

Analysis of goat value chains in Tanqua Abergelle district, Tigray, Ethiopia

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Acronyms

AbARC	Abergelle Agricultural Research Centre
CBE	Commercial Bank of Ethiopia
CGIAR	Consultative Group on International Agricultural Research
CSA	Central Statistical Agency
DECSI	Dedebit Credit and Saving Institution
ETB	Ethiopian Birr
FGD	Focus Group Discussion
GTP	Growth and Transformation
ICARDA	International Center for Agricultural Research in Dry Areas
ILRI	International Livestock Research Institute
Kg	Kilogram
KII	Key Informant Interview
Km	Kilometre
Masl	Meters above sea level
Mm	Millimetre
MoFED	Ministry of Finance and Economic Development
NVI	National Veterinary Institute
OoARD	Office of Agriculture and Rural Development
PA	Peasant Association
PPR	Peste des Petits Ruminants
PRA	Participatory Rural Appraisal
RBoFED	Regional Bureau of Finance and Economic Development
TAMPA	Tigray Agricultural Marketing Promotion Agency
TNA	Training Need Assessment
TOT	Training of Trainers
UMB	Urea Molasses Block
USAID	United States Agency for International Development

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 2013, 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 assessment 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 assessments 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

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- Halima Hassen ICARDA
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Introduction

The diverse biophysical and agro climatic conditions in Ethiopia make it suitable for the production of different breeds of goats. There are nine known breeds of goat in the country, characterized through phenotypic and molecular methods (Gizaw et al. 2007). About 99.9% of Ethiopia's total goat population consists of indigenous breeds (CSA, 2013). These animals are owned and managed by resource poor smallholder farmers and pastoralists, under traditional and extensive production systems.

Small ruminant production (sheep and goats) is an important activity for smallholders in many parts of the country, particularly resource poor farmers. There are about 25.51 million sheep and 24.1 million goats in Ethiopia (excluding the number of animals in five zones of Somali region and three zones of Afar regional states). About five million sheep and goats are slaughtered each year in the country, a figure that indicates the potential for meat production (CSA, 2013). Small ruminants provide a vast range of products and services, such as immediate cash income, meat, milk, skin, manure, risk spreading/management and social functions (Adane and Girma, 2008). They are also a key source of foreign currency (Berhanu et al. 2006). With their high reproductive capacity and fast growth rates, small ruminants are ideally suited to production by resource poor smallholders (Tibbo, 2006). Small ruminant production plays an important role in the improvement of income for poor farmers, as well as in poverty and hunger alleviation and can make a major contribution to the country's development plan.

Commercial goat production is almost non-existent in Ethiopia. Small ruminant production and productivity, as well as benefits to producers, fall way below expectations. This is due to health constraints, inadequate feed – both in terms of quality and quantity – low genetic potential and various management problems. Infectious diseases pose major constraints to small ruminant production in Ethiopia (Zinash et al. 2001; Sisay, 2006; Tibbo, 2006; Tsedeke, 2007; Getahun, 2008; Gizaw et al. 2010).

Levels of goat production and productivity in Ethiopia are therefore generally low. For example, the average carcass weight per slaughtered animal for the years 2000-2007 was about 10 kg (FAO, 2009). However, there is huge demand for live goats and goat meat in the Gulf countries. Demand and prices for goats and goat meat are also increasing locally, due to increased urbanization and higher incomes. According to the Ethiopian Institute of Biodiversity Conservation (2004), increased goat production and productivity is of growing importance, given forecasts that the country's population will rise to about 129 million by 2030. Current production is unable to satisfy increasing demand from the export abattoirs for export quality slaughter animals (Negasa and Jabar, 2008). Since production is not market oriented, supply is also inconsistent. It is reported that export abattoirs are currently operating at 56% of their operational capacities.

Several factors influence performances of the existing goat marketing system. First and foremost is the absence of efficient marketing systems to link the many smallholder producers and their cooperatives with domestic and international markets. The marketing systems that are available also fail to encourage goat producers to coordinate and collaborate with each other, so as to produce market oriented products. Unless producers become more organized, joining together for activities such as purchasing medicines, supplementary feed and arranging marketing, individual transaction costs will remain high for them.

According to Legesse and Hordofa (2011), these factors are a significant cause of market imperfections and of limited participation of smallholder farmers in existing markets. Secondly, the livestock species currently produced by farmers fail to satisfy the quality attributes required by various markets. Thirdly, the existing livestock marketing system is fragmented and disorganized and the supply chain linking smallholder producers with domestic consumers and export markets is long and extended. This depresses farmgate prices and prevents producers from receiving better revenues, since a vast array of brokers and middlemen tap a large proportion of the price paid by consumers and exporters, without adding value to the product (Legesse and Hordofa, 2011).

There are a total of 264,596 goats and 78,245 sheep in Tanqua Abergelle district (WTAoOARD, 2010). Despite the huge livestock resources in the area, the production system is not market oriented and the marketing system is disorganized and fragmented.

As a result, there is a need for cost-effective marketing channels and coordinated supply chains that reduce transaction costs among different actors along the supply chain. Achieving such improvements will require an understanding of market performance, conduct and functions, as well as business linkages, constraints and opportunities along the value chain. This study therefore sought to investigate the performance of the Abergelle goat value chain in Tanqua Abergelle district. The project is the results of a partnership between the International Center for Agricultural Research in the Dry Areas (ICARDA), the International Livestock Research Institute (ILRI) and the Abergelle Agricultural Research Centre of the Tigray Agricultural Research Institute.

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.

Objective of the study

The overall objective of the study was to analyse the goat value chain so as to identify promising intervention options that could improve the goat value chain in the study area. More specifically, the study sought to:

- Identify the core functions, actors and activities performed in the goat value chain.
- Investigate the natural (ecological), technical, financial, legal and institutional opportunities and constraints in the goat value chain.
- Identify the point of interventions, or possible leverage points, so as to develop the goat value chain function in a better way.
- Forward possible policy implications with a view to developing the goat value chain accordingly.
-

Organization of the report

This report is organized as follows. Section one deals with the background, justification and objectives of the study. Section two presents the methodology used to analyse the goat value chain in the study area. Section three covers various subsections, describing the characteristics of actors in the goat value chain, major channels and routes and distribution of costs and margins along the various paths. Section four presents an analysis of constraints and opportunities along the value chain. Section five offers conclusions and recommendations for solving the constraints hindering development of the goat value chain and an intervention plan for its improvement.

Methodology

Study area

Location: The study was conducted in Tanqua Abergelle district (Figure 1), located in the central zone of Tigray Regional State, Ethiopia. The study district is about 120 km west of Mekelle. It is situated at 13° 14' 06" N latitude and 38° 58' 50" E longitude.

Demographic features: Tanqua Abergelle district has a total population of 92,844, with an annual growth rate of 2.7% and a population density of 64.22 persons per km² (CSA, 2007). Of the total population, 92.43% lives in rural areas, while 7.57% lives in urban areas. The total number of farm households is estimated at 20,211 and the average landholding per household ranges from 0.75 to 2 ha (WTAAOARD, 2011).

Climate: The district is categorized as a hot to warm sub-moist lowland (SMI-4) sub-agro ecological zone. The altitude ranges from 1300-1500 m above sea level, with mean annual rainfall ranging from 400 to 600 mm and rainfall patterns characterized as low, erratic and unpredictable. The mean annual temperature ranges from 28-42°C. There are four seasons in the study area: *Meher* from September 25-November 25, *Bega* from November 25-March 25, *Tsedey* from March 25- June 25 and *Kiremt* from June 25 –September 25.

Livestock and crop production: There are a total of 264,596 goats, 78,245 sheep, 81,649 cattle, 15,732 equines, 104,496 poultry and 11,220 hives of honey bees (WTAAOARD, 2010). The dominant soil types are vertisols (50% of land area), clay (25%) and silt loam (20%). The total land area is about 144,564 ha (1,445.64 km²), of which 29,466 ha is cultivable land, 15,381.7 ha is enclosed and the remaining 99,716.3 ha is uncultivated (includes bare lands, marginal lands, rocky, roads and very steep and unproductive land) (WTAAOARD, 2010).

The major crops grown in the study area include sorghum, maize, cowpea, groundnut and sesame. Crops are grown mainly for their grains and to make use of crop residues for animal feed. The crop residues are used as animal feed and for house construction. As yet, there is no irrigation scheme in the study area.

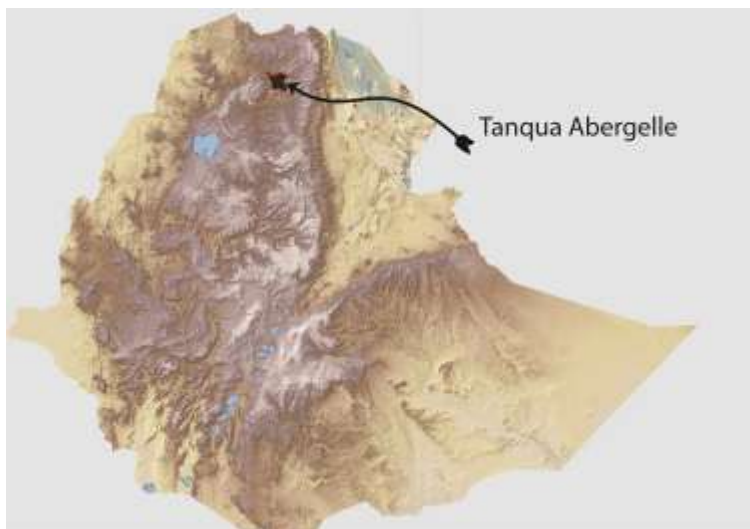


Figure 1. The study area

Data collection

Primary and secondary data were collected to analyse the Abergelle goat value chain. Participatory Rural Appraisal (PRA) tools, including Focus Group Discussions (FGD), Key Informants Interviews (KII) and field observations were used to collect primary data. Different sets of checklists were used for different groups of actors, so as to guide group discussions and KIIs. Secondary data was collected from the Tanqua Abergelle Office of Agriculture and Rural Development (OoARD) and Tigray Agricultural Marketing Promotion Agency (TAMPA). Relevant literature and documents were consulted to provide technical support and develop a basic understanding of how the goat production system operates in the study area.

Focus Group Discussions (FGD)

Focus group discussions were conducted with 10 goat-keepers, of whom 3 were women and 7 were men. The goat-keepers were selected from the Hadnet farmers association. The main criteria for selection of the goat producers were livestock ownership (especially goats), gender, age and educational status.

Key informant interviews

Livestock extension experts, as well as traders, butchers, hotel/restaurant owners and veterinarians from Tanqua Abergelle district Office of Agriculture and Rural Development were consulted as key informants for the study. A total of 30 key informants were interviewed during field data collection.

Data analysis

Data collected through Focus Group Discussions (FGD), Key Informants Interview (KII) and observations were examined using a thematic analysis approach. Quantitative data was examined using descriptive statistical analysis techniques, to calculate costs and margins for the different actors along the value chains.

Results: Core functions in the goat value chain

The core functions in the goat value chain of the study area include input supply, production, marketing, transportation, processing and consumption. Within these various core functions, different activities are performed by different actors. Details are outlined in Figure 2.

