

A Gender Perspective into the Potential for Enhancing Livestock Productivity through Improved Feeding in Dodicha, Adami Tullu District, East Shewa, Ethiopia

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Introduction

Livestock production plays a significant role in the livelihoods of households in rural areas of Ethiopia. The poor performance of the livestock sector in the country has been related to different reasons such large livestock numbers, poor quality of breeds, insufficient amount of good quality feeds and seasonal variation in their availability, poor health of livestock and inadequate health services, inefficient management of livestock, poor infrastructure, poor marketing and credit facilities, inadequate knowledge of integrated mixed farming system and inability of the farmers to exploit this resource due to different priorities. Recent increases in livestock production have mainly been due to expansion of herds and not improvements in productivity (Jahnke, 1982). Thus, tackling this problem through proper and strategic intervention is expected to bring certain improvement to livestock productivity.

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. FEAST differs from conventional feed assessment approaches that focus on the feeds, their nutritive value, and ways to improve it. FEAST broadens this assessment to account for the importance of livestock in local livelihoods, the relative importance of feed problems locally, and the local situation related to labour, input availability, credit, seasonality, and markets. This tool was used to characterize the farming and livestock production system including feed resources and related aspect of small holder farmers in Adami Tullu district of East Shewa zone in Oromia Region, Ethiopia. The feed assessment study was conducted from June 28th to 2 July, 2015. by researchers from Adami Tullu Agricultural Research Center with backstopping from the International Center for Agricultural Research in Dry Areas (ICARDA).

The objective of the study was to establish the perceptions of men and women smallholder farmers to major livestock production challenges, opportunities and possible potential interventions with special emphasis on livestock feed and related aspects, for the improvement of livestock production and productivity in the Adami Tullu district.

Methodology of the study

Study site

Adami Tullu Jido Kombolcha (ATJK) district in East Shewa is a targeted action site of the CRP-Dryland Systems representing intensive rain fed systems in which intensification is the focus. Dodicha peasant association (*kebele*) is located in ATJK, a distance of 10 km from Ziway Town, the administrative center of the District. It lies 10.24°N, 39.44°E at an altitude of 1650 m.a.s.l. Cultivation of crops comprises 29% of the area.. It has a minimum and maximum temperature of 13°C and 29°C respectively and receives average annual rainfall of 760 mm.

Sampling method

Selection of villages

Adami Tullu was selected on the basis of representativeness of the action site and scalability of results to other areas, interest of communities to participate, presence of a national/regional research station in proximity and access to the market. Dodicha was selected on the basis of accessibility.

Selection of participants

Livestock keepers were selected using a criteria based on gender, age and wealth classes according to land holdings.

Survey structure and format

Two tools were used for the survey. The Participatory Rural Appraisal approach was used to conduct two group discussions, each comprising exclusively men or women. A total of 21 men and 16 women participated. The group discussions yielded qualitative data on agricultural production systems and feed resource availability and utilization. Nine farmers from each group were interviewed individually and yielded quantitative data on crops grown, income sources, feed availability and seasonality. The surveys were conducted

Data analysis

Narrative reports collected from individual *men* and *women* group discussions within each *kebele* were initially examined separately, later compared and then reported. Individual interview results were analyzed using the FEAST excel temple (www.ilri.org/feast).

Major findings

Overview of the farming system

The farming system in Dodicha is classified as a maize based mixed crop-livestock production system. Farm land size varies among the households. Depending on the land holding size, farmers in the *kebele* were classified into four classes of landless, small, medium and large (Fig. 1), whereby majority of farmers lie in the medium range of land holding as mentioned by both men and women. The average land holding in the study *kebele* is 2.0 hectare per household. Although different estimates of land size were given by men and women, both groups categorized most farmers as owners of medium-sized land. Farmers reported a decreasing land holding size per family which can be related to increased land fragmentation due to a larger family sizes over the years. The average family size is estimated as 6.

