Role of Women in Agro forestry Management in Tembaro District, Southern Ethiopia

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Abstract*: The role of women in agroforestry management is given little recognition partly due to cultural and traditional bias against them. This study was, intended to assess role of women in agroforestry management in Tembaro woreda. Multistage stratified random sampling was employed 120 households in three kebeles of six villages. Household survey, key informant interviews, focus group discussion and field observations were used to glean and evaluate data. In total, 30 key informants and 6 group discussions were made. The qualitative data were summarized thematically and quantitative data were analyzed by using Microsoft office EXCEL, Chi-square Tests and SPSS. The result indicated that homegarden, village forest garden and woodlots are the major type of agroforestry practices. Women in the study area perform a decisive role in agroforestry production. In enset, food crop production, women have showed averagely 98.5% contribution in manure application, harvesting, processing and marketing. With regard to enset(Enset ventricosum) women make most of decisions such as clone selection (46%), time of harvest (80%) and they have the control and decision power on income from enset product selling (91.5%). In coffee, cash crop, they are involved mostly in harvesting (55%) and processing (48%). Compared to enset men have a strong say (54%) as to how, when and how much to sell their coffee. The findings of the study also show that women from FHHs and women from the poor households carry out more management activities than women from wealthy households and MHHs.. Therefore, the role of women in this system should be understood by different stakeholders and be given impetus to enable this agroforestry production system to remain sustainable.*

Keywords: *Agroforestry management, Agroforestry practices, Women, Ethiopia.*

1. INTRODUCTION

1.1. Background and Justification

Women in rural settings play an important role in development. In addition to caring for their families, women in the developing countries spend considerable proportions of their time and energy using and preserving land for production of food and fuel and to generating income for their families and communities. These activities include crop production, growing fruits and vegetables, raising small livestock, tending trees, processing products for food and markets, and managing and collecting water and fuel (IFAD, 2010). They also possess wide specialized knowledge about the use and conservation of natural resources (Clarke, 1999).

Like for most rural development sectors mentioned women also play a great role in agroforestry land uses. Agroforestry land uses are particularly promising for heavily women populated poor rural communities. Most agroforestry types are low-cost system that require minimal inputs and offer diverse products and services such as fodder, food, timber, fruits and soil fertility improvement; it offers immense opportunities to women who in most cases cannot afford to adopt high cost technologies due to their severe cash and credit constraints (Kiptot and Franzel, 2011). Besides their obvious importance in farmers" livelihoods, common sense observation of agroforestry reveals that women play a key role in their management. Women have traditionally played important roles in agricultural production and in the use and management of trees (Fortmann and Rocheleau, 1985). They are often responsible for food crops and trees close to their houses, for foraging in forests, and for the care of large and small livestock. However, as several studies have shown, their roles vary between regions and cultures (Clarke, 1999; Mitchel and Hanstad, 2004; Zoughbi, 2008).

Women constitute nearly half of the total population size in Ethiopia. Majority of them live in rural areas of the country-where agriculture is the dominant source of livelihoods. Rural women are responsible for much of the household chores and reproductive activities. Besides, they play a significant role in productive activities. Evidently enough, they do spend close to 85% of their labor on farming activities (Yeshi, 2002).

The Ethiopian economy is still predominantly agrarian and women, especially in rural communities, are key players of the agrarian economy of the country. According to Federal Democratic Republic of Ethiopia Population Censes Commission (FDREPCC, 2008), about 84% of the population in Ethiopia lives in the rural areas. Ethiopian rural women who constitutes about half of the population make significant contribution to agriculture and to ensure food security and are the mainstay of the farm labor (Ametemariam, 2009 cited in Meaza Gebreyohannes,2010). Women generate around 50% of income of the sector by actively participating in production (FAO, 2007). Despite their vital contributions, they are given little recognition for their efforts due to lack of understanding and insight on women roles in agricultural production.

In developing countries rural poor are the most directly dependent on natural resources including traditional agroforestry for their livelihood and food security. There are several types of traditional agroforestry practices in different part of our country. Coffee shade based,scattered trees on the farmland, homegardens, woodlots, farm boundary practices, trees on grazing lands, parkland, etc (Mesele, 2002; Zebene, 2003; Tesfaye, 2005; Azene, 2007;) for example are, some of the known examples of traditional agroforestry practices. Women have traditionally played important roles in agricultural production and in the use and management of trees (Fortmann and Rocheleau, 1985). They are often responsible for food crops and trees close to their houses, for foraging in forests, and for the care of large and small livestock.

In Ethiopia most homegardening tasks seem to be performed by women. For example, in most of *enset*-based agroforestry systems the *enset* (*Enset ventricosum* (Tesfaye Abebe, 2009.) production and processing activities are performed by women (Sandford and Helen, 1996; Almaz, 2001; Tadesse, 2002; Negussie 2004; SLUF, 2006 ;). The importance of these roles is,however, often hidden. What also distinguishes women and men in many places is the fact that women‟s work is unrecognized and undervalued in economic terms (Clarke, 1999). In addition to the traditional division of labor and the lower value attached to their contribution, the nature of women's participation in agriculture has been shown to differ with their social class and economic conditions (Regassa, 2006).