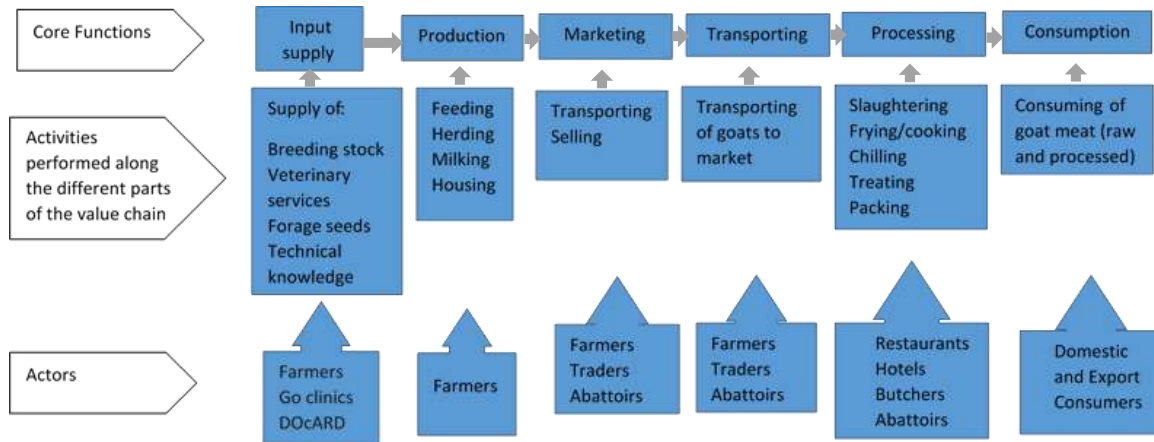


Figure 2: Core functions, actors and activities performed in the goat value chain in the study area

Supply of inputs and services

Inputs supplied for goat production in the study area include feed and water, veterinary services, business support and development services (credit, extension), breeding stock and market information. Figure 3 summarizes the inputs supplied/types of services provided and the suppliers of each input and service.

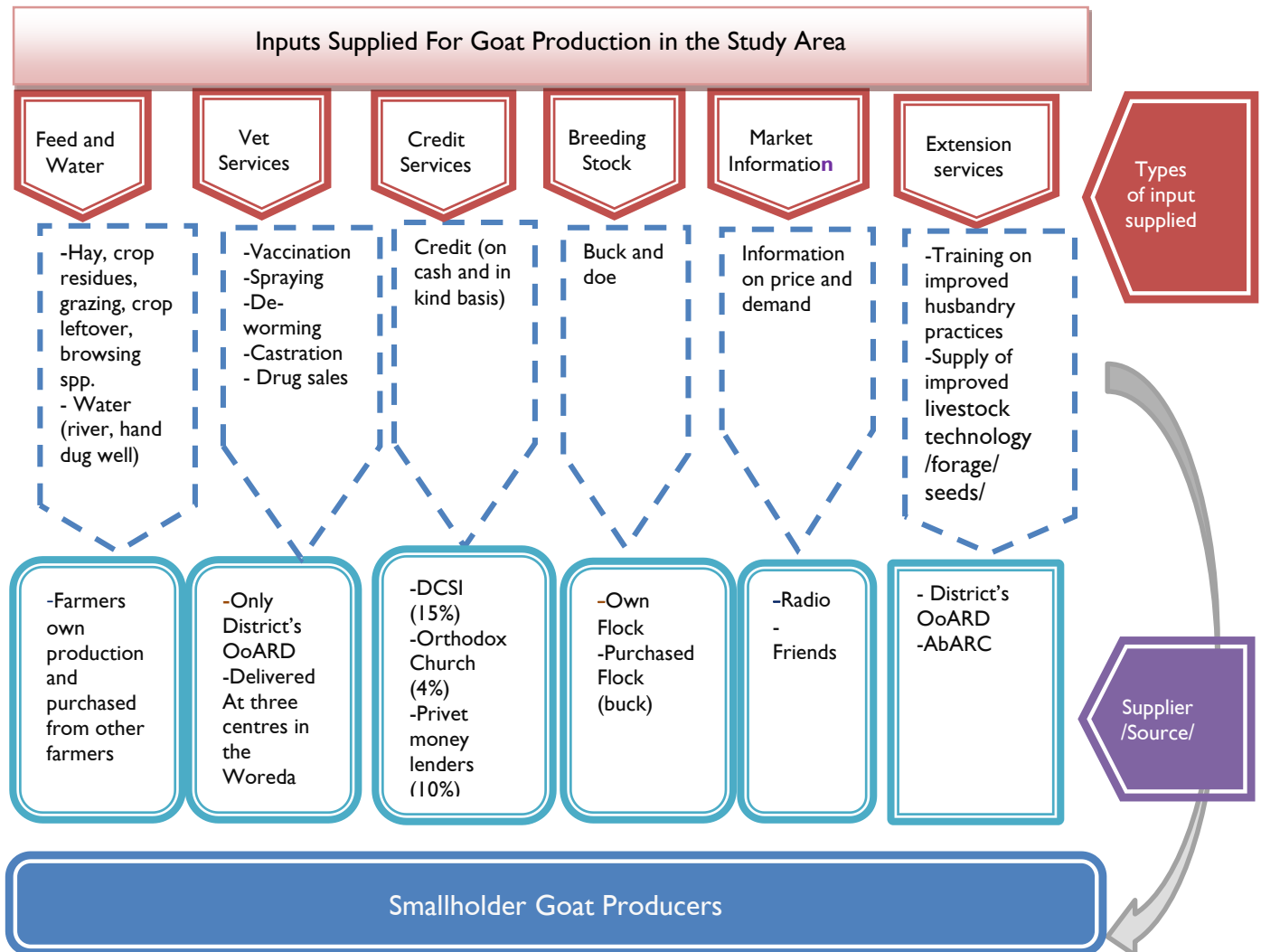


Figure 3: Inputs supplied for goat production; types of inputs and suppliers

Feed and water supply

Farmers in Tanqua Abergelle district in general, and in the study *kebele*¹ in particular, practise mixed crop-livestock agriculture. Since the study area is drought prone, with erratic and unpredictable rainfall, animal feed and water are in short supply. The major source of feed for goats is browsing. Crop residues (mostly cowpea, groundnut and sorghum) and hay are fed to goats when they are emaciated or during seasons when crop species for browsing are in short supply. Within the study *kebele*, there are farmers who sell crop residues, but improved animal feeds such as wheat bran and Urea Molasses Block (UMB) are unavailable, except in Mekelle.

¹a *kebele* is the smallest administrative unit in an urban or rural center, with its own jurisdiction.

For this reason, farmers do not give such products to their goats and they are mostly unaware of these feeds. However, farmers do buy salt blocks, mixing them with homemade bran from various crops before feeding them to their goats.

Goats are taken to drink at nearby water sources. This duty is mainly carried out by children, who trek the animals to the water sources. During the dry season, goats are watered by women and children. In this season, women fetch water for the animals either by using donkeys, or by carrying it on their backs or heads. They bring water to both goats and calves together, at home. If the water source is located far from residential areas, this becomes an additional burden for women.

Veterinary services

The Tanqua Abergelle district Office of Agriculture and Rural Development is the only supplier of veterinary services. Previously, a private store supported by a USAID project sold drugs and medicines, but this has now closed and no private veterinary clinic or drug store operates in the area. Veterinary services supplied by the district Office of Agriculture and Rural Development include vaccination, deworming of various internal parasites, spraying animals against different external parasites, provision of multivitamins and treatment of microbial and viral diseases. In addition, the clinics provide a closed castration service.

These services are offered in sub-district centres, namely, Jijiga, Agbe and Yechila towns. There are also three veterinary health sub-centres in the district, each with two health professionals. Farmers have to bring their sick animals to the centres for treatment. However, the centres function poorly due to shortages of personnel and supplies and problems with facilities.

Supplies of breeding stock

Supply of breeding stock is a crucial factor in animal production. Farmers use traditional breeding through selection methods, without paying attention to inbreeding and breed improvement measures. They consider body condition, kidding intervals, milk yield and prolificacy when selecting animals. The main source of breeding stock for farmers in the study area is their own flock. They also purchase breeding does and bucks from other farmers. Farmers consider colour, conformation and body condition when buying bucks for breeding purposes, and colour, conformation, fertility, milk yield and prolificacy when selecting and buying does for breeding purposes. The Abergelle Agricultural Research Centre, which was set up in the study area with the main objective of improving small ruminant production and productivity by introducing improved livestock technologies, is currently conducting breeding research activities. The centre is crossing Boer goat breeds with Abergelles, and has distributed about 104 crossbreeds with 50% Boer blood and 50% Abergelle to farmers in Hadnet and other kebeles. The majority of the crossbred goats are males.

Credit services

Goat producers in Tanqua Abergelle district obtain credit from various sources. The primary source is the Dedebit Credit and Saving Institution (DECSI), which provides credit services both in kind and cash. This institution gives credit to rural farmers to purchase breeding and fattening goats; it also supports urban improved dairy producers. DECSI provides two types of credit: on an individual basis and on a group collateral basis. If DECSI offers credit on an individual basis to farmers, those farmers must be supported and closely supervised by the district Office of Agriculture and Rural Development. They also have a duty to present their business plan through the extension agent; there is a committee in the Office of Agriculture and Rural Development (OoARD) that is assigned to check the viability of the plan. The committee must

verify the feasibility of the business plan before a loan can be approved. After the farmer receives a loan, the Office of Agriculture and Rural Development carries out strict monitoring, to ensure that the money is used for the business outlined in the plan.

Group collateral-based credit is provided to people wanting to invest in the above-mentioned business sectors, without being subjected to the close monitoring by OoARD. The minimum and maximum amount of credit offered by DECSI is 50 Ethiopian birr (ETB) (ETB 19 = USD 1.00 at 3 December 2013) and ETB 20,000 respectively and the interest rate is 15% per annum. The second source of credit is the Ethiopian Orthodox Church, which offers loans within the study area at a lower interest rate (4% per annum) but in smaller amounts. When farmers are unable to access loans from DECSI, and when cash is badly needed for a shorter period of time, some of them borrow money from wealthy individual farmers (private moneylenders) at a high interest rate (10% per month).

Extension services

Extension services delivered to goat producers in the study area – Tanqua Abergelle in general and the Hadnet farmers association in particular – include provision of improved crop and livestock technologies. Among these are technologies for forage crops such as *luceania* and *susbania* and improved goat breeds, such as *Begait*. Extension services also supply veterinary care and improved husbandry skills (through training in improved animal husbandry practices in the areas of feeds and feed management, housing management and animal health management).

Market Information Service

Market information is the most important factor in influencing farmers' decisions on production and sales of their animals. Goat farmers receive information on the Abi-Adi and Mekelle markets via radio. But they also obtain market information about demand for goats and current prices at the Yechila and Finaruwa markets through friends and relatives, who make advance inquiries before the farmers decide to make the trip.

Production

Agricultural production in the study area is mainly mixed (crop-livestock). Small ruminant production is the major livestock activity. However, the overall goat population declines from time to time. This is mainly due to intermittent falls in availability of feed as a result of rainfall shortages, population pressure and expansion of crop cultivation and forestry lands (area enclosure), at the expense of grazing lands. Reduced availability, in terms of both quality and quantity, of veterinary health services is also responsible for a decline in the goat population.

Reasons for goat rearing

Farmers in the study area rear goats for different reasons. Firstly, because the area has good potential for goat production since it is rich in browsing species. Secondly, the fact that the area is prone to drought, with erratic and unpredictable rainfall, persuades many farmers to keep goats as a diversification strategy, so as to spread risk in the event of crop failure. The third reason for keeping goats is to help meet household expenditure needs at a time when cash is in short supply due to demand for agricultural inputs (such as fertilizer and improved seeds), as well as to pay school fees, medical care and other expenses. Goats' fast reproduction rates, and the rapid return on investment that they offer, are other important factors in convincing farmers to keep small ruminants. Above all, goats are sources of milk and meat for household consumption. Moreover, goats offer a major source of finance for buying large stocks. According to respondents questioned for the study, goats are more resistant to heat and feed scarcity

during prolonged dry spells, compared with large ruminants. Information obtained from Focus Group Discussions (FGD) reveals that farmers' priority for rearing goats lies in their use for sale, home consumption (milk and meat) and manure production.

