

# Analysis of sheep value chains in Atsbi Woreda, Tigray Region, Ethiopia

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## 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/>

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# Introduction

In Ethiopia, sheep and goats represent an important component of the farming system by providing 12 per cent of the value of livestock products consumed and 48 per cent of the cash income generated at the farm level (Kassahun et al. 1989). They contribute a quarter of domestic meat consumption, about half of domestic wool requirements, 40 per cent of fresh skins and 92 per cent of the value of semi-processed skin and hide export trade.

Just over 1m sheep and 1.1m goats are consumed annually in Ethiopia (Adane and Girma 2007). Small ruminants are an integral part of the system, providing milk, meat, manure and cash to the farmer (Sandra 1991). Small ruminants act as a store of wealth and determine social status; they play an important role in improving food security and alleviating poverty. Because they are central to the nutrient cycling, small ruminants are important to the efficiency, stability and sustainability of farming system (ILRI 2002).

Sheep are produced in various agro-ecological contexts. The feasibility of cropping and the type of crops produced depend on climatic, edaphic and biotic factors (Adugna and Aster 2007). The extent of cropping and the type of crop, in turn, determine the quantity, quality and distribution of animal-feed resources throughout the year. On the other hand, the feed-resource base and disease patterns determine animal production (Adugna and Aster 2007).

Improving sheep production in Ethiopia requires situation-specific development interventions. The first consideration is to describe the current performance levels of sheep and understand constraints and opportunities. Little or no research has been done so far to identify husbandry practices, reproductive performance, and utilization and marketing of sheep in Tigray. This study aims to fill that gap.

## **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.

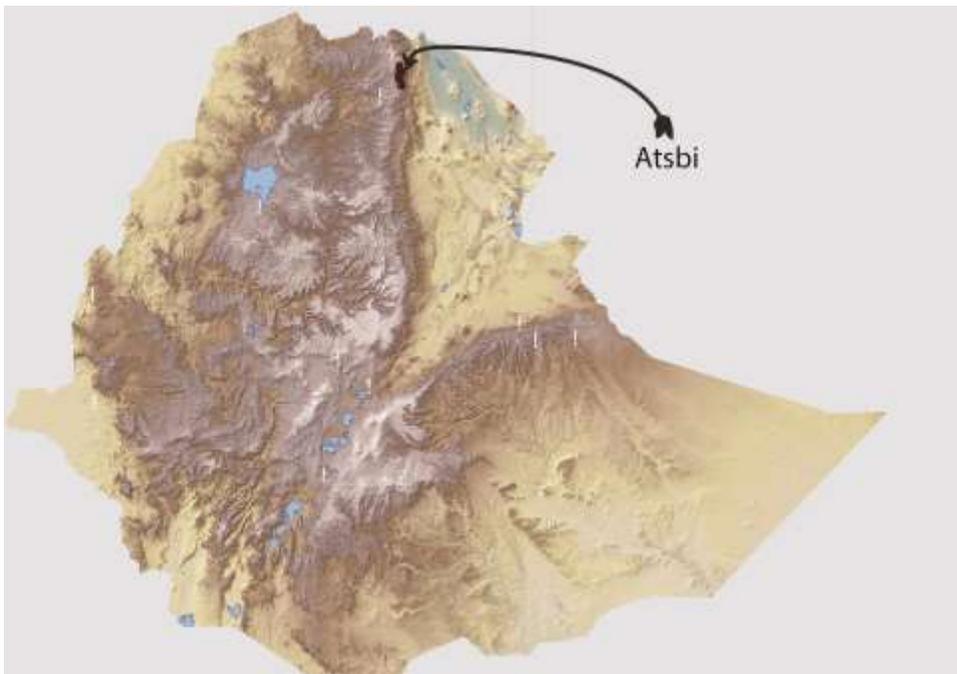
## Objectives

The major objective of the study was to characterize sheep value chains in order to identify intervention areas that can improve the efficiency of sheep production, marketing and consumption. Specific objectives were:

- To identify, technical, financial, legal and institutional opportunities and barriers that influence the development of sheep value chain.
- To analyze marketing strategies and channels with a view to develop the sheep value chain.
- To suggest key intervention areas for researchers, development practitioners and policy action.

## Study area

The Atsbi-Wonberta woreda is found in the eastern part of Tigray 65 kilometres (km) from Mekelle city. The woreda is bordered in north by the Saese-Tsaedaemba woreda, in the south by Enderta woreda, in the east by Afar regional state, and in the west by Kiltawlaelo woreda. Elevation ranges from 2400 to 3000 metres (m) above sea level at Dega (highlands), and from 1800 to 2400 m above sea level at Weynadega (mid-highlands).



**Figure 1: Location of Atsbi-Wonberta**

The woreda has a total area of 1223 km<sup>2</sup>. Generally the Woreda has 70% and 30% Dega and Weynadega agro-ecologies, respectively. The major types of land use are: 89,185 hectares (ha) of forest; 8,742 ha grazing land; arable 35,305 ha; and 13,050 ha cultivated (ARDO 2006).

The climate ranges from cool to warm. The average temperature is 18°C. Rainfall is usually intense and short, with an annual average of 668 millimetres (mm).

According to the information from the Woreda Agricultural and Rural Development Office (2006), the woreda has a total population of 112,639, of whom 55,359 (49.2 per cent) are males and 57,280 (50.9 per cent) are females. The urban and the rural population are respectively 9,609 and 103,030.

The dominant cereal crops of the area are barley, wheat, tef, maize and sorghum. The important marketable crop commodities are beans, field peas and lentils. Despite the large population of livestock, especially sheep, livestock productivity is low. Dairy and horticultural products are important marketable commodities – 30,588 cows; 15,431 goats; 82,950 sheep; 47,265 poultry; 9,416 donkeys; 1,333 mules, 79 horses and 54 camels.

## Data collection and analysis

A combination of different techniques was applied to capture the required information about actors, constraints and opportunities in the sheep value chains at the target sites. Secondary information was collected from Woreda Office of Agriculture and the Woreda Livestock and Marketing Agency. Moreover, relevant literature and documents were consulted to provide technical background and to develop a basic understanding of how sheep production system operates in the study areas. Participatory Rural Appraisal (PRA) tools, Focused Group Discussions (FGD), key informants interview and visual observations were used to collect primary data. Specific checklists were used for the different group of value chain actors to guide group discussions and key informants interviews.

Focus group discussions (FGD) were held in the two target kebeles with a group of 16 sheep producers in each kebele. Land holding, gender and age were considered in identifying the participants. Experts in livestock extension as well as traders, butchers, hotels managers and veterinarians were included as key informants in the study. A total of 29 key informants were interviewed (Table 1).

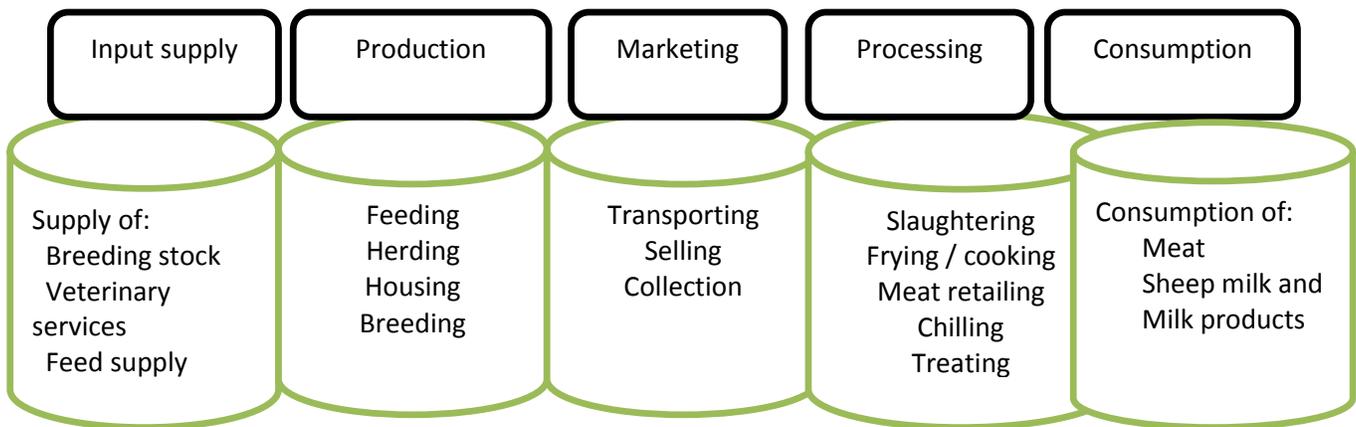
**Table 1. List of the key informants interviewed**

Key informants	Location	Number	Remark
Woreda experts	Atsbi	6	For production and input
Credit providers	Atsbi	1	Credit service
Feed suppliers	Astbi	2	Feed supply
Export abattoir	Mekelle	1	For marketing and consumption
Hotels	Mekelle	2	For marketing and consumption
Butcheries	Mekelle	2	For marketing and consumption
Veterinarians	Mekell and Atsbi	3	Vet service
Traders	Atsbi and Mekelle	12	Market channel, margin
Total		29	

The data collected from focus groups, interviews and visual observations were analyzed using a thematic analysis approach. Quantitative data were analyzed using descriptive statistics to calculate costs and margins along the value chains.

## Results: Mapping core functions in the sheep value chain

The activities observed in the sheep value chain of the study area were listed according to the core functions of value chains: input supply, production, marketing, processing and consumption (Figure 2). Different activities are performed by the different core functions.



**Figure 2. Map of core functions of sheep value chain**

### **Input supply**

Establishing an effective input supply system based on market demand will enable the farmers to obtain quality inputs in the required quantity, at the place needed, and on time, at a reasonable price. In general, the strengthening and expansion of market-oriented livestock development requires the creation of an efficient input delivery system that includes the multiplication of inputs domestically in the quantity and type required.

The input supply for sheep production in Atsbi woreda includes breeding stock, feed, veterinary, drug supply and credit. The sources of the inputs (like feed, breeding stock and veterinary service) for sheep production mainly comes from the farmers themselves, the Office of Agriculture, the Tigray Agricultural Research Institute (TARI) and traders. Sometimes the Dedebit Credit and Saving Institution (DECSI) gives sheep (female) to female-headed households or female farmers on credit. The woreda Bureau of Agriculture and TARI only provide veterinary services to the farmers.

### **Breeding stock supply**

Despite its importance to subsistence farmers, sheep breeding has not received the attention it deserves from development institutions. The Office of Agriculture and TARI are the local agricultural service providers. These institutions have not given attention to small ruminant breeding in general and sheep production in particular. This can be inferred from farmers' awareness and skills in sheep breeding and management practices.