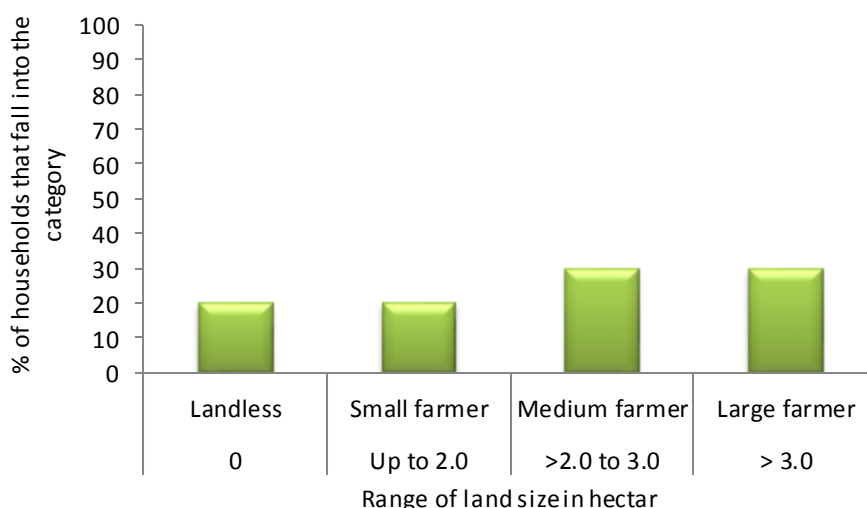


Figure 1a: Women's perception of the proportion of farmers in different ranges of land size in Dodicha *kebele*

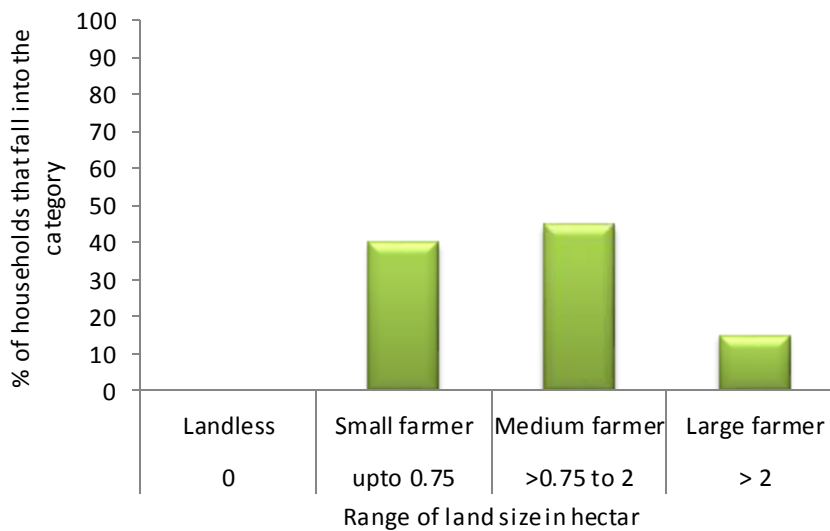


Figure 1b: Men's perception of the proportion of farmers in different ranges of land size in Dodicha *kebele*

Farmers in the study *kebele* indicated that there is only one cropping season namely *kiremt*. The *kiremt* season occurs from May to November. Activities in each cropping season include planting up to harvesting. There is no fallowing practice. Majority of the farming activities are based on rainfall except very few farmers who use minor irrigation from hand-dug wells, Bulbula river and water from the Desta Danbi irrigation scheme. Men estimated that 25% of the households have access to irrigation, whereas women mentioned 48%. Irrigated crops comprise of onion, tomato, maize, cabbage, green paper and green beans. The rainfall pattern over twelve months of the year 2014 was scored by the farmers. The score was given on a scale of 0-5, where 5 = excess, 4 = high, 3 = medium, 2 = low, 1 = very low and 0 = no rain. Table 2 shows that high rainfall occurs between June to August.

