



# Characterization of the farming and livestock production systems and the potential to enhance livestock productivity through improved feeding in Jawe, Lemo Hadiya District, Ethiopia

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Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

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# Introduction

Livestock production plays a significant role in the improvement of farm households in rural area of Ethiopia. Although the country has the largest livestock population in Africa, its productivity and contribution (18%) to the National Gross Domestic Product (FAOSTAT, 2004) of Ethiopia is very low.

The poor performance of the livestock sector in the country is due to various reasons such as large livestock numbers per household, low quality breeds, insufficient amount of good quality feed and seasonal variation in its availability, poor health of livestock and inadequate health services, inefficient management of livestock, poor infrastructure, poor marketing, insufficient credit facilities, inadequate knowledge of integrated mixed farming system and the inability of the farmer to exploit this resources due to different priorities.

More recently, the livestock sector has been given attention by the Government, than ever before. This is an opportunity for professionals and concerned stake holders to break through a number of challenges within the sector and contribute best efforts to the country's growth and transformation plan. Among the aforementioned problems, feed scarcity is often cited as the primary and major constraint to livestock productivity in crop-livestock mixed farming systems (Legese et al., 2008).

Lemo district is one of the locations in Ethiopia where livestock feed shortage was reported as one of impeding factors for the improvement of livestock production and productivity (Ellis-Jones Jim et al., 2013). Thus, tackling this problem through proper and strategic intervention is expected to bring certain improvement in livestock productivity in the area.

The Feed Assessment Tool (FEAST) is a systematic method to assess local feed resource availability and use. It offers a systematic and rapid methodology to assess feed resources at site level with a view to developing a site-specific intervention strategy to improve and optimize feed supply, utilization and animal production through technical or organizational interventions.

This tool was used to characterize the farming and livestock production system in Jawe, Lemo district of Hadiya zone in Southern Ethiopia. The study was conducted on 27 - 30 December 2013 by researchers from Areka and Worabe Agricultural Research Centers with backstopping from the International Center for Agricultural Research in Dry Areas (ICARDA). The objective of the study was to provide an overview of farming and livestock systems and identify the major livestock production challenges, opportunities and potential interventions with special emphasis on livestock feed for the improvement of livestock production and productivity.

# Methodology

## Study site

This feed assessment study was undertaken in Jawe *kebele*, Lemo district. Lemo district is one of the districts in Hadiya zone. The administrative capital of the zone is Hossana town which is located 230km South of Addis Ababa. Hadiya zone in general and Lemo district in particular are known for the production of wheat; due to its popularity in wheat production the area is called 'Ethiopian Canada'. The main livelihood in the district is Enset based mixed agriculture. Jawe is located at a distance of 9km south-west of Hosana town. It has a total population of 4439 (1801 males, 2638 females).

## Sampling method

### *Selection of villages and participant farmers*

Jawe is one of the Africa RISING project sites in Lemo Hadiya. Farmers for the study were selected based on gender, age and wealth. Both male and female farmers were involved. Elders and youth to address age issues were considered. To incorporate all wealth groups, size of landholding was considered, thus farmers from small, medium and large land size were involved. A total of 17 farmers, 12 male and 5 female farmers participated in the study.

### *Survey structure and format*

A focus group discussion and individual interviews were administered. A focus group discussion was initially undertaken with all participant farmers to discuss the overall farming system and feed situation. Thereafter, individual interviews were undertaken with 9 selected farmers from farmers participating in FGD using a FEAST questionnaire. The criterion for the selection of farmers for FEAST was size of land holding (small, medium and large). The survey was conducted from 27-30th December, 2013.

## Data analysis

The FEAST excel macro program ([www.ilri.org/feast](http://www.ilri.org/feast)) was used for data analysis. Narrative responses collected from the group discussions were examined and reported.

# Major results

## Farming system

Land holding in Jawe is divided into three classes such as small (<1ha), medium (>1ha to 2ha) and large (>2ha) where 25 %, 55 % and 20 % of households (Figure 1).

