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Analysis of sheep value chains in Doyogena, southern Ethiopia

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Acronyms

BoA	Bureau of Agriculture
CSA	Central Statistical Agency
DA	Development agent
ETB	Ethiopian Birr
FGD	Focus group discussion
Ha	Hectare
HAB	Household asset building
ICARDA	International Center for Agricultural Research in Dry Land Areas
ILRI	International Livestock Research Institute
masl	meters above sea level
mm	millimeter
NGO	Non-governmental organization
ORTDP	Operational Research Technology Dissemination Project
PSNP	Productive Safety Net Program
qt	quintal
SMS	Subject matter specialist
SNNPR	Southern Nation, Nationalities, and Peoples' region
VCA	Value chain analysis

Foreword and acknowledgements

In mid-2012, stakeholder discussions and planning for the Livestock and Fish small ruminant value chain development project were initiated by the International Center for Agricultural Research in the Dry Areas (ICARDA), the International Livestock Research Institute (ILRI) and national partners.

After selecting eight research sites meeting various criteria, the first step was to conduct rapid value chain assessments in each site. In November 2012, national teams were formed and trained to carry out these assessments (including for the associated 'safe food fair food' project). Field implementation of the rapid value chain analysis took place in December 2012 and January 2013 with mixed teams comprising staff from CGIAR and national organizations. The teams used a toolkit developed through the Program and undertook focus group discussions with farmers using checklists and participatory methods as well as key informant interviews with local experts, traders, butchers, livestock researchers, transporters, veterinarians and NGOs.

The preliminary reports from these assessments were reviewed at three multi-stakeholder workshops held in March and April 2013. In these workshops, participants from research and development partners validated the value chain analysis and formulated initial 'best bet' intervention plans for each of the sites.

These activities are documented at http://livestockfish.cgiar.org/category/countries/ethiopia/

The following people contributed to this process

- Barbara Rischkowsky ICARDA
- Jane Wamatu ICARDA
- Halima Hassen ICARDA
- Aden Aw-Hassan ICARDA
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Introduction

Livestock development is an integral and important component of the agricultural sector in Ethiopia. In terms of priority, livestock is the second most important commodity next to crop production, but it is also the most overlooked commodity. Although Ethiopia has the largest population of livestock in Africa, its productivity both per capita and total is the lowest on the continent, and this is the main reason for its very small (18%) contribution to national GDP (FAOSTAT, 2004). Livestock also provide wide and year-round employment opportunities for surplus family labour in rural Ethiopia (MEDaC, 1999). Cash income from livestock production is especially important for the poor and landless Ethiopian households, particularly women, as is the case in many other developing countries (Delgado et al., 1999).

The population of small ruminants in Ethiopia, including expert estimates of the pastoral areas, is about 66 million heads, of which an estimated 35 million are sheep (Negassa et al., 2011). In Ethiopia, sheep are the second most important species of livestock, with diverse breeds that are distributed in varying ecotypes from the cool alpine climate of the mountains to the arid pastoral areas of the lowlands. Altogether, there are nine breeds of sheep in the country that have been characterized using phenotypic and molecular measures (Gizaw et al., 2007). About 99.6% of the total sheep populations of Ethiopia are indigenous breeds (CSA, 2008) which are owned and managed by resource-poor smallholder farmers and pastoralists under traditional and extensive production systems. These herds provide nearly 46% of the national meat that is consumed and 58% of the value of hide and skin production (Awgichew et al., 1991). For most smallholder farmers, the sheep also have many advantages over larger ruminants, such as: lower feed costs, quicker turnover, easy management and size at slaughter (Wilson, 1991; Abegaz, 2002; Donkin, 2005). They also suffer less mortality during drought compared to larger ruminants (Galal, 1983; Wilson, 1991) which is another important reason why subsistence farmers prefer them — the risk of larger ruminants dying and leaving them with nothing is too great (Sölkner et al., 1998).

Market-oriented or commercial production is almost non-existent. Thus, the level of productivity in sheep rearing in the country is generally low. For instance, the average carcass weight per slaughtered animal for the period 2000–2007 was about 10 kg (FAO, 2009). On the other hand, there is huge demand for live sheep in addition to sheep meat in the Gulf countries. At the same time, the demand and prices for sheep are increasing locally, due to increased urbanization and increased income. According to the Ethiopian Institute of Biodiversity Conservation (IBC, 2004), the increasing demand for sheep is especially pressing given that the population of the country is expected to rise to about 129 million by 2030. Nevertheless, the present production of sheep is unable to satisfy the growing demand of the export abattoirs for the required export-quality slaughter animals. Since production is not market-oriented, supply is also inconsistent. Currently, it is reported that the export abattoirs are operating at 56% of their operational capacities (Negasa and Jabar, 2008).

The current performance of the livestock sector in the country is mainly due to the high number of animals; insufficient amount of good quality and quantity feed as well as seasonal variations in its availability; and animals infected by diseases and parasites combined with a lack of adequate health services. In addition, poor infrastructure, poor marketing and credit facilities, inadequate knowledge of integrated mixed farming systems and farmers' inability to exploit this resource are

among the many factors contributing to the low productivity potential of existing livestock populations. Feed scarcity is often cited as the primary constraint to livestock productivity in crop–livestock mixed farming systems (Legese, et al, 2008; Gebremedhin, 2006). There are a number of factors affecting the low availability of animal feed, including: the degradation of grazing land, invasion of noxious range weeds, crop encroachment, poor adoption of improved forage production, mismanagement of available feed resources and frequent droughts. In general, the shortage of feed and its low quality are the major bottlenecks for livestock production in Ethiopia and, in particular, the Doyogena district where this sheep value chain analysis was carried out.

This study

This study contributes to the Ethiopian small ruminant value chain development project of the CGIAR Research Program (CRP) on Livestock and Fish. It is being implemented in eight target districts throughout the country. For each site a team was formed to conduct a rapid value chain analysis (VCA) using a toolkit developed by an ICARDA-ILRI team and researchers from the partner centers (http://livestock-fish.wikispaces.com/VCD+Ethiopia). In addition to the site reports, the national team prepared a synthesis report incorporating the findings from all eight sites (http://livestockfish.cgiar.org/focus/ethiopia/). The synthesis report also includes the conceptual framework and describes the general methodology applied for the rapid value chain analysis.

Objectives

A major objective of the study was to characterize the sheep value chain in order to identify proper interventions that could improve the efficiency and effectiveness of marketing sheep. Specific objectives were:

- to identify the natural, technical, financial, legal and institutional opportunities and barriers that influence the sheep value chain
- to evaluate whether improvements can be made by improving systems from production through to the final consumer
- to document important elements and market strategies to develop the sheep value chain
- to suggest key interventions for the development of practitioners and policies

Study area

Doyogena district is located in Kembata Tembaro Zone in the Southern Nation, Nationalities, and Peoples' region. It is bordered on the south by Kacha Birra; on the west and north sides by the Hadiya Zone; and on east side by Angacha district.

The altitude of Doyogena is 1900–2300 meters above sea level (masl) and the agroecologies of the district are classified as mid-land (30%) and highland (70%). Annual rainfall is 1200–1600 mm and the mean temperature varies 10–16°C (Bureau of Agriculture (BoA), 2012). Within the district there are 14 farmers' associations covering 17,263.59 hectares (ha) of land. Of this, 86% is used for cultivating crops, 11.8% contains forest and bushes, 2% is used for grazing, and 0.2% comprises degraded land. The district has livestock populations of cattle (46,703), sheep (13,822), goats (1,444), horses (6,343) and poultry (27,253) (BoA, 2012).

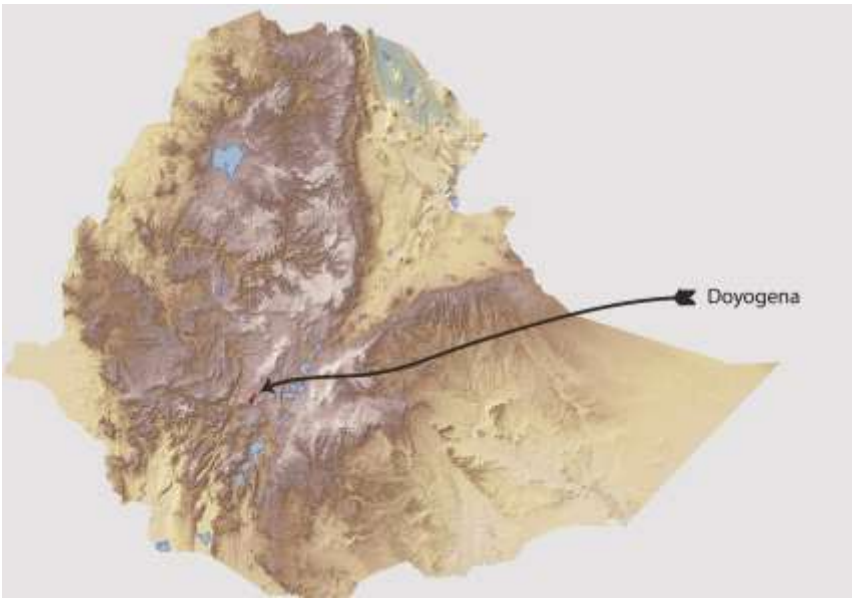

Figure 1: Location of Angacha (Doyogena) district

In the study Kebeles, the maximum, minimum and average-sized landholdings per household were 3.5 ha, 0.25 ha and 0.75 ha respectively, with an average family size of 5 members. The major crops produced in the area include ensete, faba bean, potato and wheat. Farmers also rear different types of animals, including cattle, sheep, goats, horses and poultry. As mentioned by farmers in the study, about 60% of household income is from crop production while 40% comes from livestock production. Within the 40% income from livestock, 30% comes from small ruminants and 10% from other species.

The district is newly established and it is not yet possible to get a new map of the area. Figure 1 shows the location of the old Angacha new Doyogena districts.

Data collection and analysis

Secondary information was collected from district agricultural offices and livestock market agents. In addition, relevant literature and documentation were consulted to provide technical background and to develop a basic understanding of how sheep production systems operate in the study areas. Participatory Rural Appraisal (PRA) tools, Focus Group Discussions (FGDs), key-informant interviews and visual observations were all used to collect primary data. Checklists were used for each different group of actors to guide group discussions and key-informants interviews. The field data collection and report writing was undertaken from July 2012 to February 2013.

Secondary data was collected from previous similar research reports, literature, Central Statistical Agency (CSA) reports, district reports and websites.

A team of researchers from different disciplines held focus group discussions with two sets of 20 sheep owners from two kebeles of Doyogena district. Each group comprised 5 male and 5 female farmers. A subsequent discussion on sheep marketing was held with a group of traders, ranging from collectors to large-scale operatives. District agricultural experts also played an important role in identifying the groups of sheep owners and traders to take part in this study.

Key informants were identified from institutions directly or indirectly involved in the sheep value chain. They comprised experts from agricultural offices and unions, butchers, hotel managers and veterinarians. A total of 40 key informants were interviewed as part of the field data collection.

To cross-check the information obtained from different sources, observations were made of sheep marketing transactions as well as facilities of veterinary service centers and other service providers.

The data collected from different sources was analyzed using a thematic analysis approach and Excel software. Quantitative data were analyzed using descriptive statistical analysis techniques to calculate costs and margins along the value chains.

Results: Core functions in the sheep value chain

The core functions in the sheep value chain of the study area included: input supply, production, marketing, processing and consumption. Different activities were performed by the different core functions, the details of which are described below in Figure 2.

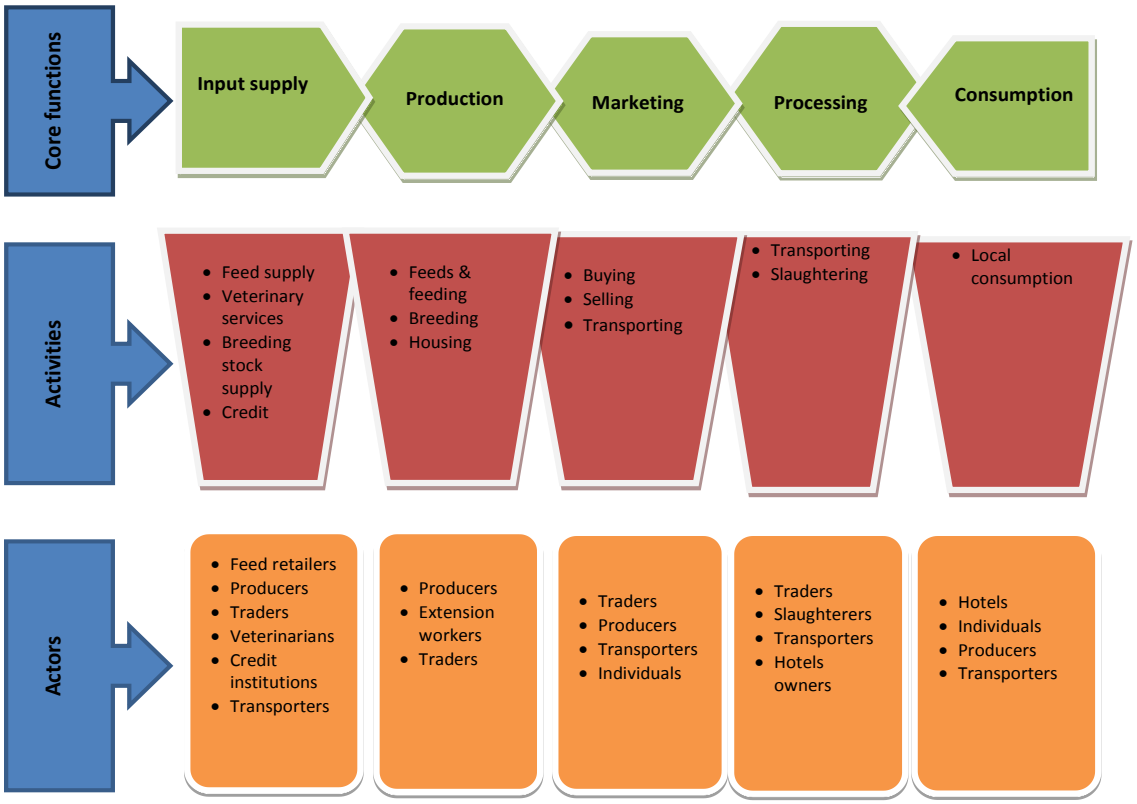

Figure 2: The five core functions, activities and actors of the sheep value chain in Doyogena

Input supply

Farmers have access to feed, breeding and veterinary inputs. They get feed mainly from their own sources and little from private and public sources. These consist of industrial byproducts from shops in Doyogena town and improved forage such as desho grass and elephant grass. Breeding stock comes from farmers' own herds, traders and other farmers in the local market. Farmers get veterinary services from either public or private veterinary service centers. Detailed information on input supply is presented in Table 1.

Table 1: Main supplier of inputs/services for small ruminant production in Doyogena district

	Availability	Proximity (hours walking)	Supplier (source) 1=farmer, 2=government, 3= co-op, 4= traders, 5=private	Proportion farmers receiving from this source*
Feed	Yes	1	1, 4	50%
Breeding stock	Yes	1	1, 4	100%
Credit	No	-	-	-
Veterinary service	Yes	1–1.5	2	100%
			5	50%

*% of farmers out of the total number accessing these services

Feed supply

Feed is the major input that has the greatest impact on the productivity of sheep in the area. The major feed suppliers include flour processing plants (such as the Hosana flour processing factory supplying wheat bran, wheat middling and mixed concentrate feed), traders and retailers (supplying wheat bran, wheat middling and oilseed cake) and public institutions like the BoA, research organizations and NGOs (supplying improved forage seeds and planting materials). There is also a supply of local brewery byproducts.

Wheat bran and wheat middling. Both wheat bran and wheat middling are the two major byproducts of flour milling factories. Wheat bran is the most preferred and is widely used as supplementary feed for livestock, especially for dairy cows and for fattening sheep and cattle. Wheat middling, in most cases, is used as feed for horses, sheep and draught animals. Wheat bran is more palatable for the animals and is well known for its laxative characteristics because of its water-holding capacity, compared to wheat middling. The selling price of these two feed ingredients differs according to customer preference: wheat bran and wheat middling is sold for 300 Ethiopian Birr (ETB)/quintal (qt) and 240 ETB/qt respectively at times of high demand (January and February) and 210 ETB/qt and 190 ETB/qt respectively during months of low demand (June to September). With regard to supply, wheat middling is more available as it is a major milling byproduct of the Doyogena flour processing plant. Farmers and other customers in the district obtain wheat bran from traders and retailers who purchase the wheat bran from the Hosana flour processing factory.

