Journal of Natural Sciences Research www.iiste.org
ISSN 2224-3186 (Paper) ISSN 2225-0921 (Online)
Vol.7, No.13, 2017

Assessment of Feed Resources Availability and Utilization in Daro Labu district, Western Hararghe Zone

Muleta Debela[1] Getachew Animut[2] Mitiku Eshetu[3]
1.Mechara Agricultural Research Center (McARC), P. O. B 19, Mechara, Ethiopia
2.Agricultural Transformation Agency (ATA), P. O. B 708, Addis Ababa, Ethiopia
3.Haramaya University, School of Animal and Range Sciences, P. O. B 138, Dire Dawa, Ethiopia

Abstract
The study was conducted in Daro Labu District of West Hararghe Zone, Eastern Ethiopia to assess the availability and utilization practices of feed resources in the study area. Data was collected by semi structured interview, focus group discussion and secondary data was collected from different sources. Three Rural Kebeles (villages) were purposively selected in the highland, midland, and lowland in the district. The purpose of keeping livestock species in the study area were for milk (for sale and home consumption), meat, draft power, source of cash (from sale of animals and their products), source of manure and transport. The survey result indicated that mixed crop-livestock production is the key farming activity in the study district. Both sale of crops and livestock were the main sources of income. Crop residues and leaves of fodder trees and shrubs were the major sources of feed in dry season while thinned plants and weeds from crop fields were the primary sources of feed in the wet season of the study area. It is concluded that crop residues, fodder trees and shrubs, and thinned plants and weeds from crop fields are the major feed resources in the study area. Feed shortage, livestock disease, water shortage, extended drought and market problem is the major identified problems and constraints of livestock production in the study area. Finding of the study also revealed that frequent occurrence of drought, over population, and cropland expansion account for the major causes of feed resource shortage in the study area. Proper cultivation and utilization of improved forage and fodder trees and shrubs can serve as a means of improving animal feed availability. This opportunity should be recommended to supplement with other feed resources to improve the nutritional quality of available feed resources. More and effective extension services and strengthening the capacity of farmers in feed resource conservation techniques should focus on solving for livestock feed shortage in the study area.
Keywords: Crop residues, Feed, Feed resources, Fodder trees and shrubs

1. INTRODUCTION

In tropics & sub- tropics where natural pasture is the major livestock feed, animals suffer nutritional stress frequently for much of the year, because of expansion of crop land, over grazing, land degradation & high human population growth. The productivity of the sub- sector is constrained by inadequate feed, poor quality feeds, and livestock diseases, absence of organized breeding program, marketing and lack of livestock product technologies. Among these constraints feed shortage is major factor for the low productivity of the sub- sector (Alemayehu, 2002). Livestock feed availability both in quantity and quality fodder particularly in the dry season is a major factor constraining livestock production in Ethiopia.

There is no or little effective study and strongly investigations on livestock feed resource availability and utilization practices and prioritizing constraints in livestock production and productivity in Daro Labu District. Addressing these investigation and constraints is very essential to develop a successful intervention program in the study area for livestock production.

Livestock plays a critical economic and social role in the lives of pastoralists, agro-pastoralists, and smallholder farm households. Enhancing the livestock production and productivity through available information as a base line data will help the improvement of livestock sub sector in increasing the sector contribution to national and agricultural GDP. Therefore, a study was conducted to assess livestock feed resource availability and utilization practices in Daro Labu District, West Hararghe Zone.

2. Materials and Methods

2.1. Description of the Study Area

The study was conducted in Daro Labu district, West Hararghe Zone of Oromia Regional State, Ethiopia. The capital town of the District, Mechara, which is located at a distance of about 434 km southeast of Addis Ababa. It is bordered by in the south by the Hawi Gudina District, in the west by Arsi Zone, in the northwest by Guba Koricha District, in the north by the Habro district, and in the east by Boke District. The study area is located at $8^0$10’ N latitude, $40^0$30’ E longitude and the altitude ranging between 1300 to 2450 meters above sea level. The district encompasses three distinct agro-ecologies, of which 12% of its area lies in the highland, 44% in the midland, and 44% in the lowland agro-ecological zones. The rainfall pattern is bimodal, the small rains fall starting from March/April to May and the main rainy season extends from June to September/October with an

average annual rainfall of 963 mm and average annual minimum and maximum temperatures of 14^0C and 26^0C, respectively. The area constitutes different farming systems (mixed farming and agro pastoral and pastoral) and is predominantly known for cash crop production particularly coffee (*Coffea arabica* L.) and *Khat* (*Catha edulis*) (Dereje *et al*., 2013).