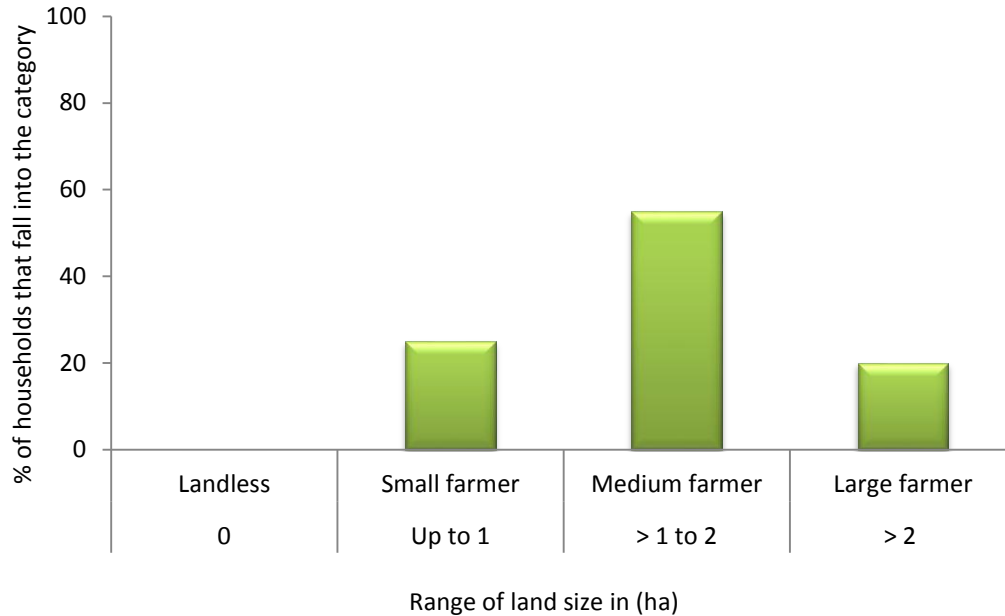


Figure 1: Range of landholding sizes of farmers in Jawe kebele

The average family size is 6, with a range from 4 to 10. There are two cropping seasons, locally named *meher* and *belg*. *Meher* season is from June to October and *belg* season is from February to October. The area receives the highest rainfall during July, August, June and September. During dry seasons, only 1% of the farmers use irrigation. Farmers mainly depend on rainfall to produce their crops.

Farmers in the area use human and animal labour for their agriculture. Availability of labour in the area is not a problem. Labour is required throughout the year for various agricultural activities, such as planting, weeding, cultivating, harvesting and threshing. However, the peak labour requirement is during harvesting. When family labour is not enough, farmers hire labour. The cost of hired labour varies by activity. For example, during peak labour time the cost is 50 Ethiopian Birr (ETB; \$2.5) per man-day. Most farmers use contract labour who are paid 350 – 400 ETB per 0.25ha (locally 1 timad) area of land for harvesting (especially for wheat and tef). In addition to this cash, farmers pay for the food. It is mandatory to prepare food for the hired labourers. Hadiya zone is nationally known for the large numbers of people who migrate from Ethiopia in search of work in foreign countries particularly South Africa.

Major crops grown in Jawe include wheat, tef, faba bean, enset, and field pea (Figure 2). Crops like sorghum, barley and maize are also grown on small acreages. Wheat, tef, faba bean and enset crops are the dominant crops.

