

# Assessment on the Livestock and Feed Production and Utilization Practice in Basona Worena Woreda of North Shewa, Ethiopia

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The [Sustainable Intensification of Mixed Farming Systems Initiative](#) aims to provide equitable, transformative pathways for improved livelihoods of actors in mixed farming systems through sustainable intensification within target agroecologies and socio-economic settings.

Through action research and development partnerships, the Initiative will improve smallholder farmers' resilience to weather-induced shocks, provide a more stable income and significant benefits in welfare, and enhance social justice and inclusion for 13 million people by 2030.


Activities will be implemented in six focus countries globally representing diverse mixed farming systems as follows: Ghana (cereal–root crop mixed), Ethiopia (highland mixed), Malawi: (maize mixed), Bangladesh (rice mixed), Nepal (highland mixed), and Lao People's Democratic Republic (upland intensive mixed/ highland extensive mixed).

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## Introduction

Basona worena is one of the woredas in North Shewa zone, which is located about 25 km north of Debre Berhan town and about 155 km north of Addis Ababa. Integrated crop and livestock production is practiced in the woreda. Livestock husbandry, specially, cattle, sheep, goats and equines are the major component of the farming system. The contribution of livestock to the livelihood of the households is very crucial. The main challenges of livestock production in the woreda are poor genetics, infectious disease and most importantly feed shortage. The available feed resources are inadequate and not enough for year-round feeding of animals. Moreover, it is mainly roughage and poor in nutrient content and digestibility. Feed availability is highly variable over the seasons and often the quality is very poor. Grazing lands are unproductive and free grazing is becoming very limited and slowly abandoned by the community. In most livestock production systems of developing countries men and women have different roles and contributions in the overall agricultural activity and livestock husbandry (feeding of animals). Roles of men and women in the day-to-day farming practices, challenges and needs most often different. Therefore, looking the feeds assessment from the perspective of gender helps in designing more efficient and impactful interventions in improving feed production and utilization. Looking into the mixed crop-livestock production system to diagnosis the feed availability and utilization will help to identify appropriate innervations that would lead to improved livestock productivity This rapid assessment had the following objectives.

- To characterize the farming system practice in Abamote Kebele of Basona Worena woreda in North Shewa.
- To Assess the different gender roles and responsibilities, major challenges and social barriers specially in relation to livestock production
- To evaluate the existing status and availability of feed, its conservation and utilization practices, seasonal variations, coping strategies and required interventions.

## Methodology

This assessment was done using the Gender Feed Assessment Tool (G-FEAST), which is developed by the International Livestock Research Institute (ILRI, 2019). This farmer-centered diagnosis methodology provides a means to systematically and rapidly assess feed resources at site level with a view to developing a site-specific strategy for improving feed supply and utilization interventions. The Gendered Feed Assessment Tool is complemented with, a set of forms and spreadsheets to help collect and analyze data related to local conditions and agricultural practices. This study was done for Abamote Kebele (Figure 1). Abamote kebele represents most of the Basona worena Kebeles in terms of farming system, topography, livestock husbandry practices, rainfall pattern and weather conditions. Abamote Kebele is located on the main road from

Debre Birhan to Dessie at the distance of 25km from Debre Birhan and 155 km from Addis Ababa and composed of four sub-Kebeles: Abamote, Legida, Bura and Tikurit Bado with area coverage of about 3126 hectares.

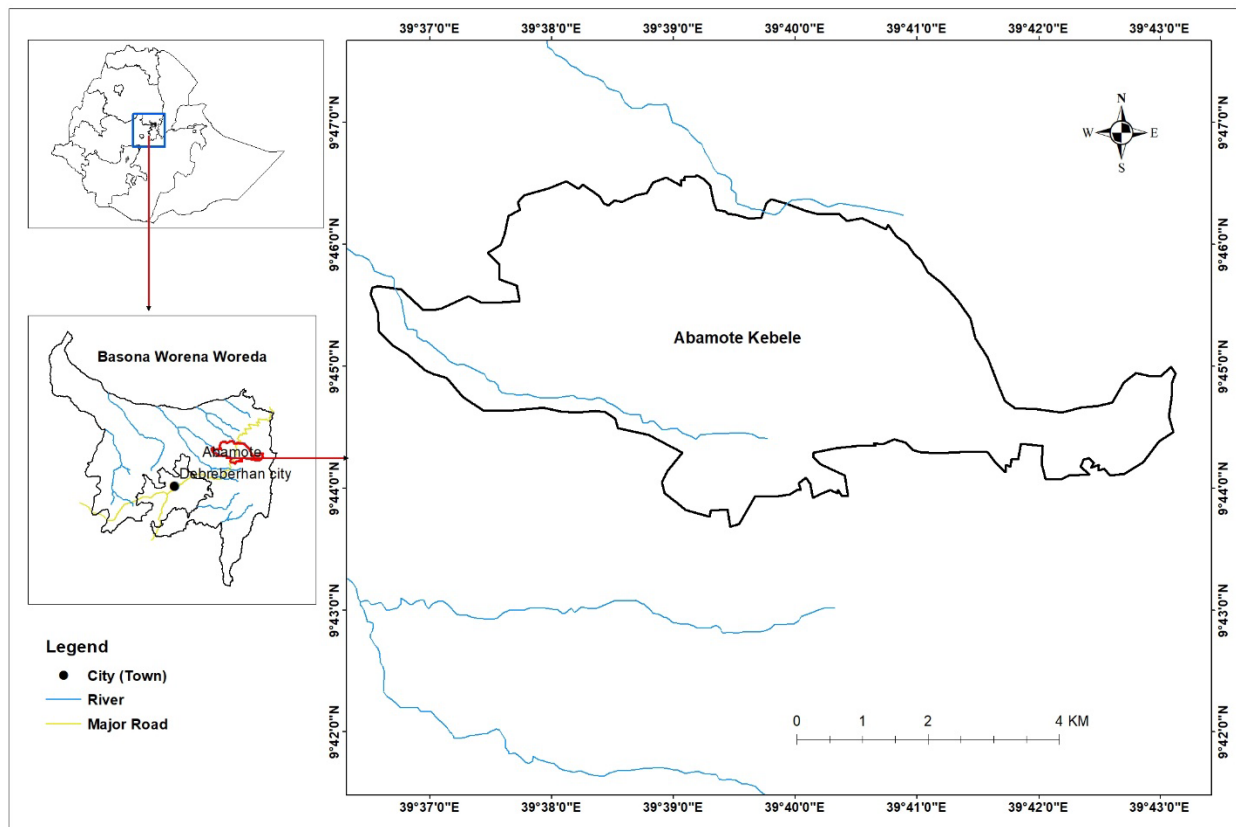


Figure 1. Map of the Abamote Kebele in Basona woreda of Amhara region, Ethiopia.