Gender role in goat production and management

Goat production is practised by both men and women, with more burden on women, especially for feeding and watering the animals (kids and does) during the dry season. For consumption of meat and milk, however, there is a bias towards men. For example, it is taboo for women to consume goat's milk (whole milk), because of a belief that drinking whole milk makes women physically strong, so that they will no longer obey their families, and will look after boys early, which is alien to their societies' culture.

There is no commercial goat production in the study area. Herd size ranges from 15 to 200 goats per household. The average landholding in the area is 1 ha per household. The maximum landholding is 2 ha, while the minimum is 0.5 ha. There is considerable disparity in the degree of land ownership between male and female headed households.

Female headed households have smaller plots of land compared with those of male headed ones. The average family size for the study area is 6 persons per household. Within a family, men and women share different tasks for goat husbandry. Though labour is a constraint to agricultural production, farmers generally use family labour to carry out all agricultural activities (crop cultivation, goat herding etc.). They only hire labour during harvesting and planting seasons. The main source of labour for the study area consists of labourers from Tanqua Abergelle and outskirts.

Goat ownership differs according to gender, with male headed households having larger herds than female headed ones.

Goat feeding and watering

Tanqua Abergelle district receives erratic and unpredictable rainfall. The major sources of animal feed (Figure 5) are green grass (cut and carry grass during the rainy season), hay, crop residues, browse species and grazing on untilled land. The major feeding system is free grazing and browsing. Only a few farmers practice partial stall feeding of calves and kids. Farmers mostly produce their own feed, but they purchase crop residues and hay from other farmers in the event of short supply. They also collect naturally occurring green feeds, such as field weeds and crop thinnings. Goats are allowed to browse freely and emaciated goats have hay and straw as supplementary feed. Old goats are allowed to roam, looked after by children and women, while kids are kept at home, mainly taken care of by women. Goats are allowed to go to a nearby river to drink water. But if the river becomes dry, women and children have the task of fetching water from rivers further away to water their animals at home. This may involve walking an average of six hours.

Seasonal distribution of animal feed relative to rainfall pattern

As described in the feed and water section above, the feed sources in the study area are crop residues, crop aftermath, green feed, grazing, hay and browsing shrubs and trees. An attempt was made to link the seasonal distribution of feeds to rainfall distribution and the following chart was drawn up. In Figure 4 below, the different feed types are distributed across the months of the year. The chart shows that availability of green forage, grazing grass (green grass) and browsing trees such as *Tsalwa*, *Giba*, *Weiba* and *Guaza* has a strong direct relationship with rainfall pattern.

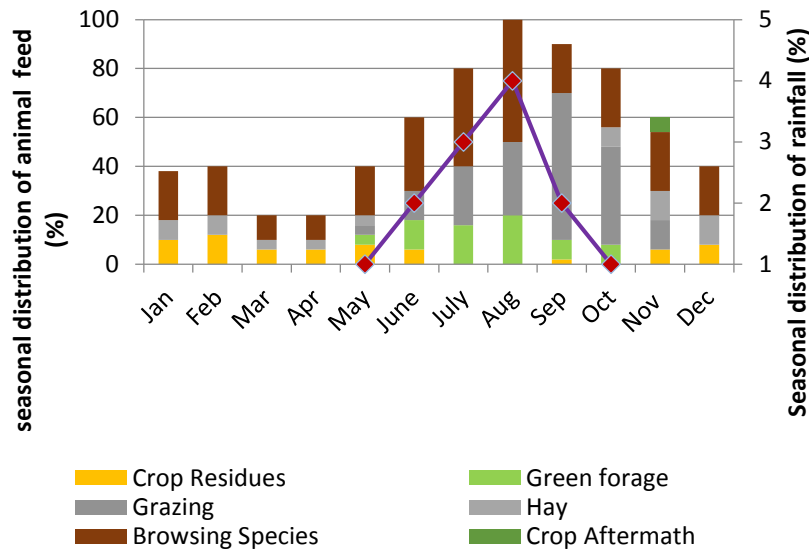


Figure 4: Seasonal distribution of feed resources relative to rainfall pattern

Coping strategies for feed shortages

As indicated in Figure 6, the major sources of feed during the rainy seasons are grazing, green forage and browsing. In the dry seasons, the availability of grazing pasture and green forage becomes very scarce or non-existent. In such periods, farmers rely on crop residues, hay and browsing. During these dry seasons, farmers herd their animals long distances in search of browsing and return to the homestead when pastureland re-emerges and browsing species rejuvenate.

Goat breeding

The Abergelle goat breed is characterized by a small body size, red and brown (mostly) and grey body colour, with dotted and patchy ears (Figure 7). This breed, known for its strong disease resistance, drought tolerance, palatable meat taste and high volume of milk production, is reared in the study area, Tanqua Abergele district. The major constraint for this breed is its failure to grow rapidly to attain the age of slaughter and reproduction. Farmers in the area use traditional breeding practices. There is no controlled mating system. Breeding through selection is not a common practice in the area. Only a few farmers select goats with good body conformation for breeding purposes and this is carried out without knowledge of inbreeding. Farmers in the area do not use any recording system for their herds. One buck serves up to 15 does. Farmers prefer to breed their goats with brown coloured bucks, which in turn increases the market value of goats produced.

Farmers are aware that a lack of good breeding bucks has a negative impact on the performance of their animals. They also perceive that Abergelle goat breed produces good tasting meat.

Neither community-based breeding through stock rotation, nor individual rotation of breeding bucks among farmers is practised in the study area. On the contrary, resource poor farmers often borrow other farmers' bucks.

Goat housing management

The information generated from focus group discussions conducted with producers indicated that farmers in the study area practise traditional housing management. Farmers use different types of housing during different seasons of the year. They use earthen roofed houses with stone walls during the rainy seasons to protect their animals from rain. During dry seasons, farmers build houses from tree branches, mainly for shade and to ensure ventilation. They also build barns for their animals on communal land where browse species are available, providing crop residues as supplements and leaving their animals there until the rainy season. Farmers do not divide their goats according to age and gender. They acknowledged that poor spacing and lack of separate barn arrangements have a negative impact on health, contributing to abortions due to fights, as well as other physical damage.

Few farmers prepare separate barns for goats and large animals, allowing them to share the same housing. Sometimes, animals also share housing with farm households in living rooms. This mainly occurs due to lack of space and poor awareness of housing management issues.

Goat marketing

Goat marketing involves the transportation, buying and selling of goats. Farmers sell their goats at any time there is an immediate need for cash, regardless of market demand. Respondents using the proportional piling method (Figure 5) revealed that both supply and demand for goat products seemed to increase during the months of September, January, April, May and June, but decreased during other months. Strong supply is explained by the fact that in those months, cash is needed for farm, household and other expenses, as well as to pay for higher consumption levels, due to public festivities such as Ethiopian New Year, Christmas and Easter. Farmers said that they are reluctant to sell large ruminants, since they strive to maximize numbers of their bigger stock. The decision to sell either cattle or small ruminants depends on the quantity of cash required at a given time. Farmers sell large ruminants when they require a significant sum of money; the sale of large ruminants for a small amount of money is considered an extravagance.

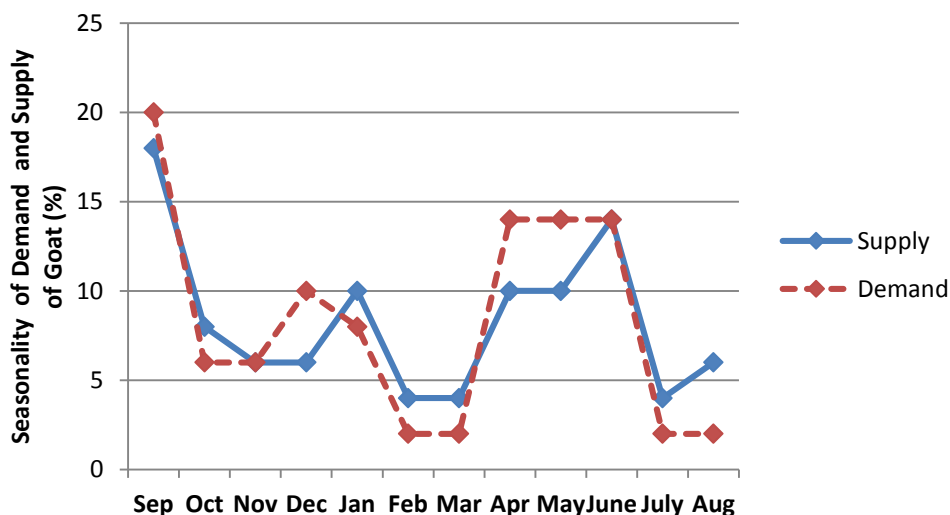


Figure 5: Percentage of demand and supply of goats in study area

As indicated in Figure 6, farmers mainly sell their goats at market in Yechila – accounting for 70% of all sales – and Finaruwa, which accounts for 20%. They rarely sell their goats at farmgate

(10%). Producers prefer to sell their animals at market rather than at farmgate because of the price difference. A goat sold at market fetches an average of ETB 10-30 more than one sold at farmgate.

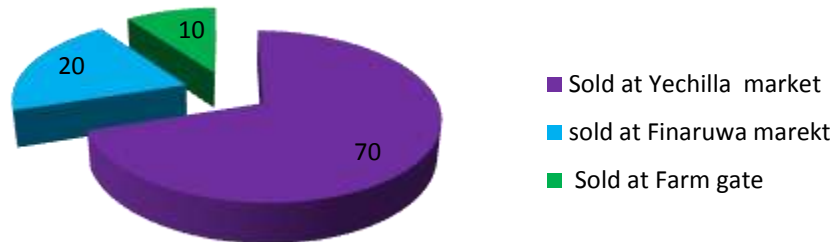


Figure 6: Producers' sales volume of goats by marketplace (%)

Farmers mostly prefer to sell their goats (intact males) to traders, since this form of transaction generally ensures higher prices and allows producers to sell larger numbers of animals. Their second preference is selling to individual consumers. These clients usually buy castrated, fattened male and sterile female goats. Hotels generally buy older does, which farmers often deliberately pass off as sterile. Such animals are taken to market in early pregnancy, when their body condition is at its peak, so that farmers can negotiate a better price.

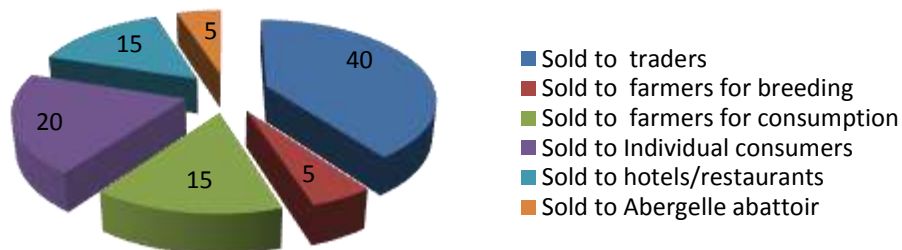


Figure 7: Producers' sales volume of goats by buyer type (%)

Producers do not always sell their animals for the price they had intended. Although prices are determined by negotiation between sellers and buyers, in this case farmers and traders, they are mainly decided by farmers, particularly during the months of January, May, June, July and September, when there is strong market demand. In other months, when farmers are obliged to sell their animals to secure cash to pay for fertilizer, improved seed, school fees and other living expenses, the price is determined by traders, since demand for animals is very low. These are periods of excessive supply of goats and farmers have very little bargaining power. Traders can make profits of ETB 50-100 due to their stronger market position during these months. However, farmers and buyers have almost equal bargaining power during major holidays in the months of September, December and April, when there is high demand for animals. Farmers are in a stronger position to determine price at harvest time (January, February and March), when there is high demand for animals and farmers have fewer problems of cash flow.