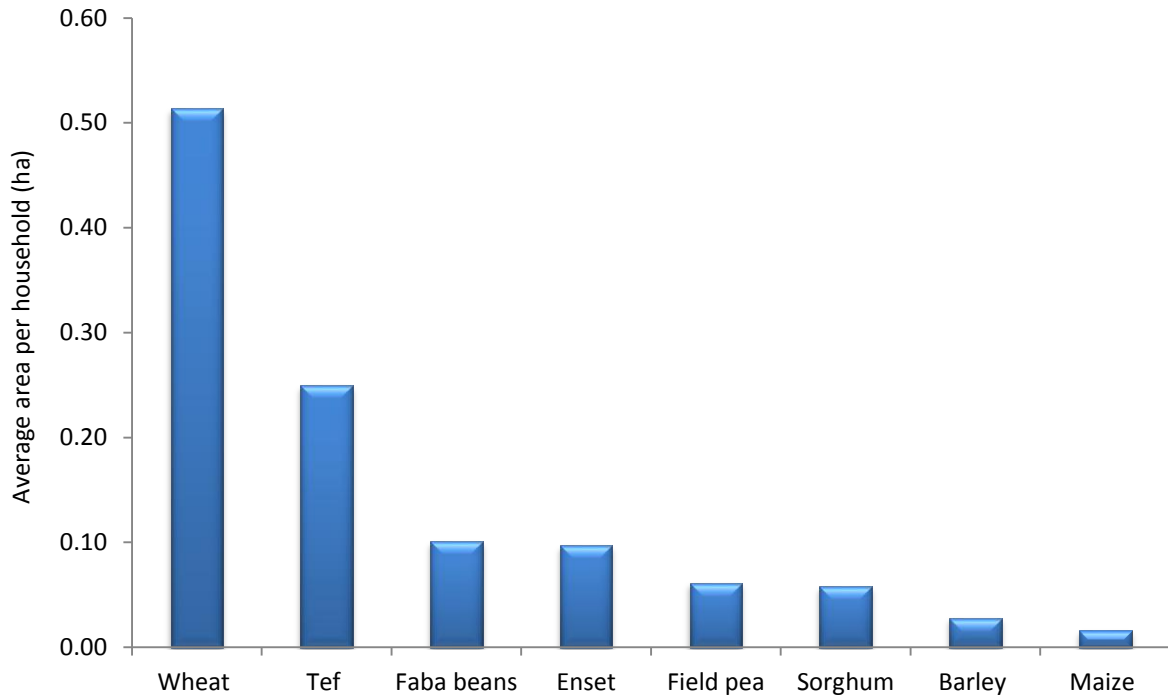


Figure 2: Major crops grown in Jawe

## Livestock production system

In addition to crop production, farmers rear different type of livestock. Farmers in the Jawe rear cattle, sheep, goat, equines and poultry. Table 1 summarizes the type, number and use of livestock in Jawe. As indicated in Table 1, more than 80% of the households own local dairy cow, draft cattle, donkey and local poultry. Sheep and goats are owned by half of the households.

Table 1: Type, use and average number of livestock owned by typical household in Jawe sub-district

Livestock species	Use	% of HH that own the species	Average number of animals per HH
Local dairy cow	Milk, manure/fire	90	1
Improved dairy cow	Milk, manure/fire	2	1
Draught cattle	Draught, sale, manure/fire	80-85	2
Fattening cattle	Sale, manure/fire	2	1
Sheep	Cash and home consumption	50	2
Goat	Cash and home consumption	60	2
Poultry-village	Cash and home consumption	90	2
Horse	Draught power and manure	3	1
Donkey	Draught power and manure	85	1
Mule	Draught power and manure	5	1

Majority of the farm households in Jawe own small numbers of livestock as a result of shortage of grazing land. Average tropical livestock unit (TLU) holding is 4.78 per household in which fattening & draft cattle, local dairy cattle and donkeys are the dominant species (Figure 3).

