



## **Assessment of cattle feed availability and constraints in Dilla Zuriya Woreda**

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### **Abstract**

This study was conducted from November 2020 to January 2021 to assess available livestock feed resource conservation strategies in dilla zuriya woreda, in Gedeo Zone by using questionnaires, face to face interview and discussion.. Purposive sampling procedure was used to selected kebeles and random sampling was used for respondents and about thirty livestock owners were selected, ten respondents from each of three kebeles. There were different livestock feed resources such as concentrate, improved forage, hay, and crop residues. The present study shows According to the assessment of feed availability there are different types of feed resources and natural pasture was the most available cattle feed resources rather than the other feeds resources in the study areas. The livestock producers mainly adopt hay making as a conservation method and use for feeding at the time of feed scarcity. Even if there were different types of feeds but not enough amounts availability in the study area and feed shortage and lack of materials unavailability were the major constraints for feed conservation in the study areas. Therefore, governmental and non-governmental organizations should be supporting and appreciating farmers those use feed conservation; and livestock owners should form cooperation and participate in livestock feed conservation.

**Keywords:** conservation, constraint, feed, hay, livestock, silage, storage

## **1. Introduction**

### **1.1 Background of the Study**

Cattle production is one of the fastest growing agricultural sub-sectors in developing countries. The increase in cattle products in turn requires an increase in different inputs for cattle production, mainly feed (Alemu 2008; Adugna *et al* 2012). Nevertheless, feed shortage in terms of quantity and quality is still a major problem, and a major factor affecting the

development of viable cattle industries in developing countries like Ethiopia (Sere *et al* 2008). Poor nutrition of ruminants will not only affect animal performance, but also the immune system that will reduce animals' ability to fight diseases (Alemu 2008). In order to introduce technologies that will improve productivity and quality of feeds in the study area, there is a need to document the available feed resources, their potential and the perceptions of farmers regarding the available feed resources.

The availability of feed resources and the nutritional quality of the available feeds are the most important factors that determine the productivity of cattle. Cattle production throughout the world is dependent on a variety of feed resources. Worldwide, there are more than 560 different types of feed resources derived from herbaceous forages, trees and shrubs, food crop residues, food crop green feeds, food crop roots and tubers, concentrates and agro-industrial by-products, mineral supplements, and others (ICRI, 2006). In Ethiopia, such feed resources support different cattle production systems that are part of the mixed subsistence farming.

In many developing countries cattle play an important role in most small scale farming systems. They provide traction to cultivated fields, manure to maintain crop productivity and nutritious food products for human consumption and income generation (Sere *et al.*, 2008). For instance, cattle production is an important component of the Ethiopian economy with an overall contribution of about 20% to gross domestic product (GDP) and 40% to the gross value of annual agricultural output.

Agriculture dominates the economies of developing countries and in these countries the cattle sector is the fastest growing agricultural sector (3.77% for cattle, 2.71% for crops in last decade). By 2020, consumers in developing countries will eat 87% more meat and 75% more milk than they do today making cattle production the largest share of the value of global agricultural output (FAO, 2005). Animal feeding system in these countries is mainly based on grazing native pastures which are deteriorating in production and quality and also vary seasonally resulting in poor animal performance. Despite the importance of cattle, inadequate cattle nutrition is a common problem in the developing world, and a major factor affecting the development of viable cattle in poor countries (Sere *et al.*, 2008). Ethiopia has huge number of cattle productions however their productivity is low due to traditional management practices and insufficient ability of both quality and quantity of feed. The main source of cattle feed resources in Ethiopia comes from natural pasture which is low in its nutrient quality and moreover it also diminishing in size from time due to conversion in to farmland as a result of rapid human population growth (Tessema *et al.*, 2011). Feed is the main driving force for improved cattle production and reproductively (Tessema *et al.*, 2011). The native quality of feed is affected by type of feed stage of

harvesting conservation system and climatic condition of the harvesting area. In Ethiopia there are different type of cattle feed resource. These can be divided into two groups, namely, resources of roughages and concentrates. The concentrated feed has high quality of nutrients but in most of Ethiopian farmers not adapted as main feed resource. However roughages are the major source of feed used by all farmers for cattle production in Ethiopia. They are characterized by low quality of nutrients). The feed supply in Ethiopia is critically very low especially during the dry season and drought period which causes great mortality loss of animal due to malnutrition is enormous; more over this result in decrease productivity of live animals. To increase the availability and quality of feed package are needed that combine variety of feed resources, including forage legumes, fodder trees, crop residue and agro industrial by products as well as other existing feed resources