Oilseed cake (noug seed and cottonseed cake). The seed cake supplied by traders in the area comes from Addis Ababa and Adama. By proportion, 60% of oilseed cake comes from Adama and the remainder comes from Addis Ababa. This feed is used mainly by dairy producers in Doyogena town; very few farmers use oilseed cake for feeding sheep (the farmers mix it with wheat bran to fatten the sheep). Like that of wheat bran and middling, the selling price of noug seed cake varies depending on the season. It is sold for 1,000 ETB/qt and 600–800 ETB/qt in the dry season and wet season respectively.

Improved forage seeds and planting material. Improved forage seeds and planting materials have been provided by government organizations such as BoA and agricultural research institutions as well as by NGOs. But it is not enough to satisfy the demand for improved forage from farmers and so is limited to only a small number of them. Though there is a shortage of land and little awareness among farmers, with the right inputs some are interested in developing improved forages with other food crops as well as in building soil and water conservation structures. But still the provision of improved forage seeds and planting material is very limited. In the area studied,

the marketing of forage seed and other feed sources was also limited. As a result, there was no practice of producing, collecting and conserving improved forage seeds in the district.

Discussions were planned with the major feed suppliers of the district, but at the time there was only one feed trader and no retailers supplying feed direct to customers. Instead, the Doyogena flour processing factory supplies wholesale wheat bran and middling which traders and retailers then sell to different customers across different kebeles of the district, including dairy producers, cart-animal owners (i.e. donkeys and horses) and farmers (i.e. cattle and sheep).
In this value chain, retailers are the major customer of traders and farmers the main buyers from retailers. Each stated that they sold feed items on a credit basis if their customers could not pay immediately due to financial problems, but also explained that there is no formal service for obtaining credit for the purpose of feed buying and selling.

Suppliers sell feed in different sizes and units (i.e. 50 kg and 100 kg bags depending on the customer's preference). Feed producers at the flour processing plant sell feed from their own warehouse whereas traders and retailers sell feed in their own shops.

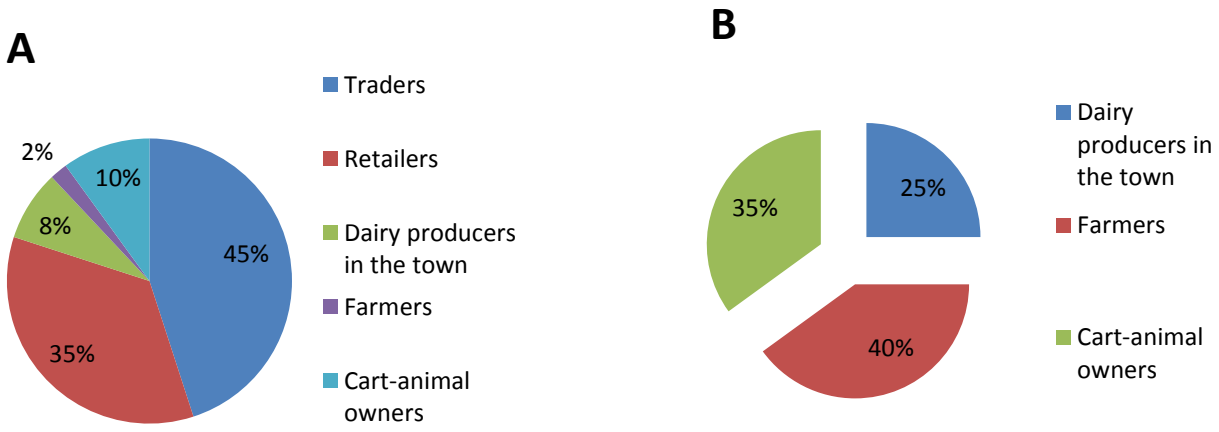

Figure 3: (A) Proportion (%) of feed bought by different customers from feed producers; and (B) Proportion (%) of buyers who purchase industrial byproducts from trades and retailers

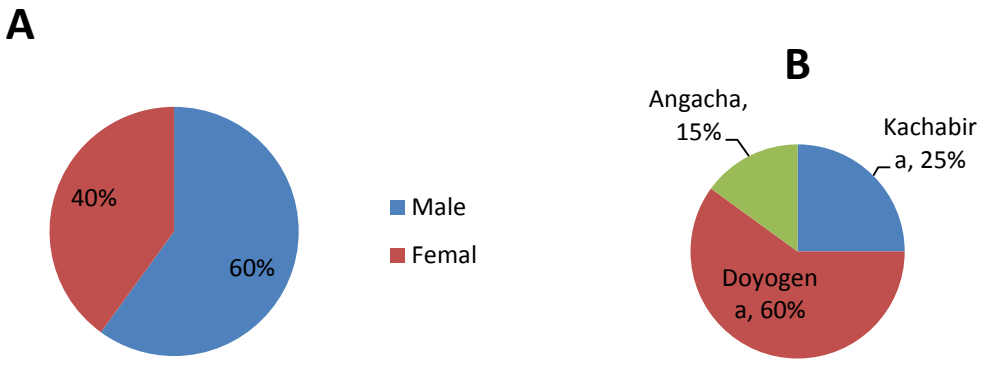

Figure 4: (A) Proportion (%) buyers by sex and (B) Proportion (%) of customers coming from different districts

Based on the explanation of feed suppliers, their customers are from the districts of: Doyogena, Angacha and Kachabira (Figure 4B).

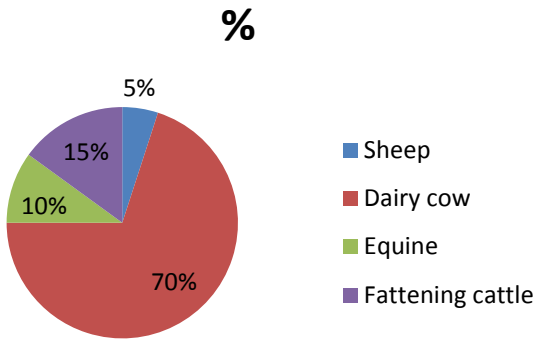

Figure 5: Proportion (%) of farmers buying feed for different types of animals

Seasonality of feed supply and demand. Supply is almost constant throughout the year as the flour processing plants are always producing wheat flour. Sometimes, when there is a scarcity of wheat supply (mostly during the wet season when there is no production), supply may be lower than in the dry season when wheat production and supply are both high. But this gap is not significant enough to influence the supply of industrial byproducts to customers; which means that, as long as there are buyers, there's no supply gap. However, customer demand follows the same seasonal variation: there is higher demand during the dry season and lower demand during the wet season. At times of low demand, suppliers — especially producers — respond by reducing their prices to encourage customers to buy.

Table 2: Seasonality of feed demand and supply (feed calendar)

Types of traded feeds	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Months of high demand												
*Wheat bran & middling**	3	3	3	3	2	1	1	1	1	2	2	2
Months of high supply												
*Wheat bran & middling***	3	3	3	3	3	2	2	2	3	3	3	3

* 3 = high demand, 2 = medium demand, 1 = low demand
** 3 = Very good supply, 2 = medium or good supply, 1 = low supply

Price trends: The trend of lowering prices at times of low demand is growing in popularity today. At the same time, livestock producers have become more aware of the availability and benefits of providing feed supplements for their animals. In previous years, when producers did not provide industrial byproducts for their animals, it took much longer to fatten them. But nowadays, almost all farmers who feed their animals for the purposes of fattening have adopted the use of supplementary feeds. However, the cost of producing feed does mean that prices fluctuate from time to time.
To overcome this, the supply of inputs can be improved through the use of advanced production technology. Livestock owners themselves can also help by producing better forages, which have been shown to have higher dry matter production levels and better nutritional value.

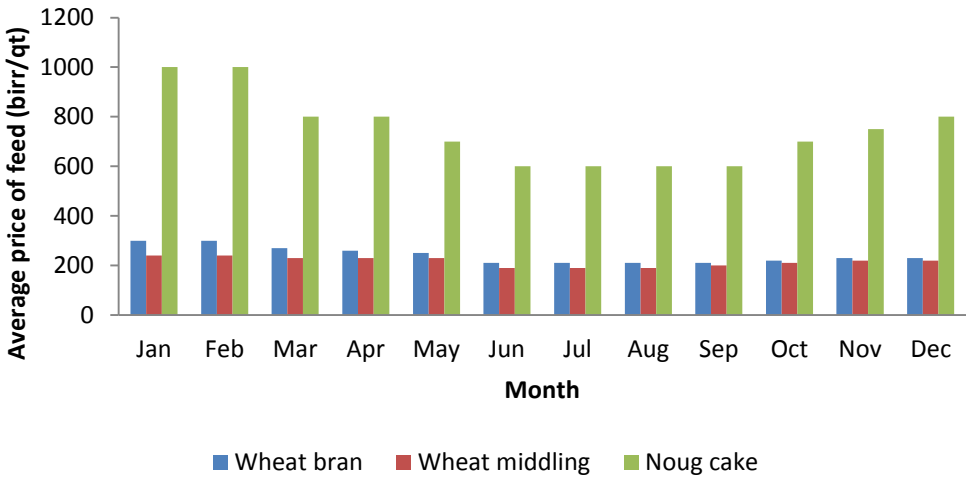

Figure 6: Price variations of industrial byproducts in different months

Feed quality assessment method. Feed buyers and sellers have their own way of assessing the quality of agroindustrial byproducts (wheat bran and oilseed cake) and use their own unique methods to assess the quality of different feeds. The quality of wheat bran and seedcakes, for example, is assessed by observing, touching and smelling the products. This is because there are no formal rules or regulations that set the standard for quality control. Customers, too, roughly classify these feeds as 'poor' to 'good quality' based on their personal quality assessment methods.

Problems with quality, in most cases, have resulted from poor storage and the duration of storage; noug seed cake is especially sensitive to deterioration if it's stored for a long time. To overcome this, producers and traders try to sell their produce to customers as soon as possible by informing them as and when the feed types are available in their shops.

Rules and regulations. All feed suppliers (producers, traders and retailers) said that there were no rules or regulations they knew of which either promoted or impeded their work. But they asked that the government provide opportunities for them to organize themselves into cooperatives and to secure appropriate credit.

Veterinary services

Farmers in the study area have access to veterinary services, but it is far from the majority of the community as one veterinary service centre serves at least three to four surrounding rural kebeles. One kebele contains 500–800 households.

Farmers' responses during the focus group discussion suggest that livestock are not exposed to any serious diseases in Serara Kebele. Major livestock diseases in the district include ovine pasteurellosis, pneumonia, black leg, foot and mouth disease, mastitis, anthrax, fasiolosis and taenia saginata (as stated by district animal health expert). The majority of time farmers bring in their animals for cases of pasteurellosis. There are also feed-related disorders when sheep overeat on grain residue or potatoes. Toxic weeds, known locally as 'sodonekela', similarly cause feed-related disorders.

Public veterinary services

In the public domain there is one clinic and six health posts in the district. The public vet clinic is located, on average, 1–1.5 hours walk for farmers from target kebeles, while the six health posts are found in the rural kebeles. In general, farmers need to walk around 40 minutes to reach the health posts. The public vet service provides technical advice, disease diagnosis and treatment, and farmers reported that they use mostly the public vet service because it is less expensive than private vet services. However, they also said that it does not always provide a satisfactory service because it faces drug shortages at times.

Doyogena district purchases drugs from importers in Addis Ababa. But there is no renewable fund for this and the budget is not always sufficient to purchase and provide all the drugs required. When a specific drug is not available from the public animal health providers, farmers are forced to buy drugs from private pharmacies. However, the farmers do not trust the private pharmacies because they are fearful of low quality (e.g. insufficient doses; expired drugs) and high prices. Farmers get around this by giving their money to animal health workers to buy appropriate quality drugs for them.

Private veterinary service

In the private sector there are three pharmacies (two of which work through delegation) and one clinic which are located in the district town. As indicated by private veterinary service providers, most farmers are satisfied by the service they receive. This is because, in most cases, the drugs demanded by customers are available in the private drug shop. Moreover, treatment given by the private veterinary clinic is effective in that treated animals recover easily from the diseases they are suffering from. A number of farmers are attending for cases of pasteurellosis and pneumonia and also to purchase anthelmintics to deworm their fattening sheep.

These private veterinary service providers, in addition to treating sick animals and selling drugs, provide technical advice for their customers. For example, the key informant Ato Tessema Abo, is providing both services. Advice includes how, when and which class of animals to deworm, the timing of bringing animals that are sick or suspected to be sick, avoiding buying drugs from informal drug sellers, and advice on the proper management of animals. According to Ato Tessema, his customers have confidence in his vet clinic service and drugs, whereas they do not trust private drug sellers as they may provide expired and ineffective drugs. Unlike Ato Tessema, these others only provide drugs rather than a full clinical service. This is because they lack the clinical equipment and technical capacity to supply a proper clinical service. These private veterinary service providers need to improve their technical skills and knowledge through experience sharing. But there is no capacity for this. These private veterinary service providers get their drugs from legally recognized drug distributers in Addis Ababa.

Licensing for both private pharmacies and veterinary clinics is provided by the regional agricultural bureau (which was provided previously by the zonal agricultural office). Though the mandate to control private veterinary service providers is the zone agricultural office, the district office of agriculture is now taking control of this. In previous years, there was felt to be a conflict of interest in this control by the government. But after understanding the rules and regulations, this view has changed. The requirement to gain a legal license to practice is to agree to professional standards and to agree to be governed by the relevant rules and regulations.

Informal vet drug business

There are informal vet drug-sellers who sell drugs on the open market that are often poor and expired. This phenomenon has had a negative impact both on the work of formal private vet service providers and on the health of animals. Due to the presence of informal drug sellers, customers lose trust and confidence in the private veterinary service. Improper instruction in drug used and the supply of expired drugs can result in abortion and other drug-related disorders in animals. The source of drugs for those illegal drug sellers is the contraband trade from Moyale and Addis Ababa where drugs are smuggled with other commodities. The mandate to control these illegal drug-sellers is with the District Office of Agriculture. Those operating legally often inform the District Office of Agriculture when this happens. However, the measures taken are not strong enough to curtail this informal drug movement and trade. The illegal drug-sellers sell especially antihelimintics. Drugs in the form of bolus are also being traded and these originate from other sources (especially from Hosana). So far, the district has punished an illegal trader with 600–1000 ETB. The District can provide a Legal Expertise License for those who wish to have their practice officially certified. This certification is based on standards set by the government.

Supply of breeding stock

Breeding stock is obtained from local markets in the district and from other farmers and traders. Local markets are usually found at an average distance of 3–4 km from the kebeles. The supply of improved breeding stock is limited. However, activities have been implemented recently by the government to introduce improved sheep breeds such as Bonga through the Operational Research Technology Dissemination Project (ORTDP) and other community based breeding improvement programs supported by the regional government.

Credit services

Farmers do not have access to special credit services for livestock production, especially for sheep production and marketing. There was a project called Household Asset Building (HAB) — a government safety net program — which bought livestock for poor women. Although this addresses a particular need, it does not support the majority of farmers who need some form of credit in order to improve their stock. Unfortunately, most farmers' credit record is poor as they often have outstanding loans which were taken out to provide other benefits to their business such as improved seeds and fertilizer. This common situation is one of the obstacles hampering farmers from gaining credit.

Farmers from Serara Kebele have access to a micro-finance institution known as Omo that provides them with a credit service. However, the farmers of Bakafa Kebele live a long way from Doyogena and have less access to credit.

There are 54 legally recognized and registered cooperatives in the district and, out of these, 22 are credit and saving cooperatives. But, there is no production and marketing cooperative for livestock except the newly established Community Based Local Sheep Breed Improvement Cooperative that has been initiated by the regional government. This cooperative was set up to produce and sell better performing sheep, but does not provide a credit service to farmers.
The credit and saving cooperatives often have problems which prevent them from running and implementing their activities in a smooth, well-facilitated and integrated way. These problems include poor administration/leadership problems, a poor sense of ownership/low commitment and more time and attention given to members' private needs and personal issues rather than

their professional responsibilities. The district cooperative office is trying to support the credit and saving cooperatives to alleviate these problems. These support activities include increasing the membership and giving technical and administrative training, but such support is dependent on the budget available. Monitoring and evaluation as well as inspection and auditing are other support services provided to farmers.