2.2 Sampling Design

The study covered three agro-ecological sites namely highland, midland and lowland were selected from rural *Kebeles* (villages) of Daro Labu district. Three villages were randomly selected from each rural *Kebeles*. Finally, ten (10) representative respondents were randomly selected from each village and a total of 90 heads of households were selected for the study.

2.3 Surveying Procedures and Data Collection

A pre-tested semi-structured questionnaire was designed to collect data on household characteristics, livestock production, feed resources, seasonal availability and utilization of indigenous fodder trees and shrubs as livestock feed resources. The survey was conducted through interviewing the respondents. Guiding questions was asked in the group discussion and key informants' interviews to capture in depth understanding of livestock feed resources in the study area. Secondary data relevant to the study were collected from various sources (Agricultural Research Center, Agricultural Office of the District and other sources).

2.4 Statistical Analysis

The data collected through survey was analyzed using descriptive statistics such as mean, frequency and percentage with Statistical Package for Social Science (SPSS) version 20 software.

3. Results and Discussion

3.1 General Characteristics of Household and Demography

3.1.1 Household size and composition

The survey result showed that the average ages of the respondents ranged from 20 to 40 years (66.7%), 41 to 60 years (31.1%) and 61 to 66 years (2.2%). Average age of respondents was 38.4 years (Table 1) showing that on average respondents found in the productive age group. The average value of the total family size of the household was 6.80. It was observed that household land holding is less than one hectare, and more than 91% of the land owned is cultivated land and the rest is grazing areas. This shows that there is a shortage of both communal and private grazing land in the study area. This study supports the study of Abdi *et al.* (2013) who reported that the total grazing land is less than one hectare revealing a critical shortage of grazing land areas or little land is given to grazing of livestock.

Table 12. Household characteristics of the respondents in Daro Labu district

Variables	Mean ± SD
Age of households (yrs)	38.43±9.33
Total family size of the households (AE)	6.80±2.30
Total cultivated land in hectare (ha)	0.819±0.417
Total grazing land in hectare (ha)	0.08±0.174

Source: Field survey.

Household education level for illiterate, adult education, elementary education, junior secondary and secondary education were 27.8%, 23.3%, 42.2%, 2.2% and 4.4%, respectively (Table 2). Most of the farmers in the study area are educated; which is an opportunity for easy acceptance and adoption of livestock production technologies. Education is necessary variable for technology adoption; it is observed that on average all respondents have an educational level of 2.3 or approximately grade two. The educational distribution of respondents' shows that majority of the respondents of the study area was elementary school level of education followed by illiteracy and adult education respectively. There was few a respondent that had secondary education level.

Table 13. Educational level of the respondents in Daro Labu district

Education level	Frequency	Percent
Illiterate	25	27.8
Adult education	21	23.3
Elementary	38	42.2
Junior secondary	2	2.2
Secondary	4	4.4

Source: Own survey

The marital status of study area shows that majority of the respondents are married and 2.2% of the respondents are divorced and the rest 1% of the respondents are unmarried (Table 3). Mixed crop-livestock

production is the key farming activity in the study area which supports the study of Abdi *et al.* (2013). The survey result showed that the major annual crops grown in the study area includes sorghum, maize, sweet potato, soybean and barley. In addition, the major cash crops are *khat* (*catha edulis*), coffee and groundnuts; sorghum and maize are the major staple food crops grown in the study area.