Although the sheep breeds of the woreda have some good qualities and a high demand, breeding and management techniques are still traditional. Farmers are the major source of

breeding stock. There is a system of ram sharing with neighbours and relatives. The farmers also occasionally purchase breeding animals from traders. There are no cooperatives mentioned as suppliers. There have been efforts to distribute breeding rams by World Vision Ethiopia, but generally there is no supply of improved genetics, a possible area for intervention.

### **Credit services**

Regularly credits are given for the purchase of dairy cows, fertilizer and improved seeds, livestock fattening, poultry production, horticultural production, apiculture, handicraft, and small businesses.

DSCI is the major supplier of credit and saving services for the farmers of the woreda. Four sub-branch offices provide services to the rural people in Atsbi-Wonberta woreda. DCSI credit is given for up to two years at 18 per cent interest. The maximum loan in rural areas is ETB 5000. A mandatory saving of 5 per cent of the initial loan (principal) plus two birr a month in saving is required of borrowers, which then provide an important source of funds. But credits are not sufficient, arrive late, and require group collateral, and farmers cannot get credit of more than one type. Informal sources of credit from friends and relatives are also important.

### **Veterinary services**

Currently the Office of Agriculture and TARI are the only veterinary service providers. The woreda veterinarian expert explained that there were 10 health posts and 3 animal clinics (at Dera PA, Atsbi town, Haikmeshal PA). The 10 health posts are not functional due to budget constraints. There are three health technicians and one veterinarian in the woreda but the experts told us that they could not render veterinary services to all farmers due to shortage of manpower and transport.

In addition to this, there is also drug supply problem, especially for controlling internal parasites. There are no laboratory services and there is a shortage of veterinary equipment and chemicals. The services offered to farmers include vaccinations once a year (said to be insufficient) and some treatment of diseased animals.

The most important sheep diseases named by the veterinarians in the included coenurosis, mange mites, streptothricosis and trypanosomiasis. The major parasites are lung worms, ticks, mites, lice and fleas. Preventive treatment is inadequate and unvaccinated animals are crowded together.

The major constraints in the veterinary service are shortage of skilled manpower, equipment, transport, drugs and storage. The illegal drug trade and farmers' poor knowledge are also issues.

### **Feed supply**

Forage legumes and trees such as cowpea, pigeon pea, lablab, alfalfa, Leucaena and Sesbania have been introduced in the area and some model farmers cultivate them in their backyards and on irrigated lands.

Farmers who practice sheep and goat fattening provide their animals with wheat bran, 'atela', made from brewing residue, barley and salt.

Feed sources in order of importance are:

- Farmers' own supplies
- Office of Agriculture (pigeon pea, Leucaena and Sesbania)
- TARI (forage seeds)
- Improving the Productivity and Market Success of Ethiopian Farmers project (forage seeds)
- Private companies (wheat bran).

### **Extension services**

Improvement of sheep production has received little attention from government and NGOs. Extension services for sheep production are poor. There have been almost no efforts invested in farmers' awareness of improved production practices and no training offered. There have been no studies on the relationship between the socio-economic characteristics of the household with small ruminant management and husbandry, or the interaction between small ruminant production and other farming activities.

## **Production**

Livestock productivity is low; feed is the major limiting factor and disease also plays a role (Kidanu et al. 2011).

### **Purpose of sheep production**

Sheep production is mostly based on traditional practices. Sheep require relatively low labour input, and may be easily maintained by poor households, women and young people. Production of sheep also serves as a risk-mitigation strategy, as it complements other farm activities and diversifies the household investment portfolio. Sheep are typically sold at an age between 6-12 months. Sheep are kept for cash sale, meat (especially during holiday seasons), and milk.

### **Animal health care**

Farmers reported that their sheep are affected by coenurosis, pasteurellosis, blackleg, sheep pox, trypanosomiasis, mastitis, liver fluke and lung worm. They also observed unspecific respiratory diseases, blood in the urine and external parasites such as tick, mites, lice, and fleas. Livestock diseases were named as a significant constraint to production.

Farmers complained there is almost no veterinary service available, and what does exist is infrequent and inefficient. Farmers are forced to use illegal sources for drugs for want of legitimate government or private sources. And priority is given to cross-bred cattle.

### **Breeding**

The most common sheep breed is known as habesha – mainly kept for meat production and also milked. There is no practice of selecting individual sheep for milk or meat; farmers simply use their sheep for both purposes. These horned, docile sheep are medium-sized with a short, wide tail. Red and grey colours are dominant. They have a good body conformation with a wide loin area. It is a hardy breed, able to cope with shortage of feed and water, and they can make good use of available feed resources in the area. Single births are common but in rare cases they deliver twins. They can reach up to two lambings per year and slaughter weight can be reached at six month of age. They are in high demand at regional level because of the carcass quality and taste, but body size is small, meat yield is low and they are susceptible to disease.

Farmers expressed the need for improved cross-bred animals with higher yields and disease tolerance, but they felt that they cannot introduce improved breeds themselves due to financial constraints, lack of availability of improved crossbreeds and limited knowledge. The majority of sheep production is based on traditional practices. Uncontrolled mating in communal grazing areas with the rams grazing together with the ewes is very common. This leads to unplanned lambing and early breeding of females, resulting in a low rate of conception, birth weight and lamb survival rate.

Keeping selected rams for breeding purposes is not common in the area, even though a few farmers practice it. Men and women farmers select rams at an early age considering body conformation, coat colour and sexual aggressiveness, and make use of them for three years. Rams are not rotated among farmers.

Most of the time promising rams and ewes are sold to the market because they fetch better prices. According to the farmers, their primary interest is to get ewes pregnant; they do not worry about improving litter size, body weight of lambs or other traits. No animal records are kept. The farmers said they were not aware of the negative impact of inbreeding and thus do not practice controlled mating.

Farmers are willing to keep an improved breed if available because they feel that their breed is easily susceptible to diseases and has small carcass, even though the taste of the meat is excellent. The following breeding constraints were mentioned:

- Lack of an improved breed
- Shortage of rams
- Selection of rams or ewes not very common
- No knowledge of breeding strategies
- No breeding programs
- No intervention on breeding
- High incidence of inbreeding due to uncontrolled mating.

World Vision Ethiopia used to distribute rams to orphans in the study area. These rams are better looking animals selected from the market.

### **Milk production and management**

The farmers of the two PAs reported that they could get an average of half a litre of milk per sheep per day. They produce butter from the milk. Milk from sheep is important for children and people who have heart problems. The highest milk yields are obtained during the seasons with high feed supply, mainly from September to December. Women and children are responsible for milking the sheep. Sheep milk cannot be stored for long.

### **Housing**

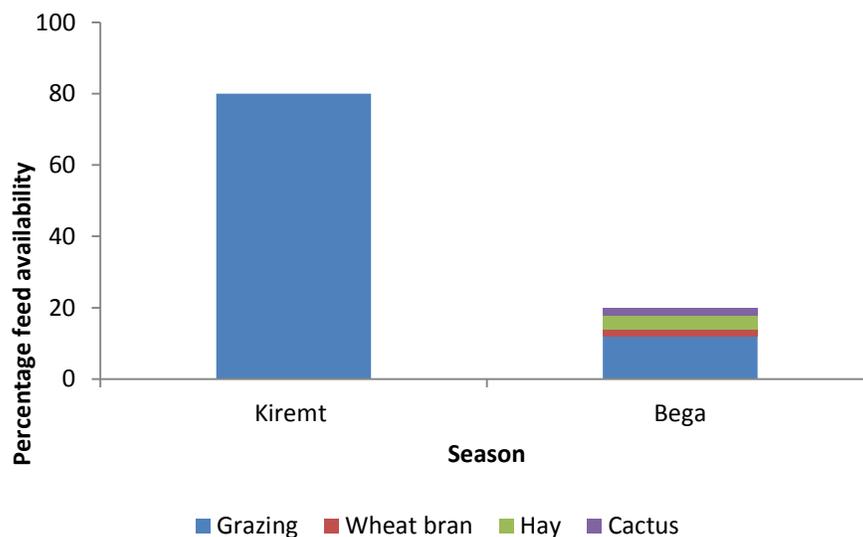
Farmers keep their sheep in barns constructed near or around their homestead. Traditionally, two types of barns are constructed. The first and most commonly used type is an open air pen without a roof which is usually used to house sheep at night during dry the season and is called 'dembe'. Almost all households said they kept their flock together with large ruminants in these pens.

The second type, a 'gebela', is mostly used to confine sheep during the rainy season to protect them from wet and cold. This type of house has walls constructed from local materials such as stone or wood and is partially roofed. Farmers with this sort of housing also keep all types of animals together and sometimes even humans spend the night with their animals to guard them. Small ruminants are often injured by larger animals. This is a cause of abortion in ewes in both housing types.

Poor housing also conduces to disease in animals and people. Farmers reported that they clean the barns once daily in the dry season and twice in the rainy season. Both men (during rainy season) and women (during dry season) are responsible for cleaning the animal sheds.

### Feed resources

Feed resources in Atsbi include grazing areas, crop residues from wheat, teff, barley and other cereals, crop aftermath, hay, wheat bran, cactus, atela , cultivated forage legumes, and fodder like acacia. Grazing lands provide the major feed resource both in the rainy season (80 per cent) and in the dry season (18 per cent ); in the dry season cactus, hay and purchased wheat bran are the other available feed sources (Figure 3). Wheat bran, salt, hay, barley and atela are purchased and used for sheep and goat fattening. Wheat bran is fed to emaciated or weak animals, dairy cattle and sheep and goats being fattened.



**Figure 3. Seasonal feed resource distribution**

Recently communal grazing areas in valleys and depressions have been closed for grazing, leading to a huge increase in biomass; cut and carry systems are now being implemented.

### Seasonality of feed availability

There are two main seasons: 'kiremite', the rainy season, from June to September, and a prolonged dry season named 'bega' from October to May. Feed availability varies with the rainfall (Figure 4).

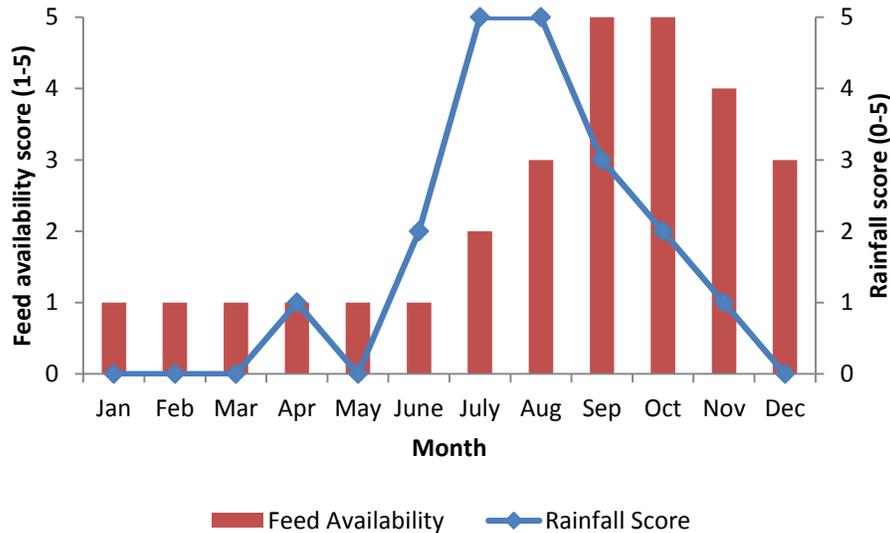


Figure 4. Feed availability relative to rainfall

### Feed utilization

Farmers use mainly natural pasture and crop residues to feed their sheep. They do not practice any improved rationing, supplementation, fattening or feed conservation. Some farmers supply hay to their sheep during the dry season. Production and use of improved forage and fodder is not common.