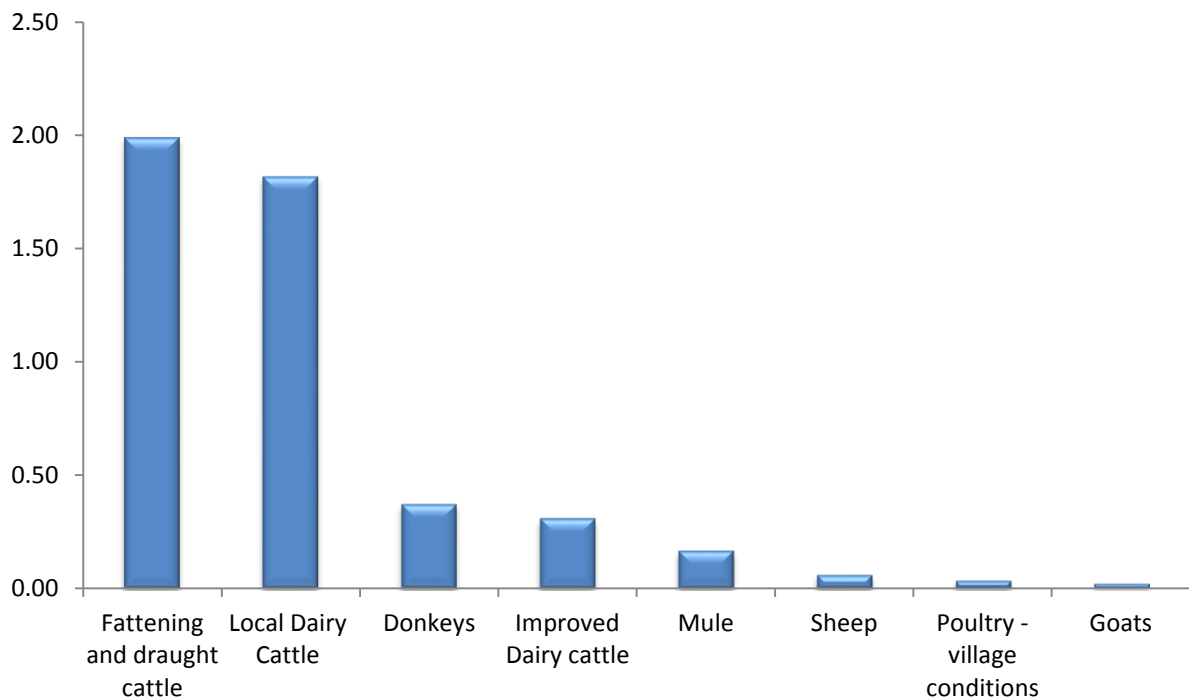


Figure 3: Major livestock species per household (in Tropical Livestock Units, TLU) in Jawe

Most farmers face cash shortage. Access to credit is very limited. There is credit service by Omo Micro-Finance Institute and by the government. This micro-finance institute gives credit to farmers for fertilizer. This is arranged through the office of agriculture/government. However, when farmers need individual credit, it becomes difficult because of the necessary credit



requirements. To get credit, farmers need to save some money (>1000 birr) and form groups (group collateral). For this reasons, farmers are discouraged to go for credit. Generally, land for cultivation is in short supply. Thus, land is cultivated continuously, i.e., it is used for more than one crop per year. Due to this reason, there is no fallowing. As indicated by farmers, supply of agricultural inputs (urea, plastic sheeting, forage seed, etc) particularly for livestock is very limited. Neither the government nor the private sector supplies these inputs.

### Feed resources: availability, quality and seasonality

Fodder crop production is very limited primarily because of limited forage seed/planting material supply, land shortage and lack of awareness. Desho grass is the dominant improved forage produced under different forage development options including soil and water conservation structures. Farmers allocate small portions of crop land for production of oat (*Avena sativa*) which is the second most dominant fodder produced in Jawe.

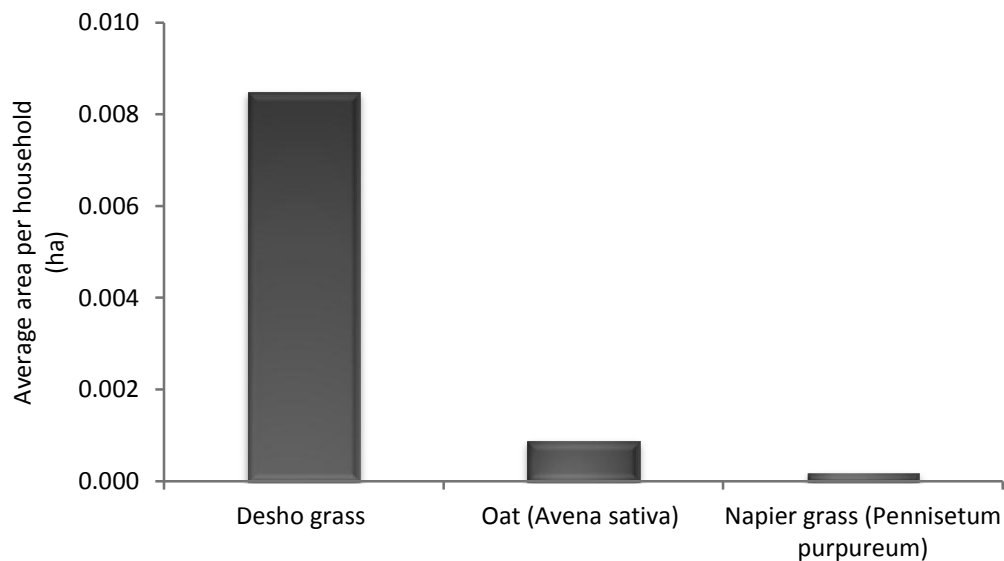


Figure 4: The dominant fodder crops grown in Jawe

Farmers are accustomed to purchase feeds for livestock during different seasons of the year. Wheat bran is the most important purchased feed followed by naturally occurring pasture (green fodder). Wheat bran is purchased mostly during dry season whereas green fodder (natural pasture) is purchased during the end of the rainy season. Pasture (green fodder) is purchased in the form of paddock of different land size. This is used for direct grazing and cut and carry. Pasture on 0.25 ha of land costs about 400 ETB where average fodder yield for cut and carry is estimated to be 10 donkey loads (one donkey load is approximately 60 kg). Figure 5 shows feeds purchased over a typical 12 month period.