Table 14. Marital status and occupation of the respondents in Daro Labu district

Marital status	Frequency	Percent
Married	87	96.7
Single(Unmarried)	1	1.1
Divorce	2	2.2
Household occupation		
Livestock production	1	1.1
Crop production	7	7.8
Mixed crop-livestock farming	82	91.1

Source: Own survey

3.1.2 Farming activity and the major income sources

Both sale of crops and livestock were the main sources of income (Table 4). The respondents (76.5%) in the study area reported that they depend on the sale of both livestock and crops and followed by sale of crops (16.8%) in the study district. A small proportion of the respondents also indicate that the sale of livestock and their products as sole source of income for the household.

Table 15. Major sources of income of the respondents in Daro Labu district

Sources of income	Frequency	Percent
Sale livestock and livestock products	5	5.6
Sale of crops	15	16.8
Sale of both livestock and crops	69	76.5
Micro-business activity	1	1.1
Total	90	100.0

Source: Own survey

3.1.3. Livestock production and utilization

Livestock provides the major traction power in crop production, dung, milk, meat and cash income to farmers. Livestock and livestock products, such as meat, skin and hides are the major sources of foreign currency earnings (Merga *et al.* 2014). The survey result (Table 5) shows that purpose of keeping livestock species in the study area were for milk (for sale and home consumption), meat, draft power, source of cash (from sale of animals and their products), source of manure (dung) and transport. Moreover, the respondents keep small ruminants for the purpose of income generation followed by meat and milk (particularly from goats) and the milk of goat was used for home consumption in the study area. This finding was in accordance with the finding of Solomon *et al*. (2007) who reported that the most important reason for keeping cattle is milk production for home consumption, income generation and meat production.

Table 5. Purpose of livestock keeping by respondents in Daro Labu district

Uses of livestock	Frequency	Percent
Milk	1	1.1
Meat	1	1.1
Source of cash and milk	16	17.8
Combination (Milk, income and draft power)	11	12.2
Combination (milk, meat, income & draft power)	38	42.2
Combination (milk, income, prestige and draft power)	7	7.8
Combination (milk, income, prestige, draft power and for dung)	12	13.14
Transport	4	4.44
Total	90	100.0

Source: Own survey

3.1.4 Major constraints of livestock production and productivity in the study area

The principal livestock production constraint in the study area according to their importance has been analysed and ranked based on index score (Table 6). The result indicated that feed shortage was the primary constraint for livestock production in the study area followed by frequent outbreak of major livestock diseases. The current result is similar to the report of Alemayehu (2003), who found insufficient and poor quality of feed, particularly during dry season, as the key constraints to Ethiopian livestock production. Feed shortage in the study area might be associated with cropland expansion that results in shortage of grazing lands.

Table 6. Major constraints of livestock production and productivity in Daro Labu district

	Constraints rank (%)						Index	Index
Major constraints	1	2	3	4	5	6	score	Rank
Feed shortage	62.2	26.7	7.8	2.3	1.5	0	0.223	1
Extended drought	2.2	24.4	38.9	21.8	13.2	2.5	0.096	4
Livestock disease	2.2	7.8	10	17.2	38.2	22.5	0.195	2
Water shortage	17.8	23.3	24.4	12.6	4.4	2.5	0.126	3
Market problem	6.7	7.8	12.2	12.6	23.5	42.5	0.087	5
Lack of improved dairy cattle	0	0	0	0	1.5	0	0.016	7
Shortage of land	7.8	5.6	0	3.4	0	0	0.029	6

Source: Own survey

Notice: *Index score = sum of (6 * percent of household ranked first +5 * percent of household ranked second + 4 * percent of household ranked third + 3 * percent of household ranked fourth + 2 * percent of household ranked fifth + 1* percent of household ranked six) given for each purpose divided by sum of (6 * percent of household ranked first + 5 * percent of household ranked second + 4 * percent of household ranked third + 3 * percent of household ranked fourth + 2 * percent of household ranked fifth + 1 * percent of household ranked six) for all constraints*.