## Marketing

Marketing is often described as a system because it comprises several, usually stable, interrelated structures that, along with production, distribution, and consumption, underpin the economic process (Mendoza 1995). In popular usage, the term marketing refers to the promotion of products, especially advertising and branding. However, in professional usage the term has a wider meaning.

Sheep marketing in Atsbi woreda comprises production, trading, processing and consumption. There are different locations of sheep marketing: farm gate, village market, town market and regional market. The common markets for Atsbi woreda sheep are Atsbi town, Habes village market, Wukro town, Haykmeshal village market, Adigrat town and Mekelle city. The prevalent marketing levels are small traders, medium traders, hotels, large traders and processors.

### Marketing levels

Generally the market hierarchy in the woreda has four levels. The first market level is trading at farmers' gate or on the road, where small traders and farmers buy and sell animals. Small

traders and middlemen (hired by larger traders and the abattoir in Mekelle) travel to the woreda to make deals and submit the animals to the terminal traders or the abattoir at Mekelle.

The second marketing level is small village markets that open one day a week. Farmers, small traders, and intermediate traders participate. Here traders can compare the condition of the animals and compare and negotiate prices more easily.

Thirdly, small traders trek their animals on foot to larger markets at village towns (Wukro and Atsbi), where they sell animals purchased at the farm gate and village markets to farmers, hotels and restaurants, and intermediate and larger traders. Collectors for big traders also participate in this market and prices rise accordingly.

The end market is in larger towns like Adigrat and Mekelle city. Consumers, hotels, intermediate traders and butchers participate. Better-off consumers will purchase live animals and slaughter them in their backyard. Some consumers band together to purchase and slaughter animals; others purchase meat from butchers who slaughter animals after inspection and approval by veterinarians and the municipality. The collectors gather some animals and submit them to large fattening and slaughterhouses. At Mekelle, the large traders also supply the Abergelle export abattoir with sheep.

Though fewer in number, castrated and fattened sheep are sold at the third level and at the terminal. Traders bring their castrated and fattened rams to these markets for national festivals or holidays.

### **Determinants of demand and price**

The market price of sheep depends mainly on body weight and condition, in turn largely a product of the availability of feed. During the dry season where feed is scarce animals lose weight and their price falls. In some cases shortage of food for people occurs in the late dry season (February to June), which forces farmers to bring their animals to market in large numbers, creating a surplus and depressing the price even further. During the late rainy season and spring (September to January), a time of national festivals and often weddings animals are well fed and fetch higher prices.

Factors such as animal colour, origin, age and temperament, though less significant, also affect price. Light-coloured, young sheep fetch relatively higher prices throughout the year; black sheep are in demand by women in September for traditional worship.

### **Transportation**

Many animals are transported on foot from the farm gate to markets, with little feed and water. During trekking the animals are allowed to rest in the evening and roam around for grazing and water. Only a few intermediate traders and large merchants transport their animals by truck. The trekking and mixing up of animals from different farms, villages and localities presents a major health risk. Export abattoirs at terminal markets discriminate against animals believed to have been trekked for long distances.

## **Processing**

Processing means transforming raw agricultural products into finished goods to maximize the value of the product and prolong shelf life.

Different actors are involved in processing Atsbi sheep meat and skins at various levels. These include the export abattoir in Mekelle, butchers in different towns, the Sheba tannery in Wukro town, and hotels and restaurants. The Abergelle export abattoir supplies meat to, especially, the Middle East. Butchers slaughter sheep and supply raw meat for domestic consumption. Hotels mainly prefer old ewes and fattened/castrated male sheep for a higher meat yield. The hotels, restaurant and butcheries mainly slaughter in their backyard and do not use the municipal abattoirs. Butchers, hotels, restaurants and export abattoirs all say Atsbi sheep meat tastes better and is easily digestible.

## **Consumption**

Most Atsbi sheep meat is consumed domestically; a small proportion that meet the requisite quality standards is supplied to foreign consumers. Domestic consumers prefer Atsbi sheep due to the quality of the meat. Because of high local demand and poor roads, less Atsbi sheep meat is exported than has been hoped for.

Sheep value chain actors

Value chain actors participate in input supply, production, trading, transporting and final processing. The main actors in Atsbi sheep value chain are producers, collectors, small traders, big traders, hotels, butchers, export abattoirs and individual consumers.

### **Producers**

The average flock size in the woreda is around 20 sheep per household. Sheep are a source of food (milk and meat), income and manure. Sheep can be raised with relatively little feed; they are easy to handle and generate quick returns on investments. Farmers are not organized in sheep producer/marketing cooperatives or associations but operate individually. Both men and women participate equally in sheep production and marketing; the main difference is that men, with greater negotiating clout, take the sheep to market. Sheep milk production is managed and controlled by women and children.

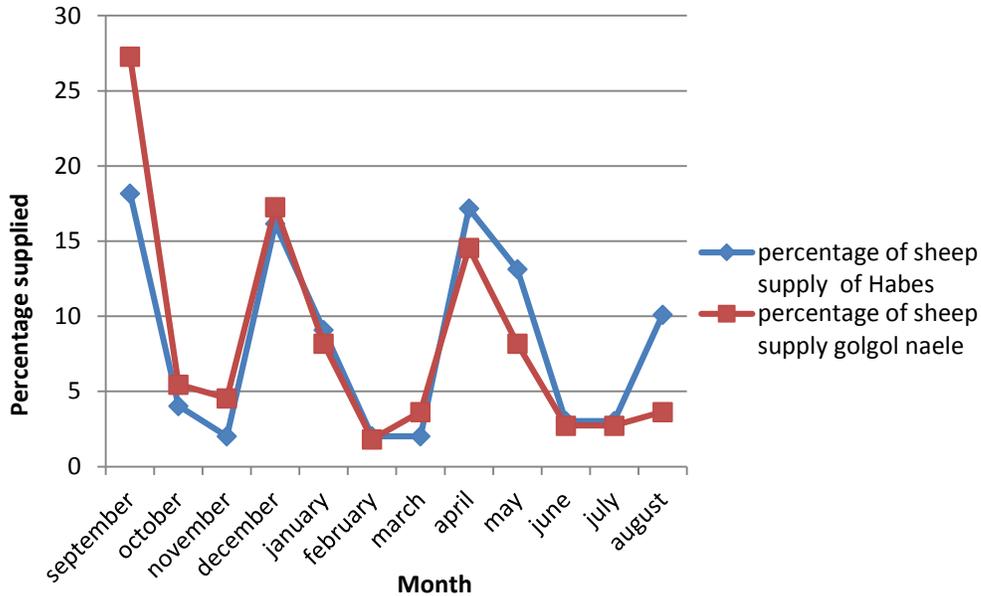
Farmers sell to the highest bidder, whoever it may be. During holidays and festivals, farmers have greater influence in setting price; vice versa during droughts and feed shortages, or in the case of distress sales.

### **Seasons of high supply of sheep to market**

The supply of sheep to market has increased over the last five years, according to focus groups. Consumption of and demand for meat have risen with people's incomes.

Farmers sell sheep whenever they are in need of cash, so there are times when the supply of sheep is higher than the demand. Each year some sheep are sold in June and July when farmers need cash to buy inputs for crop production such as fertilizer and improved seed. These months are also critical times for households' food supply as farmers have to use their grain reserves for planting and may have to buy additional grain to feed their families. However there is a low demand for sheep in these months which results in low market prices for the animals. There are specific months that most of the farmers target for selling their animals. For instance, the

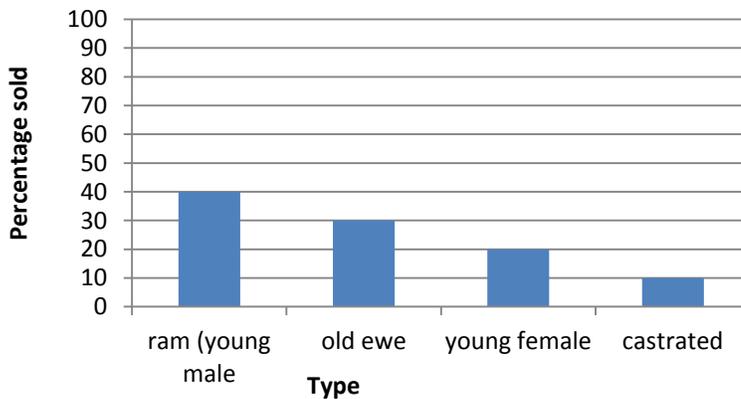
proportion of sheep supplied in September is 28 per cent for Golgolnaele and 18 per cent for Habes (Figure 5). The second highest proportion of sheep from the two PAs is marketed in December and



**Figure 5. Proportion of sheep supplied to the market from the study areas in each month of the year**

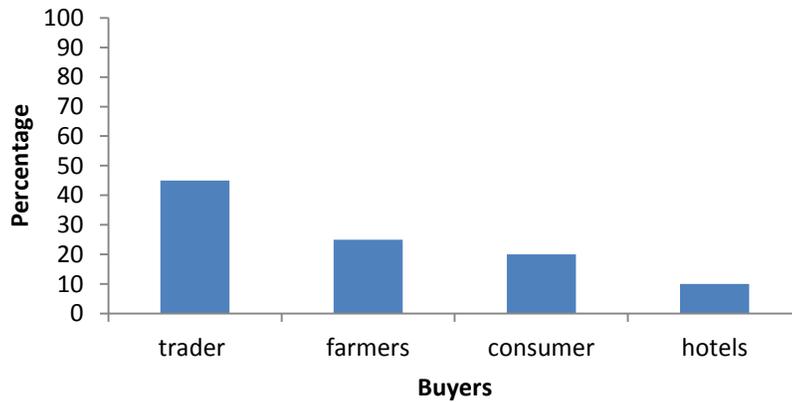
**Type of sheep supplied to markets**

Farmers sell young males, old ewes, young females and castrated males. Around 40 per cent of the sheep supplied by farmers to the markets are young males and about 30 per cent are old ewes (Figure 6). Young females are mainly used as replacement stock and kept on the farm, accounting for only 20 per cent of the total supplied to the market. Only 10 per cent are castrated males.