The GFEAST approach was employed for the study. Identification of demographically representative groups of women and men farmer participants were selected according to age, wealth/land size and type of household (male headed, female headed, female managed). Group discussions and individual interviews with a questionnaire were conducted. Separate meetings with groups of 12 women and men were arranged to collect their input regarding local conditions (*Photos 1 and 2*), problems and potential solutions related to livestock feed resources. For individual farmer interviews, from each group, six farmers (i.e. six from men’s and six from women’s FGD group) were selected to participate in one-on-one interviews to collect additional data using the individual interview questionnaire. Two small, two medium and two large scale farmers were engaged in the interview. The open-ended group



discussions and closed individual interviews provided information on agriculture and livestock conditions in the area (including gender and livestock ownership, decision-making, and labor), as well as problems and potential solutions from gender perspectives. The information collected into the data templates generates reports and graphs that inform the development of gender-responsive feed intervention strategies.



*Photo 1. Women farmer groups engaged in the GFEAST study at Abamote kebele in Basona Worena woreda of Amhara region, Ethiopia.*



*Photo 2. Men farmer groups engaged in the GFEAST study at Abamote kebele in Basona Worena woreda of Amhara region, Ethiopia.*

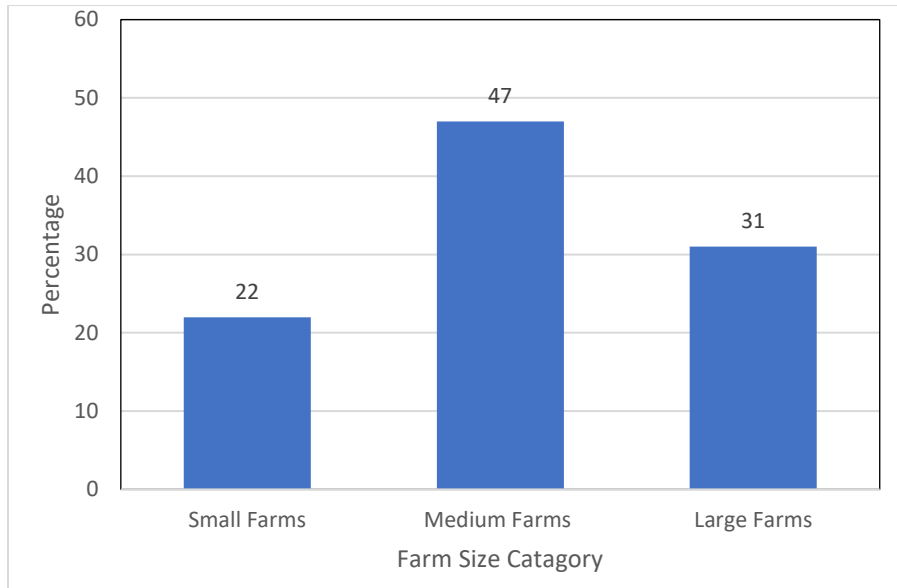
## **General Farming System**

### **1. Households, family size, farm size and land holding**

Abamote kebele is located at N 9°39'46" latitude and E 39°45'48" longitude. It has an altitude of 2990 meters above sea level. The kebele has 1222 households of which 67% (820) are men headed and 33% (402) are female headed. The average family size in the kebele is about 4 persons per household. Respondents indicated that the landholding ranges from 0.25 to 3.0 hectare. Of the total households in the Kebele about 50% own average land holdings which is about 1 ha, while about 30% of them have more than 1 ha and 20% have less than 1 ha of land. This total land holding is usually used for cropping of food crops. Both men and women have the right to own Land. Usually, married couples have joint land ownership, the land ownership is heritable. When one of the partners died then the other one (men or women) land ownership will be transferred. When couples separate land will be equally shared. Individual ownership of land in married couples is a very rare case when special conditions of marriage or partnership are arranged.

Average land holdings per household for small medium and large farmer categories are indicated in *Figure 1*. Land Ownership in the different categories showed similar trend for male headed and female headed households. Land belongs to the government by law. However, farmers have the right to use the land owned in many ways. They can pass on to the family, rent to others and use as a collateral to get loans from financial institutes.

The area receives a good amount of rainfall to support crop growth. The main rainy season extends between June and September. They also have short rains during March and April. Farmers in the area classify the different seasons of the year either by the cropping activity Calander or by the rainfall pattern. For example, planting seasons, weeding, harvesting, threshing and land preparation.



*Figure 1. Category of farmers based on farm size at Abamote kebele of Basona woreda, North Shewa zone.*

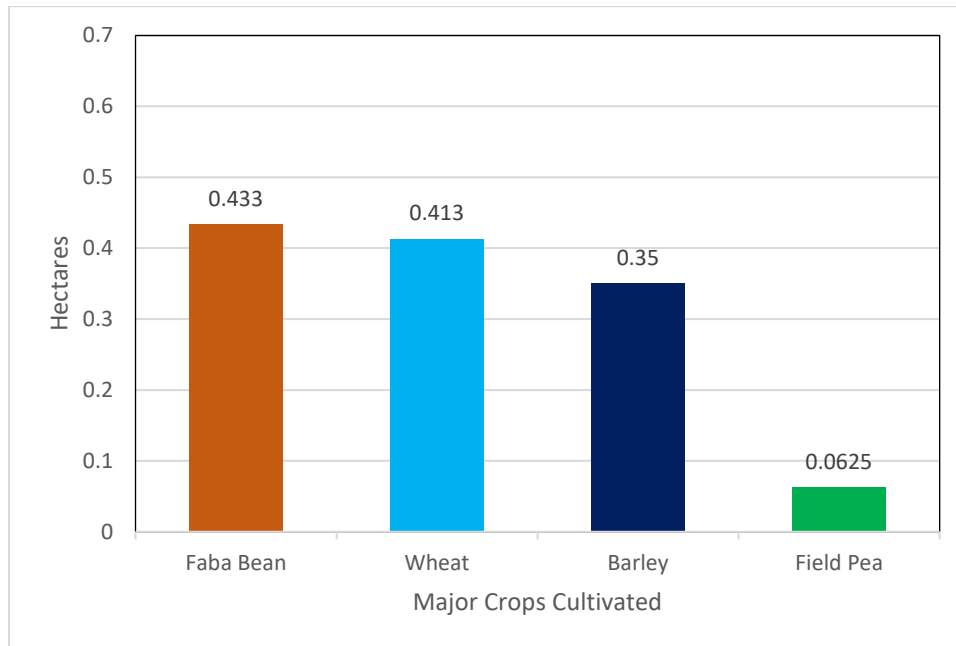
Note: Small farm size = less than 1 ha, medium farm size from 1 to 1.5 ha and large farm size = more than 1.5 ha