Traders and hotels are other actors that need a credit service. The traders' main source of capital to run their sheep trading business is credit from informal sources (friends, larger traders, etc). This credit is usually minus interest. A shortage of working capital is a common problem in sheep trading.

Most hotel owners use their own capital to run their business. They often have serious problems in working capital, even though there is a credit available in the area from both formal and informal services. These actors have tried to get this service many times but usually they are not able to fulfill most of the preconditions asked by the credit institutions. They have come to feel that visiting credit institutions is a waste of their time.

Production

Production is the core function of the sheep value chain, as it determines production of a quality product that will satisfy end-users. Improved livestock improves family nutrition (milk, butter and the like); the manure from livestock improves the productivity of crops; farmers' livestock is a ready asset during critical times of financial demand — some farmers call livestock, especially sheep, their “bank”. At kebele level, livestock have a special function, as farmers sell them to raise funds in order to send their male children to South Africa and their female children to Arabian countries to work, so they can send money home to their families. The average family size in the kebele is 5. Farmers mainly use family labour to undertake farm activities and hired labour is not common. The hired labour is invariably male and they are employed to support the feeding, breeding and housing of the animal stock.

Feeds and feeding

Major feeding systems in the district vary according to the season. In the wet season almost all cultivated lands are covered by crops. In this season, farmers tether their animals and carry the feed to them with the aim of protecting crops from damage by free roaming animals. Animals are tethered in small plots of grazing land during daytime and supplemented with green cut fodder from different sources. During the dry season, when major crops have been harvested, animals are allowed to freely graze and browse on grazing lands and crop aftermath.

Some farmers adopt different feeding systems for different categories of sheep. For example, sheep for fattening are fed while tethered in the barn (separated from the rest of the flock). This allows more feed of better quality to be given to fattening sheep.

Commonly used feed for small ruminants

Major types of feed commonly used for small ruminants in the district include: natural grazing, fresh cut grass (like Desho) and local grass during the wet season; browses (such as tree lucerne, sesbania and other local forbs and shrubs); Hamicho (enset root); small unsaleable potatoes and leaves (during the potato production season); household food scraps and residues (like the drinking coffee residue, Kocho); bran (wheat bran), noug seed cake (very rare cases), oat forage,

and local brewery byproducts. Although, oat is suitable for the agroecology and highly demanded by most farmers, its production is neglected except by a few farmers because of the shortage of land to produce the forage and because of its post-production effect (the land becomes too weedy for the main crop to be produced immediately after an oat harvest). Wheat bran is used especially for fattening sheep whereas Hamicho is given to both ewes nursing twins and for fattening sheep.

Seasonal feed and rainfall calendar

The target district is categorized as moisture-stressed (Dega and Woina Dega agroecology) According to information collected from different sources in the selected kebeles and the District Agricultural Office, a year is classified into four seasons: spring or ''Belg'' (March to May), summer or ''Kiremt'' (June to August), autumn or "First Bega" (September to November) and winter or ''Second Bega'' (December to February).

The availability of common types of feed varies in the different months of any given year. Farmers in the two kebeles described feed availability from different perspectives:
Farmers in Serara Kebele stated that green fodder is available during the wet season (from June to September) as there are both herbage growth and water conservation structures. But animals (sheep) have less access to forage as they are restricted to very small plots of grazing land. Moreover, although sheep are provided with green feeds from different sources, by the cut and carry system, the amount provided is insufficient to satisfy the daily dry matter needs of sheep, as the herbage biomass available to be harvested is minimal. During the months of September and October there is better herbage biomass to be harvested through cut and carry. From December to January, excess crop residues are available together with browse shrubs and forbs. So sheep have free and better access to graze and browse on many different fodder sources (forbs, shrubs and grasses) and crop aftermath as most crops are being harvested during these months. In general, total feed availability in Serara Kebele is considered better between July and January, which is why the feed availability graph plotted for this Kebele shows higher values in these months. With regard to accessibility, this is better between November and January. Rainfall and feed availability in each month of a given year was quantified by the farmers in the target kebeles using the seed counting technique.

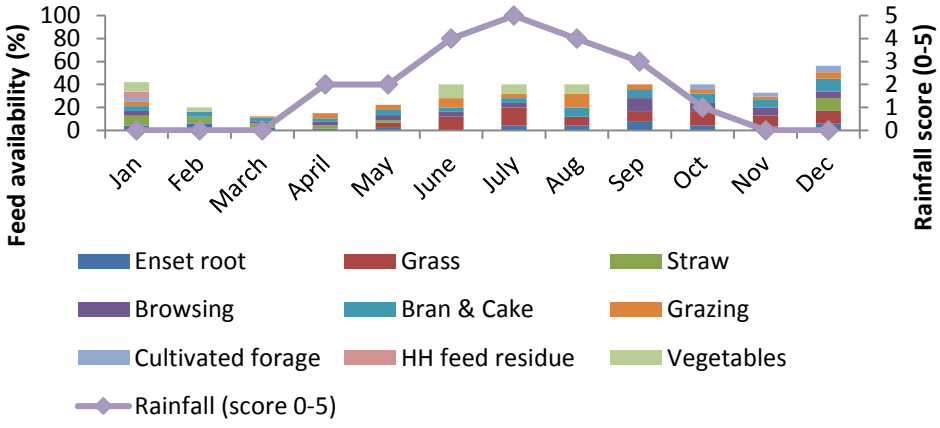

Figure 7: Rainfall and feed availability graph for Serara Kebele

The feed availability value in February and May is better than March and April. That means there is better availability of crop residue (in February) and grazing in May (as a result of 'Belg' rain). Farmers in Bekafa Kebele stated that more feed is available between June and October but becomes less from November onwards. Even though there is crop residue available between December and March, its accessibility is limited to large ruminants and equines. In most cases, there is a small amount of rain in February; as a result there is better grazing in this month as compared to the other months between January and May.

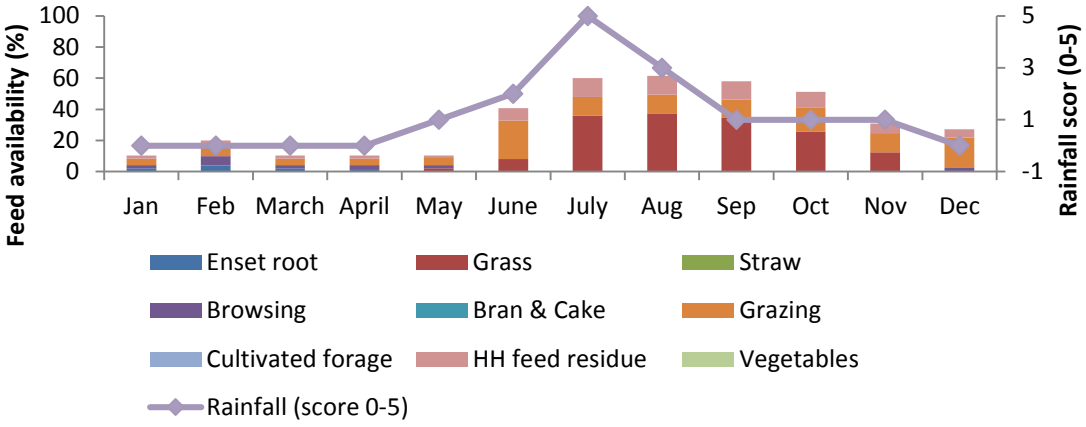

Figure 8: Rainfall and feed availability in Bekafa Kebele

The average value of rainfall and feed availability of the two target kebeles was analzyed to determine the feed availability status of the district in different months of the year. According to this, the months between July and October (with feed availability value score 2) and January (with feed availability score 3) on average have better feed availability compared to other months. In November the volume of herbage biomass to be harvested is minimal compared to the months between July and October, although there is still some restriction on the grazing of sheep due to the presence of crops on some cultivated land.

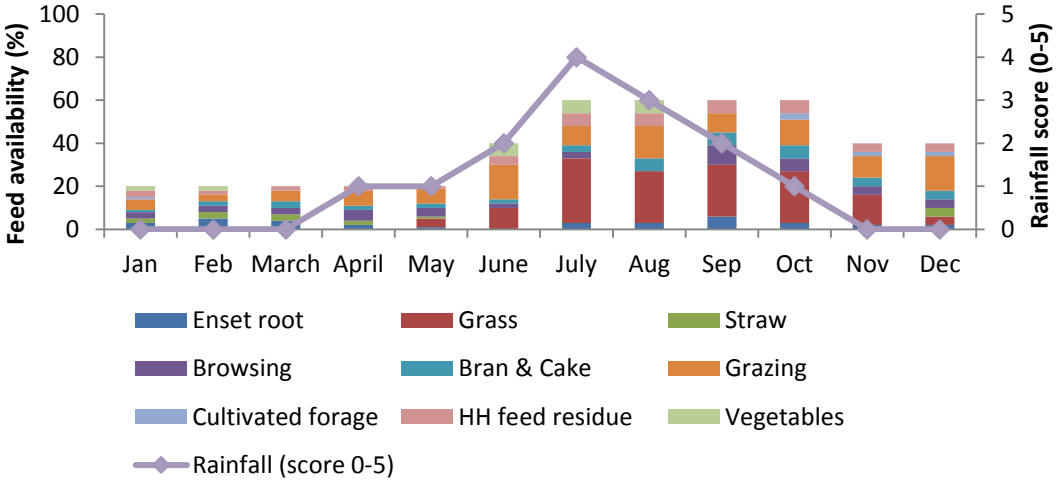

Figure 9: Average rainfall and feed availability for both target kebeles

Feed conservation

Only straw from different cereal and pulse crops is conserved to be used for times of feed shortage. However the amount conserved is not sufficient enough to cover all feed gaps during periods of feed scarcity and its availability only lasts up to April or May. There is no extra grass to be conserved as hay, due to pasture land scarcity. As a result, there is no hay conservation practice in both target kebeles of the district.

Feed supplementation and fattening

Wheat bran and local brewery byproducts are the most commonly used supplementary feed resources that farmers in Serara Kebele have adopted. Most frequently, provision of supplementary feed is limited only to fattening and lactating animals. Farmers fatten both castrated and intact males. But in most cases, farmers choose to fatten castrated males, as they reach the desired weight gain in a shorter period (within 3–4 months) than intact ones (which achieve the desired weight gain within 5–6 months). In previous years, fattening animals achieved the desired weight in about a year. More recently, fattening can be achieved in less than six months. This is due to the improvement of feed supplementation (both in quality and quantity) for fattening animals. Farmers have not received any training related to scientific feed formulation and feeding practice. BoA is supposed to give such training but, so far, farmers have not received any. However, improvements have been made because the farmers have a long practical feeding experience of fattening animals.

Availability and access to supplementary feeds

There is one flour milling plant in the district and it produces wheat flour. According to farmers' responses and from information obtained from feed suppliers, there is good availability and access to wheat bran and oilseed cake, unless farmers are unable to purchase due to other priorities or a shortage of money. Farmers purchase from both warehouses and from local retailers.

Coping with feed scarcity

Farmers purchase grass and supplementary feed to cover the feed gap of animals at some times of the year. The collection of leaves from different fodder shrubs and forbs is practiced by some farmers during particularly bad seasons. In addition, farmers use vegetable leftovers and other household food residues (e.g. 'kocho' residue, 'Hamicho' coffee residue). Grass is purchased by negotiation based on a subjective judgment of the grass density on a given paddock of land. If there is good density, 3–5 ETB per square meter (m2) is needed to purchase grass. But, if the density is not good (sparsely populated), the cost ranges from 1–2 ETB/m2. Wheat bran is purchased at an average cost of 290 ETB/qt. From the farmers' practical knowledge a 500 m2 plot of grassland could be purchased at 700 ETB and they would expect this to support four sheep for a year.

Sheep breeding and management

Farmers keep sheep for different purposes including: as insurance to avoid having to sell their cattle in bad seasons; as a main source of cash income in order to provide different household and farm inputs and utensils; for slaughtering (meat consumption); as source of manure: and to be able to sell the skin.

No improved breeds have been introduced to the target kebeles except for six Bonga breed rams that were introduced to two neighbouring kebeles (Gomera and Wagebeta) by ORTDP which is funded by Irish Aid. Farmers keep a local breed named Adilo, derived from the marketplace with the same name that is situated in Kembata-Tembaro Zone of the southern region. Sheep from different sites (districts of Wolayita and Kembata-Tembaro Zone) are collected and brought by different producers and traders to this market for the purposes of sheep marketing. This is why sheep from Wolayita and Kembata-Tembaro Zones are also known as Adilo.

The Adilo sheep population is characterized as an adaptive breed suitable for mid- to highland agroecological zones. The sheep is characterized its horns, long (thin) tail and attractive coat (white and red). It frequently gives birth to twins and has good growth potential, i.e. it reaches maturity for breeding purposes within 6–8 months. Farmers highlighted that the Adilo sheep population performs at its best where there is improved management and feeding practice. Farmers indicated that they need another improved breed to compare with, in order to see if additional and better productive performance could be achieved. During the field discussion with farmers, it was thought that improving locally available breeds by selection could in itself solve the issue of improving the local stock.

There is no controlled mating practice of their sheep adopted by farmers. This is because rams are mixed with all available breeding ewes so that the rams randomly mate any ewe which comes into heat. As a result, there is inbreeding. Although farmers didn't have specific knowledge on the causes of inbreeding, they indicated that offspring obtained from mating of closely related animals (i.e. when a breeding ram mates with his mother or a sister) showed poor growth and reproductive performance. Farmers try to take measures such as providing the resulting offspring with supplementary feeds and obtaining technical advice from experts about bringing in non-related rams from other flocks. Farmers perceived that there was a lack of rams to improve the breed.

There is also a practice of selecting sheep with the best quality characteristics. Farmers select breeding rams of larger size, whereas ewes are selected based on their good mothering ability and likelihood of producing twin lambs. Selection in most of the cases is conducted around breeding age (1–2 years old). Selected breeding rams are used for a maximum of about two years. After that, they will be either castrated for fattening purposes or directly sold to the local market. Based on information obtained from farmers, males decide on the timing of selling sheep in the case of male-headed households. There is no record-keeping system adopted by farmers, so they undertake the selection process through a subjective evaluation of the physical appearance and performance history of the sheep's parents.

Based on information collected during FGDs and field observations, the Adilo sheep population is a fairly good breed (as evaluated based on traits like twin births, fast growth, adaptive to the different agroecology of the highland and mid-land areas) if improved breeding management practice could be followed. There are breeding related problems such as lack of breeding rams (as often the best rams are sold for market at their breeding age before giving appropriate mating service), the inbreeding problem and the lack of record keeping. Therefore, any intervention should focus on improving locally available breeds through a community-based sheep-breed improvement program and by introducing better performing breeds, complemented with other improved husbandry practice. An effective community-based sheep breed improvement program should start with a household by household identification of the total sheep population, then

community consultation to agree on the purpose. After a consultation or community agreement, phenotypically better rams will be selected from the population and taken to a breed improvement centre and the remaining rams in the population may then be culled/sold for food. The selected rams will produce the first lambs which will be used as seed. Basic data will be collected on these lambs and improved management undertaken. Finally, they will be redistributed to the community. Farmers, development agents and other concerned stakeholders need to be educated on general breed improvement and management techniques.

Housing

Most farmers do not have a separate building for their animals (including sheep) due to fear of theft and lack of construction materials. Rather, sheep stay overnight in a separate partition within an enlarged dwelling house. The walls of the house are invariably made from wood and plastered with mud. Roofing material vary from farmer to farmer (could be grass or corrugated iron sheet) depending on the financial status of the farmer. Cattle and sheep are kept in separate partitions. This is to avoid the negative impact on the productivity of sheep that occurs when they are kept with other livestock. Lambs and fattening sheep also stay in separate areas. The animal area is cleaned daily with the females of household taking full responsibility for this activity. The pellet (barn waste) is used as a fuel source and as manure. Farmers do not have a strong awareness of how the type of shelter and housing system affects the productivity of sheep. Most farmers use a smaller feed storage shed made from any locally available construction material (wood or bamboo) except for some who pile feed around the yard without any proper storage.

