



Crop and livestock value chains in Sinana district, Ethiopia

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

The three regional projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian highlands). The International Food Policy Research Institute leads the program's monitoring, evaluation and impact assessment. <http://africa-rising.net/>



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Acronyms

AEZ Agro-Ecological Zone

AIB Agro-industrial by-products

AI Artificial insemination

BOA Bureau of Agriculture

CIAT International Centre for Tropical Agriculture

ETB Ethiopian birr

ICARDA International Center for Agricultural Research in the Dry Area

IITA International Institute of Tropical Agriculture

ILRI International Livestock Research Institute

PCA Participatory Community Appraisal

USAID United States Agency for International Development

USD United States dollar

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Executive summary

The rapid value chain assessments covered six enterprises; three on crops and three on livestock. The study focused on the role and functioning of the agribusinesses involved in the purchase, processing and consumption of products generated by the six value chains. The main aim of the assessment was to obtain a better understanding of these businesses and how they can play a role in expanding the volume of raw products produced, processed and sold.

The selection of the enterprises was based on the preference of men, women and youth, enterprises with commercial orientation or importance and finally, enterprises that were well preferred across the project sites for ease of scalability and learning. With respect to findings from these market assessments, various reliable interventions have been suggested and are expected to be implemented. A total of 147 actors: 85 crop actors and 62 livestock actors were interviewed using a well-structured questionnaire, complemented by secondary data and information on the enterprises from the project areas. The assessments also benefited from earlier studies such as Participatory Community Appraisals (PCA) and other studies earlier conducted.

Crop value chain

A rapid market assessment was conducted on 3 crops; faba bean, wheat and potato. In addition, the input system that supports the value chain of the three crops was surveyed. The input system included seed, fertilizer, farm implements and chemicals. To understand the crop value chain, two main types of actors were interviewed; traders and processors. The traders interviewed mainly involved wholesalers or retailers.

Results from the study indicate that wheat value chain in Sinana region is more established. Wheat grain is used in the preparation of a range of products such as: the traditional staple pancake ('injera'), bread ('dabo'), local beer ('tella'), and several others local food items (i.e., 'dabokolo', 'ganfo', kinche'). Besides, wheat straw is commonly used as a roof thatching material, and as feed for animals. The use of wheat straw integrates well into the livestock systems and should be further strengthened as part of the by-products that have good market potential. The wheat market involves both retailers and wholesalers who sell wheat grains to collectors, final consumers and processors. Primary cooperatives are key collectors in Sinana region who play a very important role in wheat grain collection from individual farmers. There was a difference in average selling price between traders and primary cooperatives. Primary cooperatives sold wheat grains at a lower price (Ethiopian birr¹ 7.4) compared to both the wholesaler (ETB 7.5) and sole proprietor retailer (ETB 8.00). The primary cooperatives majorly supply wheat grain to union flour factories. If primary cooperatives are strengthened through capacity building for collective bulking, they can increase their competitiveness

Wheat processing involves both privately owned and government owned flour processing factories. Major traded outputs of wheat processor are flour and wheat bran. The key buyers of wheat bran for animal feed are retailers and peri-urban/urban and rural farmers. The flour processors and bakeries are the main actors involved in wheat processing. Wheat products have good potential markets within and without the district.

Faba bean value chain also involved retailers, wholesalers and processors. Dried faba bean grain is sold mostly by retailers but a small number of wholesalers are also involved. Wholesalers and retailers sell the grain to individual consumers and processors. In Sinana, there were no faba bean processors except the hotels who use the faba bean to make local dishes; 'full' and 'wot'. The processing of faba bean still has some challenges that keep it low scale within hotels mostly.

1. On February 2015, USD 1 = Ethiopian birr (ETB) 20.29.

Potato value chain in the Sinana region is not well developed. It is still 'young' and consequently, potato utilization is still minimal. Several potato retailers with very small numbers of wholesalers were identified. Both retailers and wholesalers were involved in potato trading. During the market survey it was noted that in Sinana there are large numbers of wholesalers compared to the other three sites. Other potato retailers not only sell potato but also trade in other products. During the market visit, it was observed that retailers keep small amounts of potatoes with tomato, onions and other vegetables/ goods.

