

Gender Analysis of Sorghum Production and Utilization at Raya Kobo District, North Wello, Amhara Region, Ethiopia



Study Research Team

1. Dessalegn Getu
2. Tewabe Mihret
3. Mullugeta Mamo
4. Solomon Mitku
5. Yibeltal Enyih
6. Abrham Alemu
7. Negussie Seyoume

Table of Contents

Acknowledgements.....	iii
List of Tables	iv
List of Figures	v
List of Acronyms	vi
Executive Summary	vii
1. Introduction.....	1
2. Methodology	3
2.1 Description of the Study Area.....	3
2.2 Data Collection Techniques and Sample Size	3
3. Results and Discussion	6
3.1 Demographic Characteristics of Sample Households	6
3.2 Sorghum Production Practice and Trends in the Area	6
3.3 Intercropping of Sorghum with Other Crops	9
3.4 Importance of Sorghum in the Area.....	9
3.5 Farmers' Preferences for Different Sorghum Varieties	10
3.6 Food Processing and Storage	11
3.7 Availability of Sorghum Produce and Marketing	12
3.8 Coping Mechanisms Utilized During Food Shortages.....	13
3.9 Access to Extension Services.....	13
3.10 Access to and Use of Different Inputs for Sorghum Production	15
3.11 Sources of Inputs.....	16
3.12 Access to Farm Tools.....	17
3.13 Access to Credit	17
3.14 Access to Business and Community Advisory Services.....	18
3.15 Decision Making.....	18
3.16 Gender Division of Labor in Different Tasks	20
3.17 Constraints of Sorghum Production (Production, Storage and Marketing)	28
3.18 Cultural, Traditional Taboos, Norms in the Area	29
3.19 Daily Activity Time Table	30
3.20 Seasonal Calendar for Sorghum Production	31
4. Conclusions and Recommendations	33

5. References.....	35
--------------------	----

Acknowledgements

We are very grateful to the SMIL project for its financial support to successfully complete this work on time. Secondly, we extend our appreciation to Mrs. Yeshi Chiche for her deliberate and invaluable support and daily communication through the course of the study. The research team also would like to thank Sirinka Agricultural Research Center for providing vehicles for transport.

This report is made possible by the generous support of the American People through the United States Agency for International Development (USAID). The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government.

List of Tables

Table 1. Altitude, Soil type, RF, Temperature _____	3
Table 2. Major Crops Grown in the Area (2016-17) _____	3
Table 3. Preference Ranking of Married Women and FHH Participants for Sorghum Varieties _____	11
Table 4. Preference Ranking of MHH Participants for Sorghum Varieties _____	11
Table 5. Access to and Control over Extension Services by Different Household Members _____	14
Table 6. Percentage Share in Use of Different Inputs by Gender _____	15
Table 7. Access to and Control Over for Different Types of Credit _____	18
Table 8. Daily Activity Time Table for Women and Men During Peak Season/Planting Time _____	30
Table 9. Seasonal Calendar for Long-Maturing Sorghum Varieties _____	31
Table 10. Seasonal Calendar for Improved Sorghum Varieties _____	32

List of Figures

Figure 1. Trends of sorghum in area coverage for the last seven years.	8
Figure 2. Trends of sorghum in production and productivity for the last seven years.	8
Figure 3. Area coverage of major crops grown in the area.	9
Figure 4. Importance of sorghum in relation to other crops grown in the area.	10
Figure 5. Grain availability and price variation over the year.	13
Figure 6. Different inputs used in the study area and their sources (MHHs).	22
Figure 7. Different inputs used in the study area and their sources (FHHs).	17
Table 7. Access to and Control Over for Different Types of Credit.	18
Figure 8. Decision-making of women and men on different activities and expenditures (MHH participants).	19
Figure 9. Decision-making of women and men on different activities and expenditures (married women participants).	19
Figure 10. Division of labor in land preparation, cultivation and maintenance (MHH participants).	20
Figure 11. Division of labor in land preparation, cultivation and maintenance (married women participants).	21
Figure 12. Division of labor in land preparation, cultivation and maintenance (FHH participants).	22
Figure 13. Division of labor in harvesting, transporting, threshing and marketing (MHH participants).	23
Figure 14. Division of labor in harvesting, transporting, threshing and marketing (married women participants).	23
Figure 15. Division of labor in harvesting, transporting, threshing and marketing (FHH participants).	24
Figure 16. Division of labor in different domestic activities (MHH participants).	25
Figure 17. Division of labor in different domestic activities (married women participants).	25
Figure 18. Division of labor in different domestic activities (FHH participants).	26
Figure 19. Division of labor in different community activities (MHH participants).	27
Figure 20. Division of labor in different community activities (married women participants).	27
Figure 21. Division of labor in different community activities (FHH participants).	28
Figure 22. Constraints of married women.	28
Figure 23. Constraints of FHH participants.	29
Figure 24. Constraints of MHH participants.	29

List of Acronyms

FGD: Focus Group Discussion

PRA: Participatory Rural Appraisal

WOA: Woreda Office of Agriculture

FTCs: Farmers' Training Centers

NGOs: Non-Governmental Organizations

DAs: Development Agents

Executive Summary

The role of men and women in Ethiopian agricultural production is significant and crucial for the provision of adequate food supply in the household. Understanding gender roles, needs and priorities is fundamental, as agricultural roles (both productive and domestic) are different between men and women. Failure to recognize these differences affects the effort to achieve effective agricultural development.

Therefore, this study attempted to identify gender roles and the division of labor among different types of households in sorghum production (production, processing and marketing) in the study area. The research team focused on ways community members achieved access to and control over resources and analyzed the decision-making opportunities for both genders in social, cultural and socio-economic instances. The study also attempted to assess the major challenges of sorghum production for both men and women in different household types.

Research was conducted in three kebeles in the Raya Kobo district of North Wollo Zone, which were purposively selected based on their sorghum production potential. A total of 70 farmers were involved in the study. Researchers identified and examined the roles of female and male farmers in sorghum production and management through analysis of primary data collected from participant farmers with the help of focus group discussions, participatory rural appraisal, gender analysis, proportional pilling, time-tables and seasonal calendars.

Results of the study indicated that both male and female farmers in Raya Kobo district participated in sorghum production, processing, storage and marketing, but that female-headed households worked more than double the hours of other community members, indicating that their contribution to crop production and management in study area was significantly higher: women from these households participated in almost all farming activities including productive, domestic and community development works.

1. Introduction

Agriculture is the backbone of Ethiopia's national economy, and rain-fed agriculture is a mainstay of life for more than 85% of the country's population. Although their contributions are not the same in all regions of Ethiopia, men and women do play pivotal roles in the development of agricultural production. In addition, Ethiopia comprises multi-ethnic and multicultural groups, with all ethnic and cultural groups having their own different gender roles in agriculture.

Gender divisions exist in all societies. When examining agricultural work around the world, and in Ethiopia in particular, different activities are defined by various labor divisions, one of which is gender. Household members accept that certain tasks are divided by gender; there are agreed-upon "men's" tasks and "women's" tasks. However, according to a study by Bassazenew (2008), the methods by which societies partition these activities between the sexes differs from one culture to another and can change through time. In fact, in many societies, "the traditional division of labor...is usually considered natural in the sense of being obviously and originally imposed by the sex differences in itself" (Boserup 1970, cited in Bassazenew 2008 p. 1).

Even though women in Ethiopia spend most of their daily hours working on domestic and productive tasks, society at large does not recognize their efforts toward agricultural work as significant. Specifically, rural Ethiopian women in the Amhara region spend anywhere between 14-17 hours per day on productive tasks and domestic work for which they receive no recognition or remuneration (Bassazenew, 2008). In the same study, Bassazenew goes on to explain that these women experience different forms of gender-based discrimination which, in turn, influences their status in Ethiopia, from how much money women make to the types of leadership roles they fill.

Most of the time, women's agricultural role is limited to livestock production: feeding, milking, dung clearance, management and marketing. Zewdu et al (2016) reported that "women access the lands of their husbands and their family land in the absence of male child in the family and in the presence of legal due to influenced by the culture of the area. Women were participating

in crop production activities such as seed preparation, sowing, weeding and marketing, but the rest of activities are mainly executed by men in the household” (p. 24).

Gender roles also affect how men and women access and control agricultural resources. Mostly, men are heads of household and therefore control family economics. They are more likely to market agricultural products, which means that women either have little control over income from production or receive low prices for any products they might bring to market (Motuma et al., 2016). Bassazezew (2008) also states that women’s roles are considered a “wifely duty” and seen as secondary to the work of men in the household.

Many studies that focus on gender and agricultural production discuss women as they relate to the traditional male-headed household. No specific studies take into account women in female-headed households or discuss issues specific to married women in male-headed households. In this study, we propose to avoid these omissions by comparing the activities and responsibilities of women and men in all types of households, as well as examining how the genders in both male- and female-headed households have access to and control over resources associated with sorghum production in the Amhara region.

2. Methodology

2.1 Description of the Study Area

The study area is located in the northeastern part of the Amhara region of Ethiopia, 576 km from Addis Ababa on the way to Mekele town. Specifically, the study area is situated at 11° 54'04" latitude and 39° 49'04" longitude; and has an area of 185,262.02 ha of which three percent is categorized as *Dega* (highlands), 38% is categorized as *Woyna Dega* (midlands) and 59% is categorized as *Qola* (lowlands). The district has a total population of 231,873: from this, 115,705 are females and 108,076 live in rural areas. Tables 1 and 2 show the specific breakdowns of soil type, climate and major crops grown in the study area.

Table 1. Altitude, Soil type, Precipitation, Temperature

Soil type (%)		RF (mm)	T(C°)	Altitude(m)
Black	40	500-800	12.31- 33.07	1360-3000
Brown	40			
Sandy	10			
Red	10			

Source: Woreda Office of Agriculture

Table 2. Major Crops Grown in the Area (2016-17)

Crop	Area(ha)	Male farmers	Female farmers
Sorghum	16440	33707	7771
Teff	12494	18653	6384
Maize	3061	7087	2164
Barley	2469	5163	1003
Onion	1660	4006	795
Field pea	1488	3901	462
Chick pea	850	1913	212

Source: Woreda Office of Agriculture

2.2 Data Collection Techniques and Sample Size

The study was conducted at Raya Kobo district in North Wollo Zone within three kebeles namely; Aradom, Abuarie and Ayub. These kebeles were selected purposively because they are predominant sorghum-producing areas in terms of coverage and production. Random sampling was used to select respondents from a list of the total households taken from each kebele Office

of Agriculture, resulting in 72 participants. The cluster sampling technique also was applied to disaggregate the respondents into three household groups per kebele: female-headed households, male-headed households and married women from male-headed households. Each household group contained eight individuals.

Both primary and secondary data were collected using a combination of techniques. Primary data were collected by using Participatory Rural Appraisal (PRA) techniques such as proportional piling; T-tables, pair-wise and direct matrix rankings were used for data collection. Focus group discussions also were used with sample respondents by using a semi-structured questionnaire, whereas Key Informant Interviews were held with individuals having knowledge, wisdom and experience about the study areas. Secondary data were collected from the district Office of Agriculture and the woreda livestock and fish agency.

A daily activity clock was completed in order to understand the different kinds of daily activities carried out during the peak growing season. It also examined the intensity of workloads for women and men as well as their daily patterns. FGD participants were asked to list the activities they undertake in their daily routines, either at home or on their farms. Participants listed their activities from the time they wake up until bedtime. Each participant recorded his/her own experience on paper, while other FGD participants had the opportunity to explain whether or not they agreed on the description of the activities and the corresponding time management. Once this was completed, the group discussed which activities were most tedious/time-taking/labor-intensive.

A seasonal calendar was another participatory tool used to explore the seasonal changes of agricultural activities conducted throughout the year for a given target crop. Participants were asked to list major activities associated with the production of the target crops. Data were analyzed by using both inferential and descriptive statistics. In order to describe the overall roles of gender in sorghum production and marketing as well as the proportions of activities by gender, descriptive statistics were used and presented in this report in the form of tables and graphs.

Note that some figures and other data refer to the Ethiopian calendar (E.C.). This calendar differs from the Gregorian calendar used in most countries around the world. A year in the E.C. is 13 months long: 12 months have 30 days each, and the last month of the year has five days in a common year (six days during a leap year). This results in a calendar that is seven to eight years behind the Gregorian calendar.