Table 1: Rainfall score given by female and male farmers from Dodicha *kebele*

<i>Kebele</i>	Month											
	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Women	0	0	3	3	3	5	5	5	2	1	0	0
Men	0	0	0	1	2	3	5	4	2	1	0	0

Labour is mainly from the family. However, labour shortage is not a problem with regard to the needs for agricultural activity. Migration to other areas in search of education and employment has not affected labour availability. Male daily laborers earn between 40-70 ETB per day. Women earn 40-50 ETB on average. This is because ploughing pays the highest, whereas women do not plough.

Major crops grown in the study areas include maize, tef, barley, wheat, cabbage, and green beans as soon in Fig. 2. Perceptions of men and women were relatively the same although women tended to estimate higher with cabbage, a subsistence vegetable while men tended to estimate higher with the cash crops. Agricultural inputs and materials related to crop production such as seeds and fertilizers are readily available for the farmers to buy.

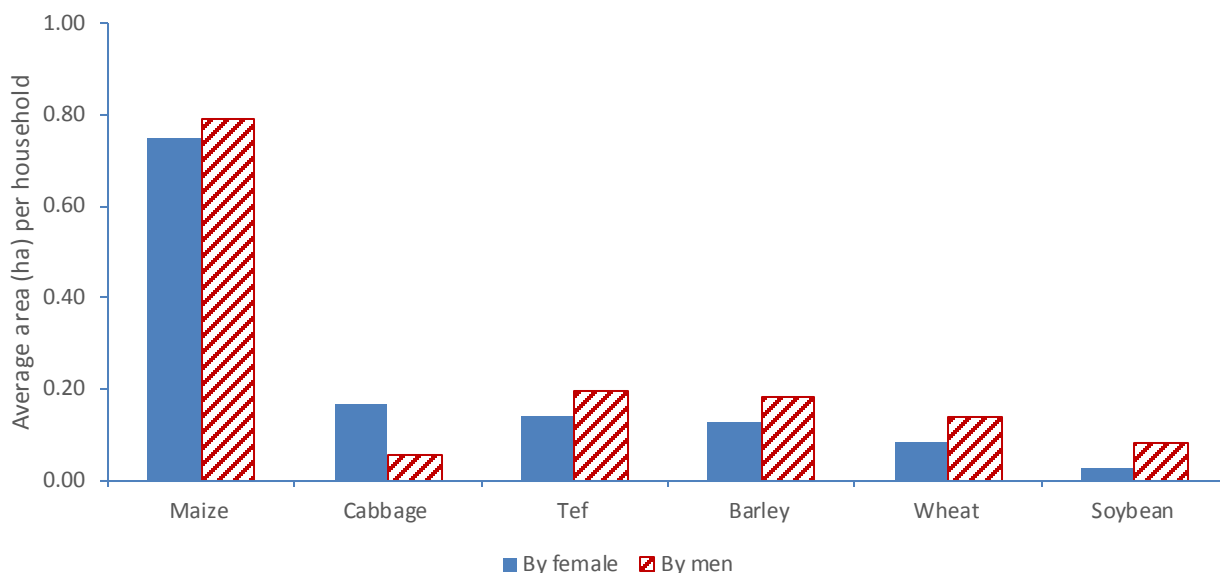


Figure 2: Major crops grown and average area (ha) per household in Dodicha by gender

Livestock Production and Management

Livestock production

Milk and meat production, cash source (from sale of animal and their products), source of manure and source of power for threshing and traction are the main purposes of keeping livestock. Different species of livestock are kept by farmers. Livestock species kept by farmers are shown in Figure 3. Average numbers of a given species and % of households that own the species are indicated in Table 2.