Marketing

Marketing is one of the five core functions of the sheep value chain analysis. Under this function there are two main activities: buying and selling. In the buying and selling process there is also a transportation activity but, since this activity exists in other functions, it is presented separately under support services. Thus only buying and selling activities are discussed under the marketing core function.

Buying

Different types of actors are involved in buying sheep. These are traders, farmers, hotels and individual consumers. Farmers buy sheep for the purposes of rearing, fattening and slaughtering. According to farmers' responses, either old or young ewes are purchased for rearing purposes and rams for fattening purposes. The type of sheep purchased for slaughtering depends on the economic status of farmers. Farmers are accustomed to buying sheep from other farmers and from traders in local markets. Farmers also go to the district market to buy sheep.

Table 3: Where farmers purchase sheep and proportion (%) of animals sold in these places

Marketing site	Proportion in %
Farm gate (from neighbours)	10
Roadside market	20
Local formal market	70

Major suppliers of sheep to Doyogena market are collectors and farmers. As reported by traders, they get 70% of the supply from collectors and 30% from farmers. The main places to sell sheep are the local market/district market, and the bush market.

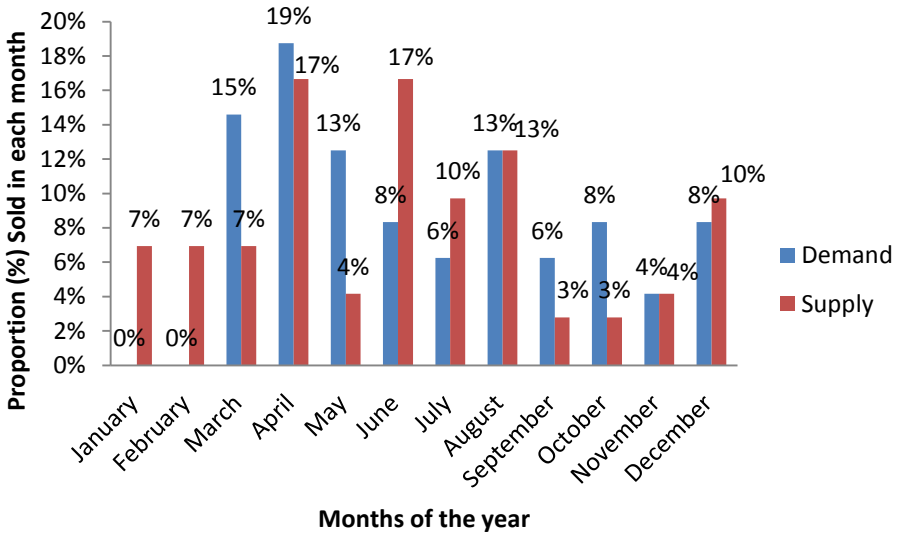

Figure 10: Seasonality of demand and supply for sheep expressed as proportions (%) sold each month

Factors affecting sheep supply in order of importance are: holidays, need for agricultural input (seed and fertilizer) and household expenditure (e.g. school fees, clothing). During holidays farmers expect that there will be a high price for their sheep, so most farmers take their sheep to sell at this time. A second factor that affects supply is the cost of any agricultural input. At the beginning of a cropping season, farmers need to buy agricultural inputs like fertilizer and seed, so they sell sheep to get the money they need. They also need money for household supplies. When farmers supply sheep to market for agricultural input purchases on a seasonal basis, it increases the supply of sheep as all farmers need to prepare for the season at the same time. However, since there is a limited demand in the market they may not get a good price. Nonetheless, buying inputs is a must, so farmers are forced to sell their sheep at a lower price.
Men and women do not receive the same price for their animals. It is often assumed that men negotiate better and therefore get a better market price than women. However, we came to understand that women negotiate harder than men when they sell or buy animals. As a result, traders prefer to buy sheep from men over women. This suggests that it is women who will get the higher price.

Regarding the method of transaction, traders do not use weight-based values to buy animals, rather they use 'eyeball' estimation. This is done deliberately, in order to undermine the price or to buy animals for a cheaper price than they are worth. When they sell these sheep to supermarkets, abattoirs or butcheries, however, sellers prefer the use of weight-based transactions. So this practice greatly affects the value shared by the farmer.

The average prices of different classes of sheep in different months of the year are presented in Figure 11. As indicated, there is a marked seasonal difference. From the most expensive to the cheapest, the order of prices for different classes of sheep is: fattened sheep, male yearlings, female yearlings, old ewes and lambs. The variation in average price for lambs is low as compared to other classes of animals. Even though it looks insignificant, there is some price variation across months of the year for other classes of animals. This suggests that there is variation in demand for and supply of different classes of sheep.

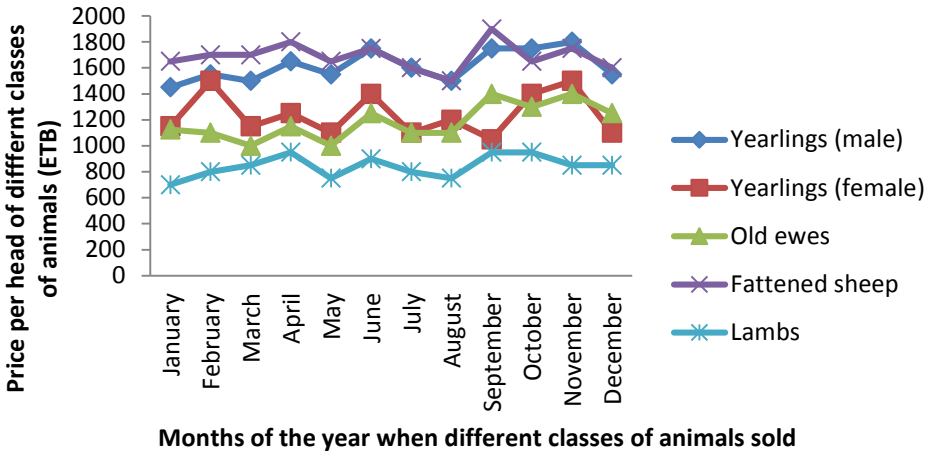

Figure 11: Average prices of different classes of animals in different months of the year as estimated by traders

Selling

Selling is the other main activity under the marketing core function. Different types of actors are involved in selling sheep. The common actors involved in sheep selling are: traders, farmers, processors, and hotels (processed meat). Farmers sell sheep for various reasons and on different occasions. Such occasions include holiday seasons such as 'Meskel', Christmas, and Easter.

They sell sheep in order to provide cash for household expenditure, to purchase farm inputs and to repay credit obtained from different sources. The most important months in which farmers sell sheep are: January (to pay annual credit bills), April (for Easter), June (for farm input purchase), July (for farm input purchase), September (for the 'Meskel' festival and sending children to school) and December (for Christmas). Figure 12 shows the key months of sheep selling by the proportion (%) of farmers.

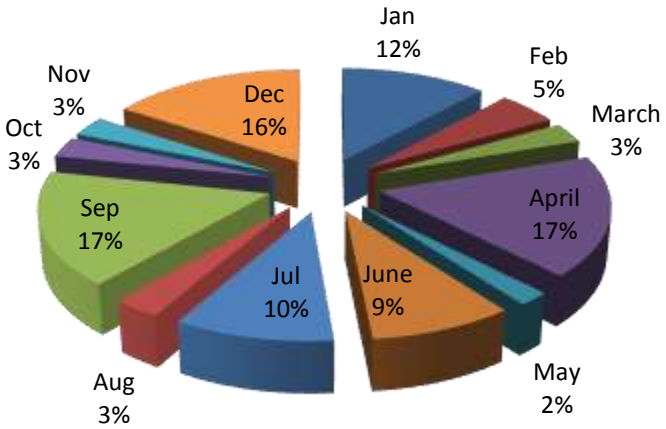

Figure 12: Key months of sheep selling by the proportion (%) of farmers

Sheep marketing is conducted based on 'eyeball' estimation and palpation (condition scoring). There is no experience of using scientific weight measuring scales to sell or buy sheep. For farmers it is better to use 'eyeball' estimation than palpation because visual estimation may give some compensation if the animal is attractive but has lower body weight. Moreover, buyers — especially traders — use the palpation method just to estimate the weight of animals and will cut the price if the animal has a lower body weight. The choice of transaction method for selling animals is not only the right of traders, but the right of buyers too. So there is no guarantee of improved fairness for farmers in using any particular method of transaction unless a standardized method is devised and put into action with rules and regulations.

Different categories of sheep may have different buyers. For example, sheep for rearing purposes (breeding rams and ewes) are, in most cases, sold to farmers (producers). Whereas medium sized and fattened sheep are sold to different traders (large traders, small traders and collectors) as well as consumers and hotels. The major purchasers of sheep in the area are traders, hotels/butcheries, individual consumers and farmers. The differences in the proportion of sheep sold to these different types of purchasers are shown in Figure 13.

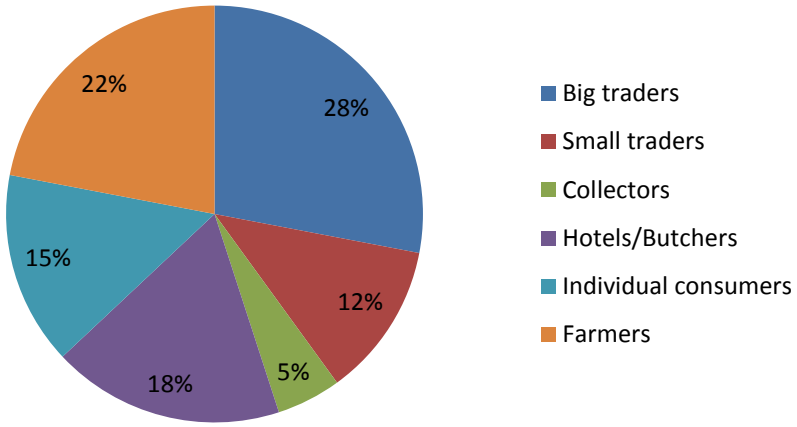

Figure 13: Percentage of sheep sold by farmers to different types of buyers

Some farmers in the study area know the specific type of buyer for the different classes of sheep they have. For example, fattened sheep have more demand from hotels and individual consumers, yearlings more demand from traders and farmers. Farmers need young female sheep for breeding purposes (replacement and foundation stock) and prefer to sell their old ewes. Hotels and butchers prefer to buy these old ewes since their price is relatively low. So, farmers target the best type of buyer for their animals. According to the farmers' assessment of the categories of traders, they believe large traders take the greater proportion. The different types of buyers of sheep in the two study kebeles are shown in figure 14.

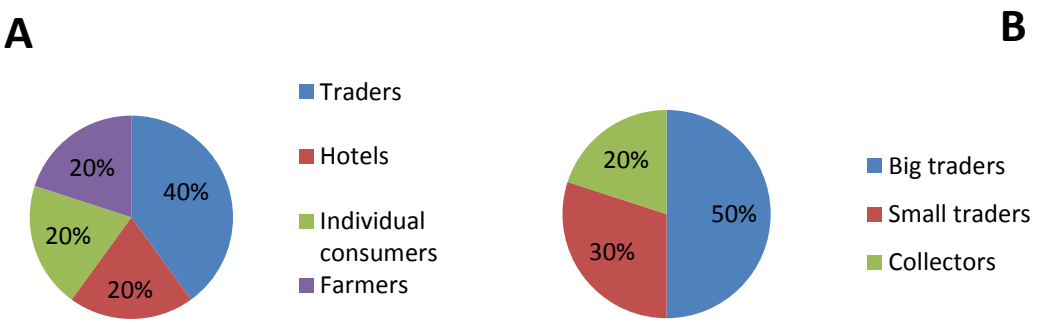

Figure 14: Percentage of buyers to whom farmers sell their animals in (A) Serara Kebele and (B) Bakafa Kebele

The selling of sheep by farmers is mostly conducted in the local (gillit) or district market so they may get the best price. This is because farmers fear that they will not get good price if they sell their sheep to neighbouring farmers or at the bush meat market. Most farmers do not know the final receiver of their products. They simply take animals to market and sell. This is because there is no market information available to farmers and it demonstrates that there is a poor extension and communication service.

On the other hand, more than 90% of farmers sell their sheep at the district market and only around 10% farmers sell their sheep either at the village/bush market or farm gate (Table 4). Farmers believe they get good prices when they sell their animals at the district market. But, they do not know where the sheep are transported to from there.

Table 4: Proportion (%) of farmers selling sheep to different places in Bakafa Kebele of Doyogena District

Type of animal	Place of sale (%)		
	Farm gate	Village/bush market	District market
Proportion of farmers	10%	20%	70%

There are different marketplaces in which the farmers (producers) sell their animals. Farmers from Bakafa Kebele sell their sheep at four marketplaces: Doyogena (40%), Hossana (30%), Angacha (10%) and Mare (Amecho Wate) (10%) (Figure 15). It takes 3 hours to drive sheep to Hossana and Angacha and 2 hours to Doyogena.

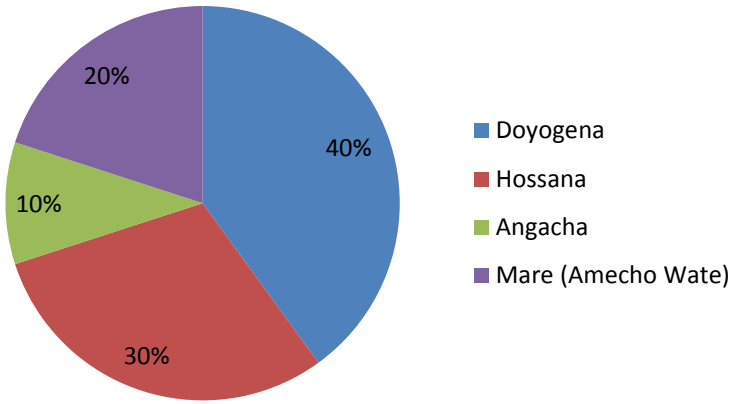

Figure 15: Common sheep marketing sites and the proportion (%) of the sale for Bakafa Kebele

Farmers of Bakafa Kebele reported that they sell sheep to different buyers. Farmers estimated that 40% of sheep are sold to traders, 20% to hotels/butchers, 20% to individual consumers and 20% to other types of farmers. Most farmers sell sheep when they have financial needs. Farmers do not worry to whom they have to sell and they do not have specific customer.

Price determination

The Bargaining power of farmers and traders varies with seasons. At times of higher demand, farmers have an opportunity to decide on the selling price of sheep, whereas traders have an opportunity to decide on the market price of sheep during times of high supply which happens, for example, when farmers are short of cash to purchase different farm inputs such as for fertilizer and improved seeds and to fulfil household needs such as household food, stationery, clothing and school fees.

Farmers take more time in selling animals and sometimes will take the same sheep to the market place 2–3 times until they obtain a good price. On average it takes 30 minutes to 1 hour to sell a particular sheep. At the end of the market day, farmers may be forced to sell their animals at a lower price; this happens when the farmers face a critical financial shortage.

The major factor affecting prices in the sheep market is dependent on the time of the sale. When there is a high supply, the trader can set a lower price and when there is high demand (low supply) the farmer can demand a higher price. To increase their bargaining power, farmers have suggested that a credit service should be implemented and would motivate farmers to save money. This would allow them to sell only when the prices were good. In the area, there is a newly established saving and credit association. But this cooperative does not reach all the farmers in terms of providing credit at times of their financial shortfall.

To some extent, the selling price varies between different actors depending on the type of sheep. Based on farmers' responses, there are marked price differences among the different buyers for the different classes of animals (yearling, ewe, castrated/fattened, etc.). Some classes of sheep in less demand by different actors due to different factors: for example, farmers do not have much demand for fattened sheep (due to high cost), consumers do not have much demand for older ewes (expecting poor quality meat), and hotels/butchers do not have much demand for lambs and

female yearlings (due to the expectation of less profit after processing). All these issues are indicated in Figure 16.