3. Results and Discussion

3.1 Demographic Characteristics of Sample Households

3.1.1 Family size.

Based on the number of families within the selected kebeles, respondents were categorized into different groups. Results indicated that the majority of respondents have a family size of five to 10 people.

3.1.2 Age composition.

The majority of male respondents were between the ages of 30-65 years; however, the majority of female respondents were between the ages of 27-36 years.

3.1.3 Education.

The majority of female respondents did not have any formal education and were illiterate, whereas 30% of male respondents had received education. The remaining male respondents had not received any education at all and were illiterate.

3.1.4 Size of land holdings.

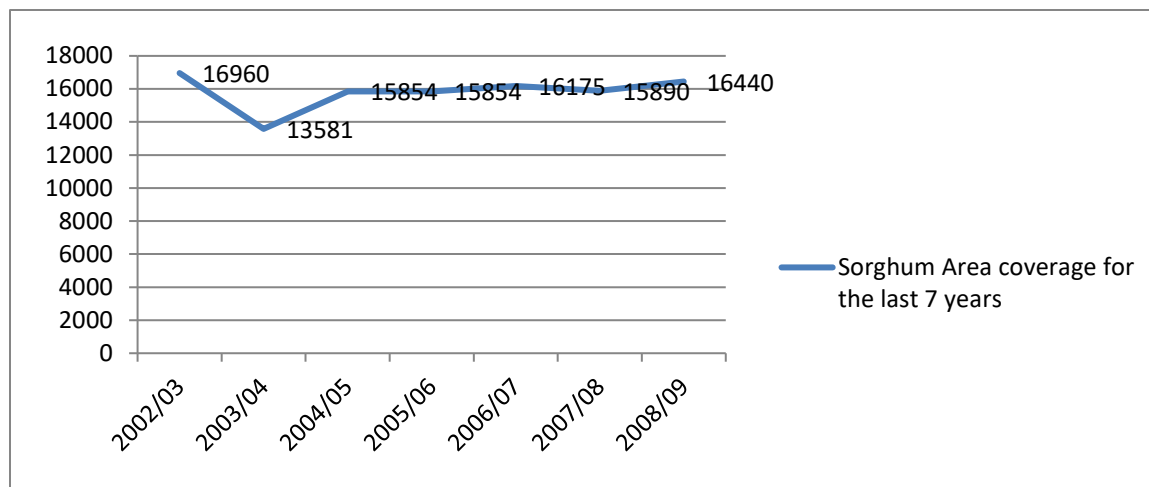
All respondents owned their own land (usually to cultivate cereal crops), but most FHHs shared or rented their farm to more wealthy community members, and some farmers from MHHs owned an additional piece of land, either rented (could be shared in or not) or used as homestead gardens. These gardens usually occupied fewer portions of land. In general, the minimum land holding size across the sampled clusters was 0.25-0.5 ha, while the maximum size was larger than 2 ha.

3.2 Sorghum Production Practice and Trends in the Area

Sorghum is a major crop in the study area: its coverage remained level in all growing seasons except during 2003-04 (Figure 1). Figure 2 illustrates the area's sorghum production trends, which dropped sharply during the 2007-08 cropping season when the country experienced widespread drought. In the other growing seasons, mainly poor rainfall distribution prevented farmers from growing late-maturing local sorghum varieties. This presents an opportunity for the

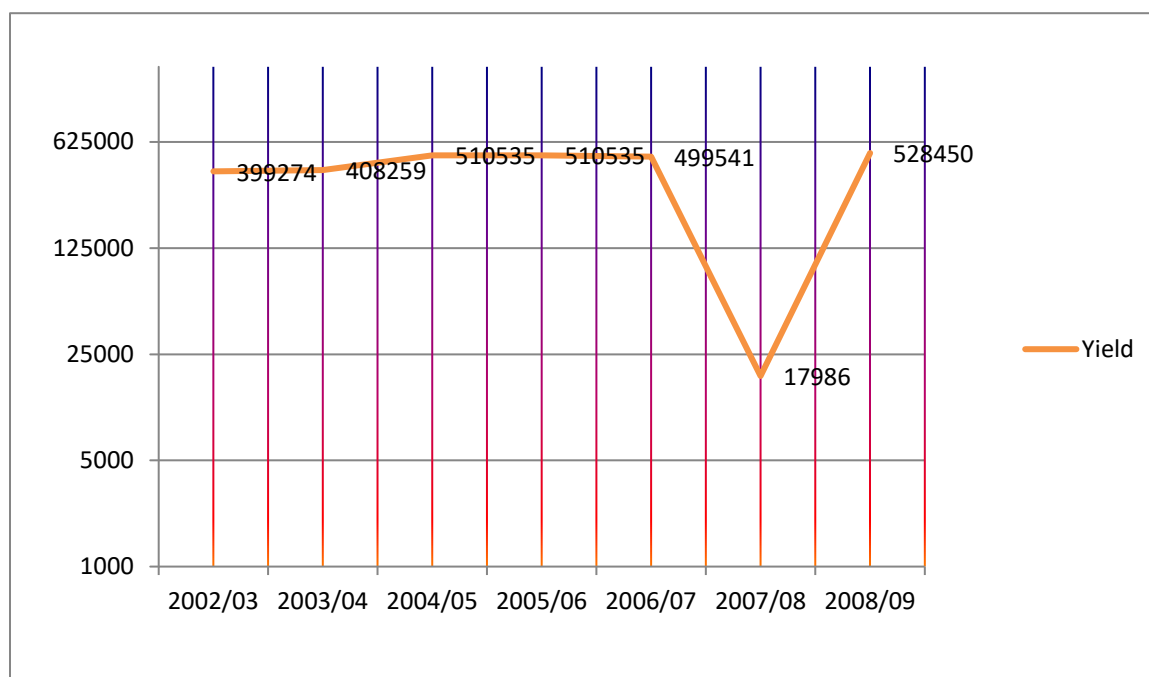
promotion of early-maturing improved sorghum varieties: these varieties were created to double and triple produce when irrigation is available. Early-maturing sorghum varieties contributed significantly in areas where farmers shifted their production due to uncertain rainfall. Additionally, the establishment of irrigation technologies encouraged farmers to grow vegetables and fruits. The expansion of these cash crops helped farmers when sorghum was unavailable and also provided improved nutrition. Maize also was produced under irrigation and was used as a green cob (for sale and home consumption) but had low area coverage when compared to the total area for vegetables and fruits. Chickpea also was produced on some farms because it can be grown in low moisture conditions. All agricultural practices in the study area favored crop rotation, which in return improved soil fertility and reduced insect infestation.

In the study area, major crops such as sorghum (37.7%), teff (28%), maize (9.7%) and chickpea (two percent) had high area coverage and production (Figure 3). Vegetables and fruits (22%) were grown for family food consumption and for sale to supplement household income in rain-fed areas and using irrigation. Data obtained from sample households indicated that different local sorghum varieties (*Jigurti*, *Abola*, *Jamyo*, *Dingeta*, *Abayrie* and *Wodiakr*) and improved varieties (Girana-1 and Wodiakr/76T1#23) were grown widely in the area. Farmers in Abuarie and Aradom kebeles planted an early-maturing improved variety (Girana-1) due to rainfall shortages; the establishment of irrigation technologies in the area led to double and triple cropping systems. Local varieties covered 70% of the area, since they can withstand water-logging conditions resulting from highland flooding, and they have higher stalk yield and better food quality.



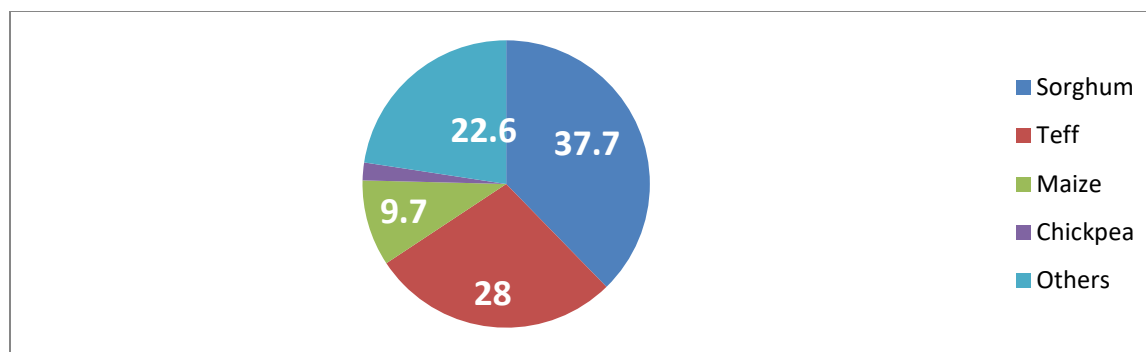
Source: Woreda Office of Agriculture

Figure 1. Trends of sorghum in area coverage for the last seven years (E.C.).



Source: Woreda Office of Agriculture

Figure 2. Trends of sorghum in production and productivity for the last seven years (E.C.).



Source: District Office of Agriculture 2015-16

Figure 3. Area coverage of major crops grown in the area.

3.3 Intercropping of Sorghum with Other Crops

Most of the time, intercropping sorghum with other crops was uncommon in the area, but sometimes farmers applied mixed cropping with sorghum, Teff and maize on homesteads or nearby farms: to get fresh maize/locally known as “*Eshet*” for sale and to maximize income, farmers grew one percent maize with 99% sorghum; to minimize risk, farmers grew 85% Teff with 15% sorghum.

3.4 Importance of Sorghum in the Area

Sorghum is highly adaptable and has been grown by farmers in the study area for a long time – it plays an invaluable role in the everyday life of the community. Sorghum has many traits that make it preferred by both female and male farmers in the area, including its use in many common foods such *injera* (alone or mixed with teff), *mengelie*¹, porridge, *nifro*² and *qollo*³. Sorghum is used also to prepare local beverages such as *tella*⁴, *areqi*⁵ and *tej*⁶. Women in some kebeles evaluated a local sorghum variety (*Abola*) for medicinal uses. They prepared it as a tea to strengthen mothers during labor; this use has been considered an area innovation. Sorghum stalks were used as sugarcane/*tingsh*⁷ for human food as well as for animal feed; the stalks also were

¹ A type of bread prepared from sorghum flour

² Cooked sorghum grains for human food consumption

³ A roasted sorghum grains for consumption

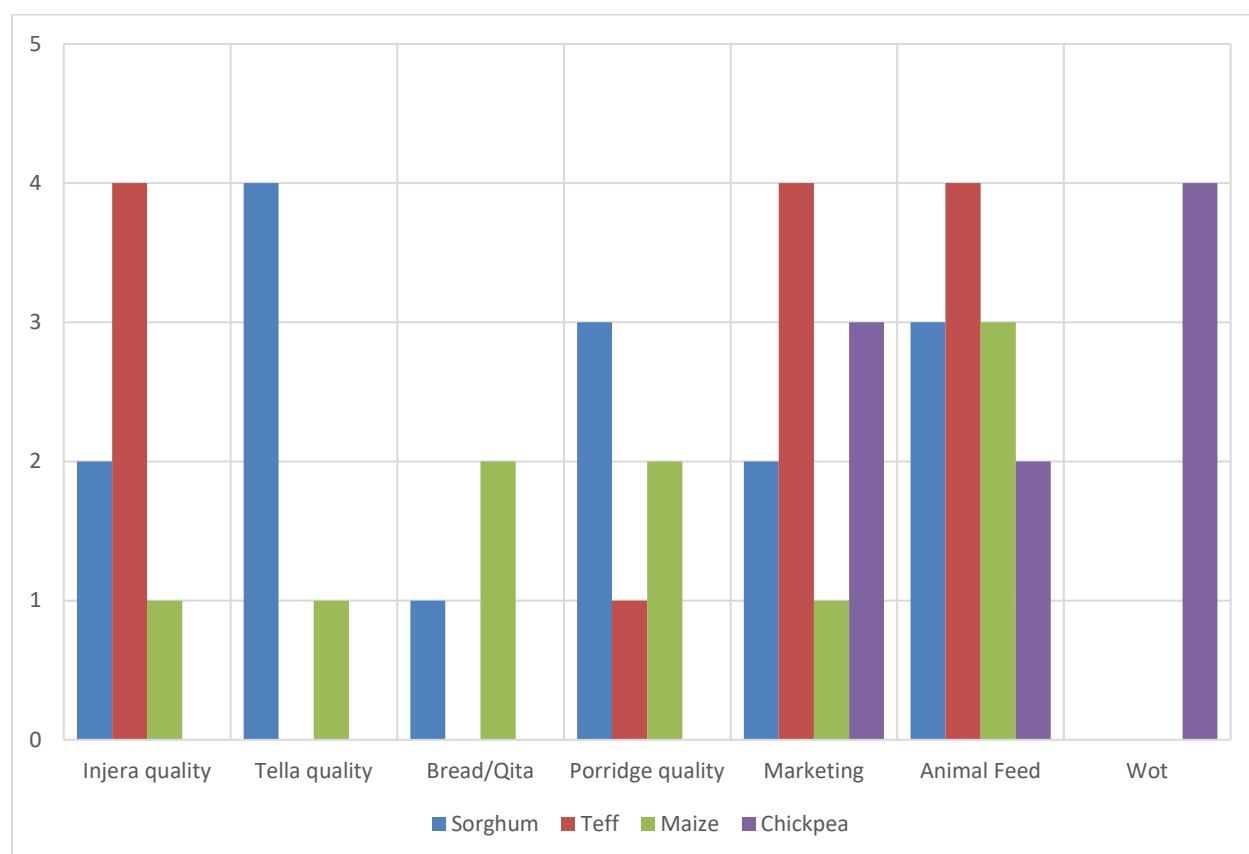
⁴ Local beer prepared from cereals

⁵ Alcoholic drink like ozo

⁶ Alcoholic drink prepared from honey and cereal grains

⁷ A special type of fresh sorghum stalk used by local residents as sugarcane

used as a source of cooking fuel and house construction for small-holder farmers. These multiple uses made sorghum unique in relation to other commonly-grown crops in the study area.