## 1.2 Statement of the Problem

It is clear that not only in the study area but also in the country in general most of the research works on the assessment of feed resources in different parts of the country so far conducted only indicated the shortage of feeds without identifying the major available feed resources. This creates a great problem to recommend a possible solution to cattle producers particularly in the extreme drought seasons in Ethiopia. Therefore, it is very much imperative to assess the already existing feed resources in each kebeles in terms of quantity and quality in relation to the requirements of cattle annual basis in the study area so that it would be very easy to suggest either improving the existing feed resources, introduce another feed alternatives or suggest development and policy interventions for each agro-ecology.

## 1.3 Objective

### 1.3.1 General objective

- To assess cattle feed availability, constraints and conservation mechanism in the study area

### 1.3.2 Specific objectives

- To assess the source of feeds in the study area.
- To assess cattle feed conservation mechanism of the study area.

## 1.4 Significance of the Study

Estimating the actual and potential cattle feed resources available in a given area is a prerequisite for planning and launching sound cattle production strategies that largely benefits producers. Understanding the level of seasonal gaps in the availability of different feed resources is also essential for implementing appropriate supplementation strategies. Thus, this paper has so many importance for the farmers and the government, and also for different NGOs who want to practice cattle fattening based on the available cattle feed resources in the study area as the information would be aware them when to practices cattle fattening depending on the seasonal variability of feed resources and show different problems that they have in their area and should be give information as an input for other investigator, development agents, and each kebeles agricultural and rural development office. And also enable to ranking of the problem related with feed resources in the district, it gave the ways toward solution and reduces the gaps that happen to influence the cattle fattening practices and the farmers give emphasis to cattle fattening as crop production, and coffee plantation.

## 2. Literature Review

### 2.1 Feed Resource in Ethiopia

Notwithstanding the continued reduction in the size of grazing lands and forest areas to crop production to feed the ever increasing human population, ruminants will still continue to depend primarily on forages from natural pastures, and crop residues. Poor grazing management (e.g. continuous overgrazing) has resulted in very low carrying capacities brought by replacement of productive and nutritious flora by supply form natural pasture is characterized by seasonal fluctuation in total dry matter (DM) production and nutritional quality because of the distinct seasonal variation in plant growth in relation to the annual rainfall pattern. In the mixed cereal cattle farming system of the Ethiopia, crop residues provide on average about 50% of the total feed resources for ruminant cattle. The contributions of crop residues reach up to 80% during the dry seasons of the year (Adugna, 2010). Further increased dependence on crop residues for cattle feed is expected, as more and more of the native the rapidly increasing human population. In spite of the rising dependence on fibrous crop residues as animal feeds, there are still

certain constraints to the efficient utilization (Adugna, 2010).

Substantial efforts have been made so far to resolve the feed shortage problem in the Ethiopia, aiming at improving feed availability and thereby improve cattle productivity. However, the impact was so little to cope with the problem that animals are still subjected to long periods of nutritional stress (LDMPS 2006). More efficient management and utilization production in sustainable manner.

### 2.2 Major Cattle Feed Resources

Feed problem is one of the major factors that hinders the development and expansion of cattle production. The main feed resources to cattle in the different part of the country are natural pasture crop residues, stubbles grazing from fallow lands, forest and shrub areas. Among the feed resources, natural pasture and crop residues contribute the largest source of feed cattle in the study area which is the case in most developing countries (Sere *et al.*, 2008).

#### 2.2.1 Improved Forage and Pastures Crop

Over the past three decades several introduced forages were tested on station in different ecological zones, and considerable efforts were made to test the adaptability of different species of pasture and forage crops under varying agro-ecological conditions (Mengistu, 2013). As a result, quite a number of useful forages have been selected for different zones, although the adoption rate is extremely low. Forage crops are commonly grown for feeding dairy cattle with oats and vetch mixtures, fodder beet, elephant grass mixed with siratro and disodium species, Rhodes/Lucerne mixture, phalaris/trifolium mixture, hedgerows of sesbania, leucaena and tree-Lucerne being common ones (Mengistu, 2013). Due to unprecedented population increase, land scarcity and crop- dominated farming, there has been limited introduction of improved pasture and forages to smallholder farming communities and the adoption of this technology by smallholder mixed farmers has been generally slow (Mekoya *et al.*, 2008).