3.2 Major Feed Resources Availability and Utilization

The indices analysis is used to rank major potential feed resources in the study area (Table 7). The result indicated that cereal crop residue ranked as the first potential feed resources for livestock followed by fodder trees and shrubs during the main production season in the study area. This might be due to shortage of both private and communal grazing land in the study area. This result is similar to the report of Dereje and Tesfaye (2008) who described that different feed resource such as stover of maize and sorghum on field, crop weeds in cultivated area, leaves strips and food byproducts and different forages are used for cattle fattening especially during the dry season where feed shortage is more sever. In the study areas, it was observed that semi-intensive livestock rearing was widely practiced with backyard livestock fattening.

Table 7. Major livestock feed resource in Daro Labu district

	% response in each rank						Index	
Feed resources	1	2	3	4	5	6	score	Index Rank
Natural pastures	4.4	3.3	5.6	3.3	7.8	8.9	0.048	6
Crop residues	64.4	17.8	5.6	6.7	3.9	1.8	0.252	1
Fodder trees and shrubs	14.4	40	16.7	16.7	6.5	0	0.199	2
Cropland weed	4.4	10	25.6	43.3	11.7	3.6	0.160	4
Crop thinning and leave strips	2.2	17.8	36.7	18.9	23.4	5.4	0.171	3
Purchased industrial by product	2.2	1.1	0	3.3	11.7	21.4	0.035	7
Hay	6.7	7.8	8.9	4.4	23.4	37.5	0.101	5
Improved forages	0	2.2	1.1	1.1	3.9	1.8	0.014	9
Leftover in the household	0	0	0	2.2	7.8	19.6	0.020	8

Source: Field survey

3.2.1 Fodder trees and shrubs utilization practice

The majority of sample farmers reported that green fodder tree and shrub leaves was ranked as the second commonly used feed resource next to crop residues in the study areas. Table 8 shows farmers preference to the major tree and shrub species that has been used as a browse. The result showed that 97.8% of respondents used browse fodder trees and shrubs as feed resources from trees and shrubs planted at their backyard, farmland, and naturally grown plants in the study areas. The sample farmers indicated that they gave priority in feeding of fodder trees and shrubs for fattening beef and goats, weak animals, draft animals and lactating cows. Farmers in the study areas reported that *Cordia africana, Erythrina abyssinica, Combretum molle,* and *Celtis africana* are the most commonly used fodder trees as livestock feeds. More than 50% of the respondents' indicated that they prefer both *Erythrina abyssinica* and *Cordia africana* in combination as a major browse feed sources. This may be due to the fact that those trees that bear leaf during dry season and produces better biomass are preferred by livestock. The study assessment shows that 83.3% of the respondents use green fodder tree and shrub leaves during dry season, 14.4% use during both dry and wet seasons, and only 2.2% of the respondents feed these plants during wet season. This is in agreement with the report of Dereje and Tesfaye (2008) who reported that fodder trees are available during severe feed and water shortage as feed resource in study area. The sample farmers are also indicated that they offer these fodder trees and shrubs through direct browsing, and cut and carry feeding system either in fresh form or after wilting and chopping of the fodder tree and shrub twig. This finding was in agreement with Alemayehu (2002) who recommends that the sustainability of livestock production needs dramatic changes in livestock management systems towards more intensive feeding systems with emphasis on

cut and carry feeding system.

Table 8. Selected browse fodder trees preferred by households in Daro Labu district

S. No	Scientific name	Frequency	Percent
1.	*Cordia africana*	7	7.8
2.	*Erythrina abyssinica*	18	20.0
3.	*Combretum molle*	5	5.6
4.	*Combretum molle* and *Erythrina abyssinica*	3	3.3
5.	*Celtis africana*, *Cordia africana* &and *Erythrina abyssinica*	2	2.2
6.	*Cordia africana* and *Erythrina abyssinica*	46	51.1
7.	*Erythrina abyssinica, Cordia africana* and *combretum molle*	9	10.0

Source: Own survey

In the study area shrubs were also used as a feed resource. The majority of respondents preferred *Acacia brevispica* followed by *Vernonia amygdalina*, *Carissa spinarum and Ehretina cymosa* are the commonly used shrubs as feed resource in the study area (Table 9).