4= Very good 3= Good 2= Medium 1= poor 0= not used
Source: FGD results

Figure 4. Importance of sorghum in relation to other crops grown in the area.

3.5 Farmers' Preferences for Different Sorghum Varieties

Both female and male farmers specified desirable traits of sorghum varieties for food preparation and production; female farmers highlighted traits such as *injera* quality, local beer/*tella* quality, porridge and marketability, while male farmers indicated preferences for sorghum's grain yield, early maturity and stalk palatability for animal feed. Preferences were calculated by assigning scores (1=very good, 4=poor); then scores were added together so that the lowest sum ranked first, and the highest sum ranked fourth. Based on this evaluation, about 90% of women and men preferred *Abola* (local) variety for its *Tella* quality as well for its higher market demand (Table 3). *Abola* also was preferred for its better grain and stalk yield. On the other hand, local variety

Jamyo was preferred for its *injera* and porridge quality, whereas the improved variety *Girana-1* was preferred for porridge, early maturity, stalk palatability higher yields (both grain and stalk).

Table 3. Preference Ranking of Married Women and FHH Participants for Sorghum Varieties

Parameters/traits	<i>Jamyo</i>	<i>Abola</i>	<i>Girana-1</i>	<i>Wodiakir</i>
Injera quality	1	2	3	4
Local beer (Tella)	2	1	3	4
Porridge	1	3	2	4
Marketability	2	1	3	4
Total	6	7	11	16
Rank	1 st	2 nd	3 rd	4 th

Source: FGD results from married women and FHH participants

Table 4. Preference Ranking of MHH Participants for Sorghum Varieties

Parameters/traits	<i>Jamyo</i>	<i>Abola</i>	<i>Girana-1</i>	<i>Wodiakir</i>
Early maturity	3	4	2	1
Stalk yield	2	1	3	4
Stalk palatability	2	3	1	4
Marketability	2	1	3	4
Grain yield	3	1	2	4
Total	12	10	11	17
Rank	1 st	2 nd	3 rd	4 th

Source: FGD results from MHH participants

3.6 Food Processing and Storage

Different types of food were produced and processed throughout the year by most households in the study area, using both local and improved varieties. Among these, *injera*, *tella*, porridge and *mengelie* were the most common food types used in daily household consumption, whereas *areqi* and *nibero*⁸ were the foods least consumed. Recently farmers brewed commercial beverages like beer and Ozo from towns nearby their villages.

⁸ A type of *injera* prepared from sorghum

Women processed sorghum by first cleaning the grain, then washing, drying, pounding and milling it to make the flour from which they prepared porridge and *injera*. The sorghum can be processed also for *tella* which seems to be locally known as *tej*.

If the sorghum grain is not for immediate use, area farmers stored it. From a total of 72 respondent farmers, 75% of them said that they stored sorghum by first dressing the grain with pesticides/chemicals to protect from weevil infestation and then stored the grain in sacks, in pots or in a hole in the ground. Some farmers prepared concrete floors to keep the storage area cool.

3.7 Availability of Sorghum Produce and Marketing

Study results (shown in Figure 5), indicated that, in early November, most of the farmers harvested sorghum produce making the grain “highly” available until late February. From March until the end of May, sorghum was “mostly” available to households, then decreased to “average” availability for the next three months until farmers faced shortages of sorghum during September and October.

Grain prices decreased during harvesting, remaining “average” until late April (Figure 5). Prices began increasing from July through late September, due to poor availability of the grain in the majority of the households; the situation was worse for FHHs, due to their low production availability associated with farming smaller plots of land and with low input use compared with MHHs. FHHs were more affected than MHHs because the entire burden to support the family was the responsibility of women, which precluded them from traveling far away in search of jobs. In MHHs, while women took care of domestic tasks, the men went out to look for work and food.

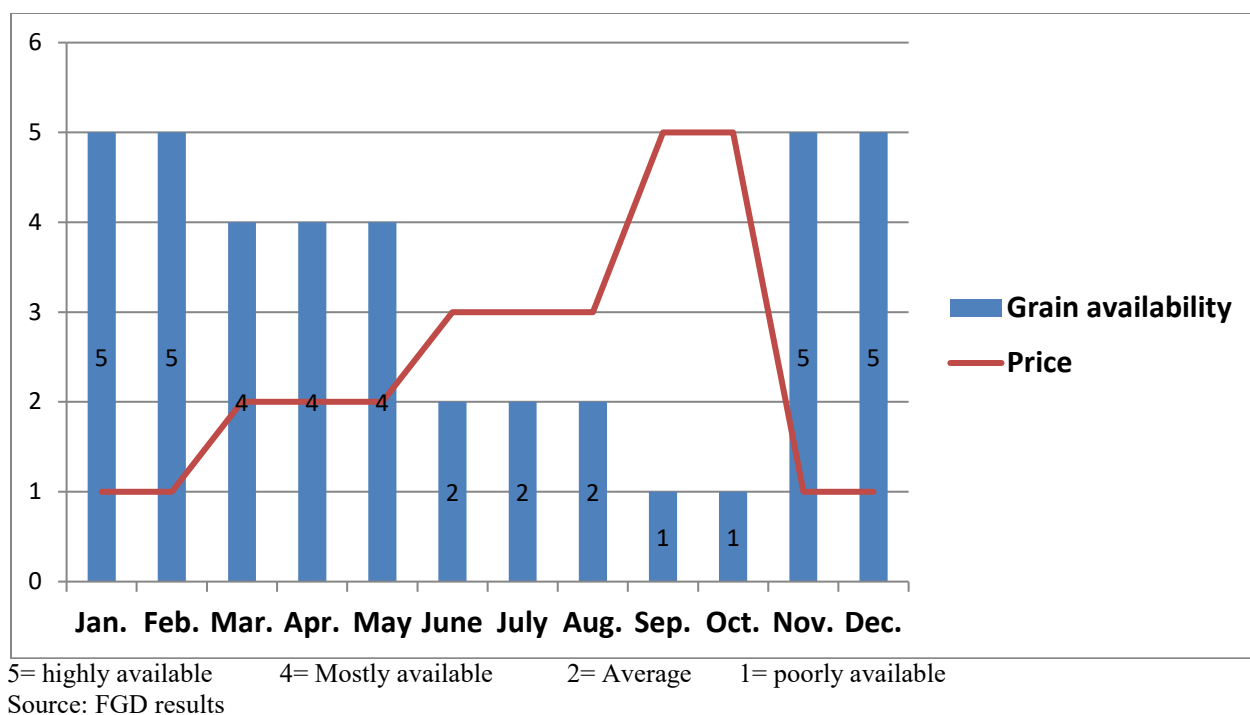


Figure 5. Grain availability and price variation over the year.

3.8 Coping Mechanisms Utilized During Food Shortages

Respondents indicated that the majority of the area's farmers had adopted the following measures/coping mechanisms during times of grain shortage (July - September). These measures were:

- selling other crops (teff, onion, chickpea or maize) and purchasing sorghum grain;
- selling livestock such as poultry, goats/sheep and calves;
- finding employment for activities on- and off-farm;
- receiving cash and food loans from relatives and neighbours; and
- receiving remittances from children living in middle-Eastern countries.

3.9 Access to Extension Services

3.9.1 Sources of extension information.

The majority of respondents indicated that 30% of male farmers and 5% of female farmers in the study area received information about recommended production packages (row planting, appropriate use of fertilizer/chemicals and improved seed), post-harvest handling, marketing,

and saving. This information came from development agents during meetings, at church and through informal contacts. Farmers also said that information on improved sorghum technologies was delivered by research centers and NGOs. About 55% of male and 10% of female farmers exchanged information on crop production among neighbors and with model farmers located near their farms.

3.9.2 Access to training, field days and demonstrations.

Data obtained from sample respondents indicated that 15% of male farmers attended field days and training; 70% of this training was participation in demonstrations held at FTCs, but only 3% of male respondents attended on-farm demonstrations. On the other hand, only 3% of female farmers were involved in trainings, field days and demonstrations. Generally, farmers' participation – particularly female farmers' participation – in trainings, field days and demonstrations were insignificant due to many reasons, such as:

- extension agents frequently contacted only those who are vocal, influential and model male farmers;
- female farmers did not participate in outdoor activities due to cultural and traditional taboos and norms (i.e., community members were critical of females participating in meetings, training, field days, etc.);
- extension agents assumed that women could not accomplish tasks effectively;
- different governmental and non-governmental bodies assigned additional workloads to kebele DAs; and
- many women farmers were illiterate.

Table 5. Access to and Control over Extension Services by Different Household Members

Types of resources	Access to		Control over	
	Women	Men	Women	Men
Extension education	10	90	7	93
Use improved sorghum variety	5	95	4	96
Use of fertilizer	10	90	10	90
Use of income from sorghum	85	15	75	25
Demonstration	15	85	7	93
Field days	20	80	12	88

Source: FGD results

3.10 Access to and Use of Different Inputs for Sorghum Production

The majority of farming households planted sorghum using the broadcasting method. Row planting was more limited, with only 11% of the total users, compared to the 89% of users utilizing broadcasting. For both broadcasting and row planting, FHHs were the minority users (Table 6). FGD respondents indicated that both male and female farmers believed that row planting affected production by reducing their farm land (crop yield and animal feed). Others said that a short rainy season during planting caused delays in planting time due to labor shortages; this problem was especially acute for FHHs because they had poor access to plowing oxen and less money to hire labor.

On the other hand, nearly 94% of the farmers (25% from FHHs and 69% from MHHs) applied fertilizer for sorghum production on irrigated plots (Table 6). Of the 17% of total users producing improved sorghum varieties, most were male farmers, with only two percent of female farmers using improved seed. Only 15% of the users (three percent FHHs and 12% MHHs) applied fertilizer during the rain fed season. Their rational was that fertilizer was ineffective (had burning effect) on the crop due to moisture deficits, coupled with high soil temperatures in the area. Others perceived that the soil was highly fertile, and since the stalks were left on the soil as a fertilizer/ground cover, there was no need for fertilizer application. Other farmers cited cost/benefit reasons for avoiding fertilizer use: returns for sorghum did not compensate for the high cost of fertilizer. In fact, only three percent of FHHs used fertilizer for sorghum production in rain fed seasons, due to lack of income coupled with unaffordable fertilizer prices.