Table 2: Uses of livestock species, percent of HH that own the species and average numbers of animals per household in Dodicha kebele

Livestock species	Bekafa kebele				
	Use	% of HH that own the species		Average number of animal per household	
		Women	Men	Women	Men
Local dairy cow	Milk, butter, cheese, calf crop for sale and manure	71	73	2	2
Improved dairy cows	Milk, butter	17	13		1
Draught cattle	Traction, trashing and manure	78	73	1	2
Sheep	Cash source, meat,	14	13	2	7
Goats	Cash source, meat and manure	72	74	4	20
Poultry-Village	Egg, meat, cash source	71	61	5	10
Horse	Transportation and trashing	7	4	1	1
Donkey	Transportation and trashing	29	43	2	2
Mule	Transportation	1	17	1	2

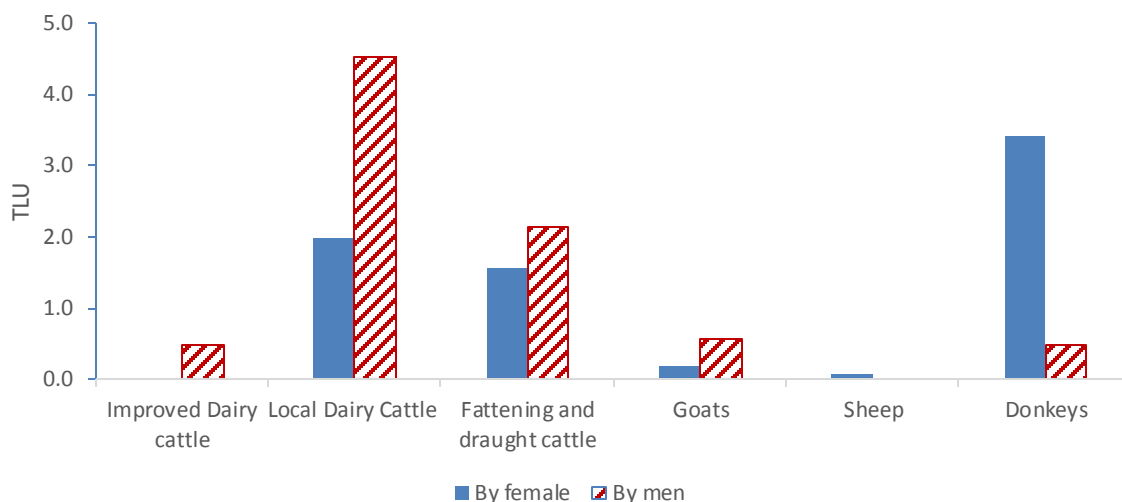


Figure 3: Average livestock species holdings per household in Tropical Livestock Unit (TLU) in Dodicha

Local dairy cattle and oxen for draught are the predominant livestock species as shown in Fig. 3. Men and women, however, seem unable to give different estimates of the numbers. Local dairy cattle, draught oxen, goats and local breeds of poultry are owned by at least 70% of all households (Table 2).

Farmers mentioned at least 3 micro-finance institutions from which they can obtain credit facilities, however only 30% of men and 50% of women indicated that they have taken credit or aspired to take credit in the last two years. It is relatively easy to access credit so long as the stringent rules and regulations are met. These include credit offered only to groups, wife and husband cannot obtain credit separately, collateral such as land, assets (type, number and colour of livestock are critical).

Farmers sell crop products, livestock and their products and services to get income. The contribution of different income sources in the *kebele* as perceived by women and men is shown in Figure 4 below. Crop production in form of cash crops (wheat, barley, tef), food crops (onion, cabbage, onion, green beans, pepper grown mainly by irrigation) is the dominant source of income. Milk and milk products from cattle and goat as well as sales of live goats are common income sources from livestock. Labour services are a major source of income for men. Credit and trading are major income sources for women.