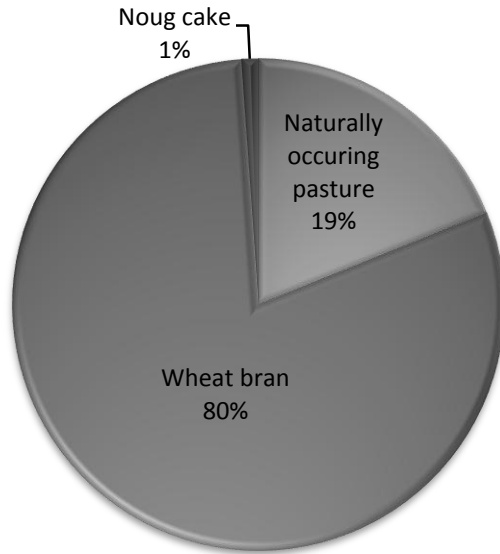
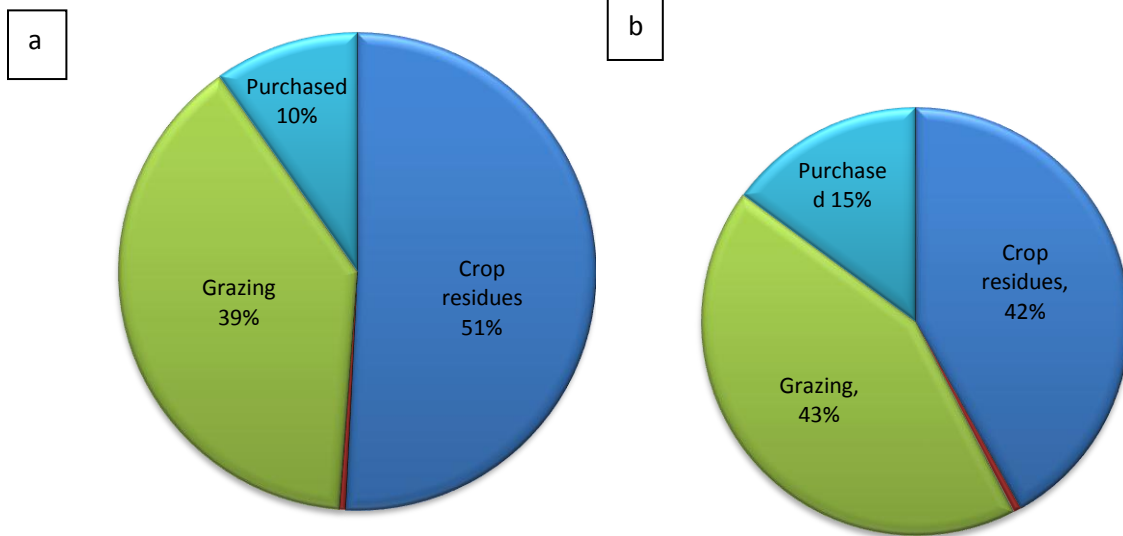


Figure 5: Quantity of feed purchased over a 12 months period

Crop residues (being the first) and grazing (being the second) are the major contributors to the dry matter content of the total diet. These two feed resources have comparable contribution for the metabolizable energy content of the total diet. Purchased feed, crop residues and grazing contribute 28 %, 34 % and 37 % of crude protein content of the total diet respectively (Figure 6).