Table 6. Percentage Share in Use of Different Inputs by Gender

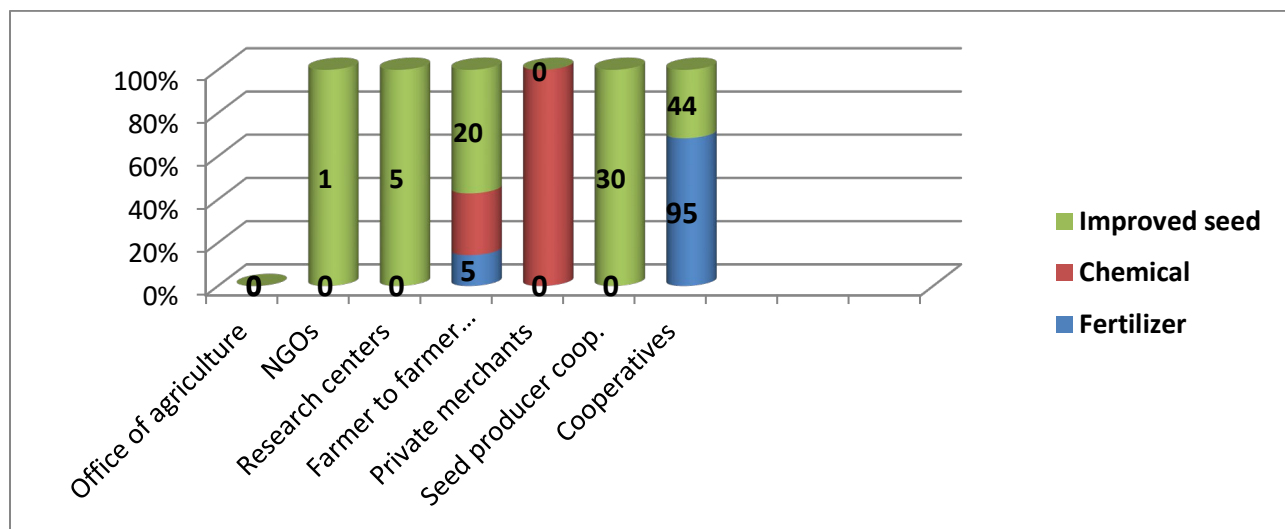
Particulars	Total users (%)	FHHs (%)	MHHs (%)
Row planting	11	3	8
Broadcasting	89	24	65
Improved seed	17	2	15
Fertilizer (rain fed)	15	3	12
Fertilizer (irrigation)	94	25	69
Chemicals	98	26	71

Source: FGD results

3.11 Sources of Inputs

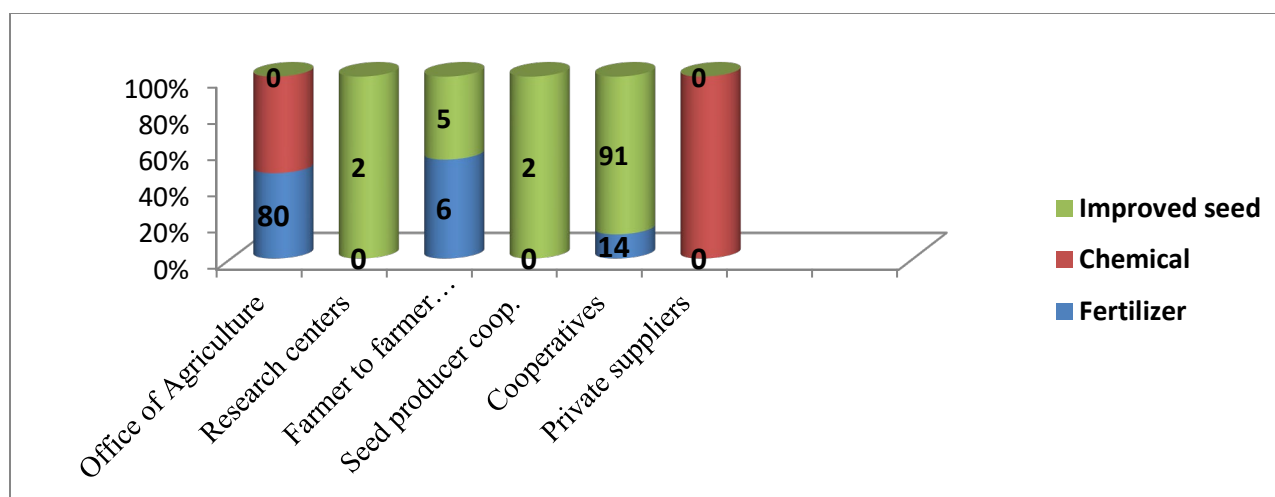
In the study area inputs such as improved seed, fertilizer, herbicide and pesticide chemicals were used for major crop production. Male farmers reported they received improved seed from the Office of Agriculture, which shared 75% of seed sources. Research centers and seed grower cooperatives accounted for 15 – 25% of seed sources in the research area, whereas farmer-to-farmer seed exchange also played a significant role as a seed source because of the efforts of progressive farmers. Farmers sourced their fertilizer from either the Office of Agriculture or from farmers' cooperative associations. Private suppliers supplied the majority – nearly 80% – of chemical supplies while 20% of chemical sources were owned by cooperatives and other farmers.

On the other hand, respondents from FHHs said they received 80% of their fertilizer and 90% of their chemical supply from the Office of Agriculture. In addition, FHH respondents received 91% of their improved seed supply from cooperatives.



Source: FGD results of MHH participants

Figure 6. Different inputs used in the study area and their sources (MHHs).



Source: FGD results of FHH participants

Figure 7. Different inputs used in the study area and their sources (FHHs).

3.12 Access to Farm Tools

Farmers in the study area used different traditional tools for various farm operations, starting from land preparation and land clearing to post-harvest handling and marketing. MHHs in Aradom and Abuarie kebeles used tractors for land preparation on contract, but nearly all of the farmers (98.5%) in the study district utilized oxen and traditional hand tools for crop production. FHHs suggested that if there were suitable farm tools available for them, they could cultivate their land by themselves, rather than renting their land to men.

3.13 Access to Credit

There were credit organizations that provide cash loans to communities in the study area. However, the majority of the farmers have not received credit due to high interest rates and collateral requirements from the institutions. Women were encouraged to get cash loans from ACSI, but the majority of these women did not have collateral and, due to their lower income, were incapable of repaying the loans on time. All other types of loans, such as fertilizer, chemicals and improved seed, were received by the farmers in cash (Table 7).

Table 7. Access to and Control Over for Different Types of Credit

Particulars	MHHs (%)	FHHs (%)	Married women (%)
Cash loan	20	2	5
Fertilizer loan	-	-	-
Improved seed loan	-	-	-

Source: FGD results of participants

3.14 Access to Business and Community Advisory Services

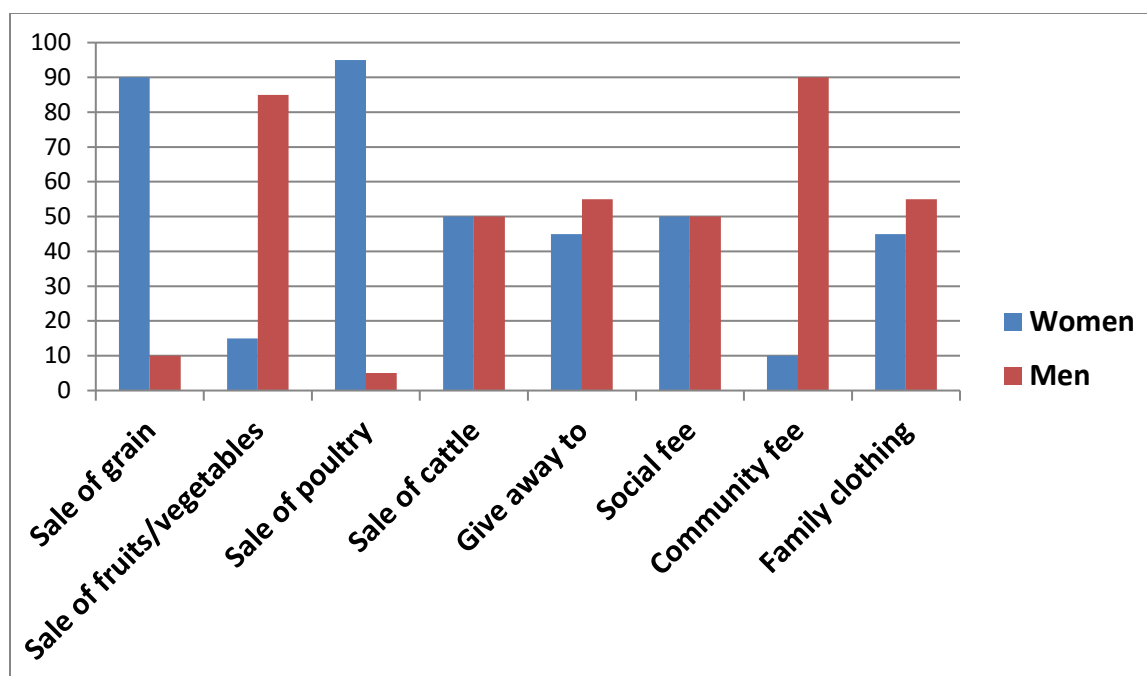
Within the study area, business organizations such as the Kobo Girana irrigation project and the Zeleke development project supplied improved seed and provided occasional employment opportunities. In addition, community advisory services such as MekaneEyesus⁹ and Save the Children provide advisory services on saving, family planning and child trafficking; they also provided incentives and inputs such as improved seed, small ruminants and poultry for organized groups of women and youth.

3.15 Decision Making

The decision-making process in the study area depended upon the matter at hand. As shown in Figure 8, decisions on some expenses (e.g., social fees, family clothing), livestock sales, and decisions on whether to give away produce to family members or other community members were made jointly between male and female household members. Men made decisions on the sales of fruits and vegetables and on expenses like community fees, while women were the sole decision-makers for the sale of poultry and grains (e.g., sorghum, teff and maize).

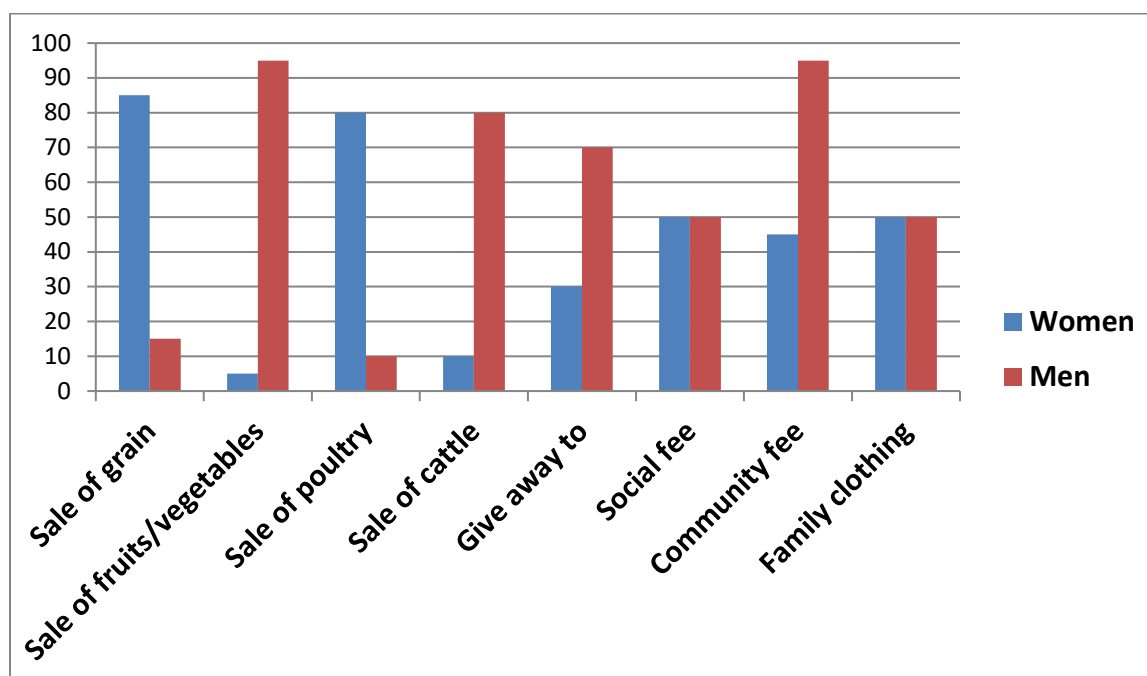
Married women agreed that the sale of grains and poultry was a decision made by women, and that the sale of fruits and vegetables was a decision made by men. However, married women indicated that livestock sales (cattle) was a decision made mostly by men, as was the decision to give produce away to family members or other community members. Married women respondents agreed that all other decision-making processes were made jointly.

⁹ Local NGO working with farmers in technology transfer



Source: Results of proportional piling of MHH participants

Figure 8. Decision-making of women and men on different activities and expenditures (MHH participants).