In cattle production one of the most important factors determining profitability is to achieve optimal level of feeding. This aim is most problematic during the dry season when available feed resource is scarce and is of low quality. Therefore, cattle farmers are facing their biggest challenge during the dry season. Producing

supplementary feed on farm by establishing grass/legume pastures would their problem (Onifade and Akinola, 2009).

### 2.2.2 Natural Pastures

Natural pastures include annual and perennial species of grasses, forbs and trees (Masiwa, 2009). They comprise the largest feed resource, but estimates of the contribution of this feed resource vary greatly. Alemayehu, (2010) estimated that 80-85 % of the cattle feed in Ethiopia comes from natural pasture. Other works estimated that the natural pasture provides 88-90 % of the feed. This is because the quantity and quality of native pasture varies with altitude, rainfall, soil and cropping intensity. There are two types of grazing lands i.e. private and communal. Furthermore, there are a few riverside grazing lands in the different study area. Over 50% of the feed to animals came natural pasture which conforms to the general indication that natural pasture is one of the major sources of animal feed (Alemayehu, 2010) of the sampled households 59.2% in the high 49.4% in the medium and 78.8% in the low altitude zones ranked natural pastures the primary source of feed to their animals.

In the management and utilization practices of natural pasture, animal are not allowed to grazing in the PGL during the wet season and during this time animal are allowed to graze on manager herbage found along road side and in CGL. Accordingly, animals are allowed to graze in the PGL from late August to November while still reserving some part of the PGL for hay production. There was no restriction to the utilization of CGL by the animals of farmers living in the same peasant association any time, but access to PGL utilization by animals of others was restricted to a certain period of the year (i.e. From July to late August). Thus, the permission for use of the PGL by animals of other farmers is only possible after much of the herbage is grazed or removed by the animals of the owner of the PGL and it starts beginning December and extends to late June. Mostly the land used for PGL was at type of land unsuitable for grazing and is prone to flooding. Some farmers left some plots fallow to restore fertility and utilized the available forage as sources of feed (Alemayehu, 2010).

### 2.2.3 Crop Residues Production and Utilization

Crop residues (CRs) are roughages that become available as cattle feeds after crops have been harvested. They are distinct from agricultural by-products (such as brans, oil cakes, etc), which are generated when crops are processed. The major crops grown by farmers in the high altitude zone are barley, wheat, field pea, and faba bean while teff, wheat and chickpea are the main crops grown in the medium altitude zone maize and sorghum are the dominant crops grown in the low altitude zone. The quantity of DM that can be obtained from crop residue is estimated from grain yield (FAO 2007) based on established conversion factor with a utilization factor of about 90% and 10% is used for other purposes like fuel and wastage. In the medium and low altitude zones, to straw was the primary source of animal feed.

### 2.2.4 Agro-Industrial by Products

Agro-Industrial by product refers to the by-products derived in the industry due to processing of main products. They are less fibrous, more concentrated, highly nutritious and less costly as compared to crop residues (Aguilera, 2011). Supplemental feeds such as the byproducts of grain and oil seed mills are feed to cattle especially when there is shortage of feed. Farmers in high altitude zone, especially those around the peri-urban areas, utilize by products of grain for lactating cross bred cows. By products of oil seeds soured through purchase from the local market are mixed with straw and other local supplement such as the spent brewers grain from the local manufacture of "atela" to feed cattle especially cross bread dairy cows, faltering animal and calves.

At present the use of a molasses/urea mixture as a drought-relief feed has been started in a pilot scheme run jointly by the Ministry of Agriculture, the Ministry of State Farms and international Cattle center for Africa (ICCA).