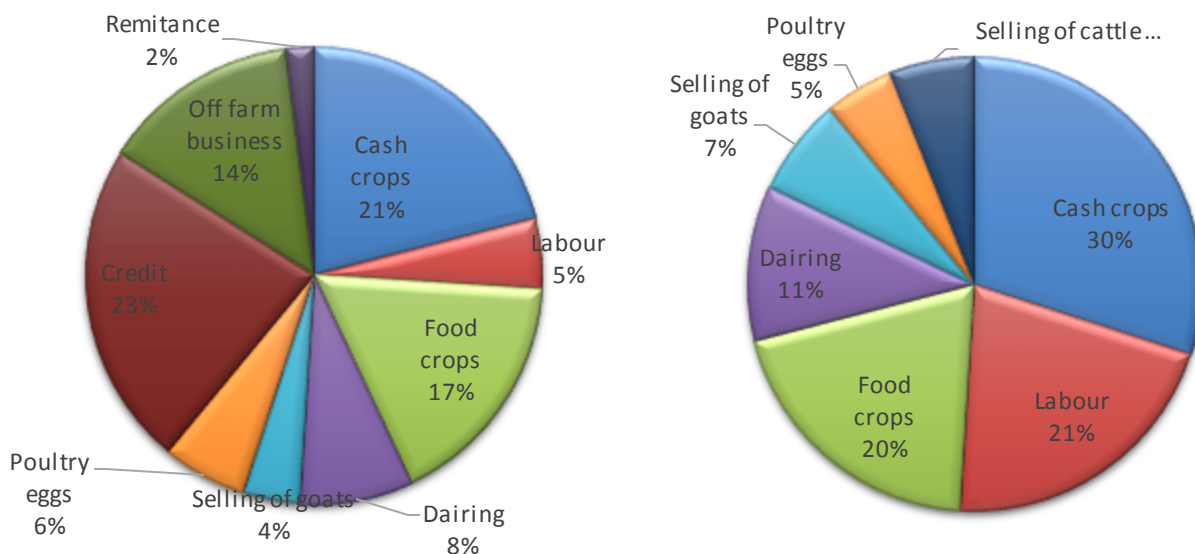


Figure 4: Contribution of livelihood activities to household income (%) in Dodicha *kebele* as perceived by women (left) and men (right)

Management of livestock species

Livestock housing

Structures built from local materials are used to house livestock. Most livestock are housed in separate partitions within dwelling houses, small stock, calves and large animals are all housed separately. There are no feeding troughs.

Feeds and feeding

Style of feeding varies depending on season. Combination of stall feeding and tethering are common during cropping season when most farm lands are covered by food crops. There is also a practice of open grazing during dry period after crop harvest. Major feed resources include crop residues from cereal straws and maize stover, natural grass (fresh cut), grazing, different natural browses. Purchased feeds are shown in Fig. 5. Men mentioned the purchase of concentrated especially for transport animals. Farmers are accustomed to mixing straw with bran, bole, and water to feed lactating dairy cow and transport animals. The only form of processing is chopping. Feed shortage is one of the major impediments for improved livestock production. Availability and quality of feeds varies along different seasons.