Source: Results of proportional piling of married women participants

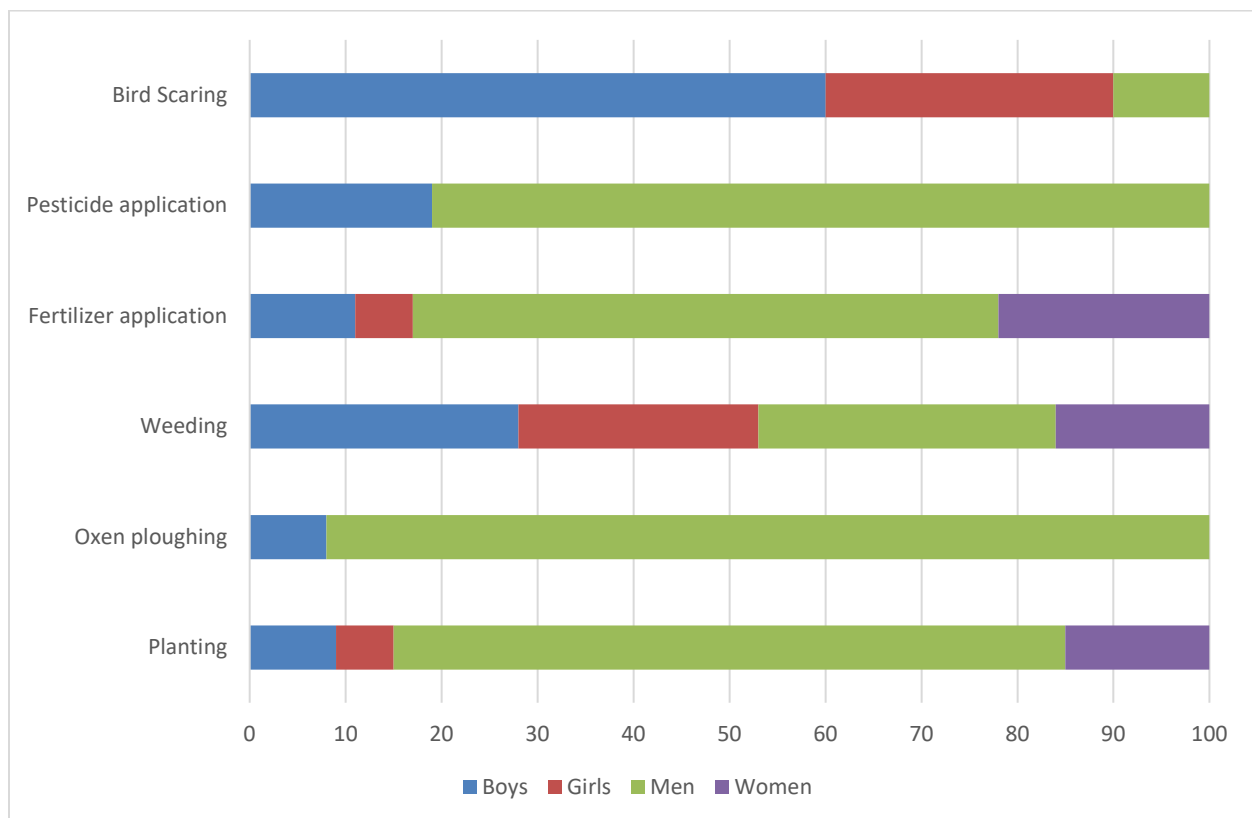
Figure 9. Decision-making of women and men on different activities and expenditures (married women participants).

3.16 Gender Division of Labor in Different Tasks

3.16.1 Productive activities.

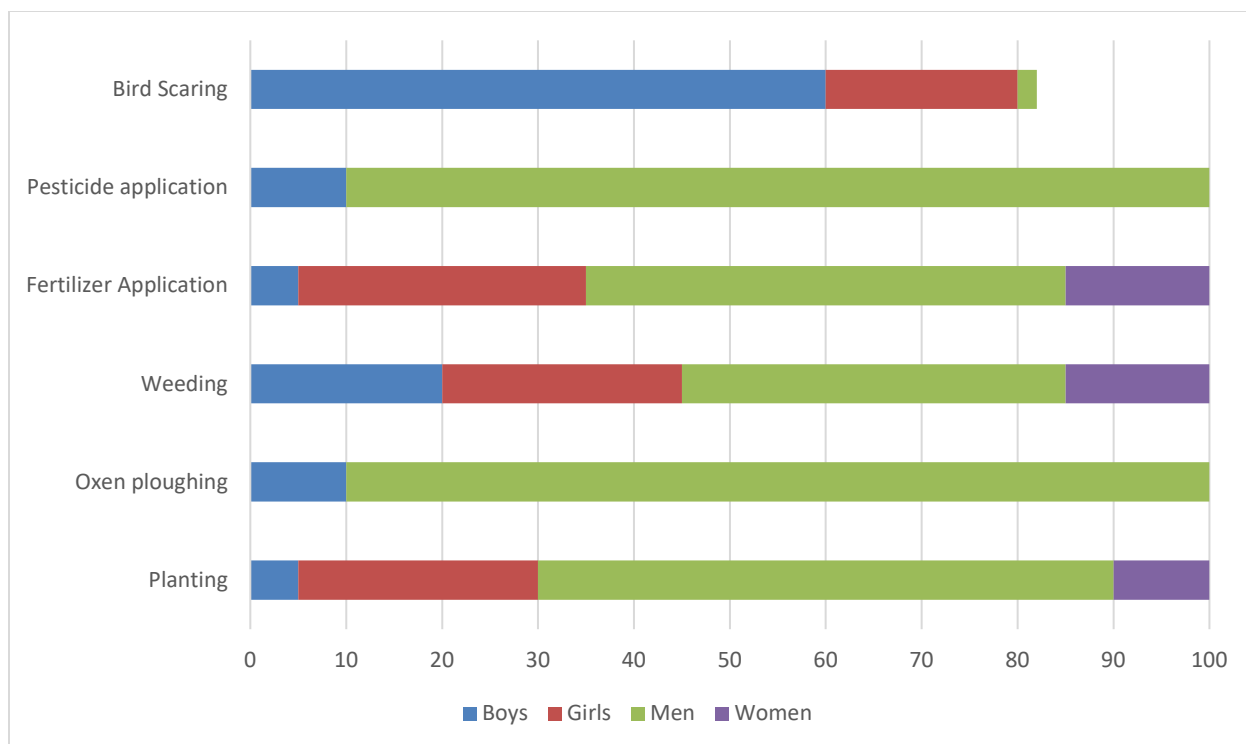
Oxen ploughing, planting, weeding, and fertilizer and chemical application were productive activities. Ploughing using oxen was a task completed usually by men and boys (92% and two percent, respectively). Although all community members, regardless of gender, had some involvement in planting, weeding and fertilizer application, men took the highest share of this responsibility (74%) for these activities.

It was mostly men who applied chemicals in the field (92%), with the remaining done by boys. On the other hand, bird scaring responsibilities were shared among boys (60%), girls (30%) and men (10%).



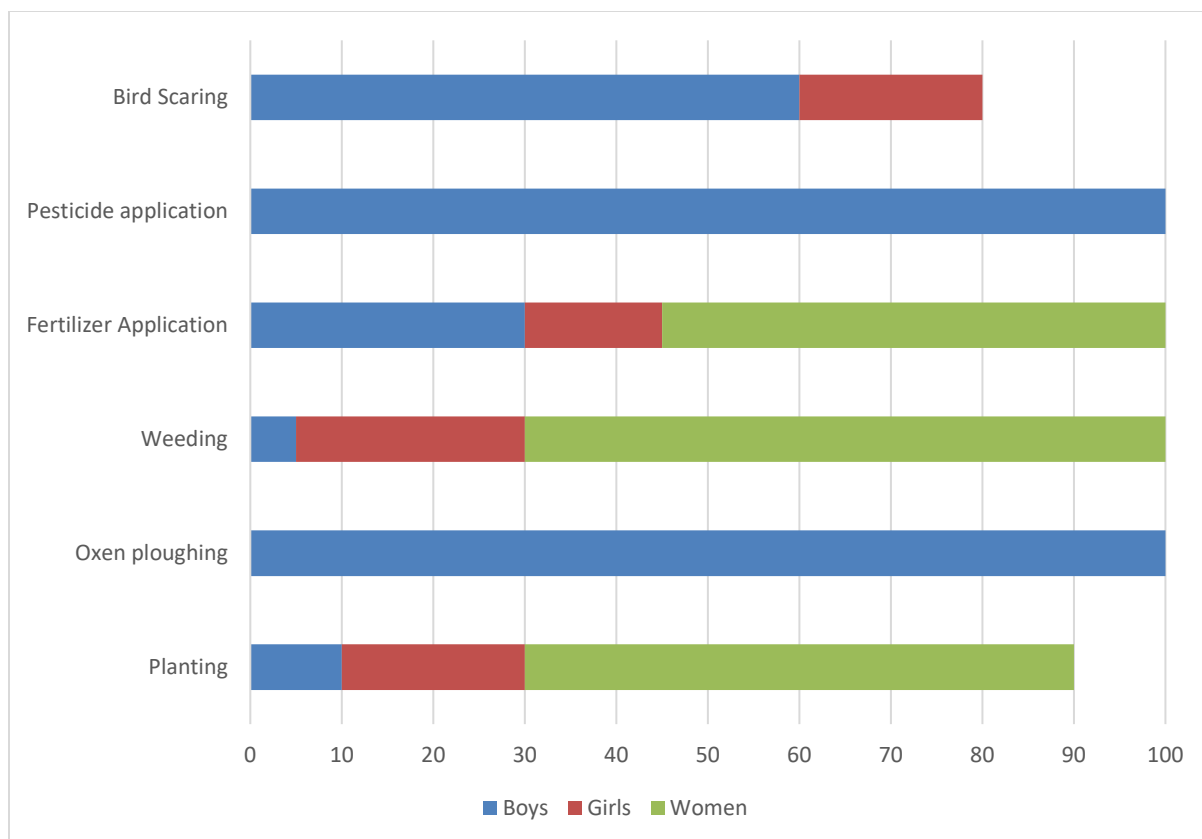
Source: FGD results of MHH participants

Figure 10. Division of labor in land preparation, cultivation and maintenance (MHH participants).



Source: FGD results of married women participants

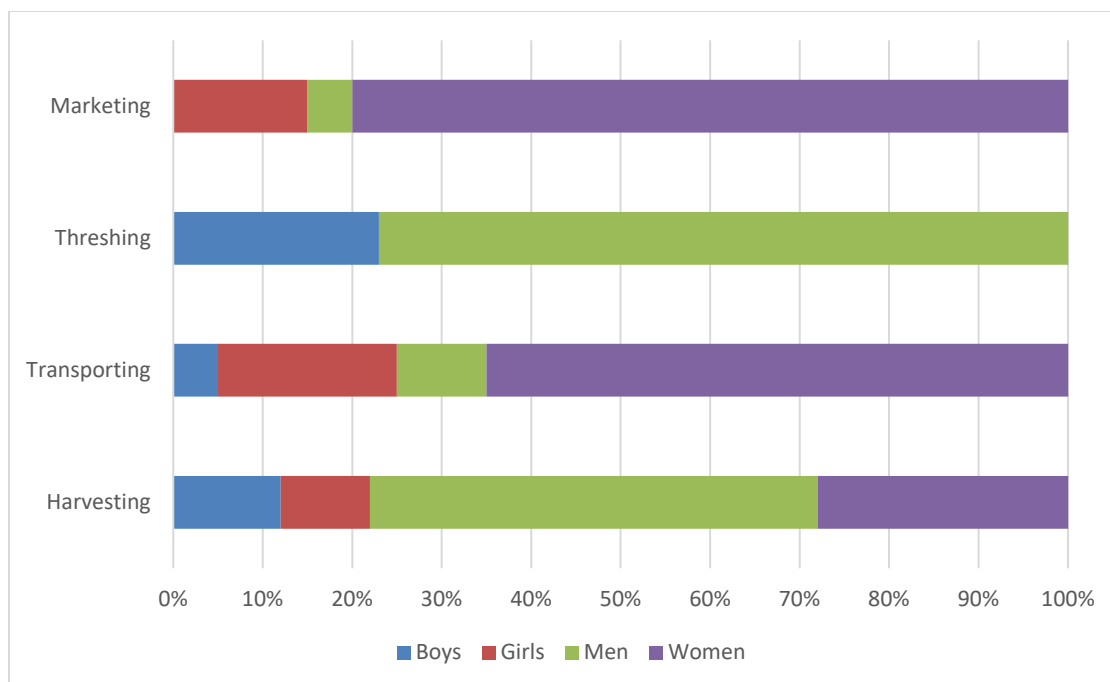
Figure 11. Division of labor in land preparation, cultivation and maintenance (married women participants).