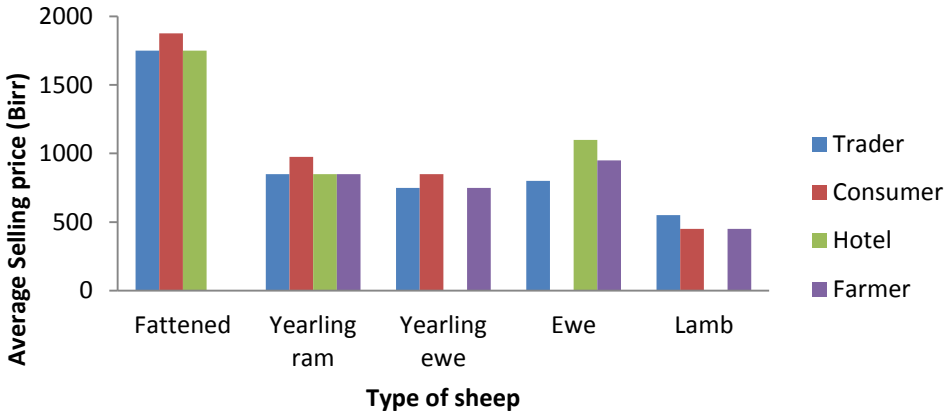

Figure 16: Average selling price of different classes of sheep to different actors

Taxes

Different types of buyers pay tax at the gate of the municipal livestock market enclosure. The amount of tax paid by the different market participants is 5 ETB. Whether farmers sell animals or not, they pay tax. In short, every animal that enters the municipal livestock market enclosure will be taxed.

On the other hand, when traders sell animals to hotels, individual consumers, large traders or farmers, transactions are made on a cash basis. The proportion of animals sold by traders to different types of buyers is shown in Table 5.

Table 5: Proportion (%) of animals sold by traders to different types of buyers

Proportion of animals sold to different buyers (Traders)	%
Hotels	27%
Individual consumer	18%
Large traders	45%
Farmers	10%

Traders do not have any preference with regard to the type of buyer. As long as they get good prices they do not worry about who is buying their animals. However, they know the type of animals preferred by the different type of buyers (Table 6).

Table 6: Trader knowledge of the type of buyer for different classes of animals

Type of animal	Common buyers	Purpose of buying
Yearling (Male)	Traders and Individual consumers	For consumption
Yearling (Female)	Traders, farmers and Individual consumers	For consumption and breeding
Fattened	Traders and individual consumers	For consumption

Old ewes	Hotels	For consumption
Lambs	Traders and farmers	For fattening and breeding

Traders mostly sell sheep at the district markets of Doyogena, Addis Ababa and Shinshicho. However, sheep are also transported to Adilo, Durame and Hossana by different actors. Regarding the destination of sheep collected from the study area, traders reported that the sheep are transported to Addis Ababa. Some of the sheep go to abattoirs around Modjo town for the meat export market or are used by domestic consumers in Addis Ababa (supermarkets or butcheries). Traders explained that the type of animal is the only factor that affects its price. In the sheep market, traders believe that they set the prices. In this area there are no brokers in sheep marketing. Traders say that they do not want brokers to be part of the system. However, traders mentioned that when they go to Addis Ababa they have to pay for parking illegally (at the place where loading and unloading takes place).

Demand and supply trend for sheep

Based on an assessment of different actors, demand for sheep has increased highly over the last five years. This is due to an increasing number of consumers and an expansion of the export market at national level. The supply of sheep, though not enough to satisfy the increasing demand, is increasing in different local markets. Farmers are becoming more aware of the significance of the cash income to their household obtained from selling sheep, particularly in the case of immediate financial need; whereas some other producers are taking their animals to market with the objective of getting better profits. Traders believe that the greater availability of sheep in the market is a growing trend. The reason for increased availability is that the demand for sheep is increasing from time to time.

Seasonality of supply and demand

Supply is high in months when producers (farmers) are in need of additional farm and household inputs. At such times, most farmers are forced to sell sheep as a means of generating cash income to fulfil different household needs such as fertilizer, improved seeds, clothing and stationery for schoolchildren, household consumable items etc. Therefore, in most cases sheep are sold for lower prices. Farmers sell their sheep throughout the year. But the proportion of farmers who sell sheep varies with months of the year.

Based on the producers' and traders' response, demand for sheep varies depending on the season. It is high during times of religious and other holidays as well as those times when there is a priority to buy household and consumer goods. Compared to other months, as a result of higher demand for sheep in January, February, April, September and December, farmers can sell their animals (sheep) at higher prices. The variation in the proportion of supply and demand across all months of the year with its associated reason is presented in Table 7 and Figure 17.

Table 7: Farmers' response on the seasonality of sheep supply and demand with its associated reason

Months	High supply		High demand	
	Proportion of farmers supplying (%)	Associated reason for selling/supplying	Proportion of sheep demanded (%)	Associated reason for the demand
Jan	5.13	To repay Meskel credit	28.21	
Feb	4.27		11.11	
March	5.13		-	
April	11.97	Easter market	26.50	Easter holiday
May	5.13		-	
June	16.24	Input (seed/fertilizer) purchase	-	
Jul	5.98		-	
Aug	5.98		-	
Sep	16.24	Meskel ceremony	5.98	
Oct	11.11	Shortage of herders (boys go to school)	-	
Nov	2.56		-	
Dec	10.26	Christmas market	28.21	Christmas holiday

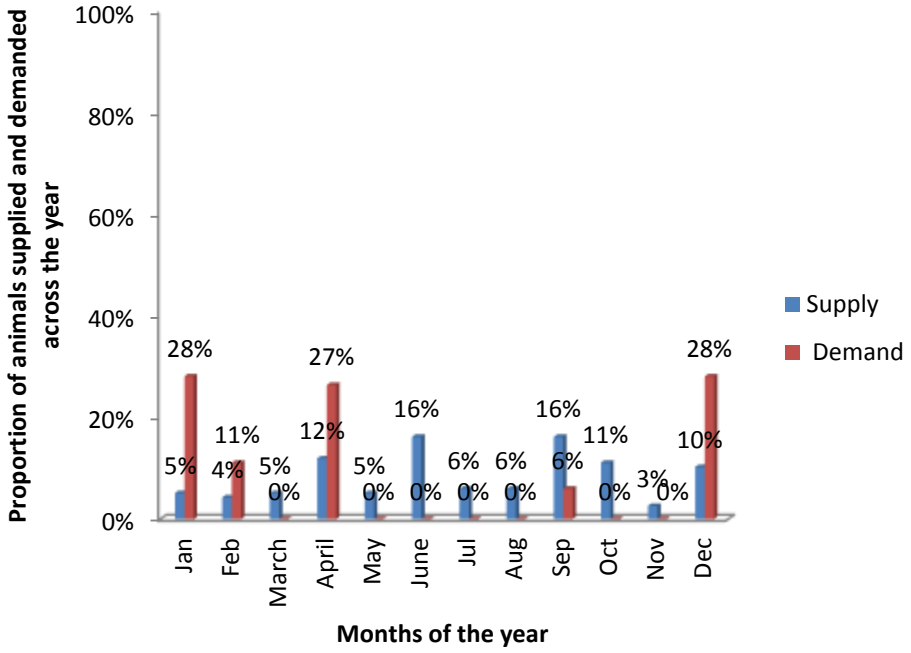

Figure 17: Farmers response on seasonality of sheep supply and demand

Processing

Processing is the fourth core function of sheep value chain. Slaughtering is the only processing activity done in the area. Processing (slaughtering) in the area is mainly done in municipal slaughter houses. The carcass which is processed at municipal slaughter houses goes directly to hotels and restaurants. Selling raw sheep meat is not common in the area. Hotels can take a sheep carcass that has been slaughtered at abattoirs and process it into different dishes. However, since sheep are transported to Addis Ababa and the surrounding big cities, there may be processing for the domestic and export markets too. Farmers and traders interviewed for this study did not know the exact place where the sheep end markets were found.

Hotels slaughter 6–11 sheep per week. They buy these animals on Fridays (the only market day at Doyogena town) and slaughter them during the week days. Hotels sell finished meat in the form of key wet, kikil, and roasted meat to individual consumers. Hotel owners reported that they did not get enough quality sheep at a low enough price. They have reported that the strategy they use to overcome this problem is to buy unwanted animals such as slimmed and old ewes. Hotels owners said they were willing to pay up to 2,000 ETB to buy good quality, large sheep. However, the truth is that hotels are slaughtering old ewes not because they can't get good quality animals in the market, but because they do not want to pay a high price for good quality animals.

Consumption

In the study area, sheep were consumed mainly by domestic consumers who buy meat at hotels/butchers or live sheep at the market which they slaughter at home. Farmers are also consumers in that they buy sheep for rearing and fattening purposes. However, there is no concrete information on the volume of sheep bought in the area by export abattoirs / live animal exporters (this is indicated by broken line in value chain map; see Figure 14).

Support services

In the area of the study actors involved in the sheep value chain received different kinds of support services from both the private and public sectors. The most common services are the extension and transportation services. The extension service is provided by the public sector and transportation service is mainly provided by the private sector. The detailed information on these services is presented in the following sub-topics.

Extension services

In the study area the office of agriculture is responsible for providing the public extension service. The district experts provide technical support and advice to farmers to support them in using improved sheep husbandry practices, although the scope and coverage of this support is very much limited. Compared to crop production, the extension service as well as the input supply service for livestock production is poor. Hence, the livestock extension service in terms of breed improvement, feeding, housing, improved forage supply, etc. is very limited.

The Doyogena District Office of Agriculture is also responsible for providing support in the area of cooperatives promotion and marketing. There are 54 legal cooperatives in the district out of which 27 are performing well. Around 22 cooperatives are also organized as saving and credit associations and some are starting to work on honey production too. None of the existing cooperatives work on livestock production and marketing, except the two recently established cooperatives that are aiming to work on livestock related issues. Farmers and others actors get additional support services from other institutions, such as research organizations and NGOs, in the form of training and the provision of improved agricultural technologies.

In addition to the support services, actors also get information services from different sources. Farmers get market information such as price, type of product required and quantity demanded mainly from other farmers, traders and marketplaces. They have no more information about breeds, but some farmers interviewed had heard about an improved goat ram service in the neighbouring district of Angacha. They also get information about feeds and animal health from development agents/vet technicians. However, the farmers had not received any formal training on sheep production and marketing. Meanwhile, traders get market information mainly from the marketplace. Here, they exchange market information on quality issues and prices with their suppliers and buyers. They tend to exchange market information on a weekly basis by telephone. Hotel owners get all their information related to sheep from the marketplace.
There is no technical support provided for the major feed suppliers. This means that none of the suppliers receive any kind of training or advice concerning feed processing, formulating, storage, transportation, and quality evaluation techniques. Rather, they are working on their own understanding.

Transportation services

At all levels of the value chain, different actors use different types of transportation services. These actors use either trekking or trucking transportation methods. For example, farmers use trekking to transport sheep to and from the market when they are selling and buying respectively. At Serara Kebele the nearest sheep market is Doyogena (District market) and it takes 45 minutes to 1 hour to trek sheep there. Farmers face no serious problems when they trek sheep to the market.

Traders use trekking when they collect animals from different primary markets and trucking when they transport animals for selling at secondary and terminal markets. Sheep traders do not usually own the truck; instead they use hired vehicles. The maximum number of animals allowed to be transported is 80–90 sheep per load/truck. However, it is common for traders to transport 110–120 sheep per load. The maximum distance traders transport animals is 258 km (Doyogena to Addis Ababa) which is completed without resting, feeding or watering the animals. The maximum distance for trekking animals is 20 km per day (Dunna market to Doyogena market). Trucking fee per sheep is 35 ETB or 3,500 ETB per truck load. Trekking fee per sheep is 2–5 ETB per animal. Hotels owners use trekking to transport animals as the sheep market (at Doyogena) is near to their hotel. The hotels pay 2 ETB per animal to transport sheep.

Analysis of end markets

End markets determine the characteristics — including price, quality, quantity and timing — of a product or service (Campbell, 2008; Legese and Hordofa, 2011). End market buyers have a powerful voice and incentive for change. They are important sources of demand information, can transmit learning and, in some cases, are willing to invest in firms further down the value chain. End markets for sheep can be broadly classified as domestic and export markets.

Domestic market demand can be categorized into demand from individual consumers, hotels, butchers and farmers. In the study it was only possible to identify the domestic markets. There was no concrete information on the export market for sheep in the study. However, previous studies have indicated that sheep are transported to Modjo to export abattoirs (Tsedeke K., 2007).

An important development in the Ethiopian sheep value chain is the opening up of sheep butcheries and sheep meat being sold in supermarkets of major towns like Addis Ababa, Debre Zeit, Adama and Hawassa. The sheep butcheries in Addis, Adama, Hawassa and other large urban areas have also started offering sheep meat. This is expanding to smaller towns as well. These are very good opportunities for sheep producers since they create continuous high demand for fattened sheep for slaughter by the butcheries and supermarkets.

Role of women in sheep production and marketing

The role of men and women in households varies from place to place. In the study area, decisions on the type of animal to rear, the type and number of sheep to sell and the timing of selling sheep is the responsibility of both men and women. Men mostly make the decisions about the selection of ram and ewe lambs, buying and selling sheep and in controlling the proceeds from sheep. However, managing sheep (feeding, herding, cleaning, etc.) is reported as solely the responsibility of women (Table 8). So far, training has not been given to women in respect of small ruminant production.

Table 8: Role of women in sheep production and marketing

Type of sheep production/marketing activity	Person responsible to handle (Men, Women or both)	
	Serera	Bakafa
Deciding which animals to rear	Men	Both
Managing small ruminants (feeding, herding, cleaning, healthcare, etc.)	Women	Women
Selecting breeding rams and ewe lambs	Men	Men
Deciding on the type and number of small ruminants to be sold	Men	Both
Deciding in the timing of selling	Men	Both
Marketing of sheep	Both	Men
Control over the proceeds from sheep	Both	Men

Other institutions

In the study area, the number of NGOs and other rural development institutions working in rural development activities is limited. Kembata Development Association is one of the local NGOs that works mainly on the development of infrastructure (school construction etc.). However, the scope of this local NGO is so limited that it has no intervention in the area of livestock development. Instead, farmers have both informal and formal institutions to turn to that have different purposes. Among informal/local institutions, Iqub and Idir are the most common. For example, livestock Idir is an informal institution which aims to provide insurance during times of livestock loss.

In the area, particularly at Bakafa Kebele, there is a government collaborative project known as HAB that works on a project known as the Productive Safety Net Program (PSNP). HAB has been designed by the government and financed by the World Bank to enable 'safety net' beneficiary households to have created assets by the time they graduate from the PSNp. Depending on the business plan prepared by the farmers, it provides credit (with the help of DAs). Thus, it can provide credit for cattle fattening, sheep rearing/fattening, irrigation farming etc.

Actors in the sheep value chain

According to the VCA framework, the actors in the value chain refer to those individuals or entities who engage in a transaction which moves a product from inception to end use. They must exchange money (or an equivalent service) as well as a product; which generally increases in value with each transaction (Campbell, 2008 as cited in Legese and Hordofa, 2011). The most common actors in the sheep value chains in the study areas, are producers (farmers), collectors, small- and large-scale traders, hotels/sheep butchers, and individual domestic consumers (who may also be producers/farmers. Analysis of the characteristics of these actors and their marketing strategies helps in designing intervention measures suitable to overcome the major causes of unnecessarily high transaction costs and other factors that depress the proportion of the final sheep price that reaches the producers. The characteristics of each of the actors are described as follows:

Butcheries

There are no private slaughterhouses that supply sheep meat to the community. But there are government slaughterhouses where hotel owners slaughter their sheep. This is done both to control the meat quality and for public safety reasons. In the area, private butcheries only supply cattle meat (beef). So customers receive only finished sheep meat from hotels and restaurants.

Hotels and restaurants

Hotels and restaurants are the main suppliers of sheep meat to the local community in the form of finished meat. They do not supply raw sheep meat. Hotel and restaurants are regular buyers of sheep in the Doyogena market.

Hotels sell finished meat (wet, kikil, and roasted meat) to individual consumers and, of course, they sell the finished meat in the hotel restaurant. On average, hotels sell one sheep per day. Sometimes on a market day they will sell two sheep. Unsold mutton is kept in the refrigerator for the next day. They do not discard any sheep products. Surfaces on which sheep products are placed are cleaned on a daily basis.

Hotels have no permanent customers to whom they sell their product and do not sell their products on a credit basis. They are concerned with the quality of the meat and gain feedback from their customers, but there is no mechanism of feedback to their suppliers. Input price (price paid for the live animal) is the only factor that determines the price of their finished product. There is an increasing trend in the availability of animals in the area and hotel owners believe that the reason for this increase is the overall economic growth in the country, particularly increases in urbanization (population increase) and increases in farmers' awareness of the profitability of sheep rearing.