**Oil-cake:** Oil cakes are an excellent concentrate feed for ruminant Cattle in Ethiopia which grows most of the temperate and sub-tropical oilseed plants such as linseed, groundnuts, rape, sesame, sunflower, cotton and Nug. Nug is a native annual composite, which produces Niger seed for oil, is also grown. The processing factories oilseeds are widely practiced on a family basis or in small village mills. Milling by-Products: The various milling by-products obtained through processing wheat, corn and barley are of great

interest as cattle feed for state farms, city dairy holders and to a lesser extent for some dairy co-operatives. Wheat grain is processed in big mills, whereas in the case of teff, barley, maize and sorghum the whole grains are processed and used for food.

**Slaughter Product:** Large numbers of cattle are slaughtered every year of these, only a small proportion of the cattle are slaughtered in abattoirs with processing facilities. Addis Ababa Municipality, which is responsible for the abattoirs, produces meat, bone meal and blood.

**Brewery by-Products:** Brewer's grains are traditionally valued for lactating cows because of their palatability and milk-producing property. In addition to commercial beer production at the more than nine breweries are practiced in the country.

### 2.3 Cattle Feed Resources Classification

Feeds can be classified according to some of their general properties. The classification used here is typical of that used in the feed industry. Feedstuffs can be classified as either concentrates or roughages.

#### 2.3.1 Concentrates:

Concentrates have low fiber content and a high content of either protein or energy or both. Cereal grains for example are considered as primary energy sources but also contribute a significant amount of protein. Energy source concentrates: are includes cereal grain ( E.g. corn, sorghum and buck wheat), grain milling by-products (E.g. wheat bran and corn gluten meal), root and tubers (E.g. cassava and potatoes), food processing by-products (E.g. molasses, bakery waste, citrus pulp distiller and brewers by-products), industrial by-products such as wood molasses. Protein source concentrates: Protein supplements generally are products with more than 20% crude protein. Some of these feeds are; oil seed meals (E.g. soybean, cottonseed, rapeseed, canola ,linseed, peanut, safflower and sunflower meals), grain legumes (E.g. beans, peens and lupines) and animal protein (E.g. meat meal, tank ages, fishmeal's and whey(Cheeke, P.R, 2005).

#### 2.3.2 Roughages:

Roughages are bulky materials which have high fiber content and a low nutrient density .Hay, pasture, silage, straw and cottonseed hulls are examples of

roughage. They are used primarily in feeds for ruminant or non-ruminant herbivores. Roughages are the feed stuffs which contain more than **18** percent crude fiber and less than 60 percent Total Digestible Nutrients. Due to higher crude fiber content, they are more bulky and have low digestibility as compared to concentrates.

The roughages are further classified into two major groups as:

1. **Green / succulent roughages** – They contain about 60-90 percent moisture eg. Pastures, cultivated fodders, tree leaves, root crops and silages.
2. **Dry roughages** – They contain about 10-15 percent moisture e.g. Straw, Hay (Tolera, A. and A. Abebe, 2007).

### 2.4 Constraints of Cattle Feed Resource

#### Feed Quality and Quantity:

Natural grazing is the major source of Cattle feed and in the lowlands cattle production is almost totally dependent on it. However, grazing lands do not fulfill the nutritional requirements of human population and high demand for food; pastures are steadily being converted to farmlands.

#### Weeds, pests and diseases

These will never improve feed quality and may well cause a decline in both quality and yield. Some weeds, such as thistles and barley grass, can damage animals' mouths, cause ulcers and affect feed intake. Other weeds are poisonous, can cause milk tainting or can be unpalatable. Some weeds are difficult to make into hay or silage and could spoil the whole harvest. Pests and diseases will reduce yield and quality by causing leaf loss. They may cause toxicity in plants through stress (e.g. forage sorghum) or may be poisonous themselves (e.g. ergot).

#### Soil Fertility:

The annual food and livestock feed deficit of the country is attributed directly to soil erosion and nutrient export. About half of the highlands are vulnerable for water erosion and the remainder has been cultivated without conservation measures for thousands of years.

### **Land Tenure/Change of Ownership:**

In Ethiopia grazing land ownership is thought to be communal, where ethnic groups used to manage grazing lands. However, the federal or regional state can allow private investment in pastoral areas. Besides the loss of grazing land, investment may prevent free movement of pastoralists that crates border conflicts and initiate urbanization.

### **Drought:**

One of the most unfortunate characters of Ethiopia's climate is great variability and erratic rainfall from year to year. Drought is particularly common in the pastoral area where rainfall is unpredictable and unreliable.