Source: FGD results of FHH participants

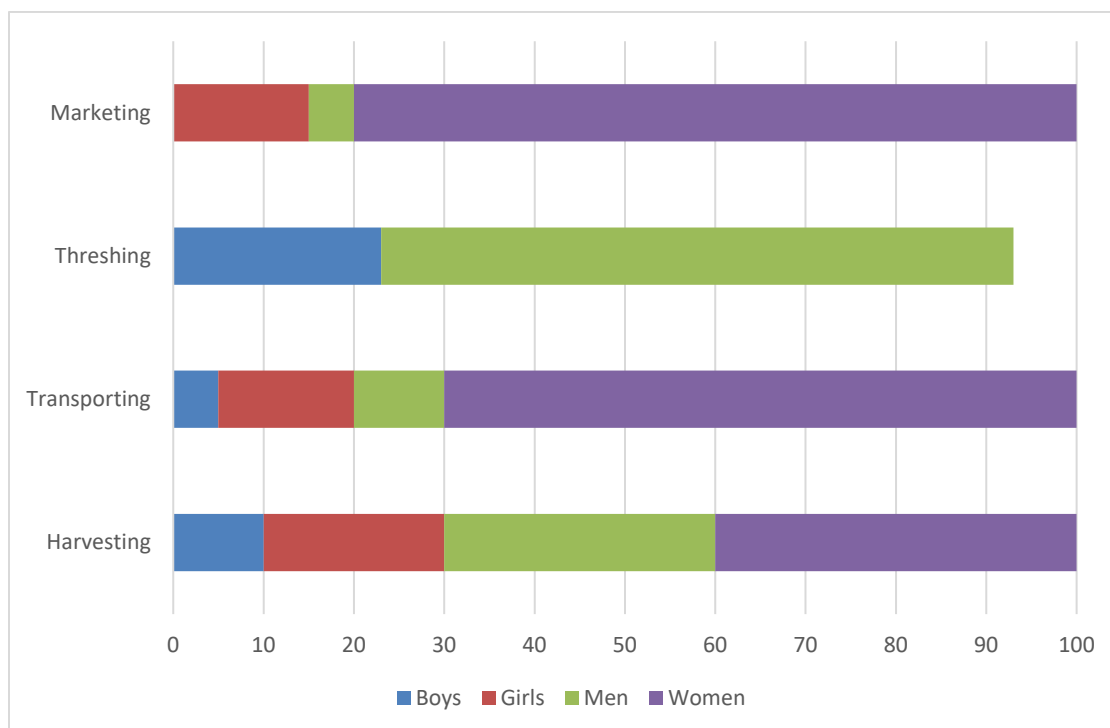
Figure 12. Division of labor in land preparation, cultivation and maintenance (FHH participants).

As shown in Figures 13 and 14, participants, regardless of their gender, were involved in harvesting and transporting. MHH participants indicated that the majority of the harvesting was completed by men (50%), but this was contradicted by the responses of married women, who indicated that women did more harvesting than the men (40% and 30%, respectively). Both MHH and married women FGD participants agreed that women did most of the transporting and marketing for sorghum, and that men were responsible for most of the threshing. Females didn't take part in this activity due to societal taboos. This was clearly shown in the responses from FHHs, where boys were responsible for 100% of the threshing, while the rest of the responsibilities were undertaken mostly by women (Figure 15).



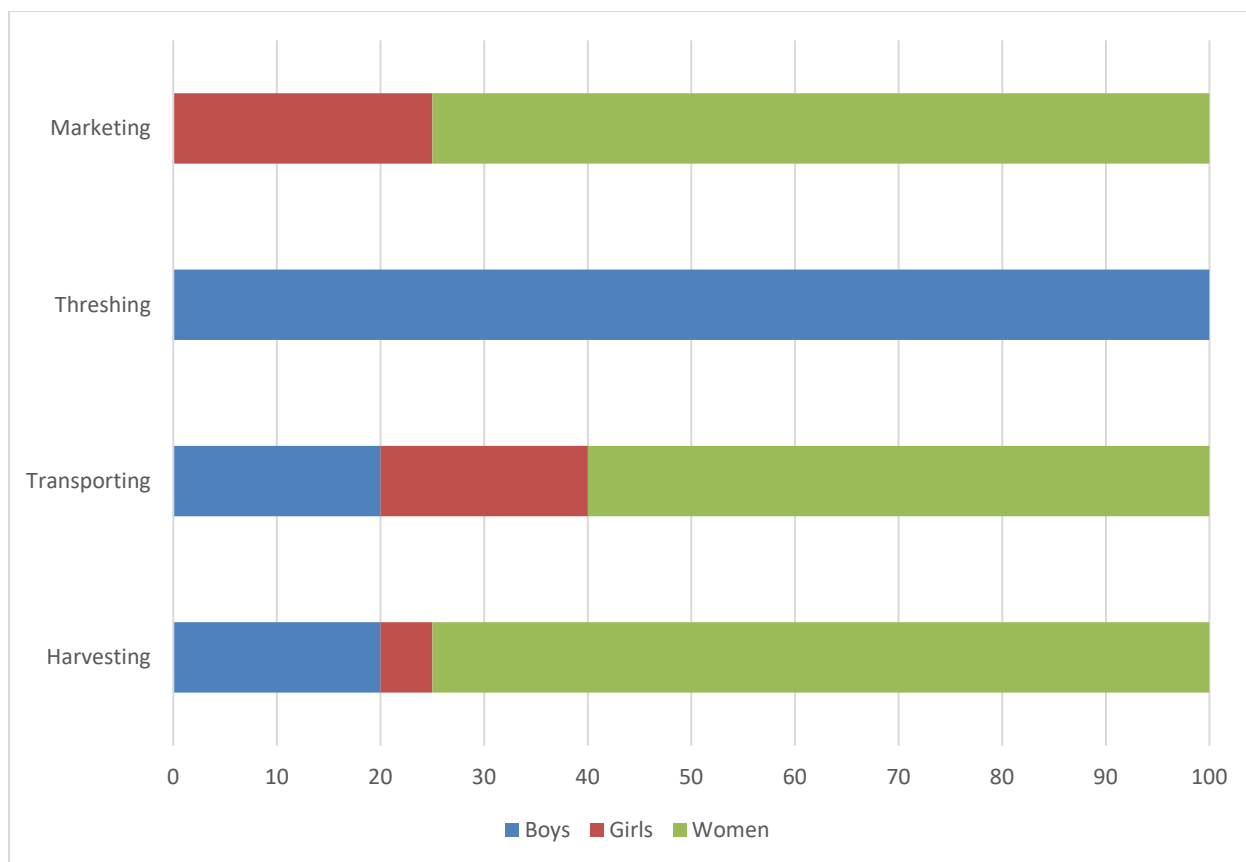
Source: FGD results of MHH participants

Figure 13. Division of labor in harvesting, transporting, threshing and marketing (MHH participants).



Source: FGD results of married women participants

Figure 14. Division of labor in harvesting, transporting, threshing and marketing (married women participants).



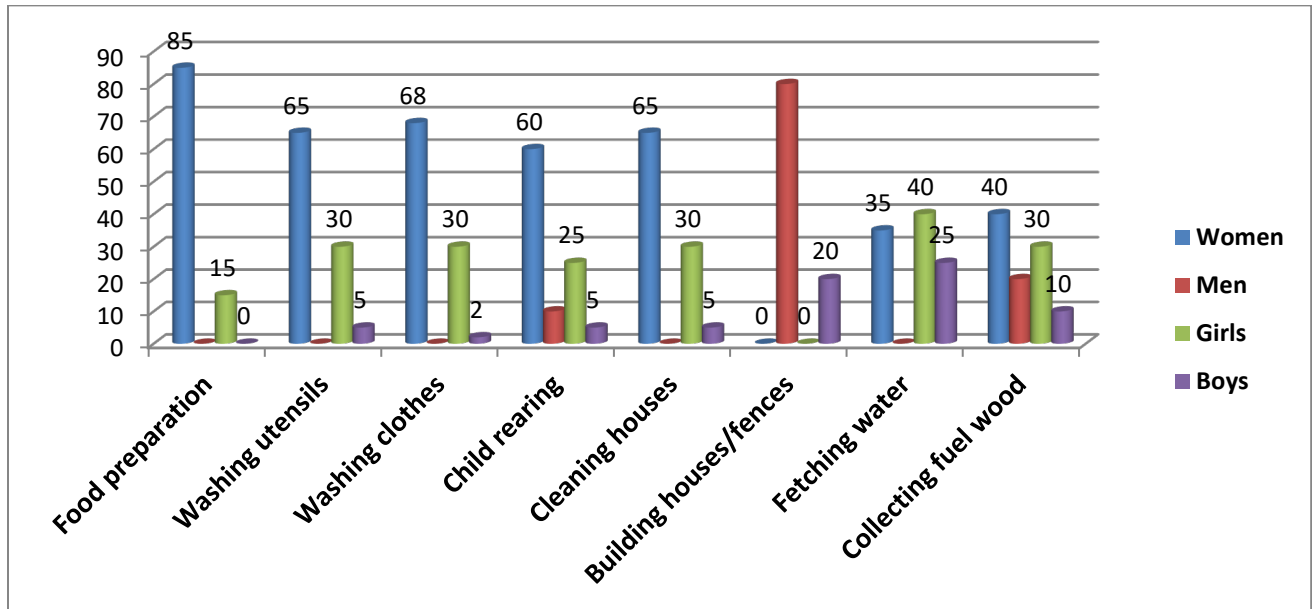
Source: FGD results of FHH participants

Figure 15. Division of labor in harvesting, transporting, threshing and marketing (FHH participants).

3.16.2. Domestic activities.

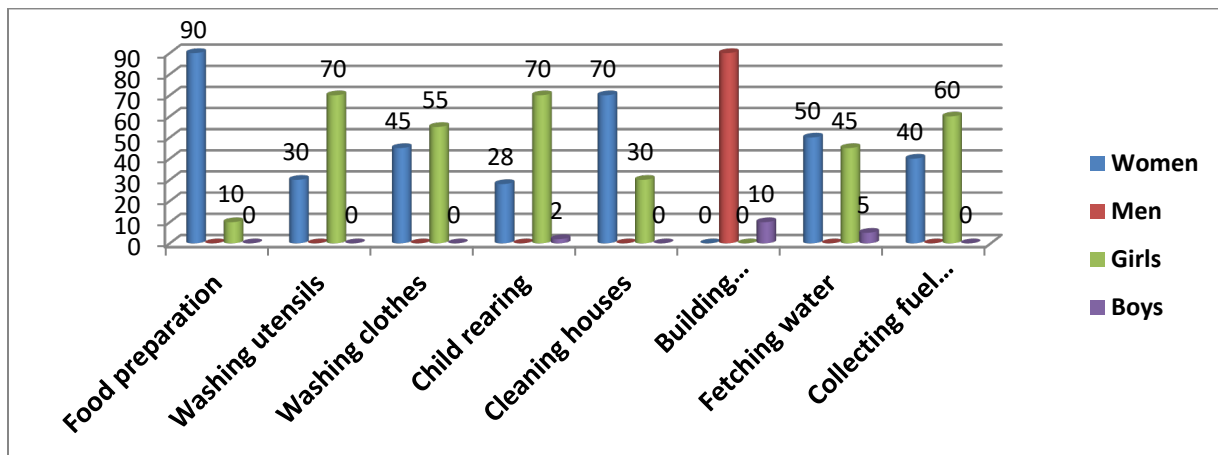
Food preparation, washing utensils and clothes, child rearing, cleaning houses, constructing/building houses and fences, fetching water and collecting fuel were included as domestic activities. Females in the household were responsible for the highest share of almost all domestic activities, with the exception of building houses/fences which was done by only men (Figure 16 and 17). As shown in these figures, women and girls shared domestic responsibilities; male participants assigned most of the domestic responsibilities to women (Figure 16), while married women in these households indicated that girls were responsible for the majority of activities such as washing utensils, washing clothes, child rearing and collecting fuel (Figure 17). Participants from FHHs also said that girls were responsible for the majority of domestic tasks such as washing utensils, washing clothes, child rearing, house cleaning and collecting firewood

(Figure 18). Fetching water was a task shared between women and girls in FHHs, and meal preparation was an activity completed mostly by women.