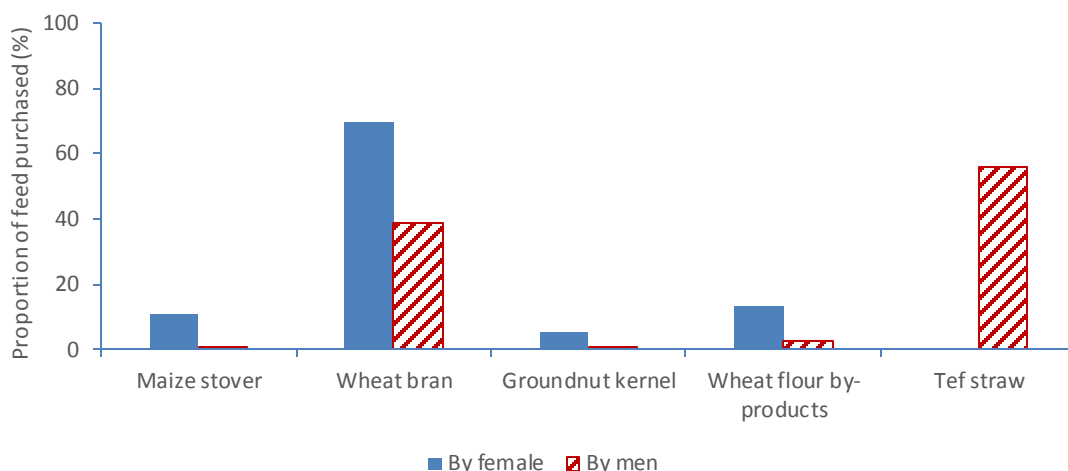
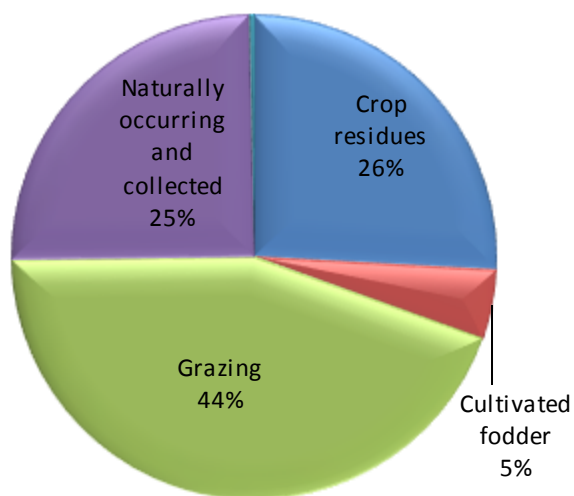


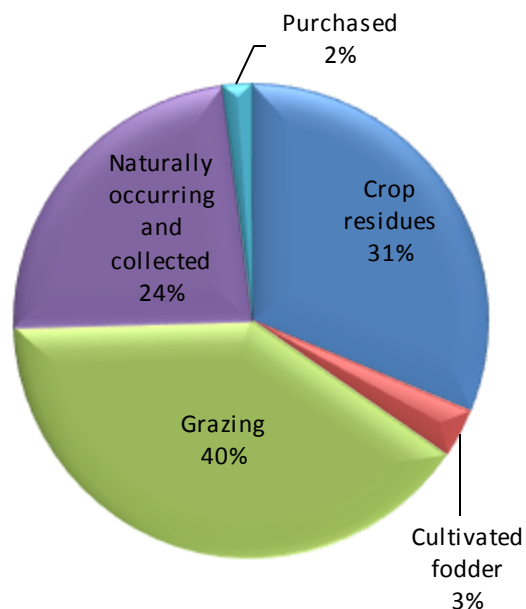
Figure 5: Quantity of feed purchased over a 12 months period in Dodicha *kebele*

Besides the shortage of feed supply, quality problem is also a critical challenge for improved productivity of livestock. Livestock in the area depends on the existing poor quality feed sources to satisfy their dry matter (DM), metabolisable energy (ME) and crude protein (CP) requirements. Dietary contribution of each feed sources in the two areas have been indicated in Figure 6 below. Crop residues, naturally occurring fodder and grazing are the main sources of dry matter, metabolisable energy (ME) and protein of the total diet of livestock.