### **Ecological Deterioration:**

Gradual encroachment of cultivation into grazing lands is common in both highlands and mid-altitude areas. So many meadows in the floodplains have been converted into croplands. Due to vegetation clearance many steep areas have become vulnerable to wind and water erosion. Important browse that was dry season forage has been wiped out to supply urban fuel and construction wood. Natural grazing land is deteriorating rapidly due to lack of attention and its carrying capacity declining due to high stocking rates especially in pastoral areas of the country.

Pastoralist is becoming less and less possible and a riskier business. Since the ecosystem is very fragile, the abuse and mismanagement of resources has created severe problems for people in grazing lands; indigenous people who are adapted to live in the dry lands are facing an ecological crisis.

### **Seasonal distribution of cattle feed**

Most of the feed in the Ethiopia is obtained from natural pasture and crop residues. Feed shortage is critical during the dry season. Feeds are abundant from December to February, and rationing starts afterwards. Quality feed is usually allotted to draught oxen, mainly in the peak farming months, when land preparation and planting operations are commonly practiced. In the months of May and June, when there is almost no green feed, but a very high demand for draught power, crop residues become the major feed source. Crop residue from pulses is considered as quality feed resource and it is fed mainly to oxen and

milking cows in mixture with straw from cereals. Improved grass forages provide a good source of energy almost throughout the year (MoA, 2012). Where seasonality of forage production is a problem, there are methods that can be used by the farmer to ensure adequate year round feed supplies e.g. stock adjustments, seasonal breeding programs, growing a range of pasture species, grass-legume mixtures, tree legumes and special fodder areas and employing fodder conservation techniques. Another possibility is to locate alternative feed sources and use them as supplements. These include banana, cassava, cocoa pod husk, copra cake, gliricidia and leucaena, oil palm products, rice by-products, sugarcane residues and by-products, sweet potato, urea, urea-molasses and multi-nutrient blocks, and various oil Cakes and meals (MoA, 2012).

### **Conservation mechanism of cattle feed**

Forage conservation is a valuable pasture management strategy. In a bad season or during seasonal shortages, the conserved feed can be fed to maintain milk production or as a longer-term emergency feed. Forage conservation can be the link between growing and managing pastures and providing realistic rations for dairy cows. Hay and silage are the main forms of conserved forage.

**Hay** is preserved by drying and will generally keep while it is kept dry. Silage involves natural fermentation, which produces lactic and other acids, which 'pickle' or preserve the forage. This fermentation takes place only under anaerobic (oxygen-free) conditions, so the forage must be packed to remove air and sealed to keep air out. Silage will generally keep while it remains sealed and anaerobic.

**Silage** is the final product when forage of sufficient moisture (> ~50%) is conserved and stored anaerobically (oxygen-free), under conditions that encourage fermentation of sugars to organic acids. The acidity generated by the organic acids (mainly lactic acid, but also acetic and propionic acids) and the lack of oxygen prevent the development of spoilage microorganisms.

### 3. Materials and Methods

#### Description of the Study Area

The study was carried out in Dilla zuria woreda of Gedeo zone, Southern, Nation, Nationality and people's Regional (SNNPR) state, Ethiopia. The woreda is 90 km away from regional city Hawassa. The Woreda is located at 360 km from Addis Ababa. The total area of the Woreda is about 13,965 hectares of which 13,442 hectares are cultivated. Although the soil type varies from place to place, black soils are the common ones. The woreda has 19 peasant associations (PAs) and each PA has one agriculture development center. There are 106 agricultural development agents in the woreda and about 25,506 farmers have access to extension service (DZWARD office, 2011). The major agricultural practice is mixed farming system. The area relatively described by low level of cattle rearing practices mainly due to shortage of grazing land. The area receives an annual maximum, medium and minimum rainfall of 1400, 1150 and 900 mm, respectively. The mean maximum and minimum daily temperature are 25.40 and 13.40 degrees, respectively. The altitude ranges from 1,350 to 2,600 m. The area is located approximately between 38 degrees and 40 degrees E longitude, with an altitude ranging from 1,350 to 2,600 m (DZWARD office, 2011; CSA, 2011).