The surveys also revealed that there was very minimal processing that was done. The major potato actors involved in processing are hotels and restaurants. The hotels and restaurants commonly used potato as boiled and as part of traditional dishes or '*wot*' (sliced, boiled potato with pepper, onion, salt and oil) or '*Beyaynet*'. There was *little* processing of potato into chips. The hotels and restaurant processors interviewed preferred large sized potato for processing. Promotion of consumption of processed potato products and developed the value chains can contribute to the growth of the potato value chain.

The three value chains are supported by an input system which was also studied. The input system is majorly steered by the government. In this region fertilizer, seed, farm implement and chemicals are supplied by the research centres, bureau of agriculture (BOA), cooperatives and unions. There is good commercial potential for services such as spraying and machine services which can be operated as new enterprises sustainably.

Some of the key interventions suggested from the study include seed production business, chemical spraying services, commercial farm implement hiring and strengthening market linkages between agribusinesses and key markets and buyers.

Livestock value chain

The rapid value chain assessment study covered 3 main livestock value chains i.e. the dairy value chain and the large and small ruminants' value chains. It is noted that Africa RISING-ICARDA conducted a value chain study on small ruminants in 2012, which included an assessment of the producers as well as potential demand beyond the district.

The role of the agribusinesses in the dairy value chains in Sinana is very limited. Sale of fluid milk purchased from urban farmers is sold to some private customers from a dairy café, who also processes it into '*irgo*', served to clients in the café. Small quantities of milk) are also purchased by hotel restaurants and/or breakfast cafes (maximum 45 litre/day/business), who use it for their drinks. It can therefore be concluded that urban consumers mostly buy milk directly from producers (urban/peri-urban farmers). Possibilities for expanding the role of the dairy cafes and breakfast cafes for the sale of milk to outside customers as well as getting involved in small scale processing should be examined—a study tour to Basona Worena district might create interest. Food safety may be improved by heating milk prior to processing into '*irgo*'.

Commercial processing of butter is negligible and traders buy lactic butter from outside the district to serve customers in Sinana. Also production and sale of lactic butter in the rural areas appears to be very limited, because, unlike other Africa RISING districts, most milk is consumed at home, as a result of different cultural habits. No value chain interventions are therefore envisaged for the foreseeable future for the butter produced in the district.

The role of the agribusinesses in large and small ruminants' trade in the district is more significant in terms of the number of animals traded by the traders and purchased by hotel restaurants. It is also noted that the number of oxen/bulls in Sinana approaches 100,000 and is the highest amongst all Africa RISING sites. Both large and small ruminants are purchased from in and outside the district and also sold in and outside the district. An interesting observation in Sinana district (as compared to other Africa RISING districts) is the relatively young age of the traded small ruminants—3 traders mentioned trading in animals between 6 and 12 months old. While most traded larger ruminants were above 4 years, one trader also mentioned selling

large ruminants between 3 and 4 years of age. This pattern deviates from the traditional pattern, where trade is mostly in older animals. A consumer survey is proposed to explore demand by institutional and individual consumers. To study demand for small ruminants outside the district (in particular for the export market), the recently conducted small ruminants' value chain study conducted by Africa RISING–ICARDA can be consulted. Based on the findings, different production cycles should be explored to produce for targeted markets/buyers and periods. Formation of marketing groups of producers should be encouraged to meet specific demands during the year as well as reduce marketing cost/animals through collective sales arrangements.

To support the commercialization of all 3 value chains, some key service and input supply businesses require attention. To improve the supply of veterinary drugs and services, private sector involvement in the provision of licensed services should be examined. Also linkages between the public sector and the private sector can be developed further to improve the supply of drugs. To reduce cost, producer groups for fattening should be formed to bulk purchase drugs with technical assistance of veterinary staff in Type D clinics, to reduce purchasing cost.