Individual consumers

Individual consumers usually buy sheep for holidays. Their effect on the demand and supply has a large knock-on effect on the price of sheep, but this effect is seasonal. The major holidays are Christmas, Easter and the Ethiopian New Year. Individuals also occasionally buy sheep for special reasons, for example for visiting guests.

Traders (small, large)

In the area, there are two large traders and seven smaller traders. The large traders buy animals from small traders and collectors and they transport sheep to the central market (Addis Ababa). Small traders buy sheep from collectors and also from the surrounding local (rural markets) known locally as “Gulit” (which means small market). One large trader can buy as many as 150 to 160 animals per week. Traders have their regular suppliers (small traders) and they can pay premium prices. Traders get good quality sheep at lower prices at 5.00–7.00 a.m. on the market day. Traders have quality parameters to be considered when buying sheep. They consider the age of animals, so mostly look for yearlings. Traders’ key months for buying sheep are June and July.

Collectors

Collectors buy small ruminants from the surrounding local (rural) markets and supply them to both small traders and large traders. There are more collectors than there are large traders and small traders together. Around Doyogena there are about fifteen sheep collectors. They collect sheep from the surrounding local markets, mainly around Doyogena, Hossana, Duna, Fandida, Kosha and Homacho.

Farmers buying animals for breeding and fattening

In the study area, farmers buy sheep for different purposes. They buy ewes and ewe lambs for breeding and ram lambs for fattening. Both farmers and collectors prefer to buy animals from particular localities, whether this is for breeding or fattening, so that they can ensure the suitability of the purchased animals to the conditions in the area of production. Collectors and small traders buy ram lambs from Doyogena and the surrounding markets and transport these to the Shinshicho and Adilo areas. The ram lambs transported to these areas are purchased by smallholder farmers and fattened. These fattened sheep are then sold at Adilo market, where the popular Adilo sheep is sold.

Export abattoirs

There are three major export abattoirs of sheep meat around Modjo town. For this study, two export abattoirs, Organic Export Abattoirs and Luna Export Abattoirs were selected for the study. The export abattoirs use 90% goat and 10% sheep for slaughtering. They classify the sheep that they slaughter into two types: highland sheep and lowland sheep. They mostly use highland sheep which are collected from the Arsi, Deberebirhan, Wolaita, Jimma and Konso areas. The sheep collected from the Doyogena/Adilo areas are commonly known by export abattoirs as Wolaita sheep. The lowland sheep are collected from the Somali region. Each export abattoir has 10–15 permanent suppliers from the major sheep producing areas and they pay a premium price to their suppliers. One large trader supplies at least one car of sheep per week. Traders buy sheep by weight and pay 26–32 ETB for a kilogram of live weight. They have a minimum weight requirement, i.e., they buy animals which weigh more than 15 kg. One export abattoir has the capacity to slaughter 5,000–6,000 animals per week or up to 24,000 sheep per month. Most of their product goes to foreign markets, primarily to the United Arab Emirates, Jeddah, Dubai and Bahrain. They also export some parts of the animal to China. Some of these export abattoirs also have their own supermarkets in Addis Ababa where they sell their products. Abdominal parts of the animal are also sold to nearby cities. The major problem export abattoirs face is low and inconsistent supply, as well as poor quality supply. Thus, they are forced to work at under their maximum capacity.

Marketing routes

Figure 18 illustrates the various marketing routes used to collect sheep that are brought to the Doyogena market and onward from here to various end users of sheep.

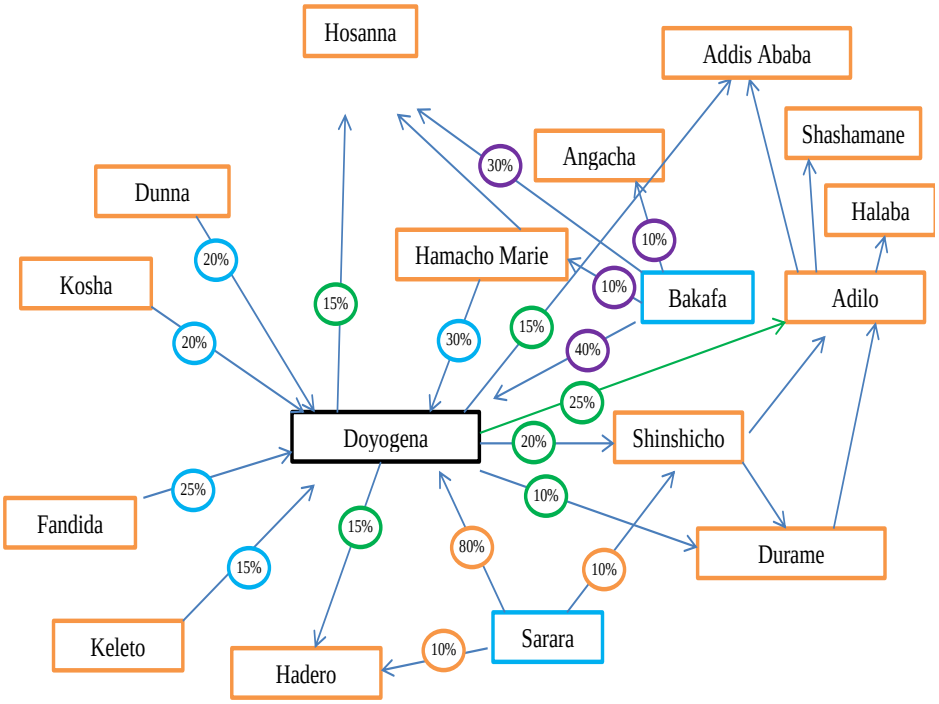

Figure 18: Sheep marketing routes

Marketing channels

Sheep in the study area come from the surrounding districts and rural kebeles. These sheep are brought to Doyogena market directly by producers and small traders/collectors. The collected sheep then pass to different actors via different channels. These channels are the outlets through which they reach end markets, to be used or consumed by end users. In the study area four major marketing channels were identified and are presented below. Figure 19 presents the sheep value chain mapping of the study area.

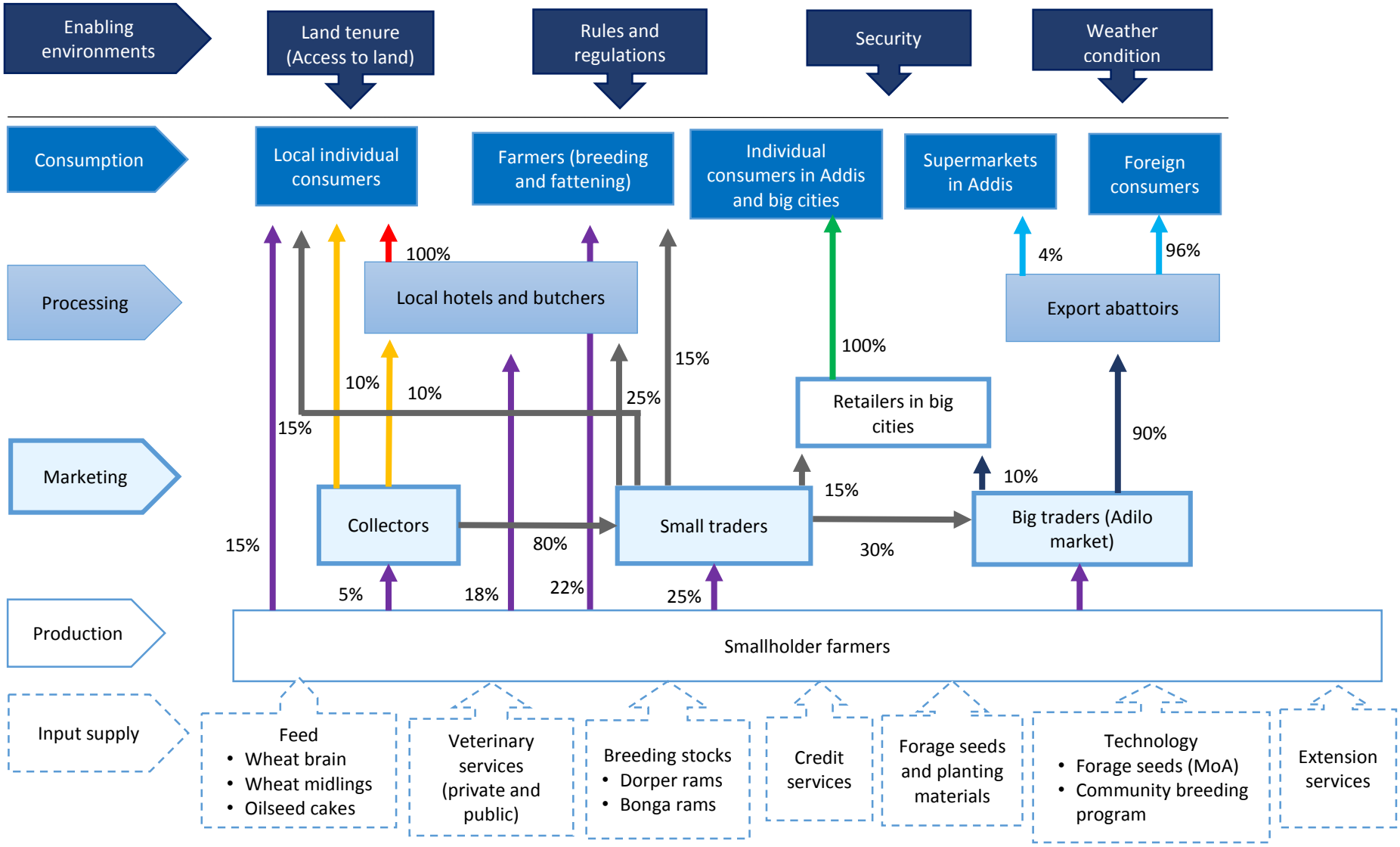

Figure 19: Sheep value chain mapping of the study area

Channel 1: Sheep purchased by local hotels

This channel is the major channel that passes sheep to end users. Hotels in the study area use mainly sheep. They buy sheep from Doyogena market. Their suppliers are farmers and traders but the major suppliers are farmers, i.e. about 80% of the supply comes from farmers and the rest 20% from traders. Among farmers almost all (98%) are male and only 2% of farmers are female. Hotels buy sheep, more or less constantly throughout the year. Major factors that affect the demand and supply of sheep are holidays and the seasonally varying level of income of the community (farmers). Hotels have some quality criteria when buying sheep but they do not feedback this information to their suppliers (farmers/traders). They prefer tall and fattened sheep which have high carcass weight. They buy sheep using eyeball estimation.

Hotels do not fatten sheep, but they continue to feed animals for as much as a week until they slaughter them. They feed sheep wheat bran and they buy this from the local Doyogena flour factory. On average they feed 50 kg of wheat bran to 16 sheep for one week. This is 12.5 kg per animal per month. Thus the maximum cost of feed for an animal will be 6 ETB per week (until the animal is slaughtered).

Channel 2: Sheep purchased by local individual consumers

Sheep in the area are also purchased by individual consumers. The sheep purchased by individual consumers are mainly fattened sheep, but they also buy yearlings. These buyers buy animals either from farmers or from small traders. Demand for sheep by individual consumers is seasonal, i.e. they buy animals during holidays (Christmas, Ethiopian Easter, Ethiopian New Year and Meskel). There are also other times when individual consumers buy animals, but the scale of these purchases is insignificant.

Channel 3: Sheep purchased by individual consumers at Addis Ababa

The sheep collected by the large traders at Doyogena market and mainly transported via this channel are sold to small traders/retailers at Addis Ababa. There are two large traders who buy and transport sheep to Addis Ababa. These traders focus on buying yearlings and fattened sheep. In one week, a large trader can buy up to 160 sheep and transport these to Addis Ababa. The large traders in this channel transfer the sheep to small traders or retailers at Addis Ababa. Most of the sheep are purchased by individual consumers from the retailers. Some of the sheep are also purchased by hotels in Addis Ababa.

Channel 4: Sheep purchased by farmers for fattening

This channel is the most important channel and it passes the majority of sheep to actors in the sheep value chain. In this channel lambs are the major class of animals passing to individuals (farmers) who grow and fatten them. These sheep are transported to Kacha Bira and Durame districts by traders and farmers for fattening purposes and they are ultimately sold at Adilo market. The fattened sheep in these areas are commonly known as Adilo breed sheep. Previous research findings show that the source of the Adilo breed sheep is the Doyogena district. These Adilo breeds are sold after fattening at Adilo market, which is known as the sheep market which supplies fattened sheep to Addis Ababa, Shashamane, Hawassa and other major towns.

Channel 5: Sheep purchased by farmers for breeding purposes

This is the other channel which passes sheep to end users; mainly to farmers. Farmers buy sheep as replacement breeding stock and as feeder animals. They usually buy such animals after harvesting their field crops because of two main reasons: The first is because, having just sold

their crops, they are in a better financial position. The second reason is that having cleared their crops, they have more grazing space and the crop residues can be used as extra grazing. At this time, farmers sell animals of known origin, the best physical appearance and good health condition. The most important sellers and buyers of this channel are other farmers. However, collectors and traders also buy animals of the required quality during these seasons.

Channel 6: Sheep purchased by export abattoirs

This is the other important channel which passes sheep to end users. In this channel sheep are collected by large traders from the major sheep-producing areas of the country and supplied to the export abattoirs. Export abattoirs use both highland and lowland sheep. The sheep which are collected from Doyogena area by small traders pass to larger traders at Adilo market and finally reach the export abattoirs. The sheep that are supplied to these export abattoirs are mainly male yearlings. The export abattoirs need fattened sheep, but traders do not supply fattened sheep to export abattoirs because fattened sheep have a better price when sold to individual consumers — which is done based on eyeball estimation.

Costs

Costs of production

In the study area the major cost of production for farmers is feed cost. Farmers use different types of locally available feed types, the major one being grass. During group discussion, farmers estimated the cost of grass which can feed a single animal for one year. Grass is purchased by negotiation based on a subjective judgment of grass density on a given paddock of land. If there is good density, 3–5 ETB per m2 is incurred to purchase grass. But, if density is not good (sparsely populated), then the purchase cost ranges from 1–2 ETB/m2. Wheat bran is purchased at an average cost of 290 ETB per quintal. From farmers' practical experience, a 500 m2 plot of grassland purchased for 700 ETB can support four sheep for a year. As a supplemental feed, 50 kg of wheat bran is enough to feed four sheep for a month. In addition to the cost of feed, farmers sometimes incur veterinary costs of 5 ETB per animal per year. Thus, the total cost of producing a yearling sheep is 180 ETB.

Marketing costs

The existing marketing system links a number of market actors, as sheep move from producers to end users through different channels. In these channels there is a marketing cost when sheep move from one actor to the other. For this study, the major sheep marketing costs, starting from sheep producers to end users and through different actors, were identified and estimated. As an indicator of the efficiency of the channel, net marketing margins of a particular marketing agent are identified as the residual of the gross marketing margin, after paying marketing costs.
The estimation of market actors' net marketing margin was estimated using the definition, (Mendoza, 1995 as cited by Shiferaw and Teklewold, 2007) and is as indicated below.

Net Marketing Margin = Marketing Margin – Total Cost
Gross Marketing Margin = Selling Price – Buying Price
Total cost = Standard Marketing Cost + Transaction Costs

Marketing costs are composed of the total costs incurred on the marketing of produce by each actor (Table 9). Average costs were estimated by respective market participants. The proportions indicate the significance of each cost item against other marketing cost components. Data

collected from the surveyed markets and from discussions made with key informants were used to analyze marketing costs. However, some cost items (e.g. search cost) which were found difficult to estimate by key-informants, were taken from the literature of previous similar studies (Legese and Hordofa 2011). The major costs for sheep producers are feed and veterinary costs. Sheep producers' marketing costs are considered zero, since they are trekking their animals to the nearby markets by themselves or are using family labour. Distribution of costs and margins was calculated for three of the four marketing channels. The highest marketing cost is incurred by hotels/butcheries (124.4 ETB) followed by large traders (50.40 ETB) and small traders (26.20 ETB). Tax, transportation and feed costs are the major marketing costs for small traders in that order. Processing costs are the major costs for hotels/butcheries.

