following delivery like that of Asikala.

Tunnako is the type of enset landrace which its name was driven from a plant known as Solanum alatum in local language (Tunnaye). This landrace has medicinal value which helps to treat malaria. Tunako is also used to treat sexually transmitted disease such as gonorrhea. The landrace Birra has livestock medicinal value which help to treat different aliments of livestock in the study area (the leaves and Amicho of this enset). In some of the study area (Dengora kewado and Mangudo) a few households said that Bulla of any enset has medicinal value for cough (locally muk prepared with butter).Generally people in the study area believed that Kocho of any enset which has stayed in the pit for a long period of time helped to treat stomachache. The results of studies conducted by Shigeta [10], Yemane and Kebebew [19] and Magule [9] are almost similar to the current study.

In Aleta Chuko district, no ritual performance were found directly relating to the cultivation of enset plants but the yield obtained from it is used for the cerebration of different cultural ceremony. These are in the cerebration of Fichae/Chmbella and Luwa. Fichae/Chembella is the Sidama New Year which has been cerebrated one time a year. The Sidama people have their own calendar or way of counting the day. Based on this counting, the days are Della, Kawalaka, Dikko and Kawado. Fichae has been cerebrated in the day Kewado. In this day the known cultural food prepared from enset is Chukamee and Bursamee. The prepared Bursamee is placed in the cultural material called Shafeta. In this holly day everybody eat this cultural food (Bursamee and Chukamee).The cerebration of Luwa has a similar pattern just like Fiche in relation to the preparation of Kocho or Bursamee. The only difference is the time interval of the cerebration, Luwa is cerebrated every seven years but Fiche is cerebrated every one year.

Funeral and Wedding Ceremony and Enset

The people in the study area said that enset is life to the Sidama and the Sidama people and enset are inseparable. Starting from birth to death enset is the main ingredients that the people used in the study area. The neighboring people who are coming in the cerebration bring Kocho. All the gusts are eating the products of enset, eating with enset leaves (as eating material) and sitting and sleeping on enset leaves. The Corpse (the dead body) lay on the pseudo stem of the enset and washed with the leaves of enset.

In Wedding ceremony, just like Funeral ceremony, the ingredients of enset play a great role in every part of the cerebration. Different dishes of food such as Bursamee and Chukamee is prepared. In the Wedding ceremony special type of food (Bursamee) is prepared from Kocho to the bridegroom and the bride. The Bursamee is put in Shafeta (full of Shafeta) and given to the bride. This has its own message which indicates that the bride is virgin (full of Shafeta indicates that the bride is virgin). The study conducted on diversity and cultural use of Enset (Enset ventricosum (Welw.) Cheesman) in Bonga *in situ* Conservation Site, Ethiopia , Yemane Tsehaye and Fassil Kebebew (2006) is reported almost similar result to the current study.

Myths and Cultural Beliefs in Relation with Enset

Myth is as a society's narratives, expresses and reflects the origins of natural phenomenon, historical events, social institutions and structures, religious and beliefs as well as man himself. Based on the interview there are two interesting myths about the origin of enset in the study area. These theories were forwarded by two ethnic groups in Aleta Chuko district. These ethic groups in Sidama Zone are: the Hadicho and Wolebicho. These theories are: - the Hadicho believed that the culture of enset

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was related to undomesticated pigs while the wolebicho stated that enset was originated from the decomposed cattle horn. As the believe of the Sbicho, first the horn of the cattle buried in the soil then became decomposed and finally grew into different sucker or Funta of enset. Then, the sucker multiplied in too many kinds of enset landraces which is impossible based on the biological point of view. But the cultivation of enset and rearing of cattle are directly related in two major ways. In one hand, the foods from enset are eaten with dairy product such as yoghurt and butter, in the other hand enset cultivation without animal dung or organic fertilizer is difficult.

There was interesting religious notion about spirits (Adbar) in the study area, mainly associated with the enset plant. Amicho, Kocho of (Ado, Birra and Asikala) together with ripened maize is cooked with butter near the Adbar. Then the elderly men of the village and other family members assemble and eat the cooked enset food with leaves (as eating material). Then the remaining food placed near the Adbar to the hyena with un- torn enset leaves. Because the people believed that the hyena never eats the remaining food if it is placed on torn enset leaves. The people in the study area believed that a good harvest, market value, and healthy could be assured by sacrificing the Kocho and Amicho to the Adbar. Such ceremonies are usually conducted near large tree selected for this purpose.

Of the interviewed households only a few of them were aware of about the origin of enset and religious notion or spirits (Adbar), mainly related with the enset plant. These issues mainly depend on the age of the individual household heads; as the age of individual increases the knowledge/awareness about this issue also increase. This is mainly due to current civilization or globalization of the World. The young generations do not accept the traditional beliefs and myths. This myths and belief in relation to enset indicated that enset is everything for the Sidama people.

Song's in Relation to Importance of Enset in the Study Area

It was found that the importance of enset is reflected by community song in Aleta Chuko district.

One of the songs is:-

"Genticha kaasi,

Gedimee kaasi,

Intanna coomanno waasi." Indicating Genticha and Gedimee are very important enset landraces.

The second song is:-

"Weese afirinnohu ayiradaho,

Uure ofoole leelinnoho" Meaning that a person who has enset is respected in his life span as well as during his funeral ceremony.

The third song is:-

"Haayi weese, weese,

Weesete anni ofoole teese,

Haayi ado, ado,

Ado hiranni'e lamunku minni baddo baddo,

Adonna damala hoogihu muleki damanna. "Depicting interrelationship of enset product (Kocho) and milk or eating Kocho with milk is best.

Only few households were aware of about Song's in relation to importance of enset in the study area. Just like that of myth and beliefs, the cultural songs are directly proportional to the age of individual households. These cultural songs about the use of enset have initiated the people in study area to manage the enset plant in a proper way which intern helps to maintain and keep the diversity of enset landraces.

CONCLUSIONS AND RECOMMENDATIONS

The result from this study showed that from the total enset landraces found in the study area, Genticho and Ado, were the most dominant followed by Midasho and Gediwocho and some of landraces were endemic (found at specific Kebele). Enset is the staple food and food products such as Kocho, Bulla and Amicho were obtained from it. There are also cultural values such as ritual (religious), myths, songs and medicinal importance's of enset plant in the study area. The result from this study also showed that information about the indigenous knowledge of farmers regarding utilization of enset and the socioeconomic and cultural aspects of its production is essential to understand how they manage to maintain the existing enset landraces diversity while wisely exploiting it. Finally, due to its unique characteristics such as drought resistant, reduce soil erosion by its perennial leaves canopy and for environmental protection in much way, enset is a plant with great hope to ensure the food security of the country. In this regard, every stakeholder should collaborate in order to conserve the Landraces from possible genetic erosion that may affect the livelihood of millions of Ethiopia in the South and Southwestern part of the country.

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