As other parts of Ethiopia, the study area has the same problem as it gives less attention to women role in their everyday activities. The reason is that culturally, women are assumed to carry,most agroforestry tasks such as production and processing activities but the importance of these roles is, however, often hidden. Although women contribute substantially to the forestry sector, their roles are not fully recognized and documented, their wages are not equal to those of men, and their working conditions tend to be poor. Rural area women account more than half of the total community and their contribution in agroforestry practice management is of great importance. But the society gave them less attention, even nil. In spite of the above mentioned facts about their active contributions, the role of women in agroforestry systems is given little recognition due to cultural and traditional bias against them. Most of this study, therefore, investigates the role of women in agroforestry practices management in Tembaro *woreda*(SNNPRS) one of the areas with tradition agroforestry practices.

Objectives

- To identify the types of agroforestry practices and
- To assess women involved in enset-coffeemanagement activities

2. MATERIALS AND METHODS

2.1. Description of Study Area

2.1.1. Location and Topography

The study was conducted in Tembaro district, Kembata Tembaro Zone in the SNNPRS. Tembaro district is located at about 400km and 180km south of Addis Ababa and south west of Hawassa. It is composed of twenty-two *kebeles* that means two municipalities and twenty administrative *Kebele*s.

The study area bordered by Omo River in the south and west, Hadero and Tunto zuria *woreda* in the east, Soro *woreda* in the north and Duna *woreda* in the north-easet. Geographically, it is located between 37021"0"E to 37039"0"E and 7013"20"N to 70"21"20"N. The total area of the district is about 27,917 hectares (BoARD, 2007). The altitude of the *woreda* ranges from 800 to 2400 masl and the slope ranges from intermediate (3%) to very steep slope (above 30%) (Tembaro Worada Agricultural Office, 2010).

Geographical location of study area
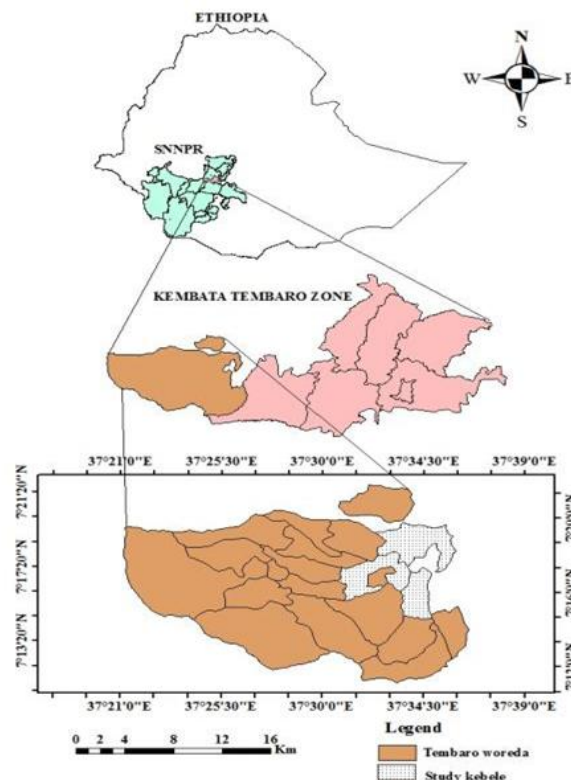
Figure1. *Map of Tembaro woreda, Ethiopia, showing the location of study site*

2.1.2. Climate

The *woreda* has a humid tropical climate and receives a mean annual rainfall ranging from 1,200 to 1,800 mm .The rainfall pattern is bi-modal, with the short-rain season, *Belg*, which is extended between March up to June and long-rain season, *Keremet*, between July and October. The mean monthly temperature is 200c with mean monthly minimum and maximum temperatures of 140c and 260c, respectively.

Agro-ecologically, the *woreda* is divided into three major zones as Midland (*Weyena Dega*)*,* Highland (*Dega*) and lowland (kola). The *Weyena Dega* constitutes 87 % of the total area, while *Dega* comprises only 5%, kola constitutes 8% of the *woreda* (SNNPR Agriculture and Rural Development Bureau, 2008).

2.1.3. Soil

The dominant soil of the district is Alfisols. Alfisols are among the best agricultural soils with clay-to-clay loam texture and imperfect drainage effective depth of greater than 150cm with the pH value from 5.5 to 6.7(SNNPR Agriculture and Rural Development Bureau, 2008).

2.1.4. Vegetation and Land Use

The common land use types of Tembaro *Woreda* can be divided into six categories. These are *enset-coffee* farm (12,793 ha), annual crops (7065 ha), forest land (1396 ha), grazing land (967 ha), marginal land (2,285 ha) and others (3411 ha), i.e., road and villages. Coffee based agroforestry practice is common in the study area, where by predominantly *Coffee arabica* L. is produced (8,610 ha) and *enset*(*Enset ventricosum*) is also substantially produced (4,183 ha) (Tembaro worada agriculture and Rural Development office, 2012).