Table 9. Selected browse shrubs preferred by households in Daro Labu district

Scientific name	Local name		Frequency	Percent
	In Amharic	In Afaan Oromoo		
Acacia brevispica	Kentefa	Hamarecha	14	45.2
Grewia bicolour	Sefa	Haroresaa	1	3.2
Dichrostachys cinerea	Ader	Jirmee	1	3.2
Carissa spinarum	Agam	Agamsa	3	9.7
Berchemia dicolor	Jejeba	Jejeba	1	3.2
Commiphora africana	Anqa	Hamessa	1	3.2
Vernonia amygdalina	Grawa	Obicha	8	25.8
Ehretina cymosa	Game	Hulaaga	2	6.5

Source: Own survey

3.2.2 Natural pasture and improved forages production

Natural pasture was one of the feed resources in the study area but its contribution is less compared to the other feed resources. This mainly due to expansion land for cereal crops, K*hat* (*Catha edulis*) and coffee production in the study area leaving little/no land for livestock feed production. Consequently, the farmers use green fodder trees and shrub leaves in cut and carry feeding system in which the animals are tethered nearby to residence, on marginal lands and roadsides. This finding is in accordance with Dereje and Tesfaye (2008) who reported that cut and carry feeding system was the most common feeding system in Hararghe Zone. Most of the farmers keep their animals at backyard and tether them during wet season, and some farmers tether their animals throughout the year. This practice reported to helps for proper feeding, to avoid field crop damage, to fatten and close follow up of livestock.

According to the result of the study, only 13.3% of the households planting and use improved forage crop species such as *Pennisetum purpures*, *Chloris gayana* and *Sesbania sesban*. The remaining 86.7% of the households did not cultivate improved forage crops in the study area. The respondents indicated that the low adoption of production of improved forage crops in the study area was due to shortage of land, lack of awareness on benefits of cultivating forage crops, and shortage of availability of forage seeds.

3.3. Feed Resources and Feeding Calendar

The respondents reported that crop residues (mainly sorghum and maize stovers) was stored to provide feed for livestock during dry season. Feed shortage is a seasonal problem as to the study area more than 98.9% of the response indicated that feed shortage is a seasonal problem and 82.2% of the respondents reported that feed shortage is a serious problem during dry season. The farmers use strategies to overcome this problem through feeding livestock with any available crop residues, and fodder tree and shrub leaves. Generally, two or more feed resources are utilized in combination both in the dry and wet season in the study area (Tables 10 and 11)

Table 10. Feed resources utilization in dry season in the study area

No	Feed resources	Frequency	Percent
1.	Crop residues	1	1.1
2.	Fodder trees and shrubs (FTS)	4	4.4
3.	Crop residues and FTS	27	30.0
4.	Crop residues, FTS and hay	29	32.2
5.	Crop residues and hay	8	8.9
6.	FTS and hay	3	3.3
7.	Natural pasture, crop residues, FTS, agro-industrial by products and hay	6	6.7
8.	crop residues, FTS, agro-industrial by products and hay	6	6.7
9.	Private grazing land, crop residues, FTS, agro-industrial by products and hay	1	1.1
10.	Crop residues, FTS, industrial by products	4	4.4
11.	Crop residues, improved forages, FTS and hay	1	1.1

Source: Field survey

Types of feed resource used in the study area differ between the dry and wet season. Crop residues for instance, are more important in the dry season, while crop thinning and weeds are main feed resources in the wet season followed by both crop thinning and weed in combination with natural pasture are the main feed resources utilized for livestock feeding (Table 11 and 12). Hay, feed from private grazing areas and improved forage are more important in the wet than the dry season mainly due to their better availability in the wet season.