The improvement in genetic resources, in particular for dairy animals, is insufficient and the introduction of a more efficient system based on mass insemination supported by mobile teams and hormones has shown some improvements but require study to improve its performance.

The development of agricultural industrial by-products businesses for dairy and fattening is already significant in Sinana, but can be further expanded because of the large areas of wheat, pulses and oil crops grown in the district. Not only can demand in the district be expanded through awareness creation and demonstration, but also through developing appropriate mixtures which can be produced commercially or on farm. It is also recommended that the availability and use of by products from milling services are studied in more details in order to increase supply and commercialize the sale.

1 Introduction

1.1 Africa RISING Project

The Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) program comprises of three research-for-development projects funded by the United States Agency for International Development as part of the US Government's Feed the Future initiative.

Working in collaboration with research and development partners, Africa RISING's goal is to improve food, nutrition, and income security of smallholder farmers (in particular vulnerable groups such as women and children) through sustainable intensification of farming systems.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (ILRI) (in the Ethiopian Highlands). International Food Policy Research Institute (IFPRI) supports the monitoring, evaluation and impact assessment component of the projects.

In Ethiopia, the project (from here onwards 'the project' refers to the Africa RISING project in Ethiopia) is being implemented in a total of 8 *kebeles*, 2 from each of the 4 regions of Amhara, Tigray, SNNPR and Oromia regions.

Africa RISING project works with partners from the CGIAR centres, local universities, regional research institutions, *Woreda* agricultural offices and federal research organizations. In consultation with partners, the project identified seven thematic areas for implementation in the coming three years (2014–2016), including cross cutting themes one of which is markets and value chains.

1.2 Rapid value chain study objective

In 2013, Africa RISING project conducted detailed diagnostic analysis in the eight project *kebeles*. As part of the diagnostics, Participatory Community Appraisals (PCA) were conducted in all the project sites to characterize agricultural production and livelihood systems, identify priority farm enterprises, major income sources, farm resources, farmer-perceived constraints and opportunities for improving income, food security and/or reducing overall risks by intensifying farm enterprises. The value chain assessment study reported here builds on the PCA findings. The PCA identified farmer perceived priority enterprises and also mapped value chains for some crop and livestock enterprises including the constraints and opportunities faced by different chain actors. However, much of the focus in the PCA was at the production stage of the value chain and little attention was paid to other elements of the value chain, particularly the agribusinesses such as input suppliers, traders, processors that are key to the performance of the whole value chain. This study therefore focused on value chain of agribusinesses for the priority crop and livestock enterprises identified in the PCA.

The specific objectives of the rapid value chain study were:

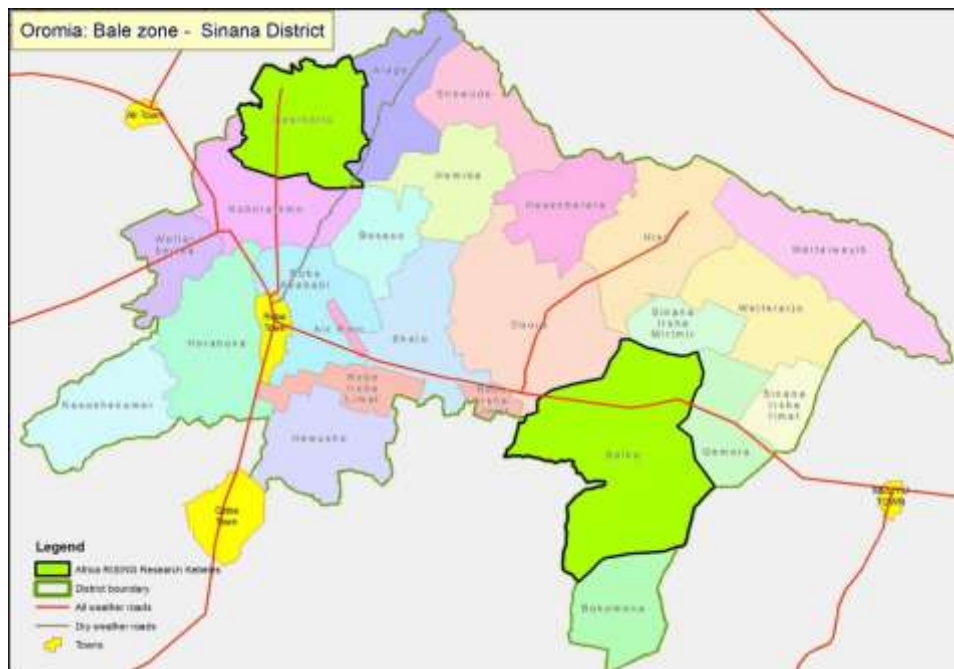
1. To identify and get an understanding of the role/importance of the value chain and input/service agribusinesses in each of the value chains
2. To get an understanding of market demand and supply of livestock products in and outside the district and suggest potential interventions based on the findings
3. To identify opportunities for strengthening linkages between value chain actors (input suppliers, producers, traders, processors and end consumers) and including suggestions for improvement in agribusiness performance (the latter will have to be discussed with specialized projects operating in the districts—in particular Agricultural Growth Program and the Livestock Marketing Development Program).