2.1.5. Population

The *Woreda* Finance and Economic Development Office statistical data shows that total population of the *Woreda* is 145, 946.Out of these 72,827(49.9%) are males and 73, 119(50.1%) are females. The *worada* has a high population density with 652 persons per km2. The total house hold size is 24,324 with average family size of six. From the total households, 85%are living in the rural area, while from the remaining 15% of population,10%, 5% living mudula and keleta town, respectively. (Tembaro Worada Finance and Economic Development Office,2012).

2.2. Sampling Methods and Data Collection

2.2.1. Sampling Method

Site selection

The district was selected for the study because of the presence of tradition of agroforestry practices particularly *enset-coffee* based agroforestry practice. The practice provides the most important food and cash crops as well as different tree species that womens" role might differ in each components management. A detailed critical inspection was first held in order to get an overview of the cultural and socio-economic aspects of the communities in the study area. Development agents (DAs) of the *woreda* and elders were contacted during the preliminary survey before the selection of the specific study sites. Information was obtained from the Agricultural and Rural Development Office of Tembaro about the socio-economic, demographic and cultural aspects in relation to the agroforestry practices management in the *woreda* and the acquainted situation results indicated that almost all of the *kebeles2* in the *woreda* are essentially similar to one another. Hence, three *kebeles*, namely Sigazo, Bada and Semen Ambukuna as well as two villages were randomly selected from each *kebele* as study sites. Accordingly, Kopate and Wamura villages from Sigazo *kebele,* Le-Goffore and Mahal Bada villages from Bada *kebele*, and Wadaya and Shenshame villages from Semen Ambukuna were the actual study sites of the research. List of all household heads in the villages were collected from the respective *kebele* administration.

Key informant and focus group selection

The Research work was started after the District Office of Agriculture and Rural Development had written an official letter to the selected PA leaders and Development agent offices about the objective of the study and introducing the researcher and the activities to be carried out. Key informants (KIs) were selected based on their better knowledge about agroforestry management, socio-economic and culture of individuals in the study area and who have been living for a long period of time in the villages. To get these individuals from the selected villages snowball method was used. To select individual farmers who could identify KIs, guided village tour was made with selected *kebele* leaders and DAs. During the guided tour, individual farmers were randomly asked to give the names of seven KIs based on the stated criteria. To do this, at least five individual farmers were asked. Finally, five KIs with higher score were selected for each village. Therefore, a total of 30 KIs were involved in the study for the six villages. One of the main purposes for selecting KIs was to categorize the households in the selected villages in to different wealth categories for the sample selection for the household interview. Focus group discussions were conducted with a group of individuals who are believed to be equally interested or affected by the topic being discussed. Therefore, about six to seven women with two age groups (15-40 and >40) for each *kebele* were invited. Thus two focus group discussions for each *kebele* resulting, in a total of six focus group discussions were conducted. This method assumes that there exists variation in opinion, experiences and knowledge among the two age groups.

Household sample selection

Stratified random sampling method was employed to select the respondents. In order to, the names of household heads in the village from koppate 242; Wamura 227; Wadaya 170; Shensame 241; Le-Gofore 215 and Mehal-bada 242 households were written down on a paper. MHHs and FHHs group listed separately. Stratified sampling technique was applied to characterize households in each village3 into different wealth category and women from male-headed household (WMHH) and women from female-headed household (WFHH). KIs were used to categorize all individual households in each selected village in to three main categories as poor, medium, and rich households according to the criteria of wealth classification used in their locality (Appendix 3, Table 1). Thus,

yardsticks for wealth including landholding, *enset* and coffee field, number of cattle, number of house etc. Although determining the sample size at certain confidence interval and precision level is common, it is also possible to use any sample size when descriptive statics is used to analyze data (Theresia, 2010).Accordingly, twenty-two households from Bada village, twenty households from Wamura, Fifteen households from Wadaya, Twenty-two households from shenahame village, Nineteen households from Le-Gofore village, twenty-two households from Mehal-Bada village a sample were taken by considering each wealth category using random sampling technique. In each of the six villages", 9% of households were sampled randomly, resulted in total sample size of 120 with purposive inclusion of 20% FHHs (Theresia, 2010). This sample size was selected so as to cope with budget and time since larger sample size would have involved more costs and time (Table 1).

2.2.2. Method of Data Collection

The information and data required for the study was collected by employing various data collection methods.

Household survey questionnaire

The data upon which this study based was collected through a structured questionnaire administered by face to face meetings with the respondents. The survey was conducted from first of March to last of May 2014. With the objectives of the study in mind, a questionnaire containing a variety of demographic and socio-economic indicators: marital status, household composition, age, family size, education, women"s role in agroforestry practices management , women"s tree species preference, and so forth were intended to collect information with the sample households in each selected villages (Appendix1). Training was provided for six enumerators. They were familiar with the study *Kebeles* and knew local customs and traditions. Their role was to convince farmers to voluntarily respond without hesitation and gave actual information during the interview.