#### Method of data Collection

The data was collected from resources available using different data collection methods. Basically two types of data sources primary and secondary data was been used. Primary data was collected directly from interview, structured questionnaire and observation while secondary data was collected from the previous research study finding and record book that is found in the study area.

#### Sampling procedure

Sampling technique and Sample size determination  
Dilla Zuria, Woreda has 19 kebeles, from these 19kebeles,three kebeles were selected by using porposively sampling technique based on their potential of cattle production. In selecting household heads, using simple random sampling technique. In each kebele, 10 household heads and totally 30 households' heads were selected.

#### Data Analysis

Selection of appropriates analytical method was primarily made to see the relations of different variables with available cattle feed resource. Simple descriptive statistical techniques were applied for the assessment evaluation of the different type of available feed resource. The data was organized summarized and analyzed using different statistical method such as mean, frequency and percentage. The level of practical knowledge and some other relationship were analyzed.

### 4. Results and Discussion

Table 1. Socio-Economic Characteristics of the Households

characteristics		KEBELES						
		Chichu	%	Gola	%	Hadeda	%	Over all%
Sex	Female	2	20	1	10	4	40	23
	Male	8	80	9	90	6	60	77
Educational status	Illiterate	7	70	8	80	6	60	70
	Elementary	3	30	1	10	4	40	26
	High school	-	-	1	10	-	-	4

The general characteristics of the interviewed respondents presented in table 1 indicated that the majority of the respondents were male 77% in all kebeles. Therefore, from this survey we can conclude that, the males were active participate than females on farming system in the areas. Concerning the

educational background of the interviewed households, Illiterate 70%, Elementary 26%, High school 4%. So, the majority of the interviewed households were Illiterate (70%) as result there was no more know how about the feed conservations mechanism and constraints in the study areas.

**Table 2 Do you conserve cattle feed?**

characteristics		KEBELES						
		Chichu	%	Gola	%	Hadeda	%	Over all%
Do you conserve cattle feed?	Yes	4	40	3	30	6	60	43.33
	No	6	60	7	70	4	40	56.66

According to the above table 2 shows the majority of the interviewed respondents in Chichu kebele(60%) and Gola kebele (70%) were not conserve cattle feeds whereas, in Haded kebele(60%) any how the majority of the interviewed respondents were conserve cattle

feeds. In general the overall percentage of the interviewed respondents shows that they did not conserve cattle feeds (56.66%). This indicates that there was less attention for feed conservation and did not use feeds wisely in the study areas.

**Table 3 what types of cattle feed is available?**

	KEBELES						
	Chichu	%	Gola	%	Hadeda	%	Over all%
Natural pasture	3	30	7	70	2	20	40
Crop residue	2	20	1	10	3	30	20
Improved forage	1	10	1	10	-	-	7
Concentrate /IBP	1	10	-	-	1	10	6
Hay	2	20	-	-	4	40	20
Other	1	10	1	10	-	-	7

According to the above table 3 natural pasture was the most available cattle feed in Chichukebele(30%) and Golakebele(70%). whereas, in Hadedakebelehay (40%) was the most available cattle feed..Generally

the survey shows that about 40% of the cattle feed was natural pasture rather than the other feeds resources in the study areas.

**Table 4 which conservation methods you use?**

	KEBELES						
	Chichu	%	Gola	%	Hadeda	%	Over all%
Hay	6	60	4	40	5	50	50
Silage	1	10	-	-	1	10	6.66
Other	3	30	6	60	4	40	43.33

As the above table 4 indicates that the majority of the respondents use Hay making as major conservations method in Chichukebele and Hadedakebele. whereas, other mechanism of feed conservations were

manipulated rather than hay and silage methods of conservations in Golakebele. Generally, about 50% of respondents were use hay making as a conservation method in the study areas.

**Table 5. For what reason you will conserve cattle feed?**

	KEBELES						
	Chichu	%	Gola	%	Hadeda	%	Over all%
For feeding the time of scarcity	4	40	5	50	3	30	40
For use at the time when drought present	3	30	2	20	6	60	37
For sale	1	10	-	-	-	-	3
All reasons	2	20	3	30	1	10	20

As indicated in table 5 above the majority of the interviewed respondents were conserve the cattle feed for use at the time of scarcity in Chichu kebele (40%) and Gola kebele(50%),whereas, in Hadeda kebele the majority of the interviewed respondents were

conserves the cattle feed for use at the time of drought seasons. Therefore, the overall percentage of the survey shows that the cattle feeds had been conserved for feeding at the time of scarcity (40%) in the study areas.