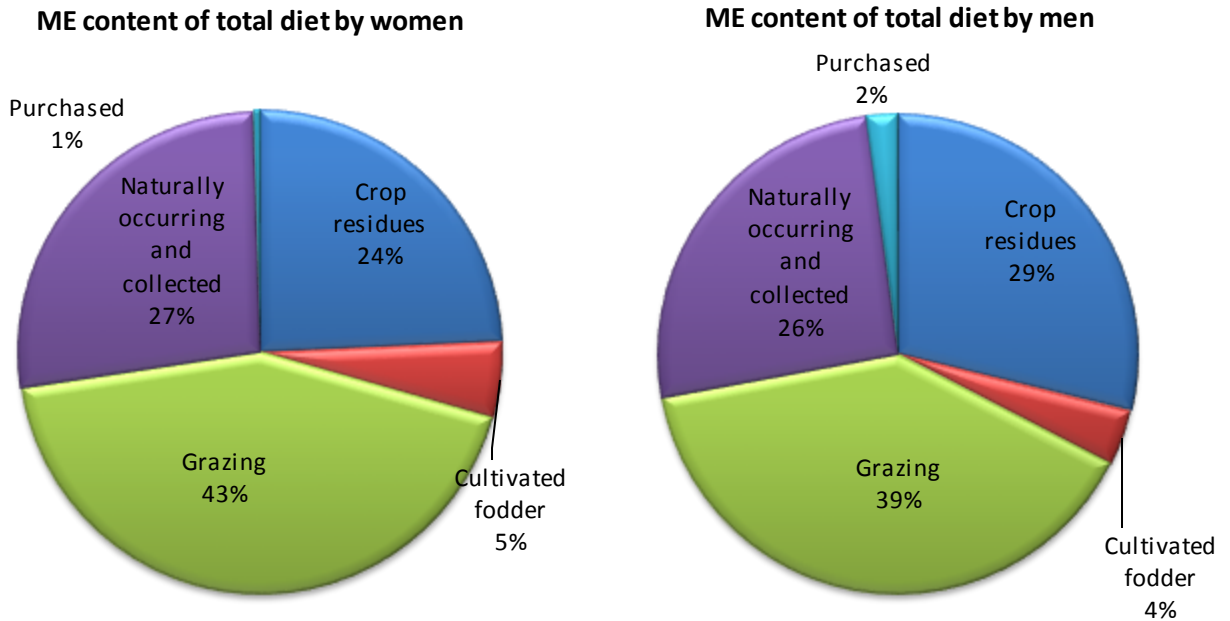
DM content of total diet by women



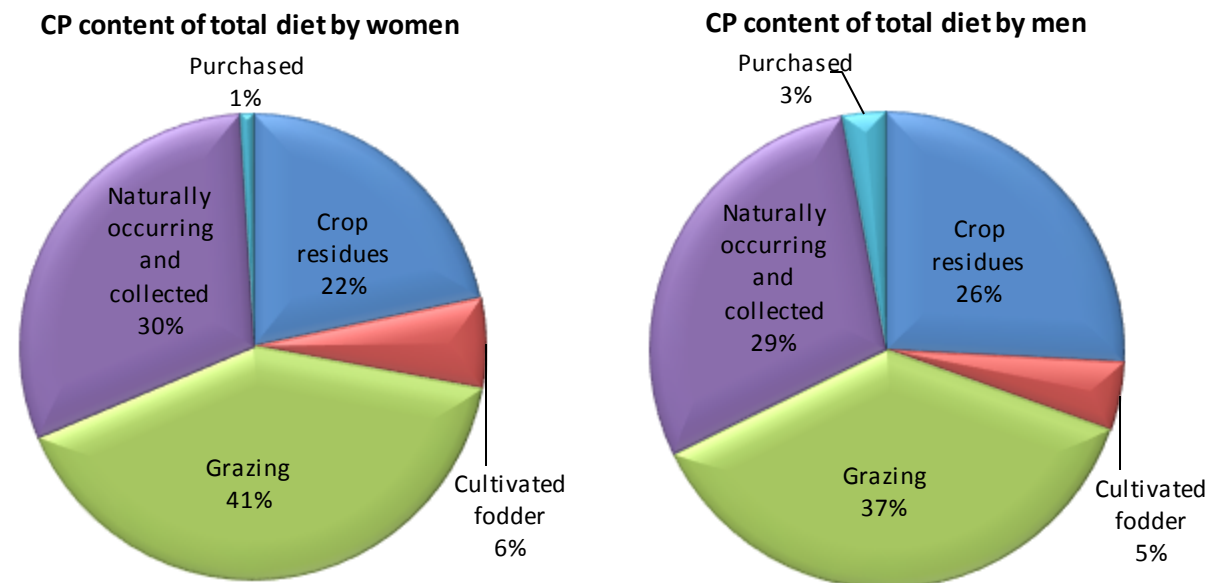
DM content of total diet by men



a. Perceptions of dry matter content of total diet



b. Perceptions of the metabolisable content of total diet



c. Perceptions of the crude protein content of total diet by women

Figure 6: Dietary compositions of DM (a), ME (b) and CP (c) of the total diet of feeds in Dodicha kebele

There is a consensus by men and women that there are only 3 predominant sources of feed namely grazing, naturally occurring and collected fodder and crop residues in that order.