**Figure 6. Percentage of different types of sheep supplied to the market in Atsbi woreda**

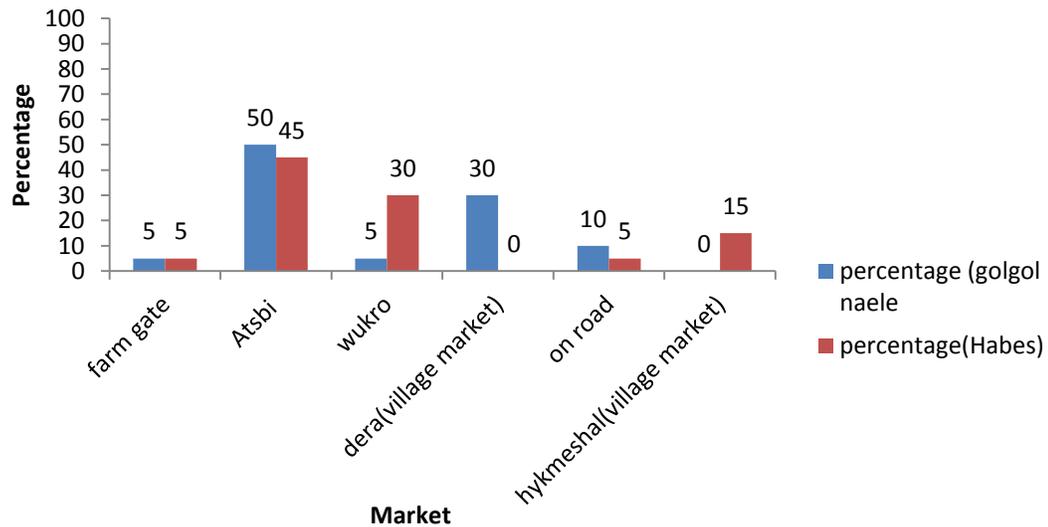
Traders buy the largest share of the sheep (45 per cent) supplied by farmers (Figure 7). Next to traders, farmers (for breeding purpose) buying 25 per cent. Lastly consumers and hotels are also the direct buyers of sheep from producers. Farmers prefer to sell their sheep to individual consumers as they pay higher prices than traders and hotels.



**Figure 7. Buyers of sheep from farmers**

### Marketplaces and prices for Atsbi sheep

Farmers indicated they sell sheep at the farm gate, the village market, in Atsbi, Wukro or on the road (Figure 8). Atsbi market is the major sheep market for Atsbi Wonberta woreda. Farmers said more than half the sheep in the woreda are sold at Atsbi. Wukro market for Habes PA and Dera village market for Golgolnaele PA are also potential markets for Atsbi sheep.



**Figure 8. Markets at which Atsbi farmers buy and sell sheep**

Farmers get better prices at Wukro market than others (Tables 2 and 3). Likewise, traders and consumers pay relatively higher prices than other buyers of Atsbi sheep (Table 4).

**Table 2. Price of different types of sheep paid at different market places of Golgolnaele PA**

Type of sheep	Price at				
	Atsbi	Farm gate	On road	Dera	Wukro
Young male	400-600	300-500	350-550	350-550	500-700
Young female	350-500	250-400	350-450	350-450	400-550
Old ewe	700-750	550-600	600-650	600-650	750-800
Castrated	1000-1100	-	-	950-1000	1100-1300

**Table 3. Price of different type of sheep paid at different market places of Habes PA**

Type of sheep	Price at				
	Atsbi	Farm gate	On road	Hykmeshal	Wukro
Young male	750	600	650	700	800
Young female	600	450	500	500	550
Old ewe	450	400	430	430	600
Castrated	1100	-	-	-	1200

**Table 4. Sheep type and prices paid by different actors**

Sheep type	Farmers	Traders	Consumers	Hotels
Young male	650	750	700	650
Young female	450	500	-	-
Old ewe	-	600	-	650
Castrated	-	1100	1200	-

### Individual consumers

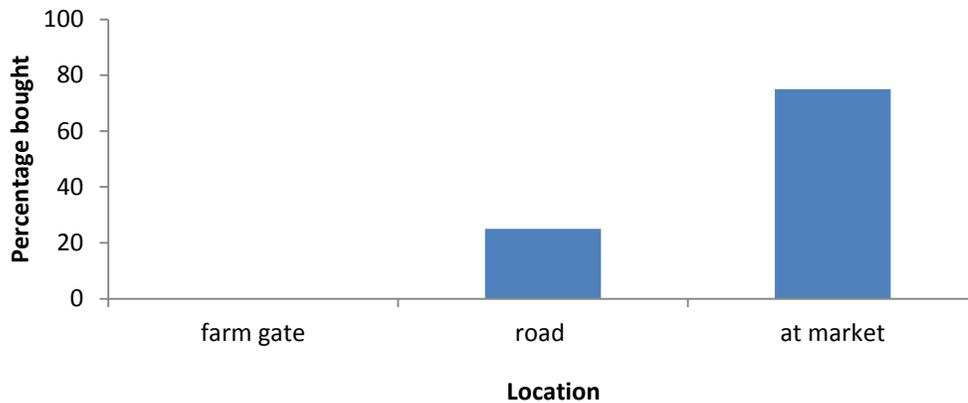
Most consumers they buy live sheep during religious holidays, weddings and other cultural ceremonies; they buy raw and roasted meat from butchers, hotels and restaurants. Consumers participate in all markets around Atsbi woreda and Mekelle market.

During holidays and other ceremonies consumer demand rises. In the village market (Dera, Haikmeshal) and woreda markets (Atsbi, Wukro), the major consumers are farmers, town dwellers and civil servants; major consumers in Mekelle are town dwellers and civil servants. Consumers' preference depends on colour, body condition, sex and tail. Red, dark red and grey sheep, rather than cheaper black sheep, are highly favoured. However some consumers do use black sheep for traditional worship. Male sheep are in high demand as consumers often suspect females are pregnant.

### Small traders

Small traders, almost all men, buy small ruminants from Dera, Haikmeshal and Atsbi and sell them in Wukro, Atsbi or to bigger traders who then transport them to Mekelle market. Usually they buy and sell at most 20 animals. Small traders participate most actively when prices are high.

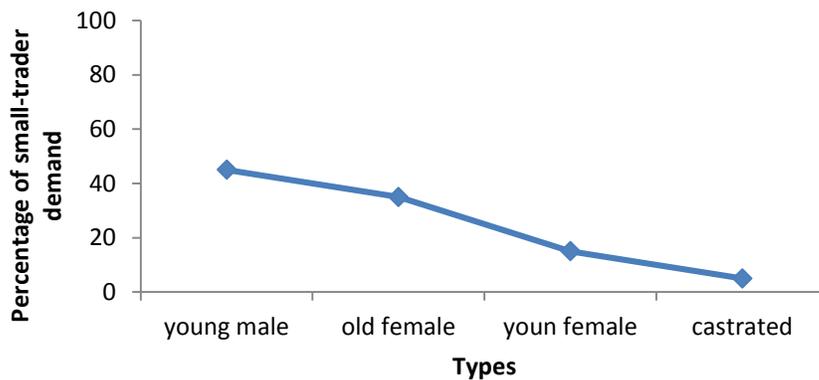
Most of the small traders do not have permanent customers, except a few supplying to hotels and big traders. Small traders buy 75 per cent of their sheep on the market and 25 per cent from farmers on the road (Figure 9).



**Figure 9. Where small traders buy sheep**

### Types of sheep small traders buy

Around 45 per cent of the sheep that small traders buy are young males (Figure 10), followed by old ewes (35 per cent) and young females (15 per cent). Young males and old ewes are in higher demand than castrated and fattened sheep. Only 5 per cent of the stocks of small traders stocks castrated and fattened sheep.



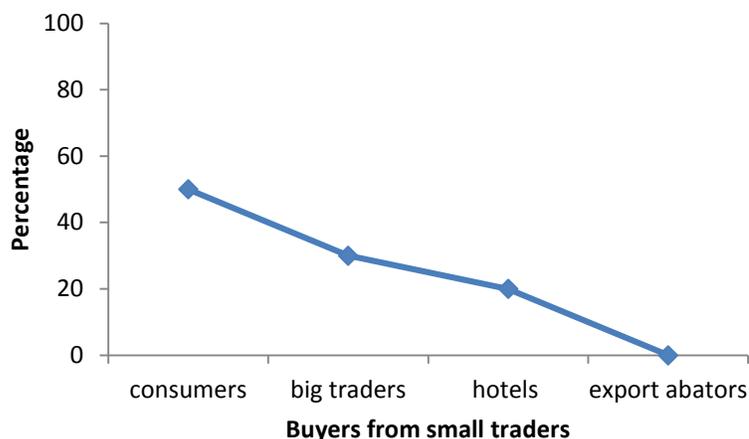
**Figure 10. Proportion of types of sheep demanded by small traders**

The price is mostly fixed by negotiations except during droughts, for example, when small traders have higher bargaining power. Small traders buy animals using a visual assessment of the body condition, age, colour and general health.

Traders indicated that lack of appropriate livestock marketing yards, taxes, lack of proper livestock transportation and diseases are the major problems they encounter when buying sheep. Large and small ruminants are sold in the same market, sometimes endangering smaller animals.

### Selling practices of small traders

Small traders sell to consumers, hotels and large traders in differing proportions (Figure 11). Small traders prefer to sell to hotels and restaurants in the hope of acquiring permanent customers.



**Figure 11: Proportion of sheep sold by small traders to different actors**

Small traders do not supply to export abattoirs because they have shortage of capital to supply the minimum number of animals (at least a truckload) at a time. They also have problems related to access to sheep transportation. Most traders have no formal relation with other traders and farmers, and there is no traders' association. Small traders sell their sheep for cash, not credit basis. There is no strong competition among traders when buying animals in sheep markets. However, traders compete when selling animals. They use different strategies such as supplying better quality animals at relatively lower prices than other traders to attract more buyers.

### **Transport**

Small traders mainly transport the sheep on foot from market to market. They travel between three hours (Dera market) up to five hours (Wukro market) to sell and buy sheep. They face disease, fatigue and the death of some sheep during the arduous trek. Some hire labour to assist with the transport of sheep.

### **Common costs of small traders**

Small traders also practice fattening and provide hay, concentrated feed and atela during fattening at an average cost of ETB 200 (Table 5).