**Table 6. In which season interval you will start conservation**

	KEBELES						
	Chichu	%	Gola	%	Hadeda	%	Over all%
June-September	2	20	3	30	2	20	23.33
October-February	2	20	2	20	1	10	16.66
March -may	6	60	5	50	7	70	60

As indicated in table 6 above the majority of the interviewed respondents were conserve the cattle feed during the time interval of March to May season in Golakebele (50%), Chichukebele(60%) and Hadedakebele (70%) respectively. Although, the

overall percentage shows that the majority of interviewed respondents were conserved cattle feeds at time interval of March to May season(60%).So the cattle feeds were conserved based on the seasons in the study areas.

**Table 7. Is there enough feed reserved after feeding for conservation**

	KEBELES						
	Chichu	%	Gola	%	Hadeda	%	Over all%
Yes	2	20	6	60	4	40	40
No	8	80	4	40	6	60	60

The above table 7 shows that the majority of the interviewed respondents have no enough feed reserved after feeding for conservation in Chich kebele (80%) and Hadeda kebeke (60%). But, in Gola kebele (60%) somehow there was enough feed reserved after feeding

for conservation. In general the overall percentage of the surveys shows that there was no enough feed reserved after feeding for conservation. this implies that why many respondents cannot conserve the feed in the study areas.

**Table 8. what constraints did you faced in case of conservation?**

	KEBELES						
	Chichu	%	Gola	%	Hadeda	%	Over all%
Feed shortage	3	30	1	10	1	10	23.33
Lack of information	2	20	3	30	1	10	20
Lack of skilled manpower	1	10	3	30	3	30	16.66
Materials unavailability	4	40	2	20	5	50	36.66

As indicated in table in 8 above materials unavailability or lack of materials was one of the major constraints in Chichu kebele (40%) and Hadeda kebele (50%) whereas, lack of skilled manpower was the major constraints for feed conservation in Gola kebele (30%). Generally, the survey shows the majority of interviewed respondents says that lack of facility or lack of materials unavailability was one of the major constraints that they faced during feed conservation in the study areas. So, for this reason the majority of the households cannot fully participate on feed conservations in the study area.

## 5. Conclusion and Recommendations

### 5.1. Conclusion

Cattle production is one of the fastest growing agricultural sub-sectors in developing countries. The increase in cattle products in turn requires an increase in different inputs for cattle production, mainly feed. The availability of feed resources and the nutritional quality of the available feeds are the most important factors that determine the productivity of cattle. Worldwide, there are different types of feed resources derived from herbaceous forages, trees and shrubs, food crop residues, food crop green feeds, food crop roots and tubers, concentrates and agro-industrial by-products, mineral supplements, and others. In Ethiopia, such feed resources support different cattle production systems that are part of the mixed subsistence farming. According to the assessment of feed availability under present study there are different types of feed resources present. But natural pasture was the most available cattle feed resources rather than the other feeds resources in the study areas. The livestock producers mainly adopt hay making as a conservation

method and use for feeding at the time of feed scarcity. Even if there are different types of feeds present in the study area. But,, there was no enough amounts availability Therefore, Feed shortage and lack of materials unavailability were the major constraints for feed conservation in the study areas.

### 5.2. Recommendations

- ) Livestock(cattle) owners should have to be aware of how to conserve feed at the time when they have excess amount of feed and to use when feed gets scares.
- ) The worda as agricultural and rural development office must be take especial responsibility to develop appropriate policy to improve farmer's adopted conservation mechanisms by the modern one and initiating farmers to adopt feed conservation.
- ) Extension workers should have to spent time for supporting the farmer to make good quality conserved feed for using at the time of feed scarcity and sell and get good income.
- ) And also extension workers of the worda should have to focus not only on production of quality forages; but also on good quality conserved feed.
- ) Training should be given to small holder livestock producers about feed conservation and feeding system by extension workers.
- ) Governmental and non-governmental organizations should be supporting and appreciating farmers those use feed conservation; and livestock owners should form cooperation and participate in livestock feed conservation.

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