## **2. Major food and fodder crops**

The major crops cultivated in the woreda are faba bean, barley and wheat. In addition, field pea, lentil, fenugreek are also the legume crops grown. From the forage crops oats and vetch are grown in the area. These crops are well adapted in high altitude and cool agro-ecologies. In these high-altitude cool areas crop diversity is very limited. It is also observed that farmers do not have much backyard crop production due to the long dry season. *Figure 2* shows the average cultivated area of the different crops in a household. Generally, almost all crops are owned by men and women in the household and there are no specialized crops like garden vegetables which are managed by women.

Crops are produced both under irrigation and rainfed conditions. All crops are cultivated under both systems, but farmers practice crop rotation to maintain soil fertility. Most of the crop lands are cultivated either for rainfed crop production or irrigation and only a few farmers produce two crops per year. This is because of waterlogging problems. The bottom lands where it is too wet or waterlogged during the rainy season are cropped during the dry season using irrigation. While the well-drained and hill sides are cultivated under rainfed conditions during the main rainy season.

Almost all the crop residues produced are entirely used as feed for livestock. The straws and whelms are conserved properly and fed to livestock. Free grazing in the crop lands is common after crop harvest.



*Figure 2. Average size of cultivated lands (ha) of the major crops cultivated by a household in Abamote Kebele of Basona Worena woreda, North Shewa Zone*

### **3. Rainfall, water availability and irrigation, farming seasons**

The rainfall pattern in Abamote Kebele is bimodal. The main rainy season extends from June to September while the short rain seasons are from March to May. It has been indicated that often there are also unexpected showers even during the dry season. The dry season is usually from October to February. The main rainy season (“Meher”) season is when farmers grow crops, however during the short rainy season (“Belg”) the amount of rainfall in some seasons does not support crop growth, however it is very important for the growth of pasture for livestock. Abamote area is very cool, the cooler season is between October to January in which case the temperature usually gets below zero specially during the evenings and morning hours.

In Abamote kebele crops are cultivated both under rainfed and irrigation. The main source of water are springs, rivers and seasonal rainfall water harvests in small scale water reservoirs. The springs and rivers are used for irrigation, for livestock drinking and home use. While the harvested water is used for livestock. In Abamote area there are quite a lot of crossbred dairy animals and commonly managed indoors. Watering these animals is one of the main challenges. This is because fetching water from rivers, springs and dams is far from the residence and the topography is rugged. The main purpose of keeping donkeys is to transport water. There is seasonal water shortage.



Water supply is inadequate during the dry season as some of the seasonal rivers dry out and in some years water in reservoirs become exhausted.

It was indicated that the youth want to cultivate high value crops such as vegetables like onions. However, diseases are reported as the main problem. Moreover, shortage of arable land and water for irrigation has been indicated as major challenges to improve crop and livestock productivity.

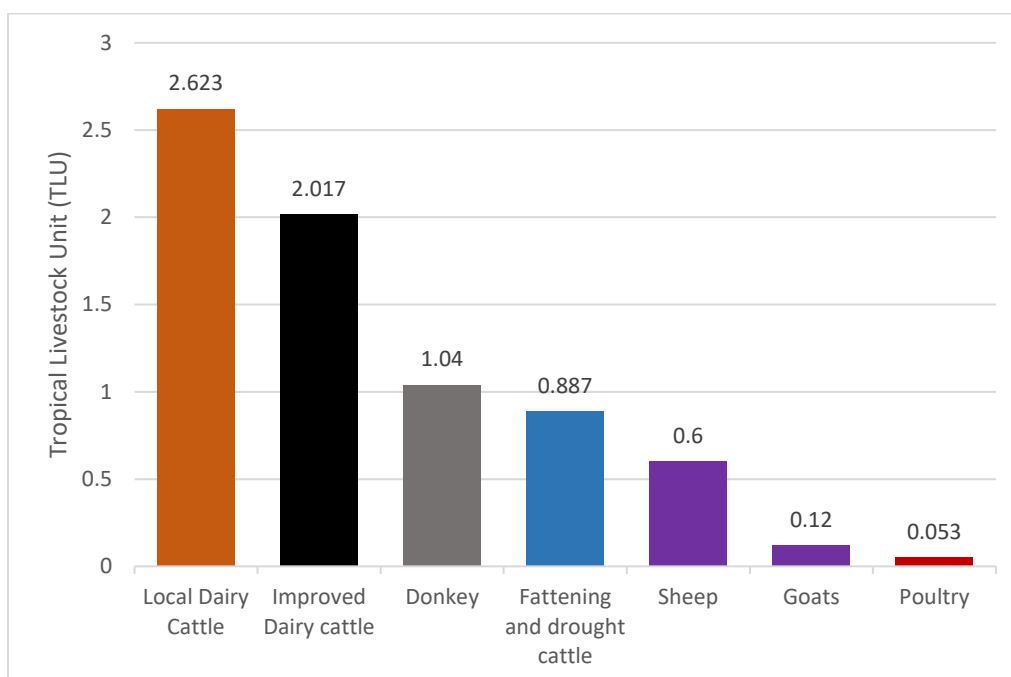
#### **4. Labor**

The farmers in the area reported that labor is limiting during peak seasons of farming activities in the year. Shortage of labor has been critical during ploughing, planting, weeding, harvesting and threshing. Most of the farmers in the community adapted to labor intensive and traditional agricultural practices. Oxen are used for plowing. On the other hand, harrowing and weeding are done by human labor. Most of the time, farmers transport agricultural inputs and products using either pack animals or human labor. The labor cost in Abamote area ranges between 200 to 300 Ethiopian Birr (about 4 - 5 USD) per day. The daily rate varies over the seasons and sometimes on the type of work. Daily rates are the same for men and women. However, it was reported that as a tradition some of the farm activities are accomplished normally by men and others by women. For example, men perform plowing and crop harvesting whereas women engage more on cooking, family caring and other activities around the house. Both men and women are responsible for weeding. Labor is contract either on daily, monthly or annual basis. There are also contractual agreements for a given activity such as harvesting a hectare of wheat field. About 50% of households face seasonal shortage of labor. Most of the farmers in the area usually do not afford to hire laborers to work for them. The communities overcome labor shortage through labor sharing among themselves in rounds.