**Table 5. Small traders' costs of sheep trading (in birr)**

Cost category	Cost per sheep
Tax	1.5
Transport	10.0
Labour	5.0
Treatment	10.0
Rope	0.5
Broker fee	10.0
Total cost/sheep	37.0

### **Small traders' sources of market information and credit**

Small traders get market information from other traders, farmers, radio and brokers, but they mostly use the information from other traders. They collect prices and demand and supply information from various different markets.

Capital shortage is a major problem. Small traders get some credit from friends and family and DECSI. There is a credit service in the woreda but it does not have specific credits for sheep trading. The traders take credit from micro-finance using group – about 75 per cent of their trading capital. But high interest rates and delayed disbursement are major problems.

The major problems of sheep trading as ranked by the small traders are capital shortage, lack of proper livestock marketing yard with proper facilities, repeated taxes on the same animal, disease and transport.

### **Large traders**

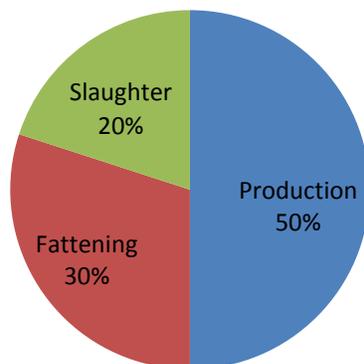
Big traders buy sheep from farmers, collectors and small traders and supply to larger towns like Adigrat and Mekelle. In most cases, they use collectors to buy large number of animals and are actively involved in sheep marketing throughout the year. These traders are permanent suppliers of Abergelle export abattoir and big hotels and butchers in Mekelle. Big traders use Isuzu trucks to transport their sheep from different towns to Mekelle and pay up to 30 ETB per sheep for a distances up to 200 km.

### **Butchers/hotel/restaurant owners**

In Mekelle town, butchers sell sheep meat to consumers. Nowadays small-ruminant meat is also increasing in small towns like Adigrat and Wukro. Hotel/restaurant owners buy small ruminants from farmers, small traders/larger traders and prepare local delicacies like misto, tibis, dullet, key wot, minchet, kibil and others. Hotels in Mekelle mostly buy sheep from big traders and are the second biggest consumers of sheep in the city after abattoirs.

### **Farmers buying animals for breeding purposes**

Farmers are both producers and purchasers of sheep in the study woreda. They buy sheep mainly for breeding, fattening and slaughtering at religious and cultural festivals. They buy young female sheep for breeding and young male sheep for fattening and slaughtering (Figure 12).



**Figure 12. Purpose for which farmers buy sheep from the market**

Farmers who want sheep for breeding select animals with better body shape, commonly ewes, to replace the existing ones and will often pay higher prices. The sheep demanded for fattening are males, commonly with lower weight and at a cheaper prices.

### **Export abattoirs**

Seven abattoirs operating at an industrial scale – Luna, Organic, Modjo Modern, Ashraf, Helimex, Elfora (Bishoftu, Metehara, Melgewondo) and Abergelle – are currently operational in Ethiopia, while three new export abattoirs are under construction. The Abergele International Livestock Company, which was opened in January 2009, is a USD 10m investment. Located in Mekelle, the slaughterhouse operates to EU standards with a processing capacity of 960 sheep and 240 cattle per eight-hour shift. The abattoir has a license to export live sheep, chilled and frozen meat to Kuwait, Bahrain, the UAE, Saudi Arabia, Turkey, and Jordan, Egypt, Angola, the Comoros, and China. The export routes are chilled airfreight from Mekelle airport and refrigerated containers through Djibouti.

To assist in supplying the Abergelle abattoir, the Dejena Endowment has supported the establishment of three fattening and collection centres in Tigray, used for collection, feeding and transport of slaughter animals. Each can house up to 5,000 live animals at a time, and is equipped with weighing scales, stalls, barns and grazing land between 30 and 90 ha.

The export abattoir buys most sheep from large traders and the rest from small traders, farmers and producer cooperatives. The mainly youth and women sheep producer cooperatives supply sheep to the abattoir. A contract is made between the suppliers (large traders and cooperatives) and the export abattoir with regard to number and type of sheep to be transacted.

The Abergelle export abattoir buys male sheep weighing between 20 and 25 kg. They have three sheep quality grades when they buy sheep: A, B and C. The prices of sheep differ by grade: ETB 40 per kg for Grade A; ETB 36.5 for Grade B; and ETB 35.7 for Grade C.

### **Marketing routes**

The major marketing routes of Atsbi sheep are to Wukro, Mekelle and Adigrat, either by farmers selling their animals or traders from the rural areas (Figure 12). Farmers from the different villages of Atsbi woreda take their animals to market or Wukro town.

In addition, both small and big traders take sheep from Atsbi market and neighbouring towns for sale at Wukro, Mekelle and Adigrat markets. Hotels/butchers and export abattoirs buy Atsbi sheep from these traders at Wukro or Mekelle market. Thus the marketing route starts in the villages (Dera, Haikmeshal) to Atsbi and Wukro and finally to Adigrat and Mekelle, with relatively higher demand and prices. According to key informants, the number of animals transported across this route varies between seasons mainly affected by holidays and the price consumers are able to pay.

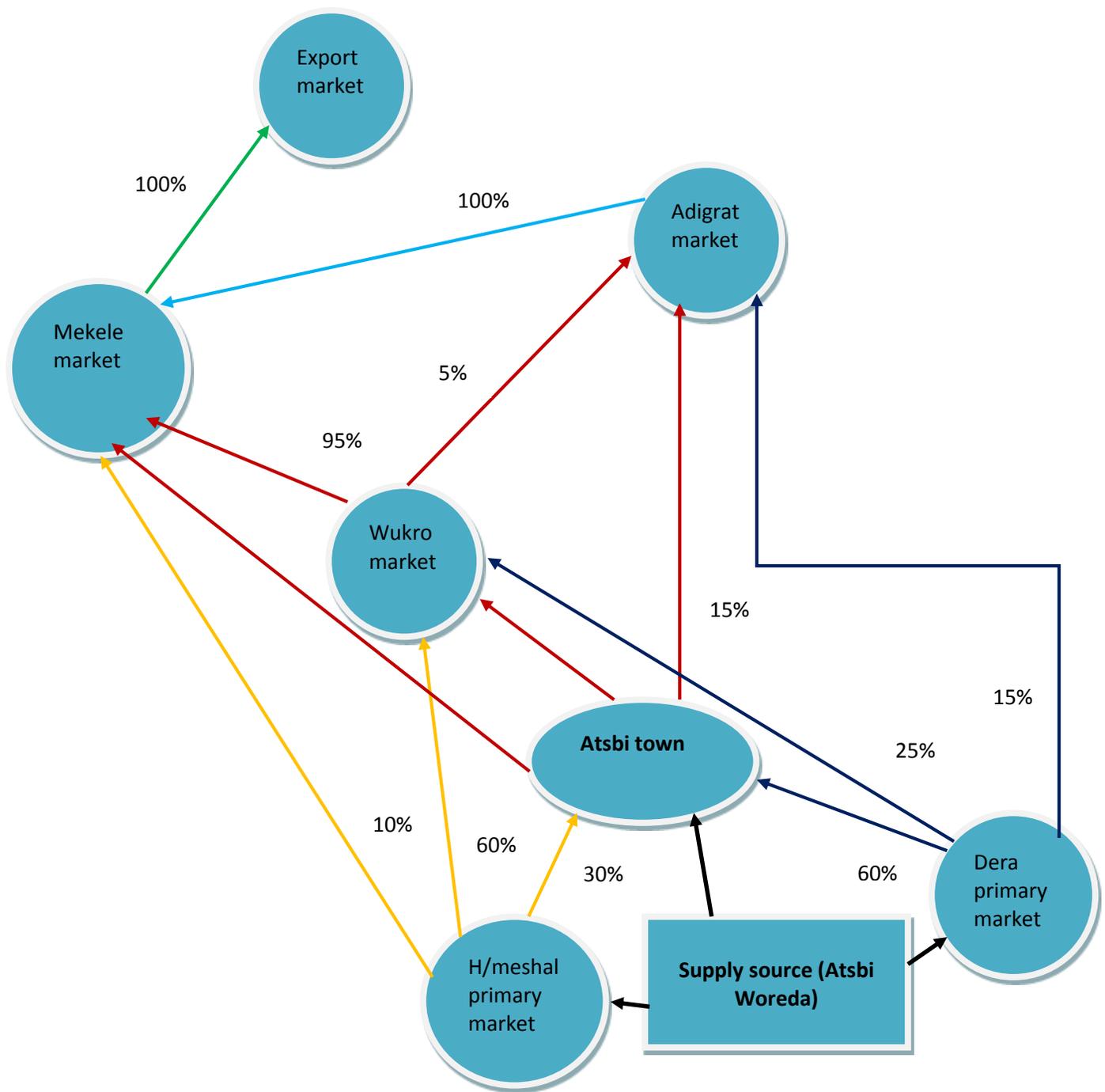


Figure 13. Marketing routes of Atsbi sheep

## Market channels

Farmers normally target the nearest market as a sales outlet for their sheep. The flow of sheep from the production centres to consumers depends on the market proximity, transport, the nature of the product and purchasing power of consumers. Nine channels through which Atsbi sheep flow from farm to consumer have been identified (Figure 14):

- Channel 1: Producer – consumer
- Channel 2: Producer – small traders – consumer
- Channel 3: Producer – small traders – hotel/butchers –consumer
- Channel 4: Producer – small traders – large traders – hotels/butchers – consumers
- Channel 5: Producer –small traders – export abattoirs – foreign consumers
- Channel 6: Producer – small traders – large traders – export abattoir – consumer
- Channel 7: Producer –hotel/butchers – consumer
- Channel 8: Producers – large traders – hotels/butchers – consumers
- Channel 9: Producers – large traders – export abattoirs – consumers