Key informant interviews and focus group discussions

In order to gather in-depth information about the major issues of concern pertaining to the role of women in management of agroforestry practices in the study area, semi-structured interviews with the selected KIs as well as focus group discussions. It is important mentioning that at the start of each interview and discussion the aim of the interview and discussion was clearly explained to informants to invoke clear and objective responses. Information on the cultural division of labor, change in gender roles in agroforestry management and the role of women in property control, particularly value property, such as land in the study area were gathered

Secondary sources

Source of secondary data were published materials such as surveys, books, reports, plans, official records, census, research papers and data files from computers. In addition to, review of secondary sources was conducted from the kebele administrations, Agricultural and Rural Development office of the woreda and the region to gather information about the socio-economic, demographic, location, climatic, edaphic and vegetation characteristics of the study area. These secondary data were used to supplement, and in some cases to compare with the primary data collected from the field.

Field observation

During household interviews, all tree and crop species and practices available in the farm area, major uses and management practices were mentioned. Women selected priority tree species from the list, according to importance of trees to them. Field observations were carried out using transect walk across farms of sampled households to obtain an impression about the type of species and management regimes mentioned during interviews.

The perennial woody species and herbaceous crop species vernacular names were identified in the field with the help of household members, KIs, *worada* agricultural office natural resource work processors experts and DAs. Their scientific names were established by referring to available literatures and researcher"s own experience following similar method as SLUF(2006) and (Azene, 2007). Identified using published Flora of Ethiopia and Eritrea volume 3 (Edwards *et al.,* 1997).

2.3. Data Analysis

A descriptive statistical method was employed to analyze and summarize the collected data. The quantitative data was analyzed using Microsoft office EXCEL, Chi-square Tests and SPSS version

20.0. The analyzed data was presented and summarized using tables, frequency, percentages and graphs. The qualitative data obtained through key informant interviews and focus group discussion was qualitatively interpreted.

3. RESULTS AND DISCUSSION

3.1. Demographic and Socio-Economic Characteristics

The household survey result indicated that the majority (97.5%) of the respondents were belongs to Tembaro ethnic groups and most (85%) of the respondents belong to the Protestant religion (Table 2). The marital status of the sampled households showed that 81.7%, 17.5%, and 0.8% of them were married, widowed and divorced, respectively. The age range distribution of the respondents showed that, 17.5 % of the respondents are in ≤ 30 age groups, 67.5 % are in 31-40 age groups, 14.2 % are in 46-64 age groups and 0.8% are ≥64 age group (Table 2). The average age of the respondents was within the range of 20-40 years (Table 2). This implies that majority (85%) of the respondents were at their highest productive and reproductive age group, which indicates that they practice high work load due to either having high number of children or fully participating in different agroforestry practice management activities. Information from household survey also indicated that the family size of the sample households ranges from 2 to 18 persons, with a mean of 6 persons per household. About 61% of the total sample households have a family size of 5-9 persons per household. With regard to educational level, most of the respondents (85%) have no education although 5.8% can read and write (Table 2).

3.2. Types of Agro forestry Practices and Management

Some of the agroforestry practices of the district include homegardens, village forest garden, scattered trees on farmland, live fences, woodlots and boundaries. Just as in some areas of the country, it is possible to see some examples of agroforestry practices in Sigazo, Bada and Samen-Ambukuna *kebele*s. These examples have emerged through the experience of people living in these areas. Individuals living in the areas developed their own version of agroforestry practices. Different types of woody perennials have deliberately been grown together with agricultural crops and /or livestock components on the same land management unit. The result of the study also revealed that, Eragrostis teff, maize (Zea mays), Sorghum, haricot bean, *Coffea arabica*, *Saccharum officinarum* (sugarcane) and fruits such as (*Mangifera indica, Musa sapientum,and Persea americana*) are the major type of crops integrated with the other agroforestry components (woody perennials) and livestock (cattle, equine and hen) which provide various benefits.

The benefits mentioned by respondents include provision of cash crops (coffee and fruits); food crops (*enset*, maize, teff, wheat and root crops). *Enset* is the staple food supplemented by other crops such as maize, teff, wheat and root crops (taro, sweet potato and potato). Besides, from these agroforestry practices the people produce fuel wood, construction, lumber, income generation, fruit, fodder, shade, fencing, beekeeping, medicine and household consumption. Some of the indigenous trees found within these practices include *Albizia gummifera, Pouteria adolfi-friederici,Cordia africana, Croton macrostachyus, Ekebergia capensis, Erythrina abyssinica, Eucalyptus camaldulensis, Ficus sur, Juniperus procera, Millettia ferruginea, Persea americana, Podocarpus falcatus, Polyscias fulva, Prunus africana, Prunus persica, Spathodea nilotica, Vernonia amygdalina.*

The knowledge in managing tree species on the part of farmers has positive implications for their propagation and survival of trees in any agroforestry systems. Traditional strategies for managing tree resources are dynamic by nature. Farmers have developed as responses to particular situations, reflecting a variety of cultural, social, economic, ecological and demographic factors. They have survived by incorporating the introduced new agricultural crops, the growth of populations, the expansion and contraction of market opportunities for particular crops/tree species and other factors (FAO, 1985). Among the traditional tree management strategies, pollarding and coppicing commonly permit a sustained yield of wood or fodder over a long period of time. The total lifetime contribution of a tree which is used in this way can be considerably greater than the volume it will produce if it is simply allowed to grow and is then cut down (FAO, 1985).