#### **5. Livestock ownership**

Livestock is a very important and integral component of the farming system in Abamote kebele. Almost all the households keep livestock. However, the stock size, species composition and the purpose of keeping livestock differs among the households. Farmers keep local and crossbred cattle. Most of the crossbred animals do not have any recording and pedigree and do not have any known level of exotic blood level and performance recording particularly for milk production. On the other hand, quite a large number of oxen is available to provide plowing service to support crop production. Sheep are widely reared by household in the area. However, goats are rarely found. Donkeys are crucially important animals owned by almost every household. In addition to donkeys often farmers keep horses. Farmers keep few numbers of local and dual purpose chickens. *Figure 3* shows the average livestock holdings in terms of tropical livestock units (TLU) in Abamote kebele. Livestock ownership among men and women is generally very good. In male headed

households all the available livestock is jointly hold by the husband and wife, unless and otherwise there is a special and peculiar agreement by the couples. In most cases the decision making for selling animals is in agreement by the husband and wife, and the initiative could come from either of them. The decision for selling cattle, sheep and goats and equines is usually in agreement between the husband and wife. However, chickens and eggs are commonly managed and sold by women without any consultation with the husband. In female headed households, all the ownership and decision making are made by the women.



*Figure 3. Average holdings of the different types of livestock in TLU (tropical livestock Unit) owned per household in Abamote Kebele of Basona Worena woreda , North Shewa Zone*

## **6. Credits land area available for cultivation and trends, distance to the market**

Farmers in the Kebele are generally do not get adequate financial services and credits. Farmers are also not much encouraged to take credit for both social, economic reasons and poor awareness of business orientations. The main sources of credit services in the area are the Amhara credit and saving association, and the kebeles saving and credit association. Farmers need credits to purchase fertilizers and seeds in crop production and to purchase oxen and cows. Farmers need to go through a very lengthy processes and expected to have collateral to get credits. There is very little or

no proper extension services provided to farmers in business development and credit service dimensions. It has been indicated that farmers get credit without proper planning. This has encouraged misuse of the loaned money and brought unwanted consequences (become a bad example in the community). High interest rates and short loan repaying time has discouraged farmers to take credits. Credit is equally accessible to both men and women. Farmers indicated that as far as one fulfills the requirements, credit is given without any discriminations. However, women are commonly not aware of the requirements and procedures for taking credits. Due to these women are commonly less encouraged to take credits as compared to men. Smallholder farmers who are landless, jobless, and those who are very poor have difficulty accessing credits from these financial institutions.

In Abamote kebele farmers reported that availability of cultivated land and grazing land is continuously declining due to the increased human and livestock population and hence migration of youth to towns is increasing over the years. On the other hand, older people, women headed households and very poor households rent out their land to other farmers and youth in different arrangements. It could be based on money (15,000 to 20,000 per hectare per year) or based on sharing the products depending on the agreed arrangements. Even some farmers arrange use of land based on sharing of crop residues which is the main source of animal feed. As land shortage becomes critical traditional farming practice like fallowing is almost abandoned, rather use of the same land for 2 cropping per year is emerging.

Supply of inputs such as seed, fertilizer, animal drugs, herbicides and other materials are available in the nearby markets or at the office of agriculture at Kebele level. According to the respondent farmers, the main challenge of these supplies is high and increasing price, poor quality and timely availability.

## **Livestock production System**

The livestock production system in Abamote Kebele is integrated/mixed with crop production. Small-scale market-oriented dairy based on crossbred cattle is emerging in the area. Cross bred animals are usually kept for market oriented dairy production and farmers manage in a better way. They provide improved feed, keep indoor and get better health services. The main components of the livestock production systems are described as follows

**Housing** – Livestock are managed in semi-intensive system in Abamote. Every household has mixed species of livestock including cattle, sheep, goats, donkeys, and horses. These animals are partly grazing on natural pasture and partly stay indoors or tethered in the compound. Exceptionally most farmers keep crossbred dairy cows indoors. Crossbred animals receive an improved management. The rest of the animals are kept indoors during the night. Animals need to be kept indoor as the area is very

cold and windy.. Most of the barns are constructed as part of residence houses or ground floors of residence houses. Houses are not well ventilated. Floors are commonly very rough and not suitable for the animals to sleep on it. The houses lack an adequate amount of light. Few households construct the barn as a separate house. Feeding troughs are available in the barn and in the compound. Generally, the housing conditions for livestock in the area is very poor that requires appropriate interventions.

**Veterinary services** – Farmers indicated that there are different infectious diseases affecting cattle, sheep, goats, and poultry. There are also problems of internal and external parasites. However, severity of the overall situations of animal diseases especially fatal diseases is less severe relative to other lowland areas. One of the important diseases reported is FMD affecting cattle, specially crossbred cattle and sheep. Vaccination is provided by the health technicians at the Kebele level; however, vaccination is not accessible for all major diseases in the area and most often do not keep the exact time of vaccination. Moreover, the efficacy of the vaccine is questionable, especially the vaccines for FMD. There is no any private animal health service provider in the area. Private health service providers are available in big towns like Debre Birhan. All animal treatments and vaccinations are provided at the Kebele health service center by the office of agriculture. In some instances, the health technicians travel to the households to provide treatment when the animals are critically sick. Farmers pay to the government for the animal treatment and vaccination service. But, the payment is subsidized and affordable by farmers. Occasionally when animals get sick farmers used ethnoveterinary treatments such as drenching juices of different plant leaves, roots and barks and mixes of locally available spices depending on the type of symptoms observed such as bloat.

**Animal Reproduction** – Livestock breeding practice in Abamote area is more traditional. They widely use natural mating in cattle and small ruminates. Farmers are aware of the presence of improved breeding practice such as artificial insemination (AI) of improved dairy genetics. However, access to these services is critically limited primarily due to the absence of AI technicians and the service generally nonexistent or insignificant. There is a well-organized improved breeding programs called community sheep breeding program. This program provides services with selected rams from the community. Cattle breeding is mainly done by bull services. Few households have crossbred bulls. These bulls have different functions for the household and the community. They are used for plowing and also provide breeding services. Almost any member of the community can use the bull and there is no payment for the service.