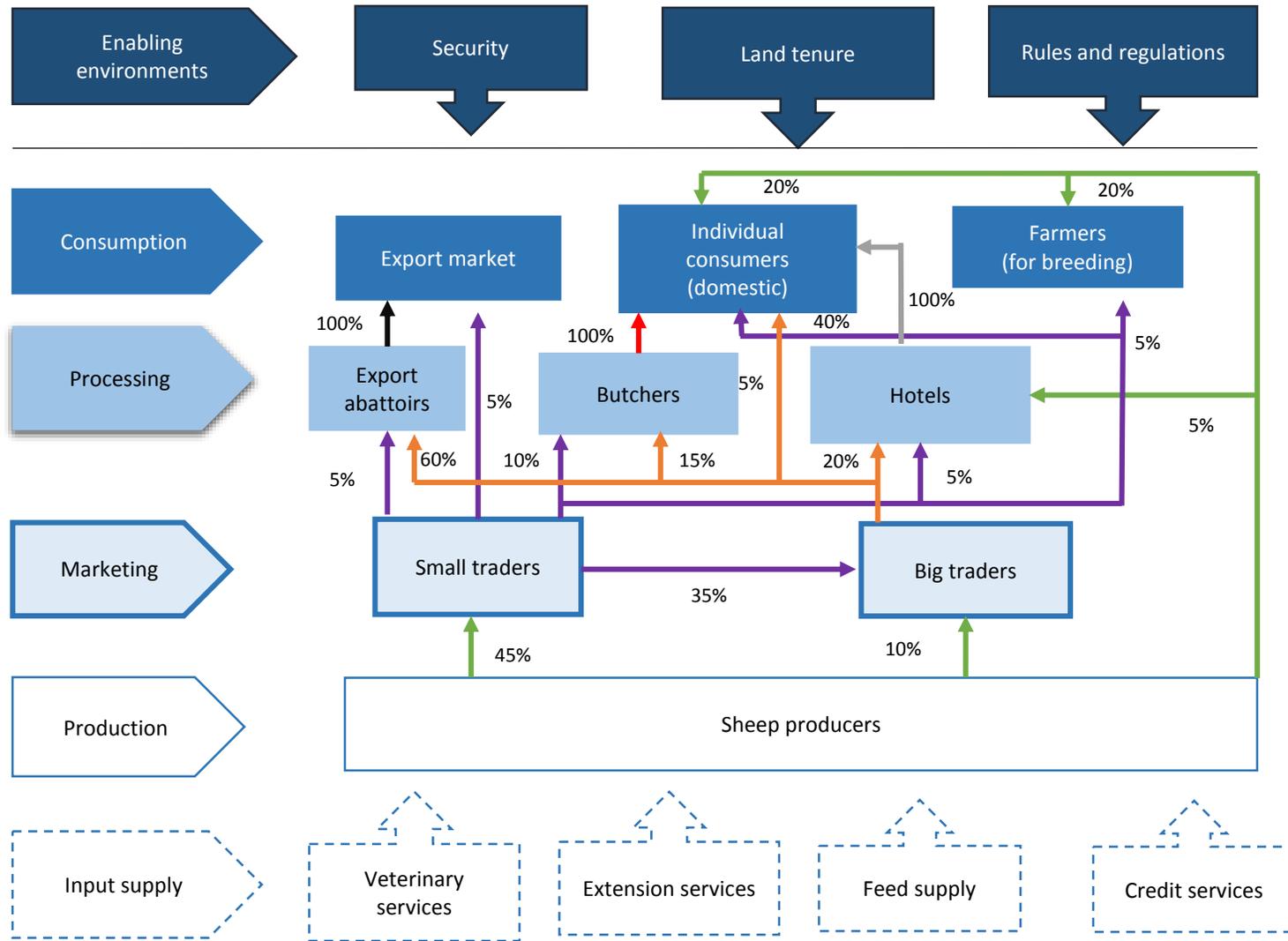


Figure 14. Marketing Channel

**Market channel 1: Producers – Consumers**

Around 20 per cent of Atsbi sheep go through this channel, with farmers selling directly to both urban and rural consumers, mostly during religious holidays and cultural ceremonies. Consumers prefer to buy through this channel because they get good prices.

**Market channel 2: Producers – Small traders – Consumers**

In this channel (about 10 per cent) small traders are middlemen between producers and consumers. They buy different type of sheep, mostly young males from different market places, and supply to various consumers.

**Market channel 3: Producers – Small traders – Hotels/butchers – Consumers**

Here small traders buy sheep from farmers and supply to hotels/butchers, which process the sheep meat in different forms and sell to consumers. This channel accounts around 5 per cent of the total. Old ewes and castrated sheep are common types here.

**Market channel 4: Producers – Small traders – Large traders – Hotels/butchers – Consumers**

In this channel (5 per cent), small traders sell to big traders who in turn sell to hotels and butchers. The producers' share is probably in decline because of the number of middlemen.

**Market channel 5: Producers – Small traders – Export abattoirs – Foreign consumers**

In this channel small traders collect from different markets and supply to export abattoirs in Mekelle, which then process the meat and supply to foreign consumers. The proportion of sheep traded through this channel is also 5 per cent.

**Market channel 6: Producers – Small traders – Large traders – Export abattoirs – Consumers**

A large proportion of sheep from small traders goes through this channel, which makes up 15 per cent of the total. Small traders buy sheep from farmers and supply them to big traders, who then sell them to the export abattoir in Mekelle.

**Market channel 7: Producers – Hotel/butcheries – Consumers**

Most of the hotels found in woreda towns and Atsbi buy sheep directly from producers. The proportion of sheep traded in this channel is 10 per cent of the total. Hotels/butchers involved in this channel get sheep at a fair price and mostly operate on a small scale.

**Market channel 8: Producers – Large traders – Hotels/butchers – Consumers**

On rare occasions large traders buy sheep directly from producers and sell them to hotels/butchers. Around 3 per cent of Atsbi sheep is transacted through this channel.

**Market channel 9: Producers – Large traders – Export abattoirs – Foreign consumers**

Large traders directly buy from producers and supply to the export abattoir in Mekelle. The proportion of sheep going through this channel is small (2 per cent) because large traders mostly buy from small traders, then sell to the export abattoir.

**Distribution of marketing costs and margins**

Analysis of the level of marketing margins and their cost components helps to evaluate the impact of the market structure and market performance. A common means of measuring market efficiency is to examine marketing margins. The overall marketing margin is simply the

difference between the farm gate price and the price received at retail sale. It is important to determine the producer's share in the consumers' price and to know the shares of other intermediate actors. Market prices reflect two elements; marketing and transaction cost on one hand and profit on the other.

Calculating the marketing margin is one tool to analyze performance of markets. Marketing margin was calculated taking the difference between producers and retail prices. The producers' share is the commonly employed ratio calculated mathematically as, the ratio of producers' price (ex-vessel) to consumers' price (retail). Mathematically, producers' share can be expressed as:

$$PS = \frac{P_x}{P_r} = 1 - \frac{MM}{P_r}$$

Where PS=Producers' share, P<sub>x</sub>=Producer's price of sheep, P<sub>r</sub>=Retail price, MM=marketing margin

The above equation tells us that a higher marketing margin diminishes producers' share and vice-versa. It also provides an indication of benefit distribution among production and marketing agents.

Calculating the total marketing margin can be done by the following formula

$$TGMM = \frac{\text{Consumer price} - \text{Farmers' price}}{\text{Consumer price}} \times 100$$

where TGMM=Total gross marketing margin

$$GMM_p = \frac{\text{price paid by the consumer} - \text{marketing gross margin}}{\text{price paid by the consumer}} \times 100$$

Where GMM<sub>p</sub>= Producers' participation (farmers' portion)

The marketing margin was compared with marketing service costs and the results are interpreted. Margins at each stage have been calculated and the share was compared.

Net Marketing Margin (NMM) is the percentage over the final price earned by the intermediary as his/her net income once his/her marketing costs were deducted.

$$NMM = \frac{\text{Gross margin} - \text{Marketing costs}}{\text{Endbuyer price (Consumers price)}} \times 100$$

Where, NMM= Net marketing margin

The common costs of traders are tax, transport, labor, and treatment and broker payment. In addition, processing cost is the major cost of hotels, butcheries and export abattoirs.

### **Marketing costs**

Marketing costs for different sheep value chain actors are shown in Table 6. Processors like hotels and restaurants, butcheries and export abattoirs experience higher costs than the other actors. Spices, injera and labour account for the major proportion of costs of hotels and butchers, processing and transport costs for export abattoirs.

### Marketing margin analysis

Analysis of the level of marketing margins and their cost components could help to evaluate the impact of the structure and conduct characteristics on market performance. A common means of measuring market efficiency is to examine marketing margin. This is an attempt to evaluate economic or price efficiency. The overall marketing margin is simply the difference between the farm gate price and the price received at retail sale. It is important to sort out the producers' share in the consumers' price and to know the shares of different actors. Market prices reflect two elements; marketing and transaction cost on one hand and normal profit on the other.

Based on the data on buying, selling, prices and applying the gross marketing margin calculation formulae, the marketing margins for trade participants in the value chain are shown in the tables below. Producers receive a higher portion of the final price of sheep in the first market channel which is farmers directly sell to consumers.

### Cost and margins of actors involved in selling sheep to hotels

Marketing costs and margins were calculated for three out of the selected nine sheep value chains. The calculation is based on the assumption that hotels, butchers and export abattoirs use male yearlings of in good condition. This means the production cost of the animal and producers price are similar throughout the three channels. However, the marketing costs and selling price for the three channels vary since the product undergoes different processes in each of the channels.

Accordingly, the producers' share of final price was found to be the least when the animal is sold to hotels passing through small traders (Table 7). This channel is therefore less efficient than when animals are sold to butchers and export abattoirs. This could be the reason why hotels usually slaughter cheaper, older ewes, from which they can get more meat than yearlings, of poorer quality. In terms of added value, hotels and butchers add more value to sheep than exporters (Tables 7–9). Though the proportion of value added to sheep is similar for hotels and butchers, hotels prepare different types of dish from sheep and retail ready to eat food to individual consumers. The net margin obtained by hotels is higher than that of butchers and less than that of export abattoirs.

**Table 7. Costs in birr per animal and margins (per animal) of actors selling sheep to hotels**

	Producers	Small traders	Hotels
Production cost	217.8	-	-
Selling price	550.0	750	1460
Marketing cost	-	48	536
Marketing margin	-	200	710
Net margin	-	152	174
Producer's share of final price (%)	-	-	38
Value added	332.2	152	174
Proportion of value added (%)	50	23	26

### Cost and margins of actors involved in selling sheep to butchers

As indicated above, the proportion of the final price of sheep reaching producers is slightly higher when animals are sold to butchers relative to hotels. However the net margin obtained by butchers (Table 8) is smaller than that of hotels and is higher than that of export abattoirs. Butchers need either well-conditioned, mature males or sterile ewes.

**Table 8. Costs in birr per animal and margins (birr/animal) of actors selling sheep to butchers**

	Producers	Small traders	Big traders	Butcheries
Production cost	350	-	-	-
Selling price	550	860.0	940	1420
Marketing cost	-	76	44	315
Marketing margin	-	310	80	480
Net margin	-	234	37	166
Producer's share of final price (%)	-	-	-	39
Value added	200	234	37	166
Proportion of value added (%)	31	37	6	26

### Cost and margins of actors involved in selling sheep to export abattoirs

In terms of the proportion of final price of sheep reaching producers, this channel is the most efficient relative to the other two channels for which margins were calculated (Table 9). Producers receive the highest proportion of the final price of sheep price in this channel relative to others. On the other hand, export abattoirs are expected to add more value to sheep relative to other actors in the value chain. However, the preliminary analysis indicated in Table 9 shows that the proportion of value added to the product is least for export abattoirs relative to other actors. This is because export abattoirs do not further process sheep meat except removing the skin, chilling the carcass and wrapping it with cotton fabric.