Table 9: Marketing cost (ETB) and the proportion (%) of total cost for different market participants

Cost category	Producers		Collectors		Small Traders		Large Traders		Butcheries /hotels		Individual consumer		Export abattoirs	
	Costs	% TC	Costs	% TC	Costs	% TC	Costs	% TC	Costs	% TC	Costs	% TC	Costs	% TC
Feed cost	175	97.2%	4.00	49%	10.00	38%			11.20	6%	2	11%	10	7.4%
Vet cost	5	2.8%	2.00	24%	5.00	19%								
Barn cost									2	1%				
labour cost													5	3.7%
Search cost			0.20	2%	0.20	1%	0.40	1%	0.20					
Spices									82	45%				
Processing cost									20	11%	10	53%	80	59.3$
Transportation			2.00	24%	3.00	11%	35.00	69%	2	1%	5	26%	40	29.6%
Total tax payment					5.00	19%	5.00	10%	5	3%				
Loading and unloading					3.00	11%	10.00	20%						
Other costs (Rope)									2	1%	2	11%		
Total cost/head	180	100	8.20	100	26.20	100	50.40	100	124.40	68	19	100	135	100

Margins and value additions

The flow of benefits among actors in the value chain is another important aspect. In the current study, the first channel is the one that leads sheep to the hotels/butcheries. In this channel, the largest net margin is obtained by collectors followed by hotels/butcheries; and the least margin is obtained by small traders (Table 10). Sheep producers obtain only about 64.83% of the final price of the processed sheep meat sold by the hotels/butcheries.

Table 10: Costs and margins of the actors involved in selling sheep to local hotels (in ETB)

Items	Producers	Collectors	Small traders	Hotels/butcheries
Selling price	800	975	1063	1234
Total marketing cost		8.2	26.2	124.4
Marketing margin		175	88	171

Net margin		166.8	61.8	46.6
Total cost	180	808.2	1001.2	1187.4
Value addition	620	166.8	61.8	46.6
Share of value added (%)	69	19	7	5
Producers' share of final price (%)		82.05	75.26	64.83

Calculation of margins and value addition was also done for the channel which transports sheep to the individual consumers in the locality. In this channel there are different types of actors involved in the sheep value chain. On the way through the marketing channel, value is added to the product. The value added to the product is shared among the value chain actors. As indicated in Table 11, producers take the largest share of the value added which is 49% followed by collectors (21%), and small traders (20%). Individual consumers get the lowest share of value added (10%). Producers' share of final price is very low, which is estimated as 53.13%.

Table 11: Costs and margins of the actors involved in selling sheep to local individual consumers (in ETB)

Items	Producers	Collectors	Small traders	Individual consumers
Selling price	850	1150	1450	1600
Total marketing cost		8.2	26.2	19
Marketing margin		300	300	150
Net margin		291.8	273.8	131
Total cost	180	858.2	1176.2	1469
Value addition	670	291.8	273.8	131
Share of value added (%)	49	21	20	10
Producers' share of final price (%)		73.91	58.62	53.13

The other important channel which passes sheep to end users is the channel to Addis Ababa market. In this channel different actors are involved. On the way through the marketing channel, value is added to the product. The value added to the product is shared among the value chain actors. As the results indicate, producers take the largest share of the value addition which is 54% followed by collectors (23%), and small traders (9%). Individual consumers and large traders in Addis Ababa get the least share of the value added. Producers' share of final price is low, which is estimated as 56.14% (Table 12).

Table 12: Costs and margins of the actors involved in selling sheep individuals at Addis Ababa market (in ETB)

Items	Producers	Collectors	Small traders	Large traders	Individuals at Addis Ababa
Selling price	750	1000	1116	1234.00	1336.00
Total marketing cost		8.20	26.20	50.40	20
Marketing margin		250	116	118	102
Net margin		241.80	89.80	67.60	82
Total cost	180	758.20	1026.20	1166.40	1254

Value addition	570	241.80	89.80	67.60	82
Share of value added (%)	54	23	9	6.43	7.80
Producers' share of final price (%)		75	67	60.78	56.14

As indicated in Table 13, calculations of margins and value addition were also made for the channel which transports sheep to the export abattoirs. In this channel there are different types of actors involved in the sheep value chain. As indicated in the following table, producers take the largest share of the value added which is 79%, followed by small traders (7%), and collectors (6%). Export abattoirs get the lowest share of value added (4.75%). Producers' share of final price is low, which is estimated as 66.49%.

Table 13: Costs and margins of the actors involved in selling sheep to Export abattoirs (in ETB)

Items	Producers	Collectors	Small traders	Large traders	Export abattoirs
Selling price	750	800	875	960.00	1128.00
Total marketing cost		8.2	26.2	50.4	135.00
Marketing margin		50	75	85.00	168.00
Net margin		41.8	48.8	34.60	33.00
Total cost	180	758.2	826.2	925.40	1095.00
Value addition	570	41.8	48.8	34.60	33.00
Share of value added (%)	79	6	7	4.98	4.75
Producers' share of final price (%)		93.75	86	78.13	66.49

As it is indicated in the above four tables, the most efficient marketing channel that benefits the producer in terms of the producers' share of final price is when sheep are sold to export abattoirs. Next is when sheep pass through the channel to hotels. The efficient/beneficial marketing channel is when sheep are sold to individual consumers.

Relationships

In the existing sheep value chain there are vertical and horizontal linkages. Some of the relationships among different actors are discussed below:

Vertical linkages

The vertical linkages in this chain exist mainly for traders (large traders to collectors). However, this relationship is not formal and is based more on trust (friendship), evidenced in terms of the premium price paid among large traders, small traders and collectors. In addition, there is a vertical relationship between government institutions and value chain actors, especially producers, in terms of technical provision in the form of training and advice.

Horizontal linkages

In the case of horizontal linkages, these exist among actors at the same position or level of participation. This linkage is evidenced by the formation of associations by similar groups of actors (e.g. farmers, small traders etc.). However, there is limited evidence of this activity in the exiting sheep value chain.

Farmers have no special relationship either with traders or other actors in the sheep value chain. In the study areas, the local cooperative had a limited number of farmers as members, but it did not carry out activities related to livestock. Nonetheless, farmers believe they will benefit if they are organized in to groups to work on livestock.

Traders have don't have any specific relationships — either with their suppliers or their buyers. As a consequence, they do not permit any transactions to be made on credit or legal agreements. However, traders collaborate with one another for transportation purposes. They also lend money to each other without charging interest. Traders do not benefit from a livestock traders' association. Instead, there is always competition among similar traders in obtaining sheep supplies and finding buyers. Price is the key point of competition. Traders attempt to manipulate the price to overcome the competition, i.e. decreasing the price when they buy and increasing the price when they sell, based on the prices of their competitors. There is no formal relationship among hotels owners.

Table 14: Major constraints associated with input/services for small ruminants production in Serara and Bakafa Kebeles of Doyogena District

Input type	Major constraints	Suggested solutions
Feed	Land shortage for feed production	Introduction of new feed technology suitable to the agroecology, such as improved forage, urea-treated straw, etc
	High feed price	Increase access to credit
	Lack of improved forage species	Increase in supply of improved forage
	Farmers' awareness is poor	Provision of training
Breeding stock	Limited number of rams	Introducing and strengthening community based sheep improvement programs.
	Inbreeding problem	Introducing and strengthening community based sheep improvement programs.
	Absence of improved sheep breeds	Introduction of improved sheep breeds

The veterinary service is not satisfactory (especially in Bekafa Kebele) due to different factors such as a lack of skilled animal-health care staff (there is one expert in one animal health centre for three kebeles), shortage of drugs, distance to the health posts, lack of transportation (to provide a mobile health service at the time and place of need), no sufficient laboratory facilities and equipment, no buildings (most of the time, parts of other buildings are used and these are not up to health care standards).

Feed problems

The most common problem related to feed is a shortage of land to produce it, high feed prices and a lack of improved forage technologies. During FGDs, farmers indicated that, per household, land-holding is too small, i.e. 0.25–0.75 ha is inadequate to produce animal feed. There is an increasing demand for cultivated land, in line with the increasing population. As a result, more pastureland has been used for crops. Consequently, there is a serious shortage of land in the district for both natural pasture and for improved forage production. Moreover, the increasing cost of feeds (both roughages and concentrates) from different sources (farmers, traders and processers) challenges the feed purchasing power of sheep producers. Such problems could be

alleviated by using improved forage technologies. Although, there are different forage development options, poor awareness of farmers of different forage development strategies and the unavailability and/or limited availability of improved forage seeds and planting material, worsens feed scarcity problems in the district, so intervention in the area of feed improvement is critical.

Breeding stock supply problems

In the area, farmers do not usually keep rams for breeding. Rather, they rather take them to market or castrate them for fattening. Thus, the number of rams in the village is always limited. Sometimes farmers have to look further afield to find a breeding ram. In addition, the knowledge of farmers about inbreeding problems is limited. The absence of the introduction of improved breeds is a further problem related to sheep breeding.

Production

Farmers have identified and prioritized five major constraints on sheep production. Pair-wise ranking was used to prioritize these constraints. As shown in table 15, the result of the pair-wise ranking shows that the problems of sheep production in Serara Kebele are, in order of importance: lack of credit service, shortage of feed, lack of training, lack of improved breeds and land shortage; whereas for Bakafa Kebele the constraints in order of importance are: lack of training, absence of credit service, feed problems, health problems and the lack of improved breeds.

Table 15: Pair-wise ranking of sheep production problems in Serara and Bakafa kebeles of Doyogena District

Problems (Serara)	***A***	***B***	***C***	***D***	***E***	***Frequency***	***Rank***
Feed (A)		A	C	A	A	3	1
Training(B)			B	D	B	2	2
Credit (C)				C	C	3	1
Breed (D)					D	2	2
Land shortage (E)						0	3
Problems (Bakafa)	***A***	***B***	***C***	***D***	***E***	***Frequency***	***Rank***
Feed (A)		A	C	A	E	2	3
Health (B)			C	B	E	1	4
Credit (C)				C	E	3	2
Breed (D)					E	0	5
Training(E)						4	1

Lack of training

Actors at all levels of the value chain lack technical competence in the process of sheep production and marketing. For example, most farmers do not use improved ways of sheep production, DAs lack the concept of the sheep value chain, traders do not have information on how to properly handle sheep during transportation. There is a management problem for leaders of cooperatives who lack technical knowhow. Leaders of cooperatives are not paid and, as a result, they lack a sense of ownership. To alleviate this problem awareness creation and the formal employment of the managers of cooperatives and accountants is important. A further problem of cooperatives is a shortage of working capital. As indicated by experts from

cooperatives in the Doyogena district, injecting capital or organizing cooperatives into unions could be solutions.

Credit problems

Actors in the sheep value chain have problems of credit and, hence, working capital. There are banks and microfinance institutions working in the area. However, these institutions have no special credit arrangements for livestock production and marketing. Most of the actors get credit from relatives or friends. As the majority of farmers in the kebele are subsistence farmers, this creates a problem in repaying credit to institutions such as the government credit schemes. Farmers' saving potential is poor as they are poor households. The main challenge for most of these credit and saving associations is their shortage of working capital. This challenge is associated with the majority as most of the capital goes to individuals for credit for input purchases. Some farmers have started to create assets from the credit they get from the association. For example, one women farmer was able to get more sheep with the profit left even after she had repaid her loan and another woman was able to buy clothes with the profit she obtained because of the credit she took. The maximum amount of credit that can be provided to farmers around Doyogena is 4,000 ETB. But in other parts of Ethiopia, such as Tigray, individual farmers can get up to 20,000 ETB. This is a further illustration of the shortage of working capital in this area.

Marketing

As indicated by traders, the following constraints are the main ones in buying animals. In order of importance these are: shortage of working capital, multiple taxation, transportation problems, long transaction times and poor supplies on rainy market days. Traders have problems of working capital needed to expand their businesses. They are not able to get credit, as the requirement and processes are too difficult for them. They also complain that they are obliged to pay tax two to three times for a single animal, i.e. they pay tax at the market gate when they buy animals, they then pay annual tax for the business they undertake, and again when they take animals to the central market (Addis Ababa). In addition they have to pay taxes when they cross the different regional government borders. Traders spend hours negotiating with farmers to buy just a single animal. Farmers do not make decisions easily about selling their animals. During rainy market days, farmers from distant places do not come to the market so, as a result, traders face supply shortages at these times. (Table 16).

Table 16: Pair-wise ranking of sheep marketing problems

Problems	***A***	***B***	***C***	***D***	***E***	***Frequency***	***Rank***
Multiple tax (A)		A	A	A	E	3	2
Transportation (B)			B	B	E	2	3
Supply problems (Rain) (C)				C	E	1	4
Long transaction time (D)					E	0	5
Capital (E)						4	1

Shortage of working capital

Like that of the production core function, the marketing core function has a problem of working capital. The major actors of the marketing function are traders and they face a shortage of capital to expand their business. Even though traders have access to credit services, they complain that

the lengthy process of getting credit and the collateral that is demanded for credit, is beyond their capacity. So they are forced to get credit from informal sources, such as friends or relatives.
Multiple taxes
Traders, especially the larger traders, complain that markets' regulations mean that they pay taxes on many occasions when they transport sheep to Addis Ababa market, and that this has a significant effect on their businesses.

Transportation problems

A further problem for actors of the marketing core function, and particularly for traders, is transportation. This problem arises because they do not own their own transport and so they are forced to pay high transportation costs. Moreover, small traders or collectors reported that they are obliged to trek animals very long distances as there is no animal transportation service from the rural sheep marketing sites.

Processing problems

As shown in Table 17 below, the result of the pair-wise rankings show that the priority problems of hotels in the area are: lack of customers, credit service problems, tax problems, unavailability of quality sheep and a shortage of hotel staff. In the processing core function, hotel owners reported that the market for their finished products is limited, i.e. the number of customers is very low. Moreover, they could not get credit to run their hotel business. They also complained that they are taxed more than expected.

Table 17: Pair-wise ranking of sheep processing by hotels of Doyogena town

Problems	***A***	***B***	***C***	***D***	***E***	***Frequency***	***Rank***
Absence of quality sheep (A)		B	C	D	A	1	4
Tax problem (B)			C	C	B	2	3
Inadequate customer (C)				D	C	4	1
Credit problem (D)					D	3	2
Labor shortage (E)						0	5

Hotel owners complain that they did not get the high quality sheep they prefer. But as discussed before, the truth is that hotel owners will only buy low price sheep and do not care if the sheep they buy are of poor quality. Most of the sheep in Doyogena market are thin or are young lambs. Most consumers' preference is for fat and big animals. Supply of such sheep varies across seasons, i.e. farmers provide fattened and big sheep for holidays which mostly occur during the dry season.

Weak relationship among actors in the value chain

There are different actors in the sheep value chain. These actors should have some sort of relationship or linkage to have an efficient sheep value chain. Some actors have good individual relationships. But most of the relationships in the sheep value chain are poor and limited in scope. The details of some of these constraints are as follows:

Most of the actors in the value chain have neither formal nor informal associations. There is little experience of being involved in associations by producers. Other actors such as traders, hotel owners, feed suppliers, veterinary drug retailers etc. have no relationship with any other actor (through associations). Farmers have an established association known as the livestock Idir, which

aims to provide insurance for livestock loss (death). There is a recently established sheep farmers association which is aimed at improving production and the marketing of sheep.

Nature related constraints (occurrence of drought)

The frequency of drought has an effect on the supply of sheep to local markets. Three droughts have occurred in the last five years and, when drought occurs, farmers face problems such as crop failure and a shortage of animal feeds. So during these times farmers are forced to sell animals (especially small ruminants) to cover the cost of their daily needs. Recently when farmers have experienced drought they have fed their animals with leaf, pseudostem and corm of enset as a coping strategy.

Inefficient credit and saving associations

Most of saving and credit associations are managed by committees. To improve the efficiency of these cooperatives, training in leadership that is appropriate for cooperative committees is critically important. Beginning last year, saving and credit associations have started to make provision for credit for agricultural input. Since this time it has been felt that cooperative members have begun to demonstrate a sense of ownership.