1.3 Description of the study site

Sinana district is comprised of 20 *kebeles* of which Salka and Ilu-Sanbitu were selected for testing the initial set of production interventions. The 2007 national census reported a total population for this *woreda* of 118,594, of whom 61,968 were men and 56,626 were women; none of its populations were urban dwellers. The majority of the inhabitants said they were Muslim, with 59.99% of the population reporting they observed this belief, while 38.93% of the population are followers of Ethiopian Orthodox Christianity.

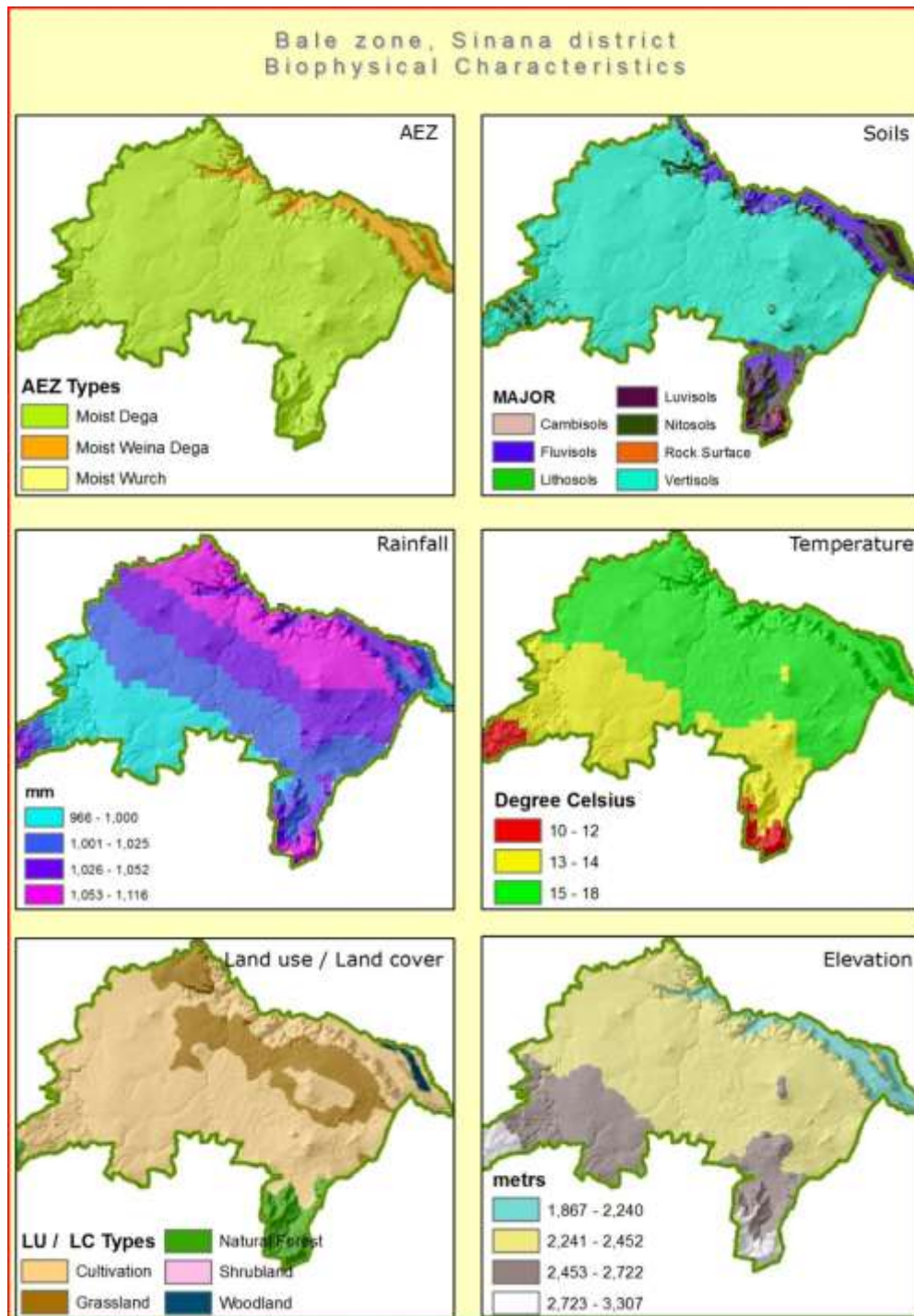
The district capital Robe also serves as the zonal capital for the Bale Zone and is therefore a major supplier of inputs and services and trading and processing. Part of the district has a well-developed road network—see map with main socio economic characteristics.