**Table 9. Costs in birr and margins of actors selling sheep to export abattoirs**

	Producers	Small traders	Big traders	Abattoirs
Production cost	217.80	-	-	-
Selling price	550	750	1040	1230
Marketing cost	-	32.5	94.5	50
Marketing margin	-	200	290	190
Net margin	-	167.5	195.5	140
Producer's share of final price (%)	-	-	-	44.72
Value added	332	167.5	195.5	140
Proportion of value added (%)	40	20	23	17

## **Analysis of end markets**

### **Domestic markets**

The highest demand for Atsbi sheep is from domestic markets. Old, young, male and female sheep are marketed at different outlets. In any case, most local sheep cannot meet the quality standards of export markets. Mekelle city is the final domestic market for Atsbi sheep.

### **Export markets**

Those sheep which can meet the quality standards of export market are sold to the Middle East and North Africa.

# Constraints in the value chain

Constraints related to input supply, production, marketing and processing were identified in the value chain analysis.

## Input supply

### Shortage of veterinary services and drug supply

The shortage of animal health workers and animal health posts in the woreda prevents sheep farmers from getting sick animals treated in a timely way. There is no private veterinary service or drug shop; veterinarians of the Woreda Office of Agriculture are too few in number. Animal health posts are not functional and/or do not have the proper equipment. The skills of the veterinarians who do exist are not adequate. Transport is also an issue. Many sheep die or severely deteriorate because of all this.

### Lack of flexibility in the credit system and the problem of group collateral

In the study areas, capital can be primarily obtained from micro-credit institutions and informal lenders such as other farmers and traders, friends and family. The problem, however, is that the credit system is not well developed; commercial banks are predominantly state-owned and collateral-based; private banks view agriculture in general and sheep production in particular as risky and ask for collateral that peasant farmers lack.

Farmers and small traders get credit based on group or asset collateral determined for other purposes and use it for sheep production and trading. Most of the time farmers are vague about the terms of loans and struggle to pay them back, often triggering migration abroad to find work to repay loans.

### Feed shortage

The primary source of feed is free grazing on common land and to a lesser extent private pastures. But seasonal changes in the availability and quality of feed lead to shortages. During the dry season, some farmers sell part of their herd to reduce the feed problem and to buy feed for the remaining animals. Others supplement with hay and residues from crops and brewing. Feed is the overriding production constraint for the farmers in Atsbi and a cause of low prices.

## Production constraints

### Breeding practices

Uncontrolled mating including inbreeding leads to unplanned lambing and productivity losses. Selling the best rams and ewes leads to a deterioration of the herds because low-performing animals are kept in the flock for breeding.

### Poor/traditional housing

Traditional housing often leads to injuries of weaker animals, in particular abortions, and promotes the spread of pathogens among the animals.

### High incidence of disease and parasites

Deficient health care as well as poor management and hygiene lead to a high incidence of disease, and parasites.

### **Lack of awareness on improved sheep production system**

The sheep production system in the woreda is still traditional and not business oriented. Sheep production has received little attention by the government and NGOs. Farmers have not been offered any training and have little access to information on improved management and marketing practice.

## **Marketing constraints**

### **Transport**

Farmers and small traders trek sheep from market to market, travelling from three hours (Dera market) to five hours (Wukro market). Some large traders truck large numbers of sheep (up to 80), but the trucks are usually not fit for purpose. Roads are poor. The combined effect of is to erode the animals' welfare and meat quality.

### **Limited access to on time, consistent and reliable market information**

Farmers usually take their animals for sale to small weekly markets. Information on demand, price, grades and standards is lacking, diminishing their bargaining power.

### **Shortage of quality sheep supply and multiple taxation**

Poorly conditioned animals are a concern for both abattoirs as well as tanneries, particularly during the dry season. The lack of proper nutrition and fattening of sheep due to seasonal feed shortage limits the end market supply, and leads to poor body condition and low prices. Farmers also do not pay attention to the pre-slaughter treatment, which can be a critical factor in determining the grade of meat and skin. Lashing animals, hot-iron branding, and the failure to treat against parasites and skin disease are contributing factors to low quality.

Multiple taxation at different markets is another marketing constraint.

### **Lack of vertical and horizontal linkage of sheep producers**

Sheep farmers operate largely as individuals and most producers sell directly to consumers or traders who also undertake transportation (primarily by trekking) to market. The general pattern of sheep markets in the study areas is that producers sell live sheep to different market actors who pay better prices. There are no longstanding buyers or producer cooperatives in the Woreda.

### **Seasonality of demand for sheep**

Price is determined through negotiations between producers and traders, except for holidays and in times of feed shortage when respectively farmers and traders have the great bargaining clout.

Producers prefer to sell their sheep during holidays because of the higher the demand of sheep and higher price in these seasons.

## Processing constraints

The Abergelle international abattoir does not operate at capacity due to limited supply. The other major constraints are diseases, skin injury, illegal cross-border trade, transport problems, and price fluctuation.

## Comparative ranking of major production constraints

Producers of Atsbi sheep were asked to rank production problems in each PA (Tables 10 and 11). Low awareness of improved management practices ranked very highly in both.

**Table 10. Ranking of problems for Golgolnaele PA**

Main problems	Feed problem	Water shortage	Credit	Low awareness	Breed problem	Score	Rank
Vet service	Feed	Water	Credit	Awareness	Vet service	1	5
Feed problem		Water	Feed	Awareness	Feed	3	3
Water shortage			Water	Water	Water	5	1
Credit				Awareness	Credit	2	4
Low awareness					Awareness	4	2
Breed problem						0	6

**Table 11. Ranking of problems for Habes PA**

Main problems	Feed problem	Credit	Low awareness	Breed problem	Score	Rank
Vet service	Vet service	Vet service	Awareness	Vet service	3	2
Feed problem		Feed	Awareness	Feed	2	3
Credit			Awareness	Breed problem	0	5
Low awareness				Awareness	4	1
Breed problem					1	4

Atsbi traders asked to rank their main problems (Table 12) put lack of capital first.

**Table 12. Atsbi traders' ranking of problems**

Main problems	Market place	Tax	Transport	Disease	Rank
Capital	Capital	Capital	Capital	Capital	1
Market place		Market place	Market place	Market place	2
Tax			Tax	Tax	3
Transport				Transport	4
Disease					5

## **Opportunities**

Strong end-market demand: The longstanding tradition of meat consumption in Tigray (particularly during holidays) provides sheep farmers with a steady demand from the domestic market. With the advent of a state-of-the-art slaughterhouse based in Mekelle farmers have access to alternative market outlets. The expansion of Sheba tannery and its direct linkages with Abergelle export abattoir may serve as a further incentive for farmers to invest in fattening and care of animals, as exportable sheep fetch better prices.

Government support: In its five-year growth and transformation plan, the Government of Ethiopia aims at increasing the meat export to 110,000 tonnes in 2015, earning of 1 billion US dollars. It says it plans to work closely with the private sector and other stakeholders to rectify the market, and solve logistics and transport problems (Duguma et al. 2012).

## Conclusions and recommendations

This value chain analysis shows that support for sheep production like veterinary and credit services and inputs like feed and improved genetic material are not yet well developed. Likewise, sheep production is mainly based on traditional practices. For example, uncontrolled mating leads to early breeding of females, unplanned lambing and inbreeding.

The sheep marketing system of the Woreda is fragmented and is characterized by weak horizontal and vertical integration among the actors. A series of strategic problems from production to consumption have been identified that hinder the smooth functioning of the sheep value chain in Atsbi woreda. Therefore, designing strategic interventions to address the core problems is vital.

Opportunities exist for better sheep marketing, however, as there is high domestic demand and an export abattoir in the vicinity, and Atsbi sheep are known for quality meat.

### Recommendations on input supply constraints

#### **Addressing the shortage of veterinary services and drug supply**

The number of animal health workers should be increased and skills of the existing ones upgraded through long- and short-term training. Improving existing animal health posts and the equipment and vehicles used by veterinarians is also important. Finally, attracting private animal drug suppliers to the woreda will solve the problem of drug supply.

#### **Lack of flexibility in the credit system group collateral credits**

It is important to establish an efficient and flexible credit system to support livestock production in general and sheep production in particular. Efforts are needed to provide credit for individual farmers, in greater amounts, and remove the burden of group collateral. Credit in kind might be part of the answer.

#### **Lack of livestock market information**

Although the woreda Cooperatives Department reports prices weekly on the radio, the majority of households are only using informal sources of information from neighbours and traders. Efficient, consistent and timely market information available will increase farmers' bargaining power. This could be done through a regular market information report posted at PA level.

#### **Feed shortage**

Improving feed management and utilization through training, feed conservation and treatment, and 'zero grazing' are possible interventions.

#### **Recommendations on production constraints**

Improving traditional breeding practices

Creating awareness on controlled mating and improved selection of breeding rams through training and demonstration is proposed to produce better genetic material.

#### **Improving housing**

The awareness of sheep producers of the animal losses caused by poor housing should be raised, and improved low-cost sheds for small ruminants demonstrated.

### **Disease and parasites**

It is important to identify the causes, sources, characteristics and economic impacts of the different animal diseases and pests in the woreda. Farmers can then be trained on how to protect their animals and administer drugs efficiently.

### **Sheep production**

So far efforts to create awareness on improved sheep management have not been sufficient. Production practices should be improved through frequent training, experience sharing and demonstrations. Extension services should give more attention to small ruminants.

## **Recommendations to address marketing constraints**

### **Transport**

This problem calls for appropriate vehicles, ventilation during transportation and the avoidance of trekking long distance. Providing capital to traders to acquire adequate trucks for small ruminant transport by government, development organizations or private sectors is important.

### **Sheep supply**

Establishing cooperatives to support sheep production and joint fattening could increase the availability of quality sheep at market. Training producers on proper feeding and medical treatment will help to improve the performance of sheep.

### **Vertical and horizontal linkage of sheep producers**

Directing producers towards more informed marketing and creating links with other value chain actors could improve integration with other producers and actors of the value chain. Establishing producer cooperatives is one option.

### **Overcoming seasonality of the demand**

Huge differences in demand result from the seasonal fasting and holidays. Meat consumption during fasting periods is very low. Producers also prefer to sell their sheep during holidays for better prices. Facilities for processing and packaging are required so that meat can be prepared for non-fasting seasons and exported to foreign markets.

### **Cross-border trade**

Applying strict rules and regulations to control cross border trade would be useful.