In the study area farmers have considerable knowledge of seedling production and tree growing. They normally propagate *E.camaldulensis, E.ventricosum and R. prinoides* by their own. This finding agrees with a study conducted in Tigray by Tesfaye (1996) where he reported that the knowledge or

skill of tree planting and maintenance was not mentioned as constraint except when they are introduced with new tree species that farmers do not know at all. A study in Rwanda done by Den Biggelaar (1996) also showed that for indigenous tree species cultivated by ancestors and inherited with land, no additional knowledge was necessary as people observed them from early childhood but for a new species or practice, the necessity of a prior knowledge was mentioned by farmers. Similarly, in this study farmers had indicated that they may need additional knowledge for some indigenous tree species as regards to tree propagation.

Women have used trees for numerous purposes for centuries, during which they have accumulated extensive knowledge about the management of indigenous tree species homegarsen agroforestry. But no research is being done to document and incorporate this knowledge which can be later used in the planning and implementations of different agroforestry practices and alleviate rural poverty in the area.

Homegarden is used here to refer to intimate association of multipurpose trees and shrubs with annual and perennial crops and, invariably livestock within the compounds of individual houses, with the whole crop-tree-animal unit being managed by family labor (Nair, 1993). Generally, the common agroforestry practices found in the three *kebeles* are homegarden, village forest garden and woodlot (Table 3). The major agroforestry practices are discussed below.

3.2.1. Home garden

The majority (97.5%) of the households in the three *kebeles* practice homegarden agroforestry practice composed of crops, trees and livestock. Almost all food crops found in the area are grown in this agroforestry practice. *Enset*, maize and root crops like taro, potato and sweet potato are grown to meet food requirements. *Enset* cultivation is mainly concentrated around the house. The result is in agreement with Abeba (2011) and Nair (1993) homegarden has been used rather loosely to describe diverse practices, from growing vegetables behind houses to complex multistoried systems. House hold survey indicate that, different tree species such as *C.Africana, P.americana, V.amygdalina, C.macrostachyus, E.abyssinica, A.gummifera, Millettia ferruginea,* etc. are grown for their ecological and economic benefits in the homegarden.(Figure 2). Since homegarden is adjacent to the house, the approach employed for soil management can influence component interaction positively or otherwise. Increasing soil fertility will have positive impact on crop productivity. Homegardens of study area is low-input agricultural systems which receives little or no external inputs like chemical fertilizer. Accordingly, soil fertility maintenance is predominantly employs the application of manure, household waste, compost and ash. Litter fall from trees and crops is also another source of soil nutrient. The finding of the study is in line with the result of Fentahun Mengsitu (2008) who reported that the major source of soil fertility in homegarden is animal manure, kitchen and house wastes, ash, litter fall and comparable with the earlier studies conducted elsewhere. Example, Tanzania homegardens (Fernandes *et al*., 1989), Kerala, India homegardens (Nair and Sreedharan,), Japanese homegardens (Soemarwoto and Conway, 1991) also arrived at the same conclusion.

Figure2. *Photo showing homegarden in Samenambukuna Village*

3.2.2. Village Forest Garden

The household survey indict that, village-forests (village-forest-gardens), which are multistrata agroforestry systems and managed mainly for cash income generation through the production of coffee, wood, fruits, and etc. Village forest garden are practiced by77.5%, 80% and 90% of the

households in Sigazo, Bada and Semen Amebukuna *kebele*, respectively (Table3). This result is in agreement with Fernandes and Nair (1986) and Kumar & Nair (2006) who described that cash crop production is the typical attribute of village forest garden. Trees such as *Erythrina abyssinica, Vernonia amygdalina, Cordia africana*, *Polyscias fulva, Ficus sur, Prunus Africana, Millettia ferruginea, etc.* are planted and management to provide shade, fuel wood, timber and other purposes in the village forest garden too.

Figure3. *Photo showing village forest garden in Wadeya and Koppate Village respectively*

3.2.3. Woodlots

Traditional agroforestry practices in study district involve tree planting in various spatial patterns to meet the demand for fuel wood and construction. The household survey indicate that multi-purpose woody perennials are planted and managed integrated into crop and animal to provide wood for fuel, construction poles and generates income as well as alleviating environmental degradation. According to (Nair, 1993; Otsyina,R., et.al; 1999;)

woodlot agroforestry practice is characterized by multi-purpose woody perennials planted and managed over time to produce fuel wood, poles, and stakes for climbing crops; food and animal components integrated into woodlots, especially during the initial establishment phase .