## **Trade Offs Between Crop Production and Livestock Husbandry**



Crop and livestock production in Abamote area is highly integrated and have several complementarities. Livestock production complements crop production in many ways. The first and most important one is provision of drought power. Unlike many other countries where mechanization is the main source of power, almost all the power required for crop production in Abamote kebele and many highland areas comes from livestock. Land is plowed by oxen usually three to four times for each cropping. Then planting (seed covering) is made by oxen, threshing is also made by livestock. Transportation of inputs like seed and fertilizers, harvested crops to residence areas is made by donkeys and sometimes using horses. If this is interpreted in terms of money a remarkable amount of cost of production crops / grain is accountable to livestock. The second important complement of livestock to crop production is provision of manure as organic fertilizer to crop farms. The largest volume of manure is produced from cattle, but small proportion is also contributed by sheep and equines. The farmers around Abamote have very good practice of compost making from animal manure and farmers either directly apply the manure to the fields or use the compost to crop fields to improve soil fertility. Thirdly livestock complements crop production as a source of cash to purchase inputs like fertilizer or improved seeds. Moreover, the cash is often used to pay for labor and other expenses. In Abamote area sheep is usually sold for this purpose as most of the farmers keep sheep in the household.

On the other hand, crop production compliments livestock husbandry in many ways. Crop production by products (residues) and grain are the main source of livestock feed. Almost all crop residue produced is conserved and used as the main source of roughage for livestock. The crop residues are normally cereal straws, legume haulms and after math grazing after crop harvest. But the use of grain as livestock feed very limited. At household level in Abamote areas, farmers processed grains to local beverages and alcohol, in which the byproducts are very good sources of livestock feed. Often when planting densities thin outs are used as feed to animals, which is normally fed to livestock green.

Generally, crop production and livestock farming has highly integrated. This integration is complementing one another that results synergy and efficient utilization of the resources, available under farmers condition.

## **Major Income Sources**

The major income sources of farmers at household level and for women are sale of dairy products, fattened animals for both cattle and small ruminants specially sheep, chicken eggs and meat. The income sources for the household and women are generally very similar. However, it is clearly seen that women's income from livestock (dairy and chicken egg and meat) is a bit higher. The contribution of different income sources for the household and women in Abamote areas are shown in [Figure 4](#). Those farmers who have crossbred dairy cows and producing good quantity of milk usually supply to the dairy cooperative in the village. Payments are made every two weeks.

Farmers supply a minimum of 2 liters of milk to their cooperative. Dairy producers in the cooperative have also the privilege to purchase brewery spent grain, which is delivered to their village every week. The quantity of brewery spent grain purchased by each farmer every week is small quantity. This is because farmers are not feeding their animals based on their requirement or productivity level and the supply of brewery spent grain is not adequate.

Income from fattening of cattle and sheep is occasional unlike income gained from dairy. Farmers fatten cattle when they get a replaced bull calf or when they think the cattle (cow and oxen) are no longer important due to old age or low productivity. Farmers normally fatten oxen and male sheep. Fattening of female animals are rare. These fattened animals are sold during holiday markets such as New year, Christmas, Easter, and other Muslim holidays. Farmers usually sell sheep every year. But the sale of fatten cattle is in every two or three years. Chicken egg produced is commonly sold to the market and almost all the income is managed by the women. It is reported that some farmers are selling eggs without fulfilling the household demand for eggs.

The main sources of income from food crops sell are from faba bean wheat and barley. In Abamote area production of cash crops is very limited. It has been reported that vegetables like garlic and cabbages are produced in the cropping seasons. Diseases are the main problems that discourages farmers for vegetable production.

Women are also engaged with production of local beverages (local alcohol) usually for two reasons. The first one is as a source of income. The second reason is as source of feed for dairy cows and fattening animals. However, the work is laborious. It takes much of women time. The workload and working conditions cause health problems for women.

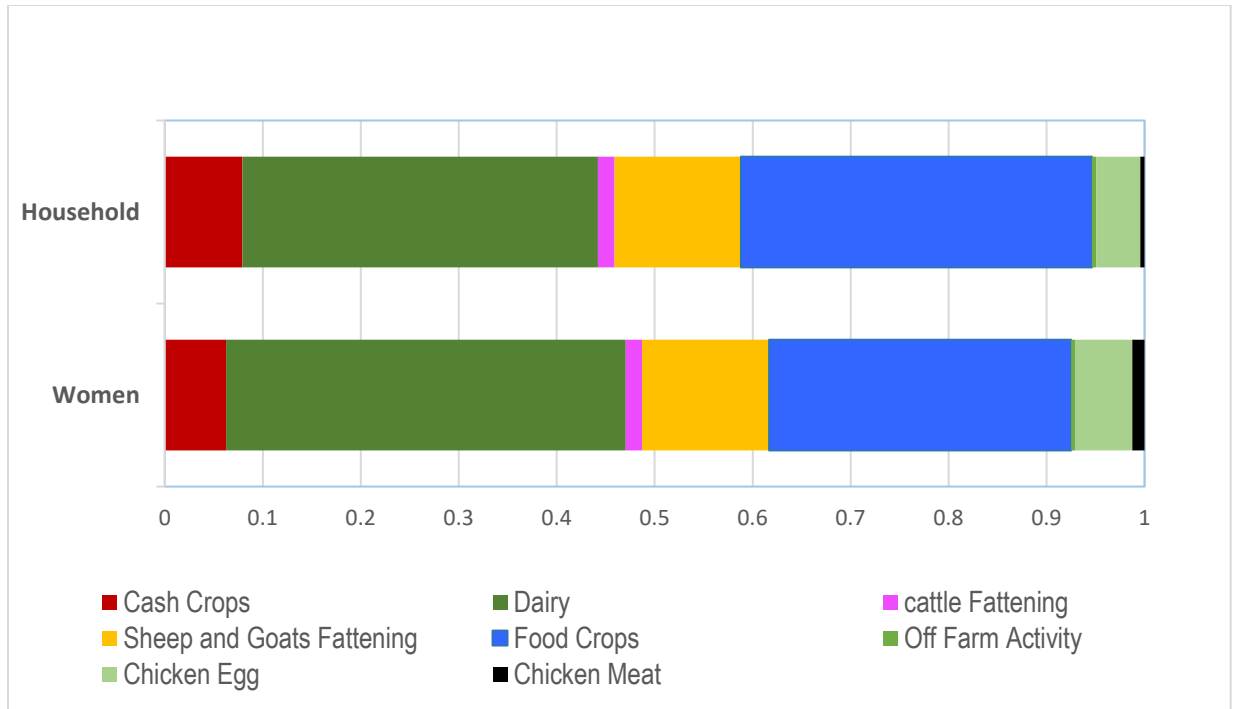


Figure 4. Average relative contribution (coefficient) of major sources of income to households and women's income in Abamote Kebele of Basona Worena woreda , North Shewa Zone