**Table 13. Major constraints and suggested recommendations, implementing bodies and time horizon needed to implement the recommendations**

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
Input supply	- Lack of awareness and skills on Improved Sheep Production	1	- Need based capacity building	- Regional BoA, - Woreda Office of Agriculture - Woreda administration - TARI - ICARDA - LIVES	Short to medium term	- Need assessment and identify the gap - Training materials preparing - delivering Training
	- Shortage of equipment and facility for the veterinary clinics and non-functional animal health posts	3	- Functionalizing the closed vet health posts by allocating the necessary facilities and human resources - Improving the equipment and facility of the clinics and health posts - Capacity building and fulfilling equipments and drugs - Constructing offices - equipment procurement - Establishing sustainable supply of drugs and vaccine	- Regional BoA, - Woreda Office of Agriculture - Woreda administration - TARI - ICARDA - LIVES	Short term	- Need assessment (Inventory and identifying the existing equipments, materials human resource...) - Implementation plan - Implement
	- Shortage of animal health workers and skill gap among the existing workers			- Regional BoA, - Woreda Office of Agriculture - Woreda administration - TARI - ICARDA/ILRI	Short term	
	- Shortage of veterinary drugs, vaccine and equipment			- Regional BoA - Woreda Office of Agriculture - Woreda administration - ICARDA/ILRI - LIVES	Short term	

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
	<ul style="list-style-type: none"> <li>- Lack of private veterinary animal health service providers and vet drug shops in the woreda and illegal drug suppliers</li> </ul>		<ul style="list-style-type: none"> <li>- Identification of the reasons behind the none existence of private vet service providers and drug shops in the woreda</li> <li>- Inspiring private sector operators interested in vet drug supply and service delivery</li> <li>- Discouraging illegal drug</li> </ul>	<ul style="list-style-type: none"> <li>- Regional BoA,</li> <li>- Woreda Office of Agriculture</li> <li>- Woreda administration</li> </ul>	Medium term	<ul style="list-style-type: none"> <li>- Detail study on the root cause of the problem</li> <li>- Developing rules and regulations</li> <li>- Inspiring youth coops to participate in supplying drug</li> </ul>
	<ul style="list-style-type: none"> <li>- Shortage of transportation facilities to extension staff to reach farmers in areas far from clinics and health posts</li> </ul>	5	<ul style="list-style-type: none"> <li>- Provision of transportation facilities for animal health workers</li> </ul>	<ul style="list-style-type: none"> <li>- Regional BoA,</li> <li>- Woreda Office of Agriculture</li> <li>- Woreda administration</li> <li>- ICARDA/ILRI</li> </ul>	Medium term	<ul style="list-style-type: none"> <li>- Assisting transport facilities and operational costs</li> </ul>
	<p>Credit</p> <ul style="list-style-type: none"> <li>- Not adequate amount</li> <li>- High interest rate</li> <li>- It is not year round</li> <li>- There are no other sources of credit than DESCI</li> <li>- There is no local saving and credit association</li> </ul>	4	<ul style="list-style-type: none"> <li>- Discussing with Dedebit Credit and Saving Institution and others on issues related to flexibility and problems of group to collateral and find mechanisms in which sheep producers can get credit without group collateral(on individual basis).</li> <li>- Inspiring other credit and saving institutions to engage in the area</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- Woreda administration</li> <li>- TARI</li> <li>- ICARDA/ILRI</li> </ul>	Short and medium	<ul style="list-style-type: none"> <li>- Establishing local credit and saving institutions</li> <li>- Injection of revolving funds</li> <li>- Introducing innovative credit based sheep insurance</li> </ul>

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
	Lack of access to livestock market information	6	<ul style="list-style-type: none"> <li>- Linking the woreda with national livestock market information system</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Regional marketing agency</li> <li>- Woreda Office of Agriculture</li> <li>- Woreda cooperatives office</li> <li>- Woreda administration</li> <li>- ICARDA/ILRI</li> <li>- TAMPA</li> <li>- Ethiopian Meat and Dairy Technology Institute</li> <li>- LIVES</li> </ul>	Short to medium	<ul style="list-style-type: none"> <li>- Collecting market data</li> <li>- Synthesize the collected data</li> <li>- Access the information to the farmers at FTC level</li> <li>- creating link to the national livestock market information system</li> </ul>
	Feed shortage <ul style="list-style-type: none"> <li>- Shortage of feed both in quality and quantity</li> <li>- Shortage of planting material and forage seed</li> </ul>	2	<ul style="list-style-type: none"> <li>- Introduction of forage and fodder trees around farm land and homestead and other conservation structures</li> <li>- Training Extension Agents and farmers on efficient utilization of available feed resources, ration formulation and use of concentrate feeds</li> <li>- Encourage suppliers of industrial bi-products (concentrate feeds)</li> <li>- Improving the seed supply system</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture,</li> <li>- Woreda Office of Agriculture</li> <li>- Woreda administration</li> <li>- TARI</li> <li>- ICARDA/ILRI</li> <li>- LIVES</li> </ul>	Short and medium	<ul style="list-style-type: none"> <li>- Identification of farmers whom need to participate in seed production</li> <li>- Capacitate the farmers through training</li> <li>- Informing the farmers to produce/ supply seed and planting material</li> <li>- biological conservation to increase forage/grass production</li> </ul>
Production	Unimproved breeding and reproduction management	3	<ul style="list-style-type: none"> <li>- Introducing community based sheep breeding</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> </ul>	Medium to long	<ul style="list-style-type: none"> <li>- Community consultation</li> </ul>

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
			<ul style="list-style-type: none"> <li>program</li> <li>- Control mating</li> <li>- Fertility management</li> <li>- Selective breeding</li> </ul>	<ul style="list-style-type: none"> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	term	<ul style="list-style-type: none"> <li>- Understanding the system</li> <li>- Breeding objective definition</li> <li>- Selection scheme</li> <li>- Communal use of selected rams</li> </ul>
	No separate housing for sheep	4	<ul style="list-style-type: none"> <li>- Separate housing for sheep and large ruminants</li> <li>- Separate sheep based on age and sex</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	Short to medium term	<ul style="list-style-type: none"> <li>- Assessment of the housing structure</li> <li>- Identifying the appropriate housing type</li> <li>- Creating awareness on improved sheep housing</li> <li>- House construction</li> <li>- Monitoring</li> </ul>
	Unidentified and high incidence of disease and parasites like pasteurellosis, coenurosis, sheep pox, liver fluke (fasciolosis), mastitis, blood urine, trypanosomosis, lung worm, tick, mites, lice, and fleas	2	<ul style="list-style-type: none"> <li>- Identification the remaining diseases and their specific control mechanism</li> <li>- Strategic seasoning of the epidemiology of parasites and disease</li> <li>- Expansion of health posts and training of vet technicians</li> <li>- Training Extension agents and farmers in sheep disease prevention and control</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	Short and medium	<ul style="list-style-type: none"> <li>- Surveillance of prevalence</li> <li>- Designing control mechanism</li> <li>- Implement accordingly</li> </ul>
	Lack of improved sheep feeding system and	1	<ul style="list-style-type: none"> <li>- Increase feed production, storage and utilization</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> </ul>	Short to medium	<ul style="list-style-type: none"> <li>- Assessment of the existing feeding and</li> </ul>

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
	husbandry		<ul style="list-style-type: none"> <li>- Feed conservation practice</li> <li>- Improving feed value of existing feed sources</li> <li>- Supplement</li> <li>- Treatment of crop residues</li> </ul>	<ul style="list-style-type: none"> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	term	<ul style="list-style-type: none"> <li>- management system identification and introduction of best feeding practice</li> <li>- monitoring</li> </ul>
Marketing	Transportation problem <ul style="list-style-type: none"> <li>- There is no appropriate truck</li> <li>- Not conditioned and ventilated</li> <li>- Trekking</li> </ul>	5	<ul style="list-style-type: none"> <li>- Encouraging the private sector to operators to use dedicated livestock transportation trucks</li> <li>- Awareness creation on animal welfare</li> <li>- Enforcing regulations on animal transportation</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Regional Bureau of Trade and Transportation</li> <li>- Woreda Office of Agriculture,</li> <li>- ICARDA/ILRI</li> <li>- Private sector operators</li> <li>- LIVES</li> </ul>	Long term	<ul style="list-style-type: none"> <li>- Awareness creation on trekking and suffocated trucking</li> <li>- Organizing marketing cooperatives</li> <li>- Exposure visit to improved transportation user sites</li> </ul>
	Shortage of quality sheep supply to the market	2	<ul style="list-style-type: none"> <li>- Training farmers in improved sheep fattening techniques</li> <li>- Incentive for quality sheep producers (premium price)</li> <li>- Introducing grading system</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	Short term	<ul style="list-style-type: none"> <li>- Selecting farmers</li> <li>- Deliver training on how to produce good quality sheep</li> <li>- Practicing</li> <li>- Monitoring</li> </ul>
	Lack of vertical and horizontal linkage of sheep producers	1	<ul style="list-style-type: none"> <li>- Establishing sheep producer cooperatives</li> <li>- Creating market linkage between farmers and other actors</li> </ul>	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	Short to medium	<ul style="list-style-type: none"> <li>- assessing the weak points</li> <li>- identifying the causes for the weakness</li> <li>- designing best mechanisms that strengthen the link</li> </ul>

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
						- implementing them and monitoring
	Marketing facility <ul style="list-style-type: none"> <li>- Resting</li> <li>- Conditioning</li> </ul>	4	- Constructing resting conditioned place/ facility before the market place	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> <li>- Abergelle export abattoirs</li> </ul>	Short to medium term	<ul style="list-style-type: none"> <li>- Identifying the existing and needed market facility</li> <li>- Implementing the possible and better marketing facilities</li> </ul>
	Seasonality of demand for sheep	3	- Encourage and support meat processing and export	<ul style="list-style-type: none"> <li>- Ministry of Agriculture</li> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> </ul>	Long term	- Awareness creation and market information
Processing	There is no facility to processing byproducts of the sheep	1	- Encouraging plantation of byproduct processors around the area	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> <li>- TARI</li> <li>- LIVES</li> <li>- Abergelle export abattoirs</li> </ul>	Long term	<ul style="list-style-type: none"> <li>- Identify business opportunities</li> <li>- Encourage private investment to engage on it</li> </ul>
	Low carcass percentage (39%)	2	- Improving nutrition and health	<ul style="list-style-type: none"> <li>- Regional Bureau of Agriculture</li> <li>- Woreda Office of Agriculture</li> <li>- ICARDA/ILRI</li> </ul>	Short term to medium term	<ul style="list-style-type: none"> <li>- Feed development and improved feeding</li> <li>- Disease and parasite control</li> </ul>

Stages of value chain	Challenges	Rank	Suggested Interventions	Implementing bodies	Time horizon	How
	Red offal are condemned due to disease and parasites	3		<ul style="list-style-type: none"> <li>- TARI</li> <li>- LIVES</li> <li>- Abergelle export abattoirs</li> </ul>		<ul style="list-style-type: none"> <li>- Disease and parasite control</li> </ul>

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