In study area Woodlots are practiced by 17.5%, 15%, 12.5% of the households in Sigazo,Bada and ,Samen-ambukuna *kebele*, respectively (Tabele 3).Averagely 18 (15%) of the households in three *kebele* have a woodlot of *Eucalyptus camaldulensis* (red gum). In recent years, single rows of *Eucalyptus* species planted along field borders have become a dominant feature of the tree in Sigazo *kebele* compared to other *kebales*. The households‟ survey indicates as *Eucalyptus camaldulensis* of wood lot provides wood for fuel, construction poles and generates income. This is in line with Zebena (2003) and Muktar (2006) who described *Eucalyptus camaldulensis* woodlots are usually associated with the growing of trees to produce cash crops, such as construction timber, fuel wood, poles, pulpwood, bark, construction poles as well as generates income.

3.3. Women's Role in Management of Agro forestry and their Components

3.3.1. Women's Role in Management of Agro forestry Practice

In the study area land cultivation is carried out by hand hoeing. The plant arrangement does not allow maneuvering of draft animals. In perennial-crop based systems crops such as *enset* are managed mainly through hoe cultivation.

The gender division of labor in Ethiopia in general varies with the different farming systems and in various cultures and agro-ecological locations (Almaz, 2001;). The result of this study supports the idea that women participation in agriculture is high in hoe cultivation (spring and Groelsema, 2004). According to (Regassa 2006) agricultural activities are predominantly men‟s task in Maqi area because of plough cultivation farming system. There is a belief that *"if a woman cultivate, there will be no rain fall."* In Maqi area women‟s involvement is not significant despite variations from one household to the other (Regassa, 2006)

Women4 generally play major roles in agroforestry practices in study area. However, their roles and levels of participation vary in different practices largely based on the location of the practice (distance

from home), types and purposes of the dominant crops produced in the practices. When women asked about their participation in different agroforestry practices management (95%) responded that they play a major role in homegardens (Tabele 3). Eighty two percent are responded they participate in village forest gardens and fifteen percent of the respondents participate in woodlot practices (Tabele 3).At the study site homegarden was found to be the dominant practice in which women are significantly active. The high participation of women in homegarden management could be due to proximity of the practice to homestead and women can take care of it while undertaking their domestic responsibilities. The dominant crop in homegarden is *enset*, for which women have more interest and responsibility Akhter *et al.* (2010) and Abeba (2011) also reported women play a key role in homegarden management and they are usually responsible for a large part of food production. Women play a major role in homegardens because they have direct access to raise their incomes and they are generally the guardians of homegarden and devote much of their time in care and management of the homegarden (Watson and Eyzaguirre, 2002; Ametemariam, 2009).

About Eighty two percent of women respondents are involved in village forest gardens (Table 3).This might be because village forest gardens are located a bit far from home where women have domestic responsibilities. Besides, the dominant crop in the village forest garden practice is the market oriented coffee which needs little women labor in the cultural division of labor of the society. According to focus group discussion women participation is high during coffee harvesting. On the other hand, only Ten percent are involved in woodlots management in addition to homegarden and village forest garden management. This could be attributable to smaller households fifteen percent practice woodlot and lack of land particularly FHHs (Table 3). According to Kiptot and Franzel (2011), planting of trees in the form of woodlot is attractive to men because of the commercial benefits they get from selling poles, timber and fuel wood while women are interested in fuel wood for domestic use. In the study area women participate in planting and in collection of branches for firewood when men cut trees for timber and poles from woodlot fields.

3.3.2. Crop Component Production

Ethiopian rural women participate in various farm activities such as field preparation, planting, weeding, manuring, harvesting, transporting, threshing, seed selection/sorting, storage,processing and marketing agricultural produce (Tsegaye, 1997). This assertion was also found to be true in the context of the surveyed villages. In study area the household survey indicates that major crop components are *enset (Enset ventricosum)*, coffee (*coffea arabica*), sweet potato *(Ipomoea batatas)*, taro *(Collocasia esculenta)*, and maize (*Zea mays*). These crops are produced in homegarden in different extents. In the study area women take responsibility of agricultural activities such as weeding, manuring, harvesting, transporting, threshing, seed selection/sorting, processing and marketing agricultural produce as well as *enset and coffee* production to ensure their food security and well-being. Similar trand were observed in Wonago *woreda* SLUF (2006) reported and in Yirgacheffe *Woreda* Abeba (2011) found that *enset* as staple food and coffee as major source of cash income for households.
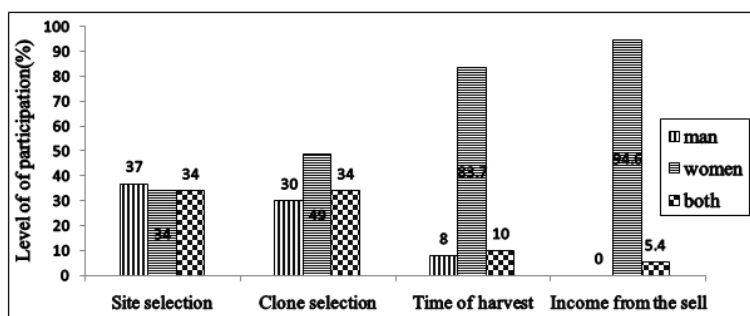
Enset production