## Major Feed Sources

The feed resources in Abamote area are less diverse. Crop residues and natural pasture grazing are the major ones. On the other hand, the contribution of cultivated forages and purchased concentrate feeds are insignificant (*Figure 5*). In addition to this, there are also other feed resources, which are commonly used in the locality. Details of the major feed resources are described as follows.

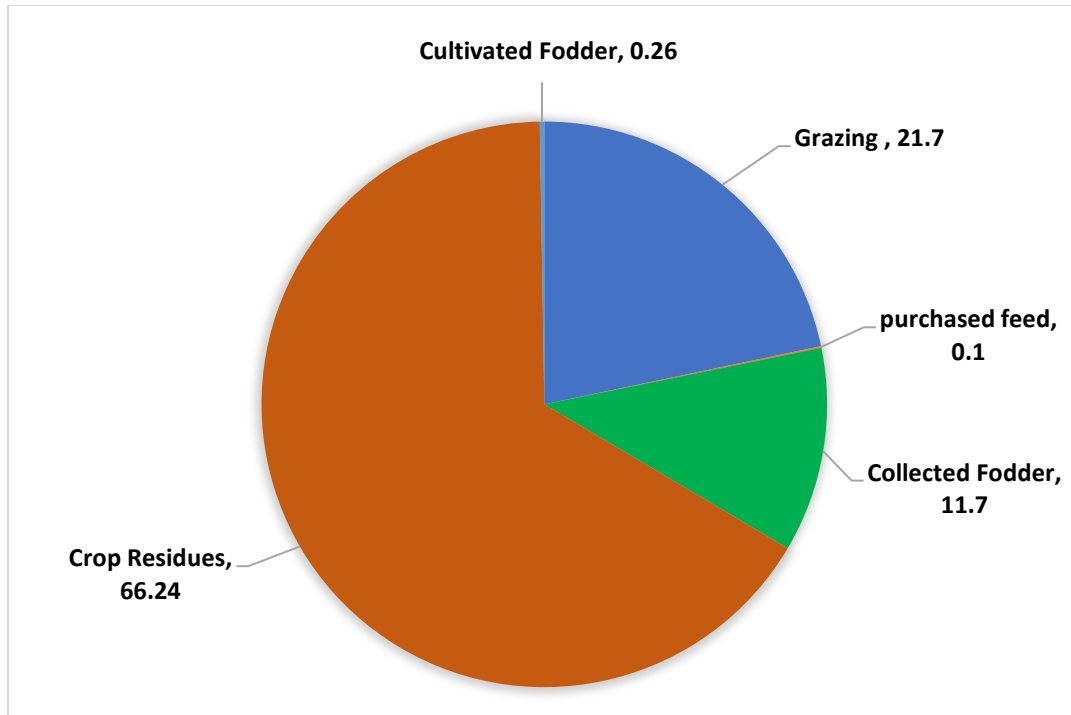
**Crop residues** – The main roughage sources in Abamote area are barley and straw; legume whelms (faba bean, lentil and field pea). These crop residues are very carefully collected, conserved and utilized. Almost all crop residues are threshed by animals to make the straw more refined and broken down to smaller pieces. Faba bean whelms threshed and chopped to fine pieces to facilitate intake by animals. The threshing grounds are normally in residences areas and all the crop harvested is transported by animals or human labor. Women are engaged in transporting the harvested crops. Farmers who have large herd sizes usually purchase additional straw from farmers who have extra straw resources. Farmers who do not have oxen commonly get the plowing service from farmers who has oxen and pay the service charge in kind (straw). The amount and type of straw to pay for depends on the agreements of the farmers.

**Grazing** – Grazing lands have continuously shrunken. Most grazing lands are privatized, however, there are small communal grazing lands. The grazing lands are seasonally protected from grazing (July to October). The grazing lands are highly degraded, and their productivity is very poor. The soil fertility is very poor. Pasture growth is stunted, and the species composition is poor in quality. Despite all the problems, the available pasture is harvested and conserved as hay. After the hay harvest the grazing lands are open and accessible for grazing. Livestock on natural pasture get little pasture for grazing immediately after harvest. However, during the short rains there are always lush grass regrowth for grazing. The other source of forage for grazing is the after-math after crop harvest. The after-math grazing is a very good forage for livestock. The after-math grazing is for few days. But farmers use the after-math privately and depending on the herd size and the size of the farm it could support for many days. Part of the stubbles of wheat and barley are collected and used for roof thatching.

**Concentrates** – The use of concentrate feeds as livestock feed by smallholder farmers is insignificant. Farmers who keep crossbred dairy and fattening animals usually used wheat bran, and dairy rations in very rare cases. This is because the very high price (> 2500 ETB for wheat bran and > 3500 per 100 kg) for dairy formulated ration, and often not accessible for most of the farmers. However, farmers are making use of wet brewery spent grain produced in beer factories around Debre Birhan. The price of the spent grain is relatively cheaper (500 ETB/100 kg). Farmers feed the spent grain for dairy cows and the demand is increasing very rapidly. The supply of the spent grain channels through the cooperative. Farmers reported the supply is very limited related to the high demand by farmers. The availability of oil seed cakes and grains as source of concentrate feed to livestock is not practiced.

**Cultivated forage crops-** few forage crops adapted to cooler environmental conditions in Aba mote. Oats, Vetch, Phalaris, Desho grass and Tree lucerne (Tagasaste) are the species found in the farmers' fields. Oats is the most widely cultivated forage crops and well known by all farmers. Oats are cultivated under rainfed and irrigation conditions. Many of the farmers cultivate small areas of oats to fill the critical feed shortage periods. Oats are grown often in mixture with vetches. Farmers use oats as cut and carry. They are also partly conserved as hay or keep to mature for production of seed. Phalaris grass, Desho grass and tagastase are planted usually in the backyards along the fence lines or in small plots. They are also planted on field borders and terraces. However, their use as animal feed is insignificant. Though feed shortage is one of the main challenges in Abamote, interventions like cultivation of improved forage crops are not well adopted and their contribution is very limited.