There is gap in executing the legal terms during occurrence of shortage in accounting balance after auditing. A decade ago in the district there was problem in that cooperatives were governed by cooperatives proclamations, but now the problem is not so serious. There is no as such educative punishment made so far for those who did not abide by the proclamation. The proclamation has its own law, but there is problem in executing this law. If cooperatives improve to be abide their own rules and regulation it will be easy to execute the sentences of the law in the cooperative proclamation. Since there was no serious problem related to shortage in accounting balance (negative balance) after auditing experts did not sense the problem in executing cooperative laws. The governance of cooperatives usually does not allow deficits to be incurred. However, if this does happen in the short term, there are ways in which it can be managed to the benefit of the members. Proper training needs to be provided to the managers of cooperatives, so that such occurrences are not seen as catastrophes. Equally, accountants/auditors need to understand the difference between a short-term cash flow issues and an organization that is in trouble.

Opportunities

Farmers' increasing interest in rearing small ruminants

From group discussions with farmers it has been understood that there is an increasing interest in rearing sheep. Farmers have come to understand that if rearing sheep, there is the possibility of immediate cash income which can be used for different purposes. This is also why farmers are giving increased attention to producing a better product by the better management of their sheep.

Large sheep population

The area of the study has a high sheep population. This sheep population is the source of breeding stock and fattened sheep for the surrounding kebeles and districts. For example, the source of the Adilo breed is the Doyogena area and that is why the regional government has launched the community based sheep breeding improvement program in this area. In the Doyogena district the sheep population is estimated as 13,822, which is the largest livestock population apart from cattle.

Existence of many rural sheep markets in the surrounding area

In the area there are many rural and district markets that supply sheep to the Doyogena district market. The availability of these markets helps maintain a constant supply of sheep to the market and helps to provide the many different classes of animals which are demanded by different types of consumers. Moreover, the existence of such markets minimizes the transportation problems of rural farmers as they can sell their animals at the smaller local markets.

Increasing trend in sheep demand

Demand for meat is increasing from both local and export markets. Sheep, because of their productive and adaptive behavior in challenging environments, have attracted the attention of major market actors. Thus, sheep marketing is growing as sheep demand and supply is increasing. Currently, there is an increasing demand for sheep to be exported to the Arabian countries. Thus, new big abattoirs have been established specifically to process sheep for export to the Arabian countries. This has encouraged the sheep market to supply sheep to accepted quality standards. This has creates an income opportunity to the actors involved in the sheep value chain. These circumstances have also motivated the majority of producers to give more attention to rearing sheep with the main objective of providing an income from the sale of sheep for a reliable price.

Establishment of private flour factories and feed suppliers

In the area, the number of private feed suppliers is increasing, so sheep producers can obtain industrial byproducts (wheat bran and seed cake) to feed their livestock. There is also a flour factory in the district that can supply wheat bran on a regular basis. Moreover, the factory plans to start producing specific animal feeds, by mixing and treating different feed ingredients for different types of animals, including sheep. The availability of such animal feed by the private sector will increase the productivity of sheep farmers.

Increased intervention by government and NGOs in sheep improvement

There is a positive opportunity for the government to support the livestock sector as a whole and, in particular, the sheep farming sector. To achieve the five-year development and transformation plan, the government of Ethiopia has devised sectorial strategies. Improving productivity in the livestock sector and thereby increasing foreign currency is amongst these strategies. In particular, the regional government of Southern Nation Nationalities and Peoples' Region (SNNPR) has launched the Community Based Sheep Improvement Program. Doyogena district is one of the project sites for this program. Moreover, some NGOs are providing support to the improvement of the Doyogena breed of sheep. For example Irish Aid in collaboration with the Areka Agricultural Research Center has launched the ORTDP project in seven districts of SNNPR. One of these districts is Doyogena. The project has an objective of disseminating agricultural technologies. Thus to improve the productivity of sheep, the project has introduced the improved Bonga breed rams in two kebeles. Moreover, ICARDA via ILRI is planning to develop the value chain of sheep in the study area. This range of support will improve the productivity of farmers and their production of sheep and thereby the livelihoods of the community.

Conclusions and recommendations

The livelihoods of farmers in the study area depend mainly on crop and livestock production. As reported by farmers during the FGD, livestock contribute more than 30% of household income. The major component of livestock production is cattle rearing. However, small ruminants, particularly sheep, play an important role in fulfilling the immediate cash income needs of smallholder farmers. Acknowledging the critical role that sheep play in generating income, both for smallholder farmers and the national economy, this study was conducted to understand and develop the sheep value chain. To achieve the study objectives a rapid assessment was made using different PRA tools such as FGDs, key-informant interviews and observations.

The results obtained from this study can be summarized in four parts. These have been classified as: core functions of the value chain; value chain actors; marketing channels; and constraints and opportunities. Five major core functions of the sheep value chain were also analzyed; there were: input supply; production; marketing; processing; and consumption. To achieve the objectives of each core function different actors fulfil different roles. For example, under input supply the activities accomplished include feed supply, veterinary supply and breeding stock supply. In the study, the main value chain actors were butchers, hotels/restaurants, individual consumers, traders, collectors and producers.

Six marketing channels were also identified: local hotels; local individual consumers; individual consumers at Addis Ababa; farmers for fattening, farmers for breeding purposes and export abattoirs. Under each function a number of constraints were identified. For input supply the priority problems were a shortage of land, high feed prices and a lack of improved forages, whereas the constraints on production were a lack of farmers' awareness of opportunities, the limited number of rams and inbreeding problems. Shortage of working capital, multiple taxation and transportation problems were the constraints of the marketing core function. While for the processing core function the constraints were limited markets, the absence of credit services and high taxation. Finally, the constraints of the consumption core function were a low quality product (sheep) and inconsistent supply.

From the results of the study, it can be concluded that the existing sheep breed has good characteristics such as rapid growth potential, twin lambing tendencies, attractive appearance and adaptive behavior. But production is not market-oriented: there are poor animal health services and facilities (shortages of drugs, skilled staff, local health posts, buildings, laboratory facilities and equipment, and vehicles to provide a mobile animal health service). Credit services were not widely available or well organized (the offer of credit came with a lot of pre-conditions). Moreover, feed production and productivity were very poor and given less priority by producers; there was a poor extension system with regard to improved forage development and use; and a proper breeding strategy was missing. In addition to overcoming the obstacles the following recommendation should be put in place to have profitable sheep production and marketing that can benefit all actors in the value chain.

Recommendations

In this study, different constraints of the sheep value chain were identified. Based on the priority of these constraints, the following recommendations have been made. One specific recommendation can alleviate more than one constraint. For example, when it comes to a shortage of land and a lack of improved forage, the recommendation would be to introduce improved forage technologies.

Introduce improved forage technologies

In the study area, one of the constraints that impeded the development of the sheep value chain was a problem with feed. This featured a shortage of land for feed production, high feed prices and a shortage of improved forage species. The introduction and promotion of improved forage technologies and the development of different forage strategies, without compromising other agricultural activity, is critically important to improve the productivity of sheep (as feed input costs account for more than 60% of the cost of production). Agricultural offices and NGOs working in rural development projects can play a critical role by introducing different forage technologies that fit the conditions of smallholder farms.

Provide training to farmers, development agents and experts

Another impediment in the development of a sheep value chain is the lack of technical knowhow of producers, traders and experts. Farmers lack knowledge on improved ways of managing sheep production, which leads to lower productivity; while traders have problems in making relationships, using transportation and handling sheep. Both farmers and traders would therefore benefit from practical training to fill observed technical gaps and improve their role in the sheep value chain. Meanwhile, experts and DAs — the technical advisors of producers — need training on improved husbandry practices for sheep.

Strengthen community based sheep improvement programs

The most important constraint related to the production of sheep in the area is related to breeding. Firstly, there is a shortage of rams as farmers in the area do not have experience of keeping rams for breeding purposes; instead, they usually fattened (castrate) the rams for selling. The second problem is inbreeding, despite most farmers being aware of the consequences of inbreeding for the productivity of sheep. This problem can be alleviated by strengthening community based sheep improvement programs. In the study area, this type of program had already been launched by the regional government.

Form farmers' cooperatives and strengthen saving and credit associations

Organizing farmers into groups increases their power to acquire necessary inputs, negotiate with other value chain actors and solve problems together. For example, in the study area there were examples of farmers forming savings and credit associations. However, the membership of these associations was low. Yet, elsewhere, the established savings and credit associations had serious performance problems. Therefore, supporting the formation of farmers' groups with specific objectives, and strengthening the performance of existing cooperatives would alleviate farmers' problems concerning input supply and obtaining credit, while increasing their negotiating power when selling animals; thereby improving the development of the sheep value chain.

Support agricultural, marketing and cooperative offices (extension services)

In the study area, the responsible bodies that provide technical support to sheep producers are the District Office of Agriculture and the Marketing and Cooperative Office. The District Office of Agriculture is responsible for providing technical support in all aspects of sheep production management. But it has a number of problems that limits its capacity to give appropriate support to farmers. These are related to a shortage of staff, transportation problems, a lack of standardized veterinary service centers and a shortfall in budget. The Marketing and Cooperative Office shares many of these problems, and is the office responsible for organizing farmers into legal groups, like savings and credit associations.

Both offices need support in terms of logistics (office supplies, vehicles and budgets) in addition to capacity building. Here's a prioritized list:

- provision of funds to support working capital
- improved inspection and auditing systems of cooperatives through training
- support to expand membership (increase the number of cooperative members)
- strengthened organization of existing cooperatives and the formation of new ones.
- overall training on the concept of cooperatives to members
- more vehicles, such as motorbikes, in order to provide technical support for cooperatives at kebele level
- more office equipment like computers, stationery, furniture
- improved marketing links

Support linkages among value chain actors

Different kinds of value chain actors were identified in the study as were vertical and horizontal linkage problems in the sheep value chain. The various actors do not have a formal working relationship. In the vertical linkage, traders sometimes used informal credit, i.e. they lent money to each other but did not charge interest. However, access to this support depends on having a personal relationship (friend or relative) and was not uniform among traders. On the other hand, there was no strong horizontal relationship between value chain actors either. There were only two recently organized farmers' associations that had been set up with the help of a community based sheep improvement program. Therefore, it is important to strengthen and give support to the establishment of both vertical and horizontal linkages in the sheep value chain, such as organizing an annual workshop for all stakeholders who are directly or indirectly involved.

Strengthen micro-finance institutions and credit service

Most of the sheep value chain actors faced a shortage of working capital or credit. Some of these actors used informal credit (friends or relatives) which was neither sustainable nor adequate. To improve the development of the sheep value chain, all actors involved should have a minimum working capital. Therefore, based on their needs and capacities these actors need credit, either from microfinance institutions or banks. At the moment, the use of credit services from these sources by the sheep value actors is limited. Intervention to improve this situation, such as raising awareness among farmers, is critically important to enhance the development of the sheep value chain.

Table 18. Major constraints and suggested recommendations, implementing bodies and time horizon needed to implement the recommendations

Stages of value chain	Challenges	Suggested interventions	Implementer	Time horizon
Input supply	Land shortage for feed production	- Introducing high-yielding improved forage crops adaptable to the area - Integrating forage development with soil and water conservation activities - Introducing feed and feeding technologies (e.g. urea and molasses treatment)	SARI, BoA, W. Admin, Cooperatives, ICARDA, ILRI	Short term (up to 2 years)
	Land use system (sole-cropping)	- Introducing intercropping of forage legumes with food crops	SARI, BoA, W. Admin, Cooperatives, ICARDA, ILRI	Medium term (2–4 years) (researchable issues)
	High feed price (for green fodder and concentrates)	- Organizing farmers into cooperatives to reduce transaction costs and improve their bargaining power. - Improving farmers' access to credit by improving linkages between the community and the credit institutions - Encouraging private forage seed multipliers - Encouraging individual farmers as forage seed multipliers through training	SARI, BoA, District Admin, cooperatives, ICARDA, ILRI, Omo micro-finance	Short term (up to 2 years)
	Shortage of planting materials for improved forage species	- Improving the supply of improved forage technologies	SARI, BoA, W. Admin, Cooperatives, ICARDA, ILRI	Short term (up to 2 years)
Production	Low farmers' awareness of improved sheep production practices	- Providing practical training on sheep production and marketing to sheep producers	SARI, ICARDA, ILRI and other partners	Short term (up to 2 years)

Stages of value chain	Challenges	Suggested interventions	Implementer	Time horizon
		- Providing training of trainers on sheep husbandry practices and marketing to SMS and DAs so that Das, in turn, can assist smallholder farmers		
	Inbreeding problem	- Introducing and strengthening community based sheep improvement programs. - Providing training to farmers on sheep breeding	SARI, BoA, W. Admin, coops, ICARDA, ILRI	Medium term (2–4 years) (researchable issues)
	Respiratory diseases	- Targeted treatment of affected animals - Basic herd health program - Prevention first (vaccination)	SARI, BoA, W. Admin, coops, ICARDA, ILRI	Short term (up to 2 years)
	Shortage of working capital	- Organizing farmers into saving and credit cooperatives - Improving access to credit	SARI, BoA, W. Admin, Marketing and Cooperative Bureau, ICARDA, ILRI, Omo micro-finance	Short term (up to 2 years)
Marketing	Shortage of working capital	- Strengthening the capacity of existing saving and credit cooperatives - Improving the accessibility of microfinance institutions	SARI, BoA, W. Admin, Marketing and Cooperative Bureau, ICARDA, ILRI, Omo micro-finance	Short term (up to 2 years)
	Multiple taxation	- Organizing stakeholder meetings (political leaders, revenue authorities, municipality, traders)	SARI, BoA, W. Admin, Marketing and Cooperative Bureau, ICARDA, ILRI, revenue authorities	Short term (up to 2 years)

Stages of value chain	Challenges	Suggested interventions	Implementer	Time horizon
	Inconsistent supply	- Improving the production and productivity of sheep through community based sheep improvement program	SARI, BoA, W. Admin, Marketing and Cooperative Bureau, ICARDA, ILRI	Medium term (2–4 years) (researchable issues)
	Inadequate local market (customer)	- Awareness creation/promotion work	SARI, ICARDA, ILRI and other partners	Short term (up to 2 years)
Processing	Supply of low quality animals	- Awareness creation, introducing and strengthening community based sheep improvement programs - Training farmers in sheep fattening techniques	SARI, ICARDA, ILRI and other partners	Short term (up to 2 years) and medium term (2–4 years) (researchable issues)
	Inconsistent supply	- Improving the production and productivity of sheep through genetic improvement	SARI, BoA, W. Admin, Marketing and Cooperative Bueruo, ICARDA, ILRI	Medium term (2–4 years) (researchable issues)

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Appendix 1: Participants in the value chain analysis

Name	Designation	Sex	Participation/role
Abeyu Lalago	Farmer	Male	FGD
Lire Makebo	Farmer	Male	FGD
Dudebe Helasebo	Farmer	Male	FGD
Tamirat Lalego	Farmer	Male	FGD
Askale Alemu	Farmer	Male	FGD
Desta Deleso	Farmer	Male	FGD
Genet Teshale	Farmer	Male	FGD
Desalegn Girma	Farmer	Male	FGD
Bekelech Tamirat	Farmer	Male	FGD
Adisse Talore	Farmer	Male	FGD
Abate Bulla	Farmer	Male	FGD
Wolde Abebe	Farmer	Male	FGD
Ayelech Kosso	Farmer	Male	FGD
Ayelech Ayele	Farmer	Male	FGD
Etore Hajero	Farmer	Male	FGD
Wolde Deboch	Farmer	Male	FGD
Abera Adelo	Farmer	Male	FGD
Belaynesh Tamirat	Farmer	Male	FGD
Zeleke Jullo	Farmer	Male	FGD
Aberashe Lema	Farmer	Male	FGD
Birhanu Tumrbo	DA	Male	Facilitation
Fikre Desalegn	DA	Male	Facilitation
Teshale Yohannes	Large trader	Male	FGD
Degefe Amaro	Small Trader	Male	FGD
Bekele Amaro	Small Trader	Male	FGD
Bekele Wolde Mariam	Small Trader	Male	FGD
Abreham Lakew	Small Trader	Male	FGD
Tesfaye Abuye	Marketing expert	Male	Facilitation
Abel Feleke	Marketing expert	Male	Facilitation
Tesema Garkebo	Marketing expert	Male	Facilitation
Tewodros Wolde Michael	Doyogena Flour Factory	Male	KII
Petros Menebo	Feed retailer	Male	KII
Dr. Zeleke Geremew	Veternary Expert	Male	KII
Ayele	Veternary Assistant	Male	KII
Dr. Amsalu	Organic Export Slaughter House	Male	KII
Dr. Reta Nigatu	Luna Export Slaughter House	Male	KII