Generally, seasons influence both market prices and the bargaining power of farmers and traders. Major factors influencing price negotiation are: goat colour, body condition, body size, etc. The red/brown goat is the most highly prized colour type on the market.

There are two markets for goat sales in the district. The major goat markets in the area are Yechila and Finaruwa, and from here, traders take the animals to Mekelle (terminal market). Market demand for different classes of animals (age and sex) varies according to different areas. For example, restaurants in Yechila prefer intact male and female goats, due to their lower price and high meat quality, compared with other classes of goat. Castrated goats are transported in large quantities by large-scale traders during festivals such as Easter (*Fasika*) and Christmas (*Lidet*). The export abattoir (in this case, Abergelle export abattoir) buys goats on a live weight basis, setting a lower price, so farmers are reluctant to sell their animals to this outlet.

Transportation

Transportation plays a key marketing role in the goat value chain. Goats purchased by small-scale and large-scale traders are transported to their destination and/or the Mekelle terminal market. Two means of transportation were observed: trucking (on an Isuzu vehicle) or on foot, driven by a herder. According to the FGD conducted with traders, and observations from the study authors, traders truck an average 90 goats per journey by Isuzu in the case of intact males and does and 70 goats per Isuzu in the case of castrated/large goats. However, not all traders use this method, due to a shortage of vehicles and the perceived higher cost of trucking by most small-scale traders. There are no dedicated livestock transportation trucks in the area. Ordinary trucks, used to transport any solid items, are used, with scant consideration for the animals' welfare. Some traders trek their goats on foot, hiring labourers to make the journey. Traders explained that they lose an average of two goats per truckload. Goats also lose weight due to overcrowding on trucks and risk physical damage (lameness) during the journey.

Processing

Processing is one of the core functions of the goat value chain. This involves transforming raw agricultural products into finished goods. Its objective is to maximize the value of raw products and also prolong their shelf life.

In the study area, processing is mainly carried out by hotels/restaurants and butchers for local consumption. Hotels/restaurants and butchers slaughter goats prior to preparing various dishes, and, in the case of butchers, to selling raw meat by the kilo. In neither case are goats slaughtered at the municipal abattoirs. The Abergelle export abattoir also plays a role in processing for export purposes. The Abergelle export abattoir mainly buys goats from Tanqua Abergelle and Alamata districts and carried out slaughtering, chilling and packing activities to supply the international market.

Consumption

Goat meat is consumed either raw or processed, fried, or in the form of stews, thick soups or tripe. Goat meat is eaten by all members of the family, but milk is mostly consumed by children after processing. About 95% of goats reared in the study area are consumed by domestic consumers (individual consumers, hotels/restaurant, butchers). Consumers buy either raw meat from butchers or buy live goats and slaughter them at home during festivities. The rest of the goats reared in the study area (5%) go to the export market, destined for foreign consumers via the Abergelle export abattoir.

Marketing routes

A market route is a path through which a product flows into different market destinations. Yechila is the main market in the study area for inflow of goats, as illustrated in Figure 8. The main source of goats to Yechila market are the *kebeles* of the study area which include *Hadnet, Felege Hiwot, Negede, Birhan, Guftame, Gera, Embarufael and Lemlem* amongst others. These account for 50% of the total share of inflow. A further 30% of inflow is accounted for by villages from *Niraqu* district, namely, *Kolle, Aresge Tsalig Sig, Bulda* and *Abamida*. The third largest source of goats to Yechila market is Tselemti district, the northwestern zone of Tigray, which accounts for 10% of inflow. Sahrti Samre and Beyeda, in the Amhara Region, each account for 5% of inflow. The inflow of goats from Beyeda, Niraqu and Sahrti Samre districts is an indicator of the presence of transregional trading of goats in the study area.

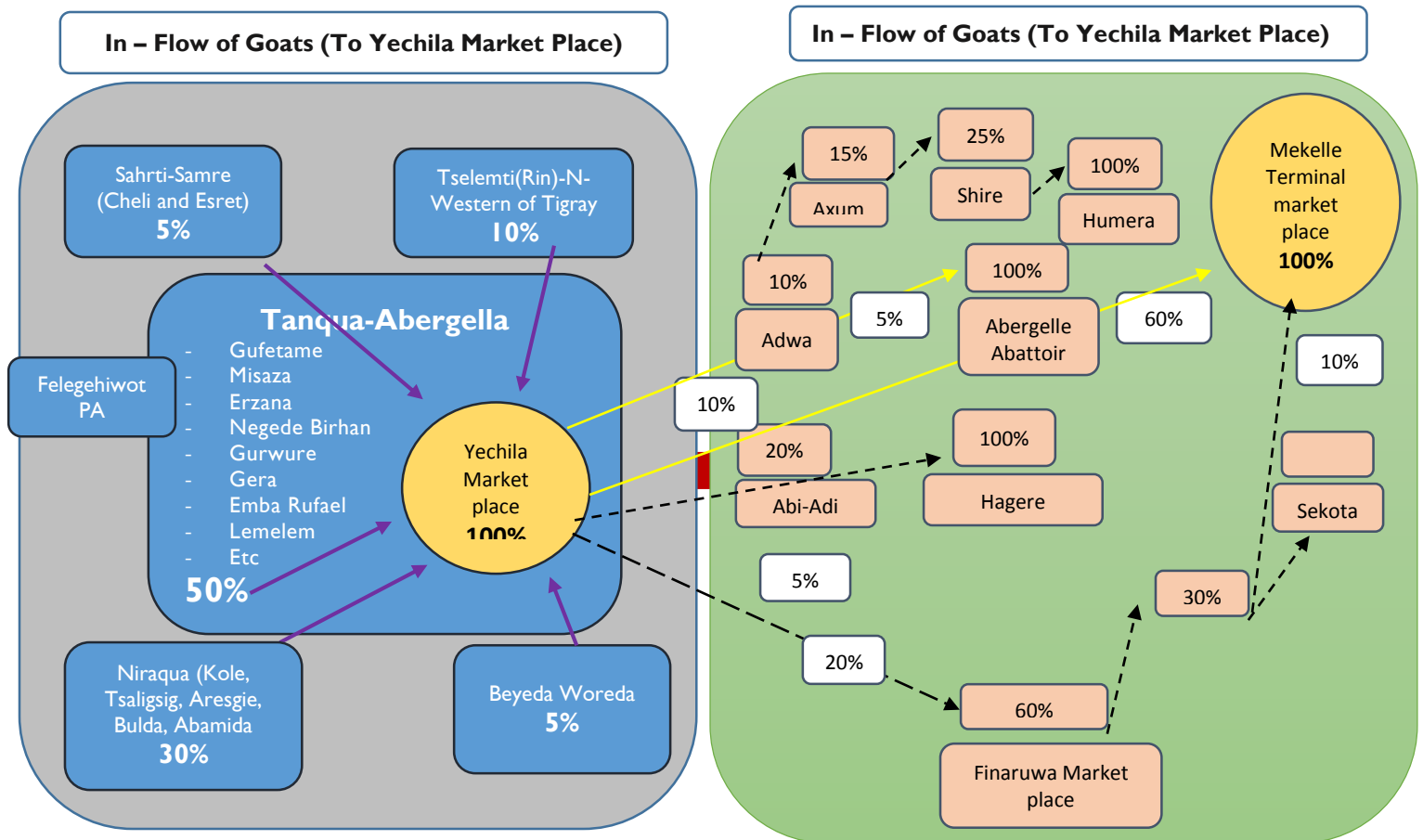


Figure 8: Goat marketing routes and estimated volume of flow

As indicated in the diagram above (Figure 8), various outflow routes have been identified for goat marketing. These are: Yechila through Abi-Adi to Humera (10%); Yechila to Abergelle export abattoir (5%); Yechila to Hagere Selam (5%); Yechila via Finaruwa to Mekelle (20%) and directly to Mekelle terminal market place (60%).

Marketing channels

A marketing channel is an organized network of different agencies and institutions which in combination performs all the activities required to link producers with consumers to accomplish the marketing tasks (Bennet, 1988; as cited by Jaleta, 2011). An analysis of marketing channels provides a systematic knowledge of the flow of goods or services from their production areas to the final market or end users.

Marketing of goats in the study area begins with the collection of goats of different classes and ages from production areas, moving on to the 'end markets' (Figure 3). In the process, animals pass successively through different market actors before reaching the end users. The number and type of market participants vary along the different market channels. To indicate the distribution of marketing costs and margins, six major market channels have been identified. The different channels represent available outlets through which goats move from different parts of production areas to end markets and end users.

Market channel one: goats sold direct to individual consumers

Individual consumers buy animals for slaughter, mainly during cultural or religious festivals (such as Christmas, Easter, *Mewlid*) and the Ethiopian New Year. With the exception of black goats, animals of all colours are equally in demand from individual consumers. Individual consumers buy goats from goat producers, at markets and at farmgate.

Market channel two: goats sold directly to Abergelle export abattoir

Some farmers sell their goats directly to the Abergelle export abattoir. About 5% of the goats reared in the area are purchased by the abattoir, which buys animals on a live weight basis. The abattoir weighs each animal individually. As a result, prices are generally lower than those based on visual appraisal. The export abattoir exports chilled carcasses to the Middle East and African countries.

Market channel three: Goats sold to hotels/restaurants via small-scale traders

In this channel, hotels/restaurants buy goats from small-scale traders. Small-scale traders find animals using their network of collectors and supply them to different consumers, including hotels and restaurants (70% of trade volume).

Market channel four: goats sold to hotels/restaurants via large-scale traders

As well as purchasing goats from small-scale traders, hotels/restaurants also buy goats from large-scale traders. These supply 85% of their live goat trade volume to hotels and restaurants.

Market channel five: goats sold to butchers via small-scale traders

Butchers are major actors in the goat value chain for this study area. They buy live goats, both from small and large-scale traders. Small-scale traders sell 30% of their trade volume to butchers. The butchers slaughter goats and sell meat on-the-bone to individual consumers. They also sell cooked meat from their premises, as well as raw meat as a take-away dish to individual consumers. When they sell raw and cooked meat at their premises, butchers incur additional processing costs, which they pass on as part of the food price to consumers.

Market channel six: goats sold to butchers via large-scale traders

In this channel, butchers buy goats from large-scale traders, who in turn buy goats directly from producers. Butchers buy 15 % of the trade volume of large-scale traders.

Market channel seven: goats sold to farmers for breeding purposes

As indicated above, smallholder farmers buy young male and female goats for breeding purposes. They buy these animals if, and only if, they know the origin (location) of the animal and when they trust the history of the animal through information obtained from neighbors and the animal's owners. Farmers usually buy breeding goats after crop harvest, when the animals will have access to feed from crop aftermath and browsing.