*Figure 5. Average contribution (%) of the major feed sources for livestock in Abamote Kebele of Basona Worena woreda , North Shewa Zone*

**Other feed resources** - Livestock feed resources in Abamote area are less diversified. Crop residues and grazing are the dominant feed sources. One of the most important feed resources for livestock are local brewery by-products such as local alcohol by product (“Brint”) and local beer by product (“Atela”). Many women produce local alcohol for market and the volume is remarkably high and supplied to Debre Birhan market. The by-product of this local alcohol making is quite big. Households visited indicated that the alcohol is produced every day and animals are also fed with the “Brint”. The use of by-products such as “Brint and Atela” for livestock feed has popularized alcohol production in the area. Nutritionally Brint is very good quality, which has about 15 % crude protein. On the other hand, local beer is usually produced for holidays and occasionally for home consumption. Selling local beer is not very common, and its importance as feed source is not regular but occasional.

**Feed conservation and storage** – Feed in Abamote and surrounding areas was found to be one of the very scarce resources. The area and productivity of grazing lands are declining over time due to human and livestock population increase. As feed becomes scarce, farmers efficiently utilize all available feed resources and minimize wastages. During the old-time crop residues are fed to animals and left on the threshing grounds. Currently, almost all available feed resources are conserved and fed to animals in a planned way. Forages harvested from natural pasture and sometimes oats - vetch mixture are dried and used as hay. The hay is conserved in a

shed or baling is not practiced. Hay storage is in loose form which usually requires more labor and also occupies more space, and the wastage is very high. Straws are also conserved in a shed well protected from rain. Farmers store residues all different crop residues as mixtures including legume residues. They said mixing improved efficient utilization, minimizes selection and improves intake of the less palatable residues like wheat straw. Most of the farmers have feed shades made of wood and either corrugated iron sheets or straw or grass thatched roofs.

**Feed utilization and seasonality:** - Generally feeding systems in Abamote area are crop residue-based. Crop residues are well known for their high fiber and low crude protein and immediately available energy contents and overall poor feeding values. Hay made from the natural grazing lands are the second important source feed sources for livestock. The quality of the hay and the forage from grazing is also poor but is better than the crop residues. The conserved feed resources are fed to all animals in the household. Better quality feeds like hay and nutrient dense supplements are provided to dairy animals and fattening male cattle. Green feeds harvested from natural pasture and field borders, cultivated forages (usually oats) and weeds are used to feed livestock mainly during the main rainy season to supplement the poor- quality conserved crop residues. [Figure 6](#) shows the monthly or seasonally available feed resource for livestock. Feed shortage is clearly shown during the wet season followed by the dry season and relatively abundant during the early dry season and short rains. Grazing is very limited during the wet season as most of the areas are cultivated. Though farmers try to maximize the utilization of the available feed resources, it seems crossbred dairy cows are not fed according to the level of productivity and requirement and hence milk productivity in the area is generally low.

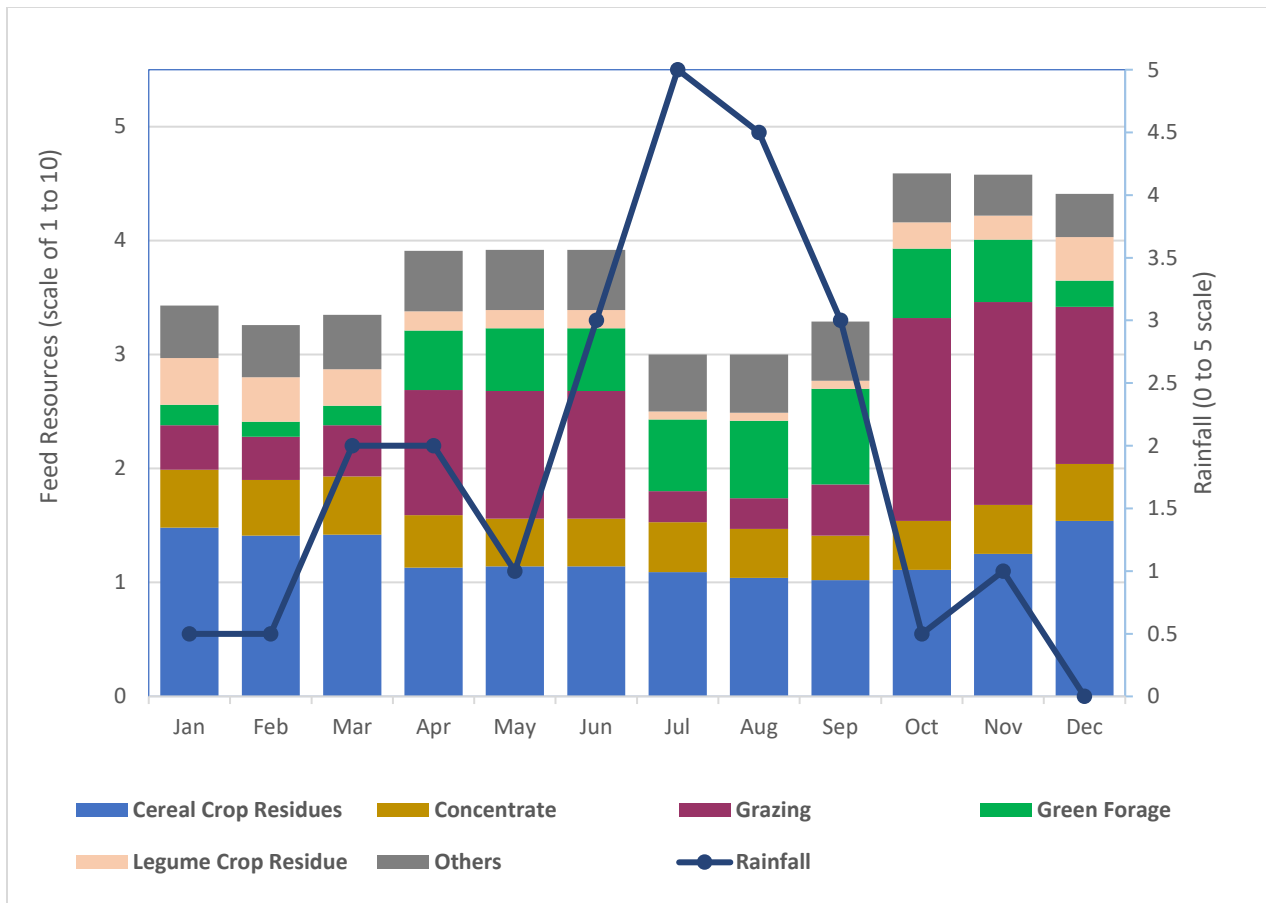


Figure 6. Average proportion of the different major feed resources available over the different months and the trend of rainfall in Abamote Kebele of Basona Worena woreda , North Shewa Zone