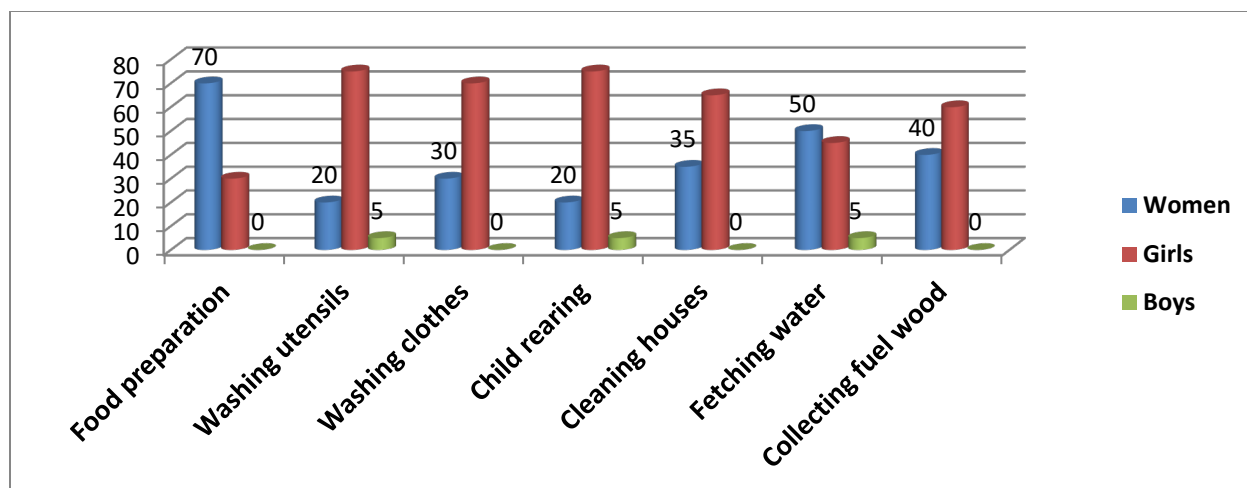
Source: FGD results of MHH participants

Figure 16. Division of labor in different domestic activities (MHH participants).



Source: FGD results of married women participants

Figure 17. Division of labor in different domestic activities (married women participants).

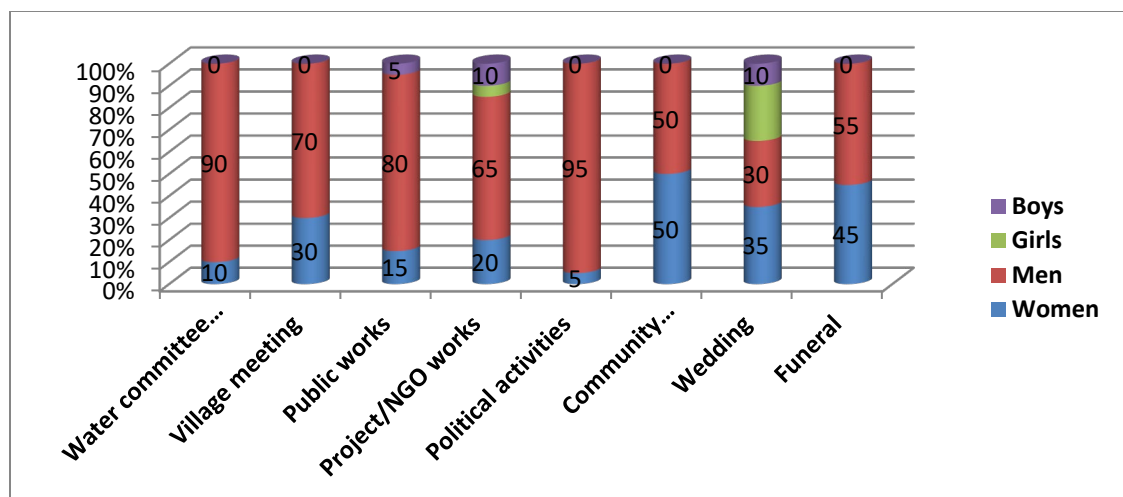


Source: FGD results of FHH participants

Figure 18. Division of labor in different domestic activities (FHH participants).

3.16.3 Community activities.

The majority of community activities such as attendance at water and committee meetings, public works, project/NGO works, and political activities were predominantly the responsibility of men. According to responses from MHHs, women did have some say in these activities (with a share between 10% and 30%); married women in these households reported that they had much less responsibility for committees and meetings, as well as for project/NGO works (Figure 20). There was also a difference between male and female responses when asked about responsibility for public works. Male respondents said that women only had a 15% share of this responsibility, while married women in the households said they had a 55% share (Table 19 and 20). Married women also said that they had more responsibility for weddings (50%), but MHH respondents said that women only had a 35% share, with a greater share of the responsibility going to girls in the household (Figure 19). Girls took part in weddings by fetching water and preparing food for the ceremony. In FHHs, the overwhelming majority of all community activities were undertaken by women (Figure 21).



Source: FGD results of MHH participants

Figure 19. Division of labor in different community activities (MHH participants).

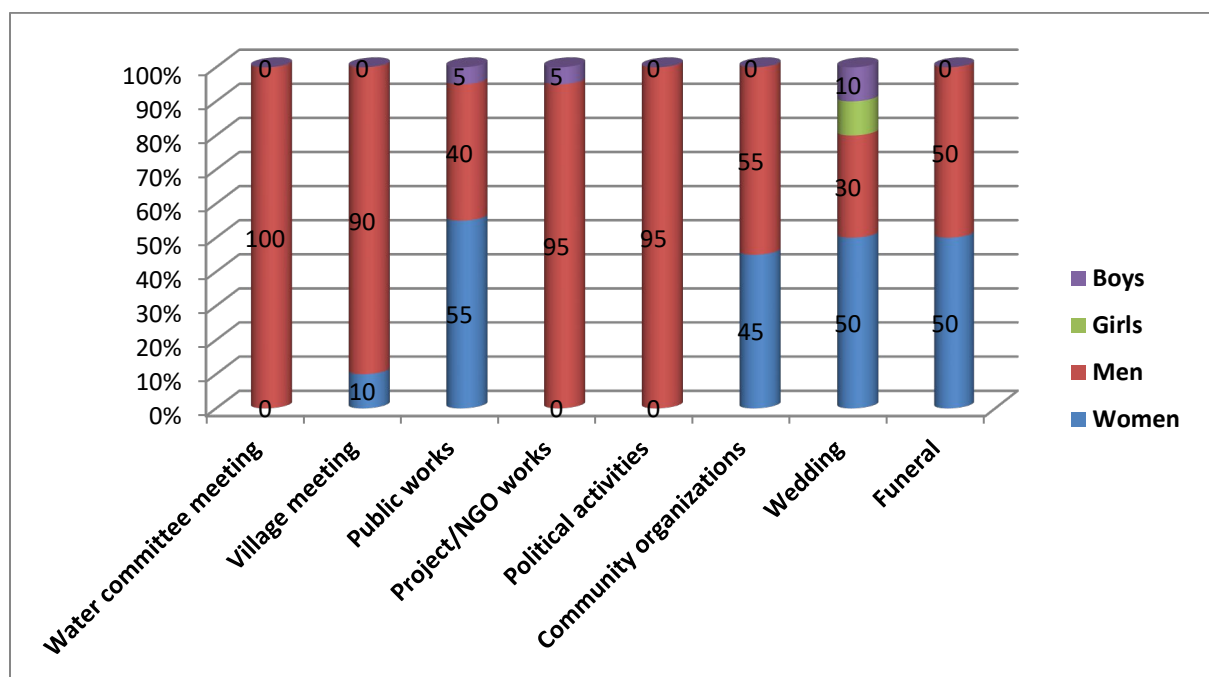
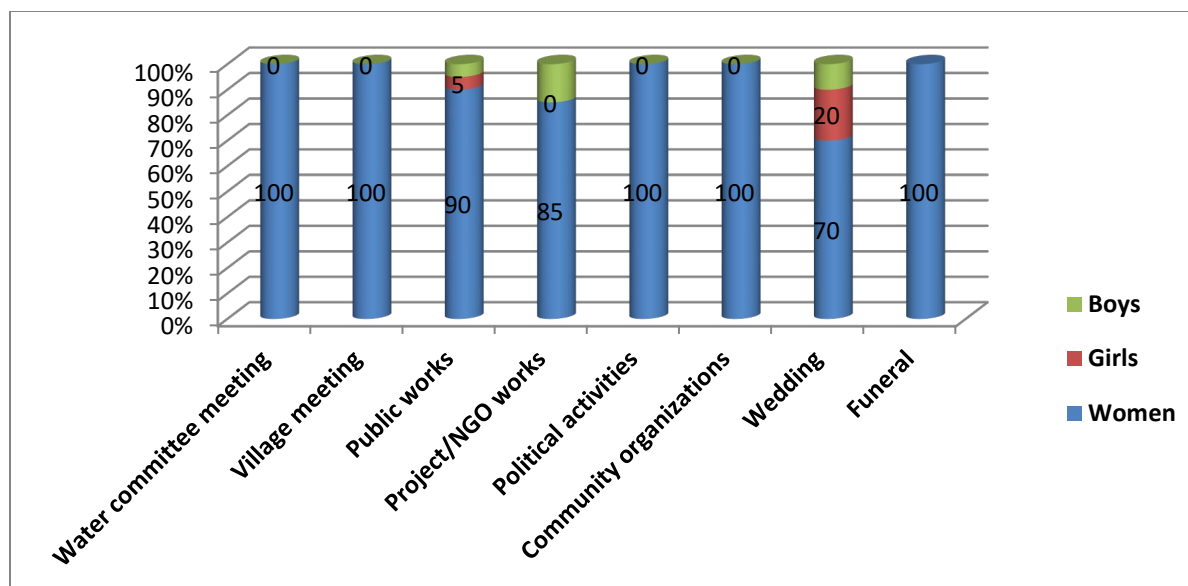


Figure 20. Division of labor in different community activities (married women participants)

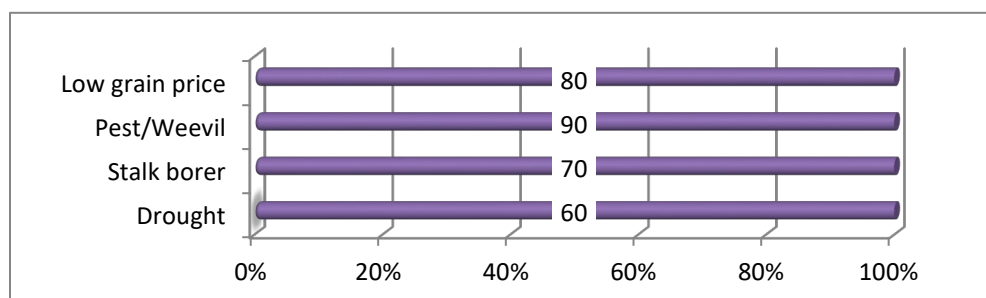


Source: FGD results of FHH participants

Figure 21. Division of labor in different community activities (FHH participants).

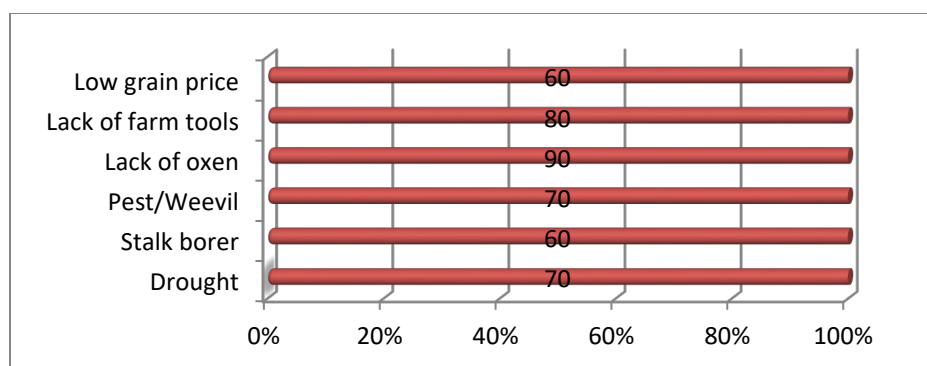
3.17 Constraints of Sorghum Production (Production, Storage and Marketing)

In the study area, there were many reported problems related to sorghum production, processing, storage and marketing. Among these, sample respondents identified and prioritized the following: weevil, low grain price, stalk borer and drought were major constraints identified by married women; lack of oxen, lack of farm implements, drought, weevil and stalk borer were major constraints reported by FHHs; drought, stalk borer, disease (smut), weeds, high cost of fertilizer and post-harvest loss were identified as common constraints by MHH participants.