The household survey data indicate that among the food crop components of the agroforestry practices, *enset* is the dominant staple food in the study area. In addition to food, the *enset* provides by-products that can be used as livestock feed, crude fiber, binding material for house construction, binding material for fencing, mattresses for rural homes, food containers in place of plates, as an umbrella during the rainy season, ropes to tame livestock and medicine . Farmers raise *enset* seedlings by vegetative reproduction using their indigenous knowledge. The *enset* suckers are produced from *enset* stump locally known as *simma* of matured *enset* of 3-4 years. The production of seedlings begins in April then after one year the suckers will be transplanted for actual planting plot. The planting is done every year and at least two persons are needed for planting *enset* suckers in the field, one for making the planting holes and planting and the other person for transporting (carrying) the plants around. Preparation of planting holes constitutes the larger portion of fieldwork in *enset* planting. Slashing of weeds under *enset* plot is done twice a year until the fourth year. After four years of age slashing is done once a year. In addition to slashing hoeing is also carried out twice for the first two years. According to household harvesting of *enset* is carried out every year. Depending on the site conditions it reaches full maturity in 4 to 6 years. Farmers harvest at any time whenever needed. The

most important thing here is that amount of *enset* being harvested is equal to the amount of planted every year. The concept of sustainable production/year is well established for *enset*.

According to data from focus group discussion and KIs the cultural gender division of labor in the study area indicates that *enset* planting; particularly in MHH is the duty of men. Men lead the planting and hoeing of the *enset*. However, women also play significant roles in all stages of *enset* development. During the planting stage they assist men in transporting the seedlings to the fields and planting them. In replanting (after harvest) they participate much more than in the first planting in the area they harvested. Women also take part in hoeing and slashing weeds and manuring. *Enset* harvesting and processing, which are the hardest of the tasks in *enset* production, is done by entirely women which men would never try it. The works of other researchers also support the result of this study e.g. Sandford and Helen, 1996; Almaz, 2001; Abeba, 2011;). About 75% of the food grown and eaten in Africa is produced predominantly by women (Swaminathan, 1987) and women in developing countries grow and harvest most of the staple crops to feed their families (Garrity, 2006).

Data from household survey indicated that women are taking the most important decisions in *enset* production particularly in *enset* clone selection and marketing of *enset* products. For instance, the household survey result indicate that more than 46% of selection of *enset* clones is made solely by women while only 24% of it is made exclusively by men (fig.5). Women know what is needed in their homes regarding food requirements, which species is good according to the different criteria such as quality, taste early maturity, etc. This is in line with Report by Abeba (2011) and Almaz (2001) revealed that women are knowledgeable about different *enset* clones. The survey also revealed that women play a major role in making decision on when and how to harvest (80%) and selling of *enset* products (91.5%), while only (8.5%) is decided by both (Fig.5). But, it was useful to note that site selection and plant identification are also jointly determined by both men and women in many cases. Hence, in study area women make a bulk of decisions because of their participation in the entire implementation task. This study is also consistent with sandford and Helen (1996) who states that Gender divisions in decision making depend on who is involved in what tasks.

The level of women participation in decisions on enset production

With regard to the implementation tasks, most of works are undertaken by either women or both men and women. Women are always engaged on manuring (93.8%), harvesting (100%), processing (100%) and selling products (98%). While, only pit preparation (76%) of the work loads of *enset* production are carried out by men. *Enset* planting is also largely the responsibility of men because of the cultural division of labor. But in reality women also plant *enset* especially after harvesting. She replace the new seedling where the area she harvested. Other tasks, such as hoeing (44.2%) and slashing (63.3%) are done by both women and men.

Table3. *Division of labor in implementation of tasks on enset production (N= 120)*

Implementation Tasks	Men (%)	Women (%)	Both (%)
Pit preparation	76.0	10.0	14.0
Planting	35.4	27.0	37.6
Hoeing	36.7	19.1	44.2
Manuring	2.0	93.8	4.2
Slashing	11.3	25.4	63.3
Harvesting	-	100.0	-
Processing	-	100.0	-
Marketing	-	98.0	2.0

Sets of works that were carried out previously elsewhere in SNNP also revealed that Women are more involved in carrying the suckers for transplanting during planting, manuring, harvesting, processing and marketing (Almaz, 2001; Sandford and Helen, 1996; SLUF, 2006).

The high participation of women in *enset* production could be due to its location. Sandford and Helen (1996) have stated that the contribution of labor and domination of the sale is often influenced by the location of the crop.

As women carry the lion share of the work in *enset* production, they also enjoy the limited income generated from the sale of *enset* products. In fact, the market of *enset* products in the area is generally limited as almost all households produce their own *enset* for household consumption. Moreover, *enset* is planted and processed mainly for household consumption.

As a result, the amount of *enset* products taken to market by women and the income generated from it is often small. Women often use this income to buy small commodities such as salt and sugar for household consumptions. All these confirm that women play central roles in *enset* production. In fact, information from KIs and focus group discussions indicate that *enset* is regarded as a woman's crop in the study area. This result agrees with Tadesse (2002) who states that *enset* among the Gedeo's people is the woman's crop. A report by Almaz (2001) in south western Ethiopia has also indicated that enset among the Kaffa's people is woman's crop.