## Gender division of labor and gendered decision in feed production, management and feeding

In the crop livestock mixed farming system, the role of women both in crop and livestock production is crucially important. Most of the activities at home such as taking care of children, feeding animals and cleaning barns are the responsibility of women and young girls. In addition, women are involved in field activities such as weeding, transporting inputs and harvested crops. Women are generally responsible for most of the activities in livestock production. With intensification of livestock production through keeping crossbred animals for dairy and indoor feeding crucially requires the involvement of women. Women and children are mostly responsible for feeding and watering dairy animals. In areas like Abamote where fetching water for home use is very difficult due to the steep slopes and rugged terrains. Indoor fed dairy animals require large volume of water and women are responsible for getting this water. Donkeys are very important animals in transporting water.

The available feed resources are mixed in different ways to make them palatable by animals. Mixing of feed resources are usually done by women. Most dairy farmers do not purchase concentrate feeds. However, when farmers purchase feed usually it is the men who decide but often some couples make a joint decision. Few farmers also grow cultivated forages, mostly oats on arable lands. Both men and women farmer respondents indicated that almost all the field activities of oats forage production are managed by men. Men decides on the cultivation of forages and all the management practice. Children are often involved in the harvesting and transporting the forage to residence areas. Oats are commonly fed as green (cut and carry) and hence harvesting of the forages is every day. Women involved in feeding the harvested forage to animals.

## Problems and Opportunities

Major problems raised by men and women in relation to livestock production have similarities and differences. FMD, feed shortage, inadequate supply of AI and improved heifers, shortage of water and land are the main issues identified by women groups. On the other hand, the men group indicated land shortage, poor economic capacity, lack of improved dairy breeds, shortage of feed and over all animal husbandry like housing as major problems that affect livestock production and productivity. A matrix comparison of these major problems was made by men and women separately (*Table 1*). Among these problems women prioritized animal health, shortage feed, accessibility of water and poor breeding services as the main problems in order of their importance while men prioritized land shortage, economic capacity animal breeding services and feed as the main challenges in the order of importance. Farmers also discussed some of these problems are somehow directly or indirectly interrelated. For example, availability of land means more feed production either through cultivation of improved forages, more grazing land and more crop residues. In addition, if farmers have good economic capacity, they can purchase improved heifers and cows can purchase concentrate feeds and other inputs.

Despite all these challenges farmers indicated that the presence of different opportunities for improving livestock productivity. They mentioned the market is an important opportunity, the price of milk, fattened cattle and sheep is very attractive and encouraged farmers to improved productivity of their livestock.

*Table1. Five major problems raised for livestock production and their matrix comparison scores by women and Men focused group discussion participants at Abamote kebele of Basona Worena woreda, North Shewa Zone*

	Women Group		Men Group
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	Main Problems	Matrix scores		Main Problems	Matrix scores
1	Animal Health	4	1	Land shortage	4
2	Shortage of feed	3	2	Low economic capacity	3
3	Accessibility to water	2	3	Animal feed	2
4	Poor breeding	1	4	Breeding services	1
5	Land Shortage		5	Husbandry practice	

## Potential interventions

According to the quick assessment of livestock production systems focusing on feed production, conservation and utilization and the role of gender in decision making, feed production and utilization in Abamote kebele of Basona Worena woreda the following interventions are suggested.

- Seeing the overall farming system and suitability of the environment for dairy production, provision of efficient genetic improvement services through artificial insemination of superior dairy genetics or provision of good performing bull services are very helpful for farmers to have productive animals.
- Improving feed supply is a key intervention required in the area. Scaling up of cultivated forage crops is the most appropriate option to produce quality feed sources. Oats (*Avena sativa*) and vetches (*Vicia spp*) are well-adapted, and productive annual forage crops in these cooler highlands. Oats have several varieties and vetches have also different species. It is very good if best performing varieties and species are introduced in the target areas. Application of best agronomic practices, conservation methods and utilization are always essential.
- Among the perennial forage crops phalaris grass (*Phalaris aquatica*) and the browse tree tagasaste / tree lucerne (*Chamacytisus palmensis*) are well performing in these areas. These forages could be integrated in the farming system at scale. They are very good to be planted on terraces, soil bands and also in the backyards and provide feed for livestock and other environmental functions.
- For efficient utilization of available feed resources ration formulation for crossbred dairy animals feeding is important. This helps efficient utilization of feed resources that can make the farmers more profitable and keep the animals healthier and produce quality animal source foods.
- As women are responsible in most of the dairy animal feed production and feeding of livestock they have to be provided with capacity building trainings in

the overall livestock husbandry practices especially dairy production. Interventions to empower women in decision making are also very pertinent.

- Most livestock barns have poor ventilation and lack adequate light during the daytime and floors are stoney and rough. All these conditions can remarkably affecting the performance of livestock. The barns have to be improved by making to have good ventilations and allow to have good diffused light to the barn and more smooth floors. Animal health problems specially provision of vaccination for the most common diseases are very crucial to the area.

## Conclusions

Abamote kebele in Bassona warena area is a high potential area for dairy production. The livestock production practice in the area is characterized by dominant traditional systems based on low input low output systems. Despite that, market-oriented livestock production based on crossbred dairying is emerging by many households. The gendered feed assessment in this target location provided the main feature of the livestock production and their major challenges and opportunities particularly on the status of feed production, availability, seasonality, and utilization. This high dairy potential area could be remarkably improved if the appropriate intervention of improved dairy breeding practice through AI and bull services and very good supply of adequate and good quality cultivated forges or feeds are supplied. Feed should be conserved properly, and seasonal deficits should be minimized and if possible avoided. The main challenges for both men and women are listed out and prioritized. These issues should be addressed towards increasing productivity, improve livelihood and empower women in decision making.

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