c

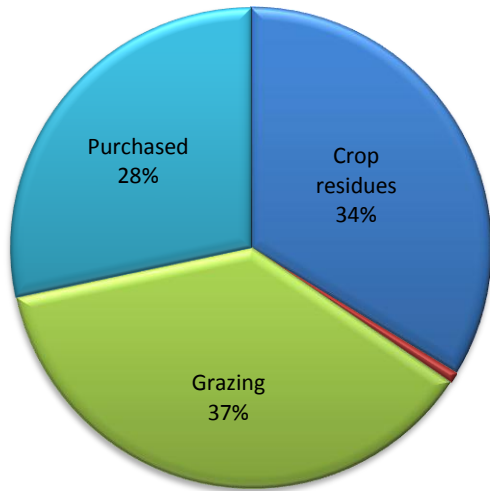


Figure 6: The contribution of feed resources to dry matter (a), metabolizable energy (b) and crude protein (c) content of the total diet

As indicated in Figure 7, feed availability varies throughout different seasons of a given year. Sufficient feed is available starting from June to October when rain or moisture availability is very good. From November to January, feed availability becomes below sufficient and starts to decline from February to May.

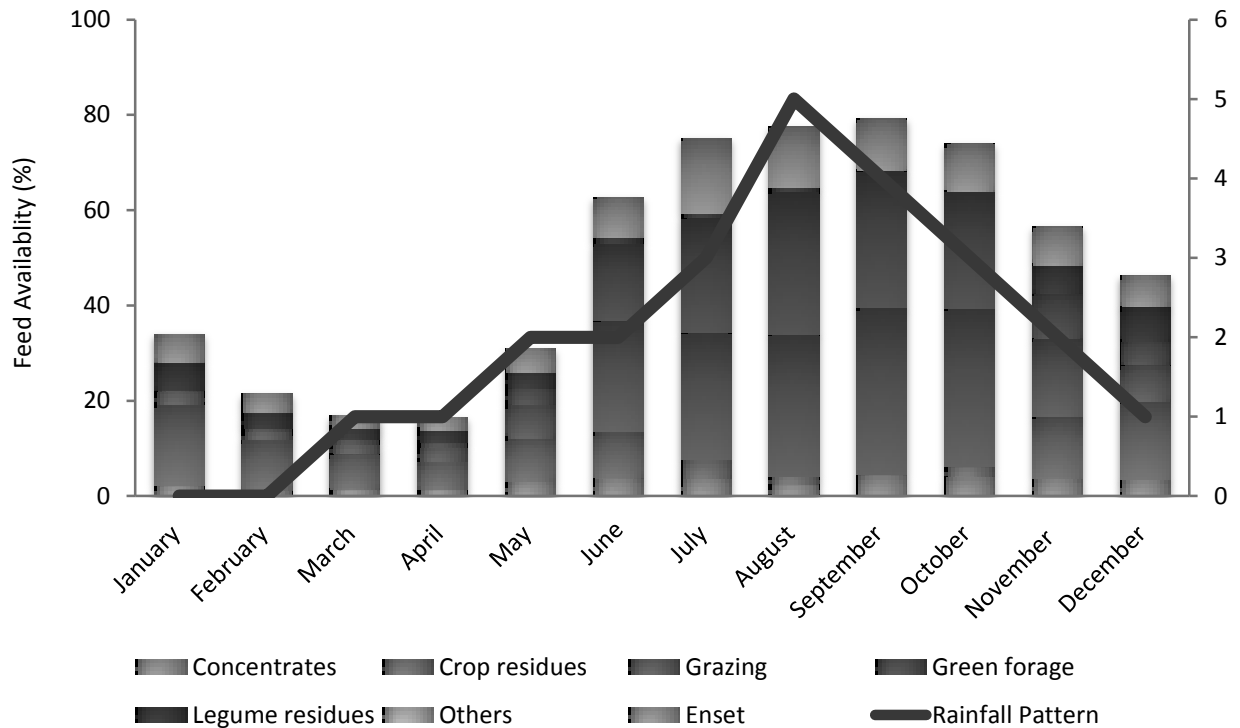


Figure 7: Seasonality of available feed resources in relation to the rainfall pattern in Jawe

## Management of livestock

Animals in most of the households are kept together with human beings, i.e. in the main house. Only few farmers (20%) keep animals in separate houses. Farmers use different styles of feeding, particularly tethering and stall feeding. Use of open grazing is limited as there is shortage of community grazing land. The style of feeding varies from village to village. Farmers in the center of Jawe mainly use tethering and stall feeding and farmers at the border of Jawe have access to open grazing lands. Processing of feeds depends on the type of feed, maize and enset are chopped before feeding. Even though farmers are aware of urea treatment, they do not use it. Some farmers use wheat bran by diluting it and mixing it with different crop residues (wheat, barley and tef).