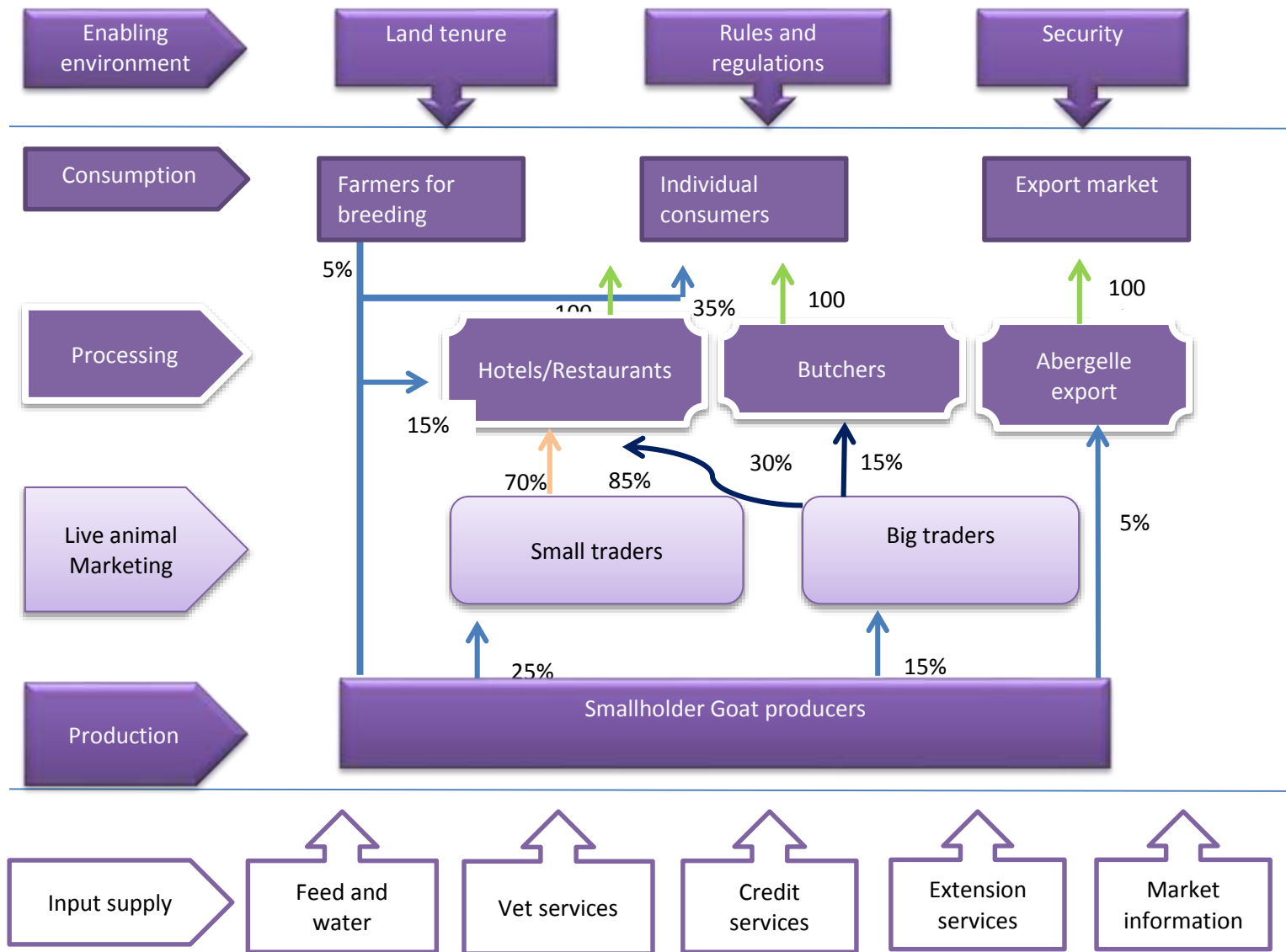


Figure 9: Map of Tanqua Abergelle goat value chain and estimated percentage flow of goat

Goat value chain actors

The major actors identified in the goat value chain for the study area include goat producers (farmers), who are the primary actors, small-scale traders, large-scale traders, hotels/restaurants, butchers, individual consumers and the export abattoir (Abergelle export abattoir). The characteristics of each of the actors involved in the goat value chain are described as follows.

Abergelle export abattoir

The export abattoir is one of the actors in the goat value chain for this study area. The Abergelle export abattoir, which was established in 1997, is the only abattoir in Mekelle. However, when this study was conducted, the abattoir was not operating, mainly due to the high cost of slaughtering animals (especially cattle) relative to the export price, making products uncompetitive on the international market. The Abergelle export abattoir has three fattening and collection centres in Tigray. These are used for collection, reconditioning (feeding) and transportation of live animals to the slaughterhouse. Each site can accommodate between 3,000 to 5,000 live animals at a given time, and is equipped with weighing scales, feed stalls, barns and grazing land of between 30 and 90 ha. The abattoir was mainly designed to slaughter and export chilled goat meat and frozen beef. Its main sources of goats are Abergelle, Alamata and Mekelle outskirts, accounting for 50%, 20% and 30% respectively of supply to the abattoir. Potential suppliers of the abattoir are traders (90%), farmers from different areas (9%) and cooperatives (1%). It is reported that there is no longstanding relationship between the export abattoir and suppliers. This is mainly due to the fact that the export abattoir buys animals on individual live weight (not group weight) basis, as opposed to visual observation, resulting in lower prices that are unattractive to farmers. The abattoir itself buys goats at markets and at farmgate. The quality parameters of the export abattoir are age (less than 2 years), breed (lowland) and body and health condition. The abattoir prefers lowland goats since the meat is believed to keep its original colour when supplied chilled and packed for export. The abattoir also uses a grading system when buying slaughter animals. It categorizes goat quality into different classes. For example, class one goats should satisfy the following quality parameters: fatty tail/head, full rib area, good condition of loin area.

The abattoir exports chilled carcasses to the Middle East (Bahrain, Jordan, Kuwait, Saudi Arabia and United Arab Emirates), as well as to Vietnam and to African countries such as Angola, the Comoros and Egypt.

Hotels/restaurants and butchers

Both hotels and butchers are important actors in the goat value chain for the study area, though they are not major processors. Both of these follow similar criteria in selecting animals. When buying goats, they give serious consideration to body size and condition, but not to the animals' colour. Hotels and butchers have a preference for mature sterile does, with castrated males as their second choice. Castrated goats are also popular since they have a higher carcass yield than intact mature and young males. However, castrated goats are slaughtered less often than mature sterile does, due to their higher price (ETB 1580-1600). Hotels and butchers use different methods to check that does are sterile. For example, they may cover the nose of an animal with their palm and fingers for a few moments. If a doe is pregnant, it releases urine when its nose is covered, and a sick animal will fall to the ground. Goat producers sell their mature does as sterile. They never reveal that the does are pregnant. This is because sterile does fetch higher prices. Goats destined for butchers and hotels are mostly supplied by small-scale traders and sometimes by producers.

Hotels use goat meat to prepare different dishes, such as fried meat, boiled meat flavoured with different spices and *dule* and *gubet kulalit*. *Dulet* and *gubet kulalit* are mainly eaten for breakfast. Butchers sell meat by the kilo to be consumed at home by individual consumers. Transactions are carried out based on visual appraisal and goat traders can estimate how much meat is likely to be produced from an animal of a given size. They consider carcass weight by estimating the live weight of animals ahead of purchase. For example, based on information from a hotel manager in Mekelle, a mature doe weighing about 25kg can yield a carcass with approximately 10 kg of meat.

Individual consumers

Individual consumers are major actors in the goat value chain for this study area. They buy goats directly from traders (small and large-scale) and from farmers. They also buy raw meat from butchers by the kilo. Preferences for size and type of animals are influenced by individuals' purchasing power and the type of festivity/holiday to be celebrated. For example, well-to-do households prefer to slaughter heavier, fattened males (mostly castrated goats known as *mukit* in Amharic) during festivities such as Easter and Christmas, while during the same period, government employees and other low-income consumers opt for young growing (uncastrated) males. Furthermore, there is a marked colour preference, which is largely seasonal or related to certain occasions. For example, for religious festivals, (sacrifice) animals of specific colour and age are required. Black coloured goats are in poor demand since society believes these animals to be cursed. They may be sold to other farmers at a relatively low price for consumption.

Large-scale traders

The study authors encountered very few individuals who describe themselves – and are described by other traders – as large-scale traders. In the context of this study area, large-scale traders are taken to mean those market agents who can supply about 100 animals each to Mekelle and other markets such as Humera. Transportation costs from Finaruwa to Mekelle are about ETB 10 per animal. Goats trucked to Mekelle are given 1-2 days' rest and fed on the outskirts of Mekelle before being marketed, so that the animals can recover from the fatigue of the long journey and can maintain their initial body weight and condition.

Small-scale traders

Small-scale traders are those market agents who operate using their own capital and buy up to 20 goats at a time. Small-scale traders buy all classes of animals and supply them to hotels and restaurants, butchers, individual consumers and large-scale traders. No longstanding relationship is reported among those engaged in goat buying and selling activities (all actors). Most of the small-scale traders have long market experience and can easily identify the type of animals required by different actors. Price is set by market negotiation.

Collectors

Collectors are market actors who usually buy animals from remote rural markets and villages and sell the animals at primary markets. Collectors use either their own capital or large-scale and small-scale trader's money to buy animals. Those who use their own capital sell to any buyer. The usual practice is for collectors to hand over their animals in bulk to small or large-scale traders after negotiating prices based on prevailing market prices. They may also sell to individual consumers and export abattoirs. Collectors using other traders' money deliver the animals to the owner of the capital in exchange for commission, depending on how effectively they have bargained during their purchase.

Farmers buying animals for breeding

Smallholder farmers buy yearling female goats for breeding when they need to replace their existing does or to increase their herd size. They also buy bucks for breeding purposes. Based on the information obtained from FGDs, farmers pay better prices than traders, butchers and hotels for such animals. Conformation or appearance (body size, colour and condition) are the major attributes considered by farmers when buying animals. Farmers also consider origin when buying for breeding purposes.

Distribution of costs and margins along the goat value chain

The goat value chain for the study area brings together different actors in the various core functions described in the previous section. Across the value chain, both live goats and processed meat are traded. The different actors identified in the goat value chain for this study area incur and obtain different costs and benefits. The value of live goats rises from the lower end of the chain (producers) to the upper end (individual consumers). Allocative efficiency of market is measured by the ability of the market to fairly distribute the benefits from marketing. As an indicator of the efficiency of the channel, the net marketing margin of a particular actor is identified as a residual of the gross marketing margin after settling its marketing costs. The following formula was used to analyse the distribution of costs and benefits of the different actors along the value chain.

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

Where: PS = producers' share

P_p = producers' price of goat

P_r = retail price of goat

MM = marketing margin

The above equation tells us that a higher marketing margin diminishes producers' share of the final value of a product and vice versa. It also provides an indication of welfare distribution among production and marketing actors.

Calculation of the total marketing margin has been made using 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_p = producers' participation (farmers' portion)

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

The net marketing margin (NMM) is the percentage of the final price earned by the intermediary as his/her net income once his/her marketing costs have been deducted.

$$NMM = \frac{\text{Gross margin} - \text{Marketing costs}}{\text{End buyer price (Consumer price)}} \times 100$$

Where NMM = net marketing margin

Data collected on costs and benefits for different actors along the goat value chain using Focus Group Discussion (FGD) and Key Informant Interviews (KII) were used to analyse the costs and margins for different market channels. The major costs observed for goat producers in the study area include feed cost, treatment and herding costs (Table 1). Goat producers' marketing costs are considered to be zero, since they trek their animals to nearby markets by themselves, or using family labour. Distribution of costs and margins was calculated for the seven marketing channels identified.