Table 11. Feed resources utilization in wet season in the study area

Feed resources	Frequency	Percent
1. Crop residues	1	1.1
2. Crop thinning and weed	30	33.3
3. Combination (natural pasture, improved forages and crop thinning)	1	1.1
4. Combination (crop residues, crop thinning and weeds)	11	12.2
5. Combination (natural pasture and hay)	1	1.1
6. Combination (natural pasture, crop thinning and weed)	21	23.3
7. Combination (natural pasture, FTS, agro-industrial by products and weed)	1	1.1
8. Combination (FTS, crop thinning and weed)	9	10.0
9. Combination (natural pasture, FTS, agro-industrial by products,		
10. Crop thinning and weed)	6	6.7
11. Combination (agro-industrial by products, crop thinning and weed)	4	4.4
12. Combination (improved forages, FTS, weed and crop thinning)	4	4.4
13. Combination (natural pasture, improved forages, hay, crop thinning and weed)	1	1.1

Source: Field survey

The available feed resources used to supply the livestock with required quantity and quality of feed is not effective to overcome feed shortage in the study area. However, crop residues (mainly sorghum and maize stovers) was stored to provide feed for livestock during dry season. Fodder tree and shrubs are feed resources that were used as feed sources throughout the year (Table 12), as most of such feed resources remain green throughout the year.

Table 12. Major feed resource availability and feeding calendar in the study area

Feed resources	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crop residues	xx	xx	x	-	-	-	-	-	-	xx	xxx	xxx
FTS	xxx	xxx	xx	X	x	xx	xx	xx	x	x	xx	xxx
Crop thinning	-	-	-	-	-	-	xx	xxx	-	-	-	-
Crop land weed	-	-	-	-	-	x	xxx	xxx	xx	-	-	-
Hay	-	-	-	-	x	xx	xx	xxx	xxx	xx	x	x
Private grazing	-	-	-	-	-	x	xx	xx	xx	x	-	-
Stubble grazing	x	-	-	-	-	-	-	-	-	xx	xxx	xx
Improved forages	-	-	-	-	-	x	x	x	x	x	-	-

Source: Group discussion

FTS= Fodder trees and shrubs, xxx = High availability of feed, xx = good availability of feed, x = fair availability of feed and – months of less or not available of feed.

3.4 Major Causes of Livestock Feed Resource Scarcity

Sufficient and quality feed resources are some of the major determinants of livestock productivity. However, the availability and quality of feed in the study area are inadequate especially during dry season and resulted in

stagnation of livestock production and productivity. The results of this study showed that shortage of livestock feed in the study area are due to recurrent drought, high population, and cropland expansion (especially coffee and *Catha edulis*) (Table 13). Furthermore, grazing land shortage and over grazing had also contributed for the shortage of feed. This is in agreement with the report of Adugna (2007) who indicated that the productivity of natural pasture is gradually decreasing due to rapidly increasing human population pressure, crop expansion and shrinkage of grazing areas leading to shortage of livestock feed.

Table 13. Major causes of livestock feed resource deterioration in Daro Labu district

	Rank (%)						Index score	Index Rank
Feed resource constraints	1	2	3	4	5	6		
Drought	44.4	24.4	21.1	13.5	58.1	0	0.300	1
Over grazing	0	2.2	8.9	21.6	0	0	0.053	5
Crop expansion	11.1	38.9	25.6	21.6	12.9	0	0.216	3
Over population	24.4	13.3	31.1	28.4	19.4	0	0.220	2
Flood	0	0	0	0	3.2	44.4	0.024	7
Shortage of land	20.0	21.1	13.3	14.9	6.5	0	0.160	4
Settlement	0	0	0	0	0	55.6	0.026	6

Source: Own survey

4. Conclusion and Recommendation

4.1 Conclusion

It is concluded that, crop residues, fodder trees and shrubs, and thinned plants and weeds from crop fields are the major feed resources in the study area. . Feed shortage, livestock disease, water shortage, extended drought and market problem is the major identified problems and constraints of livestock production in the study area. Finding of the study also revealed that frequent occurrence of drought, over population, and cropland expansion account for the major causes of feed resource shortage in the study area.

Crop thinning and leaves strips, cropland weed, fodder trees and shrubs are mainly used feed sources during the wet season, while cereal crop residues, fodder trees and shrubs, and hay during the dry season in the study area. Fodder tree and shrubs are feed resources that were used as feed sources throughout the year as most of such feeds remain green throughout the year. *Cordia africana, Combretum molle* and *Erythrina abyssinica* are the major fodder trees used as livestock feed resources that found in the hedge of homestead or backyards and as part of the agro-forestry systems in the study area. *Acacia brevispica* is also the most preferred browse shrub in the study area.