Coffee production

Coffee is one of the major cash crops produced mainly in village forest garden. In fact, the coffee produced by farmers in the study area is one of the best Ethiopian coffees obtained from coffee trees intercropped with *enset* (Tadesse, 2002). Farmers in the study area depend on natural regeneration to raise coffee seedlings. Regenerated coffee under the mother plant is used as source of seedlings. Farmers select among regenerated seedlings for transplantation based on their straight growth, bigger size, bearing of first branch and look health. Then, the seedlings are transplanted to another temporary site before actual planting, for the purpose of hardening off in April. The coffee seedlings are retained on the site until they reach to planting size (approximately 75cm). And then planted in pits dug in February and refill in March. According to them they do this to aerating the soil and use upper surface organic soil. Planting is carried out in June.

Depending on the site conditions and stage of development of coffee, two to three hoeing and slashing took place. However, as the age of coffee increase the frequency of slashing decreases. This is because coffee stand and other plants would cast shade and suppress the weeds underneath. Slashed materials are used as mulching and add organic matter to the soil. Coffee harvest in the study area has two phases. In thefirst phase, where by only ripened (deep red) berries are selectively picked. The second phase of harvest, the remaining unequally ripened beans are harvested during short period (mid December- mid January). As compared to first phase, harvesting of the second phase requires high labor. Farmers in the study area practice sun drying which take one to two weeks for the coffee to dry. Households in the study area simply sell coffee berry without processing it to coffee beans. Small quantity of coffee processed for consumption and to sell it at the local market.

The household survey result of the gender divisions in decision making regarding coffee production indicates that men have dominant roles although women do offer their opinion (Figure 5). Men have a strong say (56.6%) as how much to sell their coffee. They are also responsible for decisions regarding which area of land is to be used (51.8%) for coffee planting and which seedlings are planted (44.1%). Although women are not often the major decision-makers, they make decisions jointly with men about seedling selection (35.9%) and site selection (28.2%) (Figure 5).
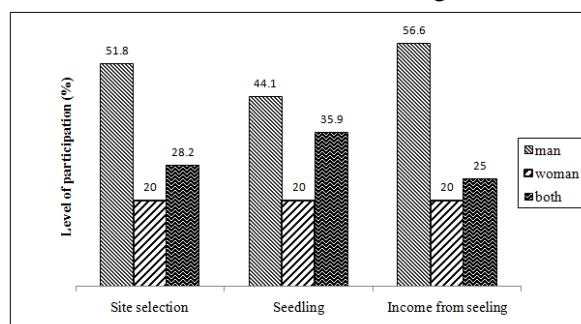

Figure5. *Decisions on coffee production*

According to empirical data from the household survey (Table 4), roles of women in the implementation tasks indicate that women are involve mostly in harvesting (55%) and processing (48%). On the other hand manuring, hoeing and slashing are done by both (38.5%), (38%) and (29.6%) respectively. According to focus group discussion women are more efficient in harvesting of coffee especially in the first phase of harvest which needs concentration to peak the red wet coffee, leaving the greenish ones behind. Even though they sell large amount of coffee without processing, women are responsible for processing of coffee used for consumption and to sell in local market. Selling is dominantly undertaken by men (76.3%) (Table 4). Women usually sell small quantities of coffee in local markets forcrop production could also be due the fact that men culturally control the economy. This fact also agrees with Dejene (2009) who argues that in Ethiopia men dominate the political, economic, and social arena in all cultures.

4. CONCLUSION AND RECOMMENDATION

4.1. Conclusion

The study findings have explicitly shown that women play important roles in the agroforestry practices management activities in Tembaro *woreda*. Women work in all tasks of agroforestry component managements. The results reveal that the contribution of women is much higher in *enset*, food crop production. Women make decisions regarding clone selection, harvesting time and regarding the income from the sale of *enset* products. There is shared decision making between men and women regarding site selection for *enset*. With regard to the implementation tasks harvesting, processing and marketing of enset products arestrictly women's work. Women also dominate in manuring. Men dominate in pit preparation. Tasks like planting, hoeing, manuring, slashing are done by both men and women. On the other hand, in coffee, cash crop, production men have strong say in almost all decisions such as site selection, seedling selection and they also control the income from coffee. In the implementation tasks the contribution of women is high in harvesting and processing.Generally, our results revealed that women has the greater involvement in agroforestry component management.

4.2. Recommendation

The result of this study shows that women play vital roles in the agroforestry practice components management activities. Therefore, the role of women in this agroforestry practice should be understood by different stakeholders and be given impetus to enable this agroforestry production system to remain sustainable.

The study also recommends enabling women to access, control and decision making over various resources through legislation and by laws.

There should be also a research on the cultural taboos that hinder women's access to resources and decision making. Appropriate regulations should be identified to eliminate these cultural taboos and practices and government has to monitor how women are benefiting at grass root level.

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