Table 1: Marketing costs and their percentage (%) of total cost of goats for each actor observed in the goat value chain

Cost faced by each actor	Producers		Small-scale traders		Large-scale traders		Hotels/Restaurants		Butchers		Abergelle export abattoir	
	Cost	%TC	cost	%TC	cost	%TC	cost	%TC	cost	%TC	cost	%TC
Feed cost	155	75.70	-	-	5	9.52	-	-	-	-	6	3.77
Rope	-	-	1.5	3.03	1.5	2.86	-	-	-	-	-	-
Vet. treatment	20	-	4	-	2	3.81	-	-	-	-	-	-
Packaging cost	-	-	-	-	-	-	-	-	-	-	3	1.89
Slaughtering cost	-	-	-	-	-	-	25	6.33	25	8.93	100	62.89
Cost of spices	-	-	-	-	-	-	100	25.32	80	28.57	-	-
Processing cost	-	-	-	-	-	-	-	-	-	-	-	-
Labour cost	-	-	6	12.12	4	7.62	50	12.66	45	16.07	-	-
Injera cost	-	-	-	-	-	-	220	56.70	130	46.43	-	-
Herding cost	30	14.63	-	-	-	-	-	-	-	-	-	-
Tax payment	-	-	8	16.16	10	10.05	-	-	-	-	-	-
Transport cost	-	-	10	20.20	10	10.05	-	-	-	-	50	31.45
Other costs	-	-	20	40.40	20	30.09	-	-	-	-	-	-
Total Cost/head	205	100	49.5	10	52.5	100	395	100	280	100	159	100

N.B: All figures used are on average basis

Distribution of costs and margins in a channel where goats are sold directly to individual consumers. This channel includes producers and individual consumers. As can be seen from Table 2, the producers' share of the final product (goat) is 100%. This is because producers sell their product directly to individual consumers. Put another way, the benefits that could have been obtained by intermediaries are entirely captured by the producers. Since individual consumers usually opt for fattened male goats that generally stay on the farm longer than yearlings, the production costs for such animals are assumed to be double those for a male yearling goat (ETB 205, see Table 1).

Table 1: Analysis of percentage share of producers in Channel 1

Channel 1	Goats sold directly to individual consumers		Producers	Individual consumers
		Selling price of goat	1200	1200
		Total marketing cost		
		Marketing margin		
		Net margin		
		Total cost	410	
		Value added	790	
		Share of value added (%)	100	
		Producers' share of final goat price (%)		100.00

Distribution of costs and margins in a channel where goats are sold to Abergelle export abattoir. The second channel observed in the goat value chain consists of producers (farmers) and the Abergelle export abattoir. In this channel, producers' share of the final product (goat) is 40%. Though farmers are directly selling their goats to the Abergelle export abattoir in the same way as they did in channel one, the selling price for this channel is more than 50% lower than that observed in channel one (1200). This is mainly due to differences in the types of animals demanded by the two buyers. Individual consumers buy matured, fattened goats, while the abattoir buys yearlings. The abattoir's buying price was ETB 27/kg and key informant interviews found the average live body weight of goats supplied to be 18 kg.

Table 2: Analysis of percentage share of producers in Channel 2

Channel 2	Goats sold directly to Abergelle export abattoir		Producers	Abergelle export abattoir
		Selling price	486	1218
		Total marketing cost		159
		Marketing margin		732
		Net margin		573
		Total cost	205	645
		Value added	281	573
		Share of value added (%)	33%	67%
		Producers' share of final price (%)		40%

Distribution of cost margins in a channel where goats are sold to hotels/restaurants by small-scale traders. This channel includes producers, small-scale traders and hotels/restaurants. In this channel, the producers' share of the final selling price is 67% (Table, 4), which is higher than the share observed when animals are sold to export abattoirs. Looking at the selling prices of producers when animals are sold to individual consumers and hotels, the latter is lower, mainly due to the animal types sold.

Table 3: Analysis of percentage share of producers in Channel 3

Channel 3	Goats sold to hotels/restaurants via small-scale traders		Producers	Small-scale traders	Hotels/restaurants
		Selling price	1100	1200	1650
		Total marketing cost		50	395
		Marketing margin		100	450
		Net margin		51	55
		Total cost	205	1150	1595
		Value added	895	50	55
		Share of value added (%)	89.5%	5%	5.5%
		Producers' share of final price (%)			67%

Distribution of costs and margins in a marketing channel in which animals are sold to hotels by large-scale traders. This channel includes producers, large-scale traders and hotels/restaurants. The producers' share of the final selling price is 68%, which is higher than the share observed in channel three. As seen in Table 5, large-scale traders pay a lower price to producers than individual consumers, but a higher one than small-scale traders. The slight difference in the producer's share of final price in channels three and four is due to the difference in prices paid by small-scale and large-scale traders.

Table 5: Analysis of percentage share of producers in Channel 4

Channel 4	Goats sold to hotels/restaurants via large-scale traders		Producers	Large-scale traders	Hotels/restaurants
		Selling price	1150	1250	1700
		Total marketing cost		53	395
		Marketing margin		100	450
		Net margin		47	55
		Total cost	205	1203	1645
		Value added	945	47	55
		Share of value added (%)	90%	0.5%	5%
Producers' share of final price			68%		

Distribution of costs and margins in marketing channel where goats are sold to butchers by small-scale traders. This channel includes producers, small-scale traders and butchers. The producers' share of the final selling price (Table, 6) is 74%. Though prices are nearly similar in the four channels discussed above, the type of animals sold to the different channels varies. There is a marked difference between the type of animals sold to hotels/restaurants and other market actors. Hotels buy old does and sell the meat after preparing it for different dishes. Thus, it is easier to make a comparison between channels five and six than between the previous four channels. The difference between channels three and four is due to the lower price paid by small-scale traders than that paid by large-scale ones. This implies that producers would be better off selling to large-scale traders than to small-scale ones.

Table 4: Distribution of costs and margins in marketing channel where goats are sold to butchers by small-scale traders

Channel 5	Goats sold to butchers via small-scale traders		Producers	Small-scale traders	Butchers
		Selling price	1 100	1200	1500
		Total marketing cost		50	280
		Marketing margin		100	300
		Net margin		50	20
		Total cost	205	1150	1480
		Value added	895	50	20
		Share of value added (%)	93%	5%	2%
		Producers' share of final price			73%

Distribution of costs and benefits in marketing channel where goats are sold to butchers by large-scale traders. This channel includes producers, large-scale traders and butchers. The producers' share of the final selling price (Table 7) is 74%, which is higher than the share observed in the previous channels, but almost the same compared with the channel where animals are sold to butchers by small-scale traders (73.33%).

Table 5: Analysis of percentage share of producers in Channel 6

Channel 6	Goats sold to butchers via large-scale traders		Producers	Large traders	Butcheries
		Selling price	1 150	1250	1550
		Total marketing cost		53	280
		Marketing margin		100	300
		Net margin		47	20
		Total cost	205	1203	1530
		Value added	945	47	20
		Share of value added (%)	93%	5%	2%
		Producers' share of final price			74%

Summary of producers' share of final product price for the six channels identified.

As can be clearly seen from Table 8, the channel where producers obtain a relatively better price is the first one (selling directly to individual consumers). Individual consumers pay a higher price to producers than any buyer type involved in the goat value chain. The other important issue that emerges from the table is close link between product type and the price paid to producers by market actors. This can be observed from comparisons between channels three and four, as well as between channels five and six.

Table 6: Summary of producers' share of final product price for the six channels identified

Channel	Actors	Producers' and final buyers' selling price respectively	Producers share the final product value (%)	Ranking of channels by producers' share of the final product value (%)
Channel -1: Goats directly sold to individual consumers	Producers and individual consumers	1200 -- 1200	100	1
Channel -2: Goats directly sold to Abergelle export abattoir	Producers, export abattoir and foreign consumers	486 -- 1218	39.90	6
Channel -3: Goats sold to hotels/restaurants via small traders	Producers, small traders, hotels/restaurants and individual consumers	1100 -- 1650	66.67	5
Channel -4: Goats sold to hotels/restaurants via large scale traders	Producers, large scale traders, hotels/restaurants and individual consumers	1150 -- 1700	67.65	4
Channel -5: Goats sold to butchers via small scale traders	Producers, small scale traders butchers, and individual consumers	1100 -- 1500	73.33	2
Channel -6: Goats sold to butchers via large scale traders	Producers, large scale traders, butchers and individual consumers	1150 -- 1550	74.97	3

Analysis of goat end markets

Analysis of domestic markets

There is strong demand for Tanqua Abergelle goats on the domestic market. The breed is known for the fine taste of its meat. Individual consumers, hotels/restaurants and butchers are the actors in the value chain for the domestic market. Some 95% of all goats reared are sold to the domestic market for meat. Different consumers and processors use different quality parameters when buying goats. Among these, taste is one of the most important factors.

Analysis of export market

Aside from domestic demand for goats produced in the study area, about 5% of the goat meat is exported to various Middle Eastern and African countries. This is done through the Abergelle export abattoir. The export abattoir exports processed goat meat to the Middle East (Bahrain, Jordan, Kuwait, Saudi Arabia and UAE), African countries such as Angola, the Comoros and Egypt, as well as to China, Turkey and Vietnam.

Constraints identified in the goat value chain

Based on the Focus Group Discussion (FGD), Key Informant Interviews (KII) and observations, an analysis was made of the factors hampering the smooth running of the goat value chain in the study area. Some of the major constraints affecting all goat value chain actors in each and every core function are discussed in this section.

Constraints in input supply

Shortage of adequate veterinary services, drugs and equipment supply. Though veterinary clinics are available in the study area, the services are delivered in three district sub-centres, namely at Jijike, Agbe and Yechila. These do not have the drugs and equipment needed by professional veterinary staff to treat diseased animals. Farmers have to bring their animals to the local centres. Two veterinary professionals are assigned to each sub-centre. The drugs and veterinary services available to farmers, such as treating illness, deworming and vaccinations, cannot keep pace with demand. Vaccine against rabies is in especially short supply in the study area. There is no adequate laboratory equipment for disease diagnosis.

Inadequate supply of forage planting material. In the study area there was no adequate supply of improved livestock technologies, such as forage seeds and cuttings, that could enhance forage development, thereby supplementing the shortage of feed in the area. However, a limited effort is being made to supply forage seeds such as *luceanea* and *susbania*.

Inadequate transportation facility for animal health workers. As mentioned earlier, veterinary services are available in three district sub-centres in the district, with two health professionals assigned to each of these. Farmers are expected to take their sick animals to the sub-centres for treatment. Aside from the risk of spreading disease, there are logistical difficulties in asking farmers to trek sick animals for two to three hours to get treatment. However, the health workers have no means of transport to reach the farmers. This lack of transport has contributed to the loss of several animals, which could otherwise have been easily treated and cured.

Ineffective drugs and vaccines. As well as difficulties caused by the short supply of drugs and vaccines, farmers and veterinary professionals in the study area have reported the poor quality of some drugs and vaccinations. Drugs are supplied by the Office of Agriculture and Rural Development without proper identification of the existing strains. As a result, the drugs and vaccines being supplied are not effective. This is especially true in the case of vaccinations for PPR, caprine pasteurellosis and anthrax.