Zero grazing is common practice during the dry season in the study area. Cut and carry system is practiced especially fodder trees and shrubs are used to feed fattened animal, weak animal, lactating cows and draft animals around homestead. Cultivation of improved forages is not common in the study area despite the attempt made by different agricultural organizations.

Mixed crop-livestock production is the key farming activity in the study area.Farmers keep animals for different purposes in the study as to the respondents response that cattle kept for milk (for sale and home consumption), meat, draft power, source of cash (from sale of animals and their products), source of manure. Moreover, the respondents keep small ruminants for the purpose of income generation followed by meat and milk (particularly from goats) and the milk of goat was used for home consumption in the study area.

4.2 Recommendations

Proper cultivation and utilization of fodder trees and shrubs can serve as a means of improving animal feed availability. This opportunity should be recommended to supplement with other feed resources to improve the nutritional quality of available feed resources.

Promoting forage development through different strategies such as intercropping, backyard, around farm edges and river basin, on soil bunds, on the sloping land areas and roadside as an option of enhancing feed resources availability.

More and effective extension services and strengthening the capacity of farmers on feed resource conservation techniques should focus on solving for livestock feed shortage in the study area.

Acknowledgement

The author would like to acknowledge Mechara Agricultural Research Center (McARC) and Oromia Agricultural Research Institute (OARI) for facilitating and encouraging the completion of the study. The author also acknowledge to Dr. Getachew Animut and Dr. Mitiku Eshetu for their professional guidance and constructive comments on the study. The author would like to thank the researchers Mr. Fekede Gemechu, Mr. Birmaduma Gadisa, Mr. Desalegn Mamo, Mr. Tadese Malka, Mr. Sudi Dawud and the driver Mr. Nibirete Abite for their kindly support during data collection for the study. Special thank goes to Mr. Kinde Lemessa, Mr. Abdi

Itafa and Mr. Hika Barsisa for their unforgettable help and continuous encouragement until the end of this study.

References

Abdi Etafa, Kemal Kasim,Yassin Esmael and Muleta Debela, 2013. Cattle Production in West Hararghe: An Opportunity and Constraints Assessments in Darolabu, Odabultum, Gemechis and Chiro Districts, Oromia Regional State, Ethiopia. Vol.1, No.1:01-15 Available online at http://acascipub.com/Journals.php

Alemayehu Mengistu, 2002. Forage production in Ethiopia: A case study with implications for livestock production. Ethiopian Society of Animal Production. Addis Ababa, Ethiopia.

Adugna Tolera, 2007. Feed resources for producing export quality meat and livestock in Ethiopia. Ethiopia Sanitary and Phytosanitary Standards and Livestock and Meat Marketing project (SPS-LMM). 77p.

Alemayehu Mengistu, 2003. Immediate cause of the famine; the conflict dimension. Proceeding of the roundtable on drought and famine in the Pastoral Regions. Addis Ababa, Ethiopia, 23-23 December 2002. Pastoral Forum of Ethiopia.

Dereje Tsegaye and Tesfaye L. 2008. Livestock production systems in Darolabu, Habro and Boke Districts of Western Hararghe. Commercialization of Livestock Agriculture in Ethiopia. Proceedings of the 16th annual conference of the Ethiopian Society of Animal Production (ESAP) held in Addis Ababa, Ethiopia. *Ethiopian Society of Animal Production*, Addis Ababa, Ethiopia.

Dereje T., Berhanu B. and Aynalem H. 2013. Prevalence of Major Goat Diseases and Mortality of Goat in Daro-Labu District of West Hararghe, Eastern Ethiopia. Journal of Scientific and Innovative Research 2013; 2 (3): 665-672.

Merga A,, Adugna T. and Getnet A. 2014: Feed Resource Assessment and Utilization in Baresa Watershed, Ethiopia. International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064.www.ijsr.ne

Solomon T. B., H. A. Snyman, G. N. Smit, 2007. Cattle-rangeland management practices and perceptions of pastoralists towards rangeland degradation in the Borana zone of southern Ethiopia. Journal of environmental management, 82: 481-494.