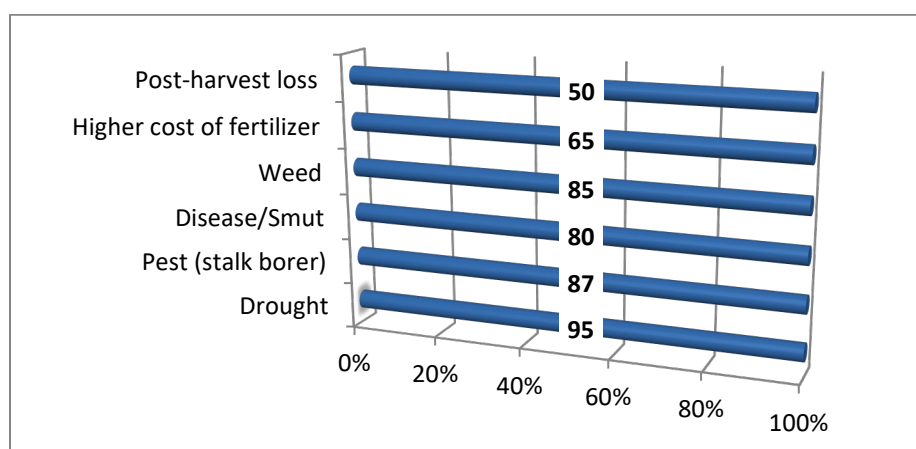
Source: FGD results of married women participants

Figure 22. Constraints of married women.



Source: FGD results of FHH participants

Figure 23. Constraints of FHH participants.



Source: FGD results of MHH participants

Figure 24. Constraints of MHH participants.

3.18 Cultural, Traditional Taboos, Norms in the Area

There were different traditional taboos and norms in relation to gender preventing women from actively participating in certain societal activities in some kebeles. FGD respondents listed the following:

- women should not be involved in threshing because it results in a curse leading to unexpected yield losses;
- men should not be responsible for indoor activities (i.e., baking *injera*) because it is perceived as unethical;
- women should not participate in meetings, trainings and field days because they may be sexually harassed by local leaders and DAs (in some cases);

- women should not be active in community leadership because they will face strong criticism or perceptions as an “over act” and “undesirable dominance”; and
- women should not have access to extension services because they are considered ineffective in productive activities, particularly in agricultural packages.

3.19 Daily Activity Time Table

The result of FGDs showed that women spent a total of 16 hours daily on work, whereas men spent 14.30 hours daily on work during peak seasons. On the other hand, women in FHHs spent double work hours (both at home and in the field) when compared to married women. Note that the times shown in Table 8 are based off of the Ethiopian clock. This is a 12-hour clock: the first cycle begins (hours 1:00-12:00) begin at dawn and end at dusk, and the second cycle begins at dusk and ends at dawn. Thus, the day begins at 1:00 (approximately 6 a.m. in conventional time) and ends at 12:00 (approximately 6 p.m. conventional time).

Table 8. Daily Activity Time Table for Women and Men During Peak Season/Planting Time

Women		Men	
Activities	Time	Time	Activities
Clean house	11:00-12:30	12:30-1:00	Prepare farming tools & feed oxen
Prepare breakfast and eating	12:30-1:30	1:00-2:00	Breakfast & go to farm land
Fetch water	1:30-2:10	2:00-6:00	Work on cultivation land
Prepare coffee	2:10-2:40	6:00-6:40	Lunch time
Prepare dough, bake <i>injera</i>	2:40-4:00	6:40-10:00	Cultivate land
Prepare lunch	4:00-5:20	10:00-11:00	Water oxen on farm
Take prepared food to the farm & have lunch	5:20-6:20	11:00-1:00	Feed animals on farm field and at home
Cultivate land	6:20-9:00	1:00-3:00	Dinner & Coffee
Collect fuel wood	9:00-11:30	3:00-12:30	Sleep
Bake <i>injera</i> , cook <i>wot</i> for dinner	11:30-2:00		
Prepare coffee & dinner	2:00-3:00		
Prepare dough for next day	3:00-3:20		
Clean utensils	3:20-4:00		
Sleep	4:00-11:00		

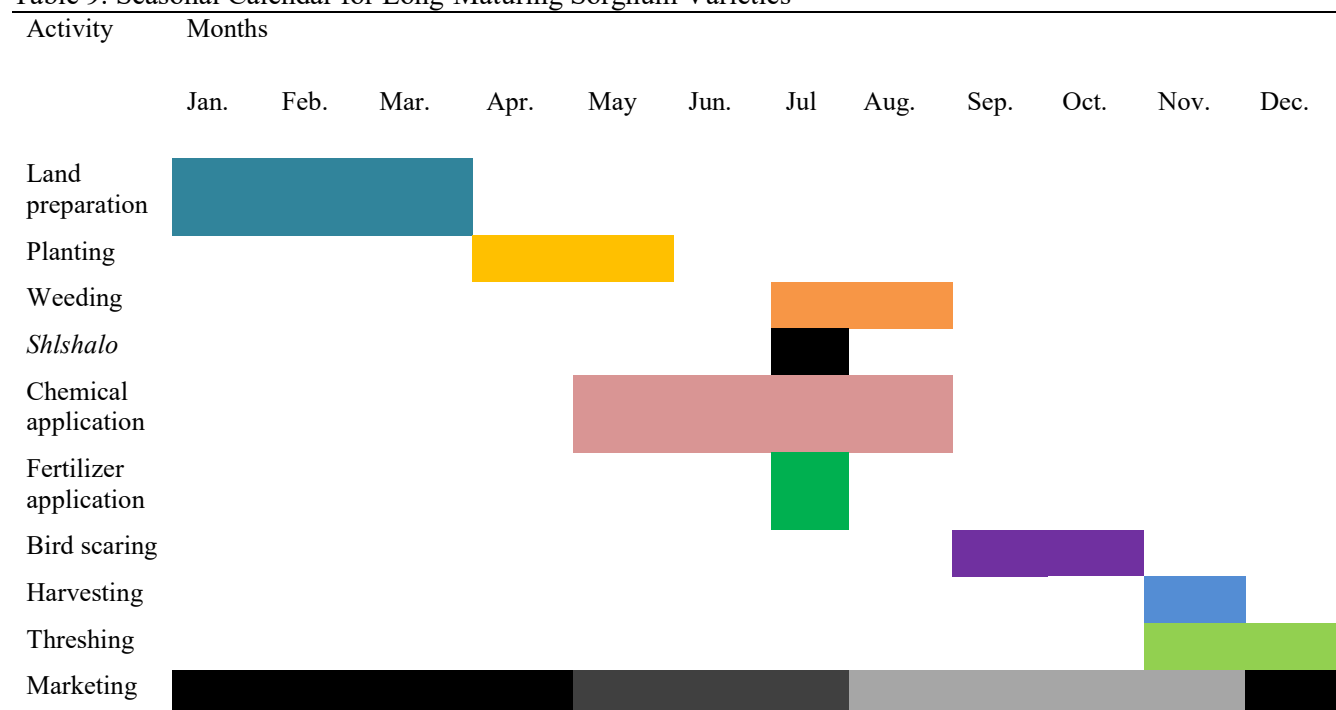
Source: FGD results

3.20 Seasonal Calendar for Sorghum Production

3.20.1 Seasonal calendar for long-maturing sorghum varieties.

Production of long-maturing/local sorghum varieties included many different activities that took place during the course of a year. According to FGD participants in this study area, land preparation took place from January-March, while planting was completed during April-March. Weeding, *shlshalo*¹⁰, fertilizer and chemical application took place from July to August, while harvesting and threshing were completed during November (Table 9).

Table 9. Seasonal Calendar for Long-Maturing Sorghum Varieties



Source: FGD results

3.20.2 Seasonal calendar (improved sorghum varieties).

Production of improved sorghum varieties included many different activities that took place during the course of a year. FGD participants from this study area said that land preparation was completed during February-March, while planting was completed during July. Weeding, *shlshalo*, fertilizer and chemical application were completed from August to September, and harvesting was completed in late October to November. Threshing occurred during November (Table 10).

¹⁰ A special type of ridges prepared locally for moisture conservation

Table 10. Seasonal Calendar for Improved Sorghum Varieties

Activity	Months											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Nov.	Dec.
Land preparation												
Planting												
Weeding												
<i>Shlshalo</i>												
Chemical application												
Bird scaring												
Harvesting												
Threshing												
Marketing												

Source: FGD results

4. Conclusions and Recommendations

4.1 Conclusions

The study area produced different improved and local varieties. During the year, the grain was mostly available in households from late November-April, less available from May-June, and scarce from July-October. Farmers in the study area used coping mechanisms to offset these availability problems – such as selling other crops (e.g., Teff, onion, chickpea and maize) to raise funds for sorghum purchase, selling livestock (e.g., poultry, goat/sheep and calves), finding employment in on- and off-farm activities, receiving cash and food loans from relatives and neighbors, and receiving remittances from children or other family members (i.e., daughters/sons who live in middle-Eastern countries).

Both males and females in the Raya Kobo district participated in sorghum production, processing, storage, and marketing, under close supervision of the head of the household. During the agricultural peak seasons, FHHs worked more than double the hours of married women and men, indicating that their contribution to crop production and management in the study area is significantly higher: women in FHHs participated in almost all productive, domestic and community development activities. Girls also contributed more than boys in domestic activities such as fetching water, collecting fuel wood, washing clothing and utensils, cleaning houses, preparing food and child rearing.

Both women and men had access to credit (e.g., cash and input loan), business and community advisory services (e.g., family planning and child trafficking), and both sexes indicated that they were active in decision-making for different activities. Most commercial and economical activities such as sale of fruits, vegetables and cattle were decided and controlled by male household members, but the sale of grain, poultry and livestock products was the responsibility of women.

Erratic precipitation and rainfall shortages, weed infestations (*Partinium* and *striga*), disease (smut), insects (stalk borer, bird, weevil), high fertilizer prices, lack of quality improved seed, low market prices of sorghum grain associated with lack of markets, and shortage of ploughing

oxen and farm implements (for FHH farmers) were the major constraints indicated by both female and male farmers with regard to sorghum production in the study area. The findings of this study argued that gender roles in household activities are socially constructed and not sexually determined.

4.2 Recommendations

The significant contribution in the study area of both females and males in productive, reproductive and community development activities with regard to sorghum production should serve as a guide for rural development. The following interventions are recommended for implementation by government agencies, development practitioners and researchers:

- There exists a need for gender-responsive farming tools in relation to sorghum production to enable FHH farmers to cultivate their own land.
- There should be access to credit for women with reasonable collateral, and interest rates that are based the borrower's ability to repay. This would enable these women to own their ploughing oxen and farm implements.
- There is a need for training on traditional taboos, norms and beliefs to educate the populace about the extent that these beliefs limit females' participation in community activities.
- There should be strong emphasis on the generation and introduction of sorghum varieties, with consideration for farmers' preferred traits (e.g., height and food quality).
- There needs to be a market linkage with beer factories and seed enterprises to increase sorghum market prices to encourage farmers to grow improved seed with a fully recommended production package.
- There should be training for all genders on disease, weed management, and pre- and post-harvest handling to reduce grain loss during threshing, transporting and storage.
- There should be new methods of food preparation and processing introduced in order to help expand the use of sorghum from just the traditional uses of *injera* and *tella*.

5. References

- Bassanenew, A. (2008). *Gender and agricultural production in Ethiopia: The case of Gozamen Woreda, Amhara Region*. (Unpublished thesis). School of Graduate Studies, Addis Ababa University, Ethiopia.
- Zewdu, A., Zenebe, G., Abraha, B., Abadi, T., & Gidey, N. 2016. Assessment of the gender role in agricultural activities at Damota kebele of Haramaya District, Eastern Hararghe Zone, Ethiopia. *Journal of Culture, Society and Development*, 26, 20-26.
- Motuma, F.Y. & Kolandavel, N. (2016). Gendered agricultural production in Hidabu Abote Woreda, North Shoa. *International Journal of African and Asian Studies*. 24, 22-30.
- Global Development Research Centre (2002). *GDRC Special Focus on Gender Analysis Framework*.