Major production constraints

Low breed productivity, high morbidity and mortality rate. Though the existing goat breed has its own valuable traits, such as meat quality and drought resistance, its prolificacy is very poor (98% single birth). The animals are compact and relatively unproductive (low carcass weight). High morbidity and mortality rates for kids are also reported for this breed.

Poor storage and use of crop residues. The farming system in the study area is mixed crop-livestock agriculture. Crop residues are used mainly as animal feed, and also for construction of homes and barns. Although crop residues are produced in the study area, farmers do not use them, or other feeds, efficiently. They store crop residues in the open air, unprotected and exposed to sunlight.

Declining feed resources due to high population pressure and climate change. It was reported that feed was plentiful and that various feed resources have been available in recent years. However, due to human population growth (through its effect on expansion of cropland at the expense of grazing) and the erratic and unpredictable nature of rainfall in the study area, feed resources are currently depleted and performance levels of animals have declined.

Poor/traditional/housing. In the study area, most farmers do not build separate barns for small ruminants (goats and sheep). They generally house all types of animals in a single barn. However, some farmers build separate barns for small ruminants (goats). In rare cases, family members share their own living quarters with animals, when either mixed species or exclusively small ruminants are kept in during the night. These rooms have earthen floors, which are difficult to clean.

High incidence of disease and parasites. According to information generated by KIIs conducted with animal health workers, there is a high incidence of bacterial, viral and parasitic disease in goats reared in the study area. The major goat diseases reported were Peste des Petits Ruminants (PPR), caprine pasteurellosis and anthrax. The major internal and external parasites reported were lung worm, coenurosis/circling disease and lice and mange mite infestations. Zoonotic diseases include rabies, goat pox and anthrax.

Lack of training in improved goat husbandry. Although there are three to four development workers in each kebele to train farmers on conservation, wise use of natural resources and improved crop and livestock production and management practices, it was reported that no training had been organized on improved livestock production and management, apart from a few informal training sessions on prevention of parasitic diseases.

High incidence of abortion and kid mortality. According to veterinary technicians and farmers in the study area, the high incidence of abortion and kid mortality is one of the main contributing factors to low levels of productivity in goats. Though little has been done to investigate the factors that cause abortion and kid mortality in the study area, it is suspected that poor quantity and quality of animal feed, brucellosis and excessive heat all play a role in the high rates, especially during the dry seasons.

Weak vertical and horizontal linkages. There are two types of linkage in a value chain: vertical and horizontal. Vertical cooperation reflects the quality of relationships among vertically linked firms up and down the value chain (Legesse and Hordofa, 2011). According to the authors, more efficient transactions among firms that are vertically related in a value chain increase the competitiveness of the entire industry. These types of linkage are critical for moving a product or service to the end market. Moreover, vertical linkages facilitate the delivery of benefits and embedded services and the transfer of skills and information between firms up and down the chain. Horizontal linkages –both formal and informal – between firms at all levels in a value chain can reduce transaction costs, create economies of scale and contribute to the increased efficiency and competitiveness of an industry. They can also contribute to shared skills and resources and enhance product quality through common production standards. Based on the FGD and KIIs conducted with farmers and district experts, it emerged that farmers in the study area lack strong horizontal linkages with each other and have a poor vertical relationship with the different actors in the value chain. Weak horizontal linkage between farmers themselves is one of the causes of their poor bargaining power in the market. Moreover, farmers are unable to leverage collective action to improve access to important inputs such as

breeding stock and feed. On the other hand, lack of trust between producers and livestock buyers (collectors, traders, processors and consumers) is caused by a lack of vertical linkage between producers and these actors. As a result, producers do not have any longstanding customer relationship with any of these buyers and they sell their products to anyone they can.

Marketing constraints

Lack of adequate working capital. Based on the KIIs conducted with traders in Yechila, Finaruwa and Mekelle, lack of adequate working is a major limiting factor for traders. Traders reported that obtaining credit is hard for them. No loans are offered for goat trading purposes. In addition, if traders want to obtain credit, they must present collateral. However, not all of them have sufficient assets to be able to do this.

Lack of formal and adequate market information. Market information plays a crucial role in improving market efficiency. The main sources of market information for the study area include radio and friends and/or relatives. However, there is no adequate formal supply of information on price and demand for goats in the study area. The information obtained from radio broadcasts focuses on crops, with inadequate attention paid to livestock.

Producers' low bargaining power. Goat producers' bargaining power is influenced by the season. They have lower bargaining power in May, June and July, when there is weak market demand and excessive supply of goats. Despite the low market demand for goat in these months, farmers are obliged to sell their animals in order to purchase agricultural inputs, such as fertilizer, and pay other family expenses. Producers are forced to sell their goats during these months, mainly because they do not have easy access to credit, which might help them to overcome their cash flow problems at this time.

Seasonality of supply and demand for good quality goats. Some of the major problems reported by traders were inadequate supplies of quality goats (goats with good body condition). Traders, processors and the Abergelle export abattoir complained that they do not receive animals in good condition throughout the year.

Transportation constraints

Trekking is the major means of transportation of goats to market. Sometimes, traders use ordinary Isuzu trucks to transport goats purchased from Finaruwa and Yechila to distant markets such as Mekelle. Transportation costs to Mekelle were reported to be ETB 10/head and traders complained that the price is very high relative to the distance from the district markets (Finaruwa and Yechila) to Mekelle (120 Km). Moreover, the use of ordinary trucks for livestock transportation causes weight loss and suffering for animals. The mortality rate rises in proportion to increases in the number of animals loaded per truck and the speed at which the vehicle is driven. About 70 (castrated and larger-sized goats) or 90 (intact goats) goats are loaded onto each Isuzu truck.

Constraints in processing

Sale of pregnant does as sterile. Meat processing is mainly carried out by hotels/restaurants, the Abergelle export abattoir and butchers in the study area. Hotels and restaurants usually slaughter matured barren/sterile does. One of the major problems in goat marketing is that the majority of mature does sold at market as sterile are in fact pregnant. Goat producers never reveal that their animals are pregnant. This is mainly because sterile does fetch better prices,

since they are believed to have larger volumes of tender meat than non-sterile does. Moreover, farmers may need to sell these animals because of pressing family financial obligations.

Shortage of supply of export quality animals. The Abergelle export abattoir demands intact male yearling goats with good body condition. However, there is an insufficient supply of goats that meet the quality parameters set by the export abattoir in order to satisfy the demand of importers.

Opportunities to enhance goat production and productivity

A growing trend in demand for live goats and goat meat. Demand and prices for goats are increasing locally due to a rising population and increased incomes and hence purchasing power. Demand is expected to continue to rise in view of forecasts that the country's population will increase to about 129 million by 2030 (IBC, 2004). Currently, the Abergelle export abattoir, located in Mekelle, Tigray, operates below its operating capacity

Availability of diverse browse species. The study area is endowed with diverse browse species, such as *Giba*, *Tsalwa*, *Weyba* and *Cha-a*. This creates a conducive environment for rearing goats.

Presence of Abergelle export abattoir. The Abergelle export abattoir, established in 1997, has a capacity to slaughter 900-1000 goats per day. However, this level of demand cannot be satisfied either in terms of quantity or quality. It therefore follows that, if volumes of good quality goats produced in the district were to increase, the demand would exist to absorb the supply and farmers' livelihoods would improve in the long run.

Presence of Sheba tannery. Sheba tannery, located in Wukro district, processes skins and hides and has difficulties matching supply with demand. In the study area, it was reported by farmers and veterinary officers that the skin from the Abergelle goat does not meet the tannery's quality standards. This is explained by high levels of infestation of these goats by external parasites (mange mites). Moreover, there is a skills gap for skinning (properly removing goat skins from the carcass) in the study area. If this gap were to be bridged through improved skills and husbandry levels, the Sheba tannery would represent a window of opportunity for local goat producers, enabling them to increase income generation from the sale of goatskins and thereby improve their livelihoods.

Presence of agricultural research centre in study area. The Abergelle Agricultural Research Centre is located in the study area. It was mainly set up to promote research that would improve levels of goat production and productivity in the study area. This represents an opportunity for goat producers, who can obtain breeding stock and training in different husbandry practices from the agricultural research centre.

Government commitment and support to increasing meat export. The Ethiopian government has developed a long-term plan called the Growth and Transformation Plan (GTP), which is primarily aimed at optimizing production and productivity in the livestock sector. As part of the five-year plan, the government has decided to increase meat exports to 110,000 t in 2015. The government forecasts earnings of 1 billion US dollars from the export of meat and live animals by this date. The government is planning to work closely with private actors and other stakeholders to rectify problems in the market and with logistics and transport for live animals, meat and other crucial export items (MoFED, 2010 cited in G.Dugumaetal, 2012).

Conclusions and recommendations

The study area, Tanqua Abergelle, is home to the domestic Abergelle goat breed. However, productivity of the breed in terms of meat and milk is very low. Important factors contributing to these low productivity levels include lack of breed improvement activities, frequent drought and consequent feed shortage, high incidence of diseases and parasites and a very weak input delivery system, including that of veterinary services. In this area, there is no selection of fast-growing animals with desirable traits. Moreover, goat fattening is not common in the Abergelle area. On the other hand, there is high demand for the Abergelle goat from domestic and export markets. Both these markets need animals with good body condition. However, since farmers in the area follow traditional husbandry practices, without any extension support, they are unable to make use of the existing market opportunity. Recommendations targeting constraints and opportunities identified along the goat value chain in the study area, are presented in the next section, followed by a detailed action plan in Table 9.

Recommendations

Based on the findings of this study, the following recommendations are made with a view to resolving the major constraints identified along the Abergelle goat value chain.

Improve animal health service delivery through the following interventions:

- Provision of adequate budget for procurement of drugs and veterinary equipment.
- Identification of root causes for absence of private veterinary services and creation of attractive working environment to enable private veterinary drug stores and clinics to open and operate smoothly.
- Identification of strains of different diseases in the area.
- Identification of root causes of poor efficacy of vaccines and drugs and corrective action to address issue.
- Provision of regular in-service training to animal health workers in the area.
- Provision of motorcycles to health centres and clinics, enabling mobile services to be made available to farmers in remote areas.
- Training farmers and extension agents in prevention and control of major livestock diseases in the area.
- Provision of regular vaccinations and treatment of major livestock diseases in the area.

Improve the genetic performance of Abergelle goats through the following interventions:

- Designing an appropriate goat breeding programme in the area.
- Training farmers, extension agents and specialists in goat selection and community-based breeding activities.
- Promoting selection and community-based breeding programmes.

Improve feed supply and feeding practices through the following interventions:

- Assessment of locally available feed resources.
- Introduction and evaluation of forage crops, such as acacia, cactus and other improved feeds that are potentially adaptable to the area.
- Demonstration of selected forage technologies to farmers.
- Scaling out the most adaptable and best performing forage varieties in the area.
- Integrating soil and water conservation with forage development by planting adaptable forage trees and grasses on soil conservation structures.

Resolve problems in the credit system through the following interventions:

- Creating stakeholders' forum for credit providers, policymakers, farmers and other stakeholders, to discuss and solve problems in rules and regulations of DECSI.
- Encouraging and supporting establishment of farmers' credit and saving association. Support could be financial or technical, depending on the need.