Livestock health management

Common health problems include tapeworm infestation, foot and mouth disease, bloating, blackleg, anthrax, pasteurellosis, lumpy skin disease. However, farmers travel up to 3km to the veterinary clinic. Service for treatment and vaccinations vary between ETB 50-150, depending on the disease or ailment. Traditional is only used to treat bloating. Honey is used.

Breeding management

Farmers stated that there is shortage of improved livestock breed specially that of cattle. During the group discussion, farmers expressed their great interest to replace local low producing breeds of cattle with improved one if they would get proper breed improvement service (which currently is very poor). Both artificial insemination and bull services are not readily available in the *kebele*. Bull service is endangered due to use of bulls for draught. Artificial insemination is not popular because of the low rates of conception. There are usually up to three repeat services.

Problems, Issues and Opportunities within the Livestock System

Major problems faced by farmers in the *kebele* with reference to livestock production include feed shortage, improved breed shortage, low rainfall and poor animal health service. Farmers take different measures as a coping mechanism for some of the existing problems. Main problems, coping mechanisms and suggested solution for each study site have been listed in Table 4.

Table 3: Problems, coping mechanisms and suggested solutions in Dodicha *kebele* by women and men.

Problems	Ranking		Suggested solution and coping mechanisms by farmers	
	Women	Men	Women	Men
Feed shortage	3	1	<ul style="list-style-type: none">On-farm production of feedsImproving palatability of crop residues	<ul style="list-style-type: none">Use of crop residuesConservation of crop residuesAllocating grazing land from croplandsAllocating land for forage production
Shortage of bulls		2		<ul style="list-style-type: none">Artificial inseminationUse of other farmer's bulls as a coping strategy
Low rainfall		3		<ul style="list-style-type: none">Prayer
Disease infestation	4	4	<ul style="list-style-type: none">No solution	<ul style="list-style-type: none">Vaccinations
Lack of capital	1		<ul style="list-style-type: none">Acquiring improved breeds on credit	
Shortage of improved breeds	2		<ul style="list-style-type: none">Artificial insemination	

Potential Interventions

Crop production is the main source of income in Dodicha. However, the sale of milk and milk products from cattle and goats has potential to increase incomes of the farmers. Limitations due to feed shortage, diseases

and low performing breeds seem to hamper productivity of the livestock. Men are particularly interested in the improvement of bulls, while women are more interested in dairying from cattle and goats. Crop residues and grazing are the main feed resources. Improving the quality of crop residues is paramount to address the problem of feed shortage in the near term. Planting of forages may not be as practical because of the trade-offs with crop production. Interventions targeting livestock productivity must aim at integrating both feed availability and quality, health issues and improvement of breeds in sustainable ways.

Conclusion and Recommendation

Both men and women are willing to accept change if they are equipped with technical and financial support. Appropriate crop residue technologies that fit the agro-ecologies and existing farming system need to be introduced to the area with the objective of improving feed availability and quality. ICARDA through the CRP Dryland Systems project of ESA seeks to approach crop residue quality by identifying cultivars and varieties of cereals and legumes in Adama Tullu that have superior traits of both food and feed and incorporating these into the feed rations for fattening bucks, which are eventually sold on the market. The community based breeding programme targeting selection of bucks for breed improvement will aim at improving breed productivity of small ruminants especially goats. It can be concluded that sustainable change can be brought about if different development and research organizations and concerned stakeholders intervene towards tackling the problems in line with suggestion given by farmers. It is imperative that both men and women participate in discussions and assessments in equal measures as their preferences and perceived solutions tend to vary.

Acknowledgements

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