Farmers get veterinary service from the nearest town, Hossana which is located 10 km away. There is vet technician for the *kebele*, so he cannot reach most of the farmers in the *kebele*. Farmers mostly use private sources due to its ease of access. They believe they get quality and cheap service from government but due to inaccessibility to the service, they seek private veterinary service. More than 60% of farmers use private vet services. The cost of treatment varies with the type of health problem, however, they mostly pay 40 to 100 ETB per head of animal.

Farmers use both bull and AI service to breed their animals. Farmers travel to Hossana town to get both AI service and bull service. AI service has recently been introduced in Jawe, however, majority of the farmers still use local bull services. Cost of AI service is 5 ETB per service; some unethical government workers illegally collect 100 ETB per service, although this problem is being gradually tackled. Cattle usually undergo 2 to 3 repeat services.

## Problems, issues and opportunities

Farmers were asked to list five most important problems that hinder the production and productivity of livestock. Table 2 shows the five important problems with their score and rank. As indicated in the table, the leading problems related to livestock production in the order of importance are water shortage, feed shortage and limited veterinary service.

Table 2: The five most important livestock production problems in Jawe sub-district

Problems identified	Score	Rank
Feed shortage	3	2 <sup>nd</sup>
Cash/credit service	0	5 <sup>th</sup>
Water shortage	4	1 <sup>st</sup>
Lack of improved breeds	1	4 <sup>th</sup>
Limited veterinary service	2	3 <sup>rd</sup>

Farmers mentioned their coping strategies and the possible proposed solutions to the respective problems. The coping strategies and proposed solutions are summarized in Table 3.

Table 3: Summary of farmers coping strategy and proposed solutions to livestock production problems

List of problems	Coping strategies	Proposed solutions
Feed shortage	<ul style="list-style-type: none"> <li>Allocate land for grazing</li> <li>Reserving crop residues</li> <li>Use of food crops (enset)</li> <li>Purchasing feed</li> </ul>	<ul style="list-style-type: none"> <li>Improved supply of improved forage</li> <li>Skill development on livestock feed</li> </ul>
Cash/credit service	<ul style="list-style-type: none"> <li>Cash generating farm activities (poultry, eucalyptus )</li> <li>Retail trading</li> </ul>	<ul style="list-style-type: none"> <li>Improve access to credit service</li> <li>Promote cash generating activities such as horticulture farming</li> </ul>
Water shortage	<ul style="list-style-type: none"> <li>Travelling to distant water points</li> <li>Digging waterhole</li> </ul>	<ul style="list-style-type: none"> <li>Government should construct water structures</li> </ul>
Lack of improved breeds	<ul style="list-style-type: none"> <li>Use of selected local bulls</li> <li>Purchase of better breeds</li> </ul>	<ul style="list-style-type: none"> <li>Improve AI service</li> </ul>
Limited vet service	<ul style="list-style-type: none"> <li>Use of traditional medicine</li> <li>Travelling to distant veterinary service centres</li> </ul>	<ul style="list-style-type: none"> <li>Employing sufficient veterinary technicians</li> <li>Improve supply of drugs</li> </ul>

## Conclusions

Feed problems are mainly attributed to land shortage, lack of improved forage technologies and awareness problem. To improve the production and productivity of livestock, it is important to address livestock related problems. Even though there are a number of problems which hinder livestock productivity, feed problem is critically important and it needs due attention if farmers have to get the expected benefit from livestock. As farmers propose introduction of improved forage technologies together with skill development, these are necessary steps to mitigate feed problems. Desho grass, vetch, oats (weed), tree legumes such as tree lucerne and sesbania which already exist on farmers' fields are potential areas of intervention.

## References

Ellis-Jones, J., Mekonnen, K., Gebreselassie, S. and S. Schulz. 2013. Participatory Community Analysis: Challenges and opportunities identified with local communities. Addis Ababa: CIP and ILRI.

FAOSTAT. 2004. Country time series for Ethiopia. FAO: Rome

Legese, G., Abebe, G., Siegmund-Schultze M. and A. Valle Zárate. 2008. Small ruminant production in two mixed-farming systems of southern Ethiopia: Status and prospects for improvement. *Experimental Agriculture*: 44(3):399-412.