Improve the livestock marketing environment through the following interventions:

- Create a regular multi-stakeholder platform to resolve issues such as multiple taxation, create market linkage between producers and other actors, improve access of livestock traders to capital and take appropriate action against problems that could arise along the value chain.
- Creating linkage with Tigray Agricultural Market Promotion Agency (TAMPA) and the National Livestock Market Information System, so as to include the study area in livestock market information data collection and dissemination and make formal, reliable, timely and relevant livestock market information available.
- Training farmers and extension agents in basic principles of livestock marketing and targeted goat conditioning and fattening activities.
- Strengthening/establishing goat producers and marketing cooperatives so as to improve their bargaining power and promote collective action, giving producers a stronger voice for obtaining access to inputs, influencing policy decisions etc.

Table 9: Intervention Plan for the Potential Challenges Identified in each Core Functions of the Tanqua Abergelle Goat Value Chain

Core Functions	Challenges Identified	Priority	Suggested Intervention Areas	How (implementation procedure)	Researchable Agenda	Implementing Agent	Time Horizon
Input Supply	- Shortage of adequate supply of vet services, drugs and vet equipment	2	Provision of adequate budget for procurement of drugs and vet equipment - Allocation of adequate budget - Provision of adequate drug and equipment - Creating inviting environment to let private drug shop	- Conducting inventory of the current resource and identifying the shortage - Allocating adequate budget required - Technology shopping - Dissemination of inputs purchased - Scaling out		DOoA , BoARD, RBoFED ILRI-ICARDA	Short term to medium term
	- Inflexible and inadequate credit service (group collateral and high interest rate)	4	- Create stakeholders forum between credit providers, policy makers, farmers and other stakeholders to discuss and solve problems in rules and regulations of DCSI - Encourage and support establishment of farmers credit and saving associations	- Identifying and conducting stakeholder analysis for the study - Holding a forum and discussion on the issue at hand - Establishing rural credit and saving cooperatives		DCSI, CBE, BoARD	Short to medium term
	- Little supply of improved forage seeds and different cuttings of animal forages	1	Forage development and Feed and feeding research: - Assessment of the current feed resource - Introduction and evaluation of forages (on station) - Demonstrating selected farmers on different sites - Scaling out the best adapting and high yielding forage	- Assessment on the current feed resource - Introduction and evaluation of forages (on station) - Demonstrating selected farmers on different sites - Scaling out the best adapting and high yielding forage	- Introduction and evaluation of different cultivars of animal forage	AbARC, BorARD OoARD	Short to medium term
Input Supply	- Lack of transportation facility to health workers	2	- Provision of motorbike to health workers	- Need assessment - Request for budget - Equipment purchase - Provision of equipments purchased		BoARD, OoARD, ILRI-ICARDA	Short to long term
	- Less efficacy of drugs supplied	2	- Identification of the strains for different diseases - Then supplying drugs accordingly	- Identification of stakeholders - Organizing physical resources need for activity - Conducting cause identification (strain, handling) study - Vaccine development and training - Intervention (adoption)	- Identification of the existing strains for the different disease - Impact study	NVI, BoARB, OoARD, AbARC, ILRI-ICARDA	Long term

Core Functions	Challenges Identified	Priority	Suggested Intervention Areas	How (implementation procedure)	Researchable Agenda	Implementing Agent	Time Horizon
				- Impact study			
	- Skill gap among health workers	3	- Provision of regular in-service training to animal health workers in the area	- Conducting TNA - Provision of TOT - Conducting training to target group	- Conducting Training need assessment	OoARD, AbARC ILRI-ICARDA	Short to long term
Production	- Low breed productivity - High mortality and morbidity rate	3	- Improve productivity through selection and cross breeding with improved breeds - Designing an Appropriate breeding program - Identification of factors causing the mortality and morbidity	- Introduction of improved breed - Conducting research on identifying factors causing morbidity and mortality	- On station demonstration of enhancing the productivity of local goats through selection - On station demonstration of enhancing the productivity of local goats through cross breeding with improved ones - Identification of factors causing mortality and morbidity	AbARC ,ILRI-ICARDA and OoARD	Short to long term
Production	- Inadequate feed access and poor management (utilization)	1	- Identification and characterization of the indigenous feed resources - Feed development (Acacia, cactus and other types of improved feeds) - Enhance soil and water conservation (bio-physical)	- Identification and characterization of the indigenous feed resources - Identifying improved feeds that can be adapted to the agro ecology - Adaptation of improved feed technologies - Demonstration of improved feed technologies - Scaling out of improved feed technologies	- Introduction and adaptation of different of different improved feeds - On station and farm demonstration of different feeding practices (efficient utilization of locally available feeds) - Scaling out of adapted improved feed technologies	Rural Community Based (farmers) Research Center (AbARC and TARI) OoARD and BoARD	Short to medium term
	- Weak horizontal linkage	4	- Establishment of farmers cooperatives on breeding and marketing	- Creating platform for farmers and discussing on the issue at hand - Establishing cooperatives on production and marketing		OoARD and BoARD, ILRI-ICARDA, AbARC and TARI	Short to medium term

Core Functions	Challenges Identified	Priority	Suggested Intervention Areas	How (implementation procedure)	Researchable Agenda	Implementing Agent	Time Horizon
				- Follow up			
	- High incidence of abortion and kid mortality	2	- Assessment of factors causing abortion and kid mortality - Provision of remedies - Training on improved husbandry practices	- Identifying stakeholders - Organizing resources required for the study - Identification of causes (research) - Intervention (provision of developed solution and training) - Scaling out of developed prevention and control mechanisms vaccine - Follow up	- Identification of factors causing abortion and kid mortality - On farm demonstration of improved husbandry practices	ABARC, OoARD and BoARD, ILRI- ICARDA	Short to medium term
	- High incidence of diseases (Rabies, PPR, caprine pasteurolosis and Anthrax)	1	- Training on prevention and control mechanisms of disease and parasites - Provision of drugs and vaccination	- Identifying stakeholders - Organizing resources required for the study - Identification of causes (research) - Intervention (provision of developed vaccine and training) - Scaling out of developed vaccine - Follow up	- Analysis of factors exacerbating the prevalence of these diseases and parasites - On farm demonstration of improved husbandry practices	BoARD, ILRI-ICARDA, AbARC	Short to medium term
Marketing	- Multiple taxation for traders	4	- Creating multi-stakeholder plat form to deal with taxation and come up with solution	- Identifying stakeholders - Organizing resources required for the forum - Intervention (amending the taxation system and implementing it) - Follow up		RBT&I, DoA, BoARD,	Short to medium term
	- Weak vertical linkage (no long standing relationship between farmers and different actors of the value chain)	4	- Assessing why it happened? - Creating plat form with the different actors of the goat value chain and discussion on the issue at hand - Establishing cooperatives on production and marketing	- Identifying actors - Creating platform with the different actors of the goat value chain and discussion on the issue at hand - Establishing cooperatives on production and marketing - Follow up		Community leaders Farmers Traders DOoA OoARD AbARC and TARI	Short to medium term
	- Lack of market information (informal and inadequate)	2	- Creating a plat form to deal with this issue - Creating linkage with TAMPA - Identifying of mechanisms on	- Identifying stakeholders - Organizing resources required for the stakeholder meeting - Developing a guideline on how to		TAMPA, DOoA, OoARD, BoARD and ILRI-ICARDA	Short term

Core Functions	Challenges Identified	Priority	Suggested Intervention Areas	How (implementation procedure)	Researchable Agenda	Implementing Agent	Time Horizon
			<ul style="list-style-type: none"> who and how to provide market information - Provision of timely and adequate market information 	<ul style="list-style-type: none"> provide market information - Intervention (provision market information) - Follow up and impact 			
	<ul style="list-style-type: none"> - Seasonality of supply due to feed shortage and body weight loss 	1	<ul style="list-style-type: none"> - Training on fattening practices to farmers (especially) and livestock experts - Targeted fattening 	<ul style="list-style-type: none"> - Identifying model and adopter farmers - Provision of training and demonstration of fattening trails to selected farmers - Scaling out the out put 	<ul style="list-style-type: none"> - Demonstration of on station and farm of goat fattening through different feeding practices (alternatives) 	AbARC, OoARD and ILRI-ICARDA	
Marketing	<ul style="list-style-type: none"> - Lack of working Capital (for traders) 	3	<ul style="list-style-type: none"> - Creating forum with stakeholders and dealing with credit services for traders - Establishing an enabling rule and regulations of credit which invites traders to take loan 	<ul style="list-style-type: none"> - Identifying stakeholders - Organizing resources required for the stakeholder meeting - Developing a guideline on how to provide market inviting credit service to traders ion - Intervention (provision credit) - Follow up and impact 		DCSI ,OoARD, ILRI-ICARDA	Medium to long term
Transportation	<ul style="list-style-type: none"> - Lack of adequate animal transportation facilities 	1	<ul style="list-style-type: none"> - Bringing animal transporters - Establish animal transporter cooperatives 	<ul style="list-style-type: none"> - Investigating the situation - Identifying alternatives 		Office of trade and transport BoARD Cooperatives International Abattoirs	Mid to long term
Processing	<ul style="list-style-type: none"> - Inadequate supply of goats which meat quality parameters of Processors (especially abattoir, hotels and restaurants) 	1	<ul style="list-style-type: none"> - Enhancing productivity of goat through introduction of improved goat breeds , through selection or cross breeding of the local with improved ones - Training farmers on improved goat production 	<ul style="list-style-type: none"> - Selecting model and adopter farers - Training on improved goat husbandry practices and supply management to farmers - Introduction of improved goat breeds, improving through selection and cross breeding of local with improved ones - Scaling out 		OoARD, Cooperatives Abergelle Agricultural Research Center	Short to medium term

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Annex 1: Participants in the value chain analysis

Goat producers, experts, feed suppliers, export abattoir (Abergelle), health professionals, traders and hotel owners involved in the value chain study through FGDs and KIs are listed in the following table.

Name	Position	Address
Priest Abraha Alemu Hialu	Farmer	Hadnet PA
Ato Tamene Abadi Gebre Tnsea	"	"
Memhir gebre Mariam Mesfin Gidey	"	"
Ato Beyene Goshu Gidey	"	"
Ato Hagos gebre Michael Belete	"	"
Ato Kahsay Gidey Mirach	"	"
Ato Belay Gebre Slassie Marsha	"	"
w/ro Algainesh Tsegay Kiflu	"	"
Astera Tesfay Gidey	"	"
Asfeta Gesessew Gebre Slassie	"	"
Haleka Fistum Hadush	District expert	Yechila
Ato Hadish Gebre Kiros	"	"
Ato Mulu Gebre Haweria	"	"
Ato Welde Abrha Hailu	"	"
Ato Hailay Gebreegziabher	"	"
Ato Kebede Meresa	"	"
Ato Haile	"	"
Ato Gebre Mariam Abadi	"	"
Ato Geda Gebre Yowhans	DECSI manager	Yechila
Ato Znabu	District vet technician	"
Ato Kalayu		"
Fisseha (DVM)	District vet professional	"
Ato Kifu Gebre Slassie	Goat trader	"
Ato Mebrahtu Negash	"	Hinallo Wajerat t
Ato Eyob Muruts	"	Sahrta Samre
Ato Welde Kiros Redae	"	"
Ato Assefa Tewelde Medhin	"	Finaruwa
Ato Teka Gebre Kiros	"	"
Ato Teklay Hailu	"	Sahrta Samre
Ato Gebre Michael Tewelde Medhin	"	"
Ato Kidanu Mariam	"	Mekelle terminal market
Ato Maesho Asefa	Abergelle export abattoir collection site manager	Agbe
Ato Abraha	Abergelle export abattoir manager	Mekelle
W/ro Zaid	Restaurant owner	"
Ato Samuel Gebressie	Restaurant owner	"
Megeta Kinfe	Animal transporter	Yechila