Figure 1. Oromia Bale Zone -Sinana District



Most of Sinana district is classified in Agro-Ecological Zone (AEZ) 'moist dega'. The area receives total rainfall ranging from 900–1150mm (SARC, 2013) annually and most of the area is between 2000 and 2500 masl. Average temperature varies with altitude, but most of the area averages between 15–18°C. The majorities of the soils are Vertisols and most is cultivated,—see compilation of biophysical maps

Figure 2 Bale zone , Sinana District Biophysical Characteristics



2 Methodology

The market value chain studies used various approaches to gather information on different enterprises. This study is built on earlier findings from the Participatory Community based Approach and Rapid Telephone Surveys which were conducted in the project in 2013. Basing on these earlier studies, priority enterprises were selected for detailed value chain analysis focusing on agribusinesses related to these enterprises.

2.1 Selection of the enterprises

Building on the previous work on PCA and telephone surveys, the enterprises were narrowed down to 3 crop and 3 livestock enterprises for further analyses. The criteria used in prioritising the enterprises were that the enterprises were equally preferred by men, women and youth, the enterprises had a commercial orientation or importance and finally, that the enterprises were well preferred for ease of scalability and learning. Based on these criteria, the selected crop and livestock enterprises are presented in Table 1.

Table 1 Summary of crop and livestock enterprises in the AR sites for value chain mapping

Site	Crop enterprises	Livestock enterprises
Oromia: Salka, Ilu-Sanbitu	1. Wheat 2. Faba bean 3. Potato	1. Dairy cattle 2. Beef cattle 3. Sheep

The initial step in the process was value chain mapping of the 6 enterprises discussed below.

2.2 Value chain mapping

This approach was used to identify value chain actors and service providers for the input and output markets for the six selected enterprises. The mapping of the value chains was conducted in all Africa RISING sites. To implement this activity, various tools were used to carry out the study, which included; focus group discussions, key informants interviews and platform meetings with value chain actors.

The key objectives of using this approach were;

1. To determine the value chain actors and processes for the supply of inputs/services and the processing and marketing of selected marketable livestock and crop commodities.
2. To determine the main channels used for processing and marketing of the produce by farmers.
3. To analyse the mapping information to propose some initial (best bet) interventions to improve the efficiency of the input/service supply and processing/marketing system
4. To use the mapping information to select actors/processes for more detailed assessment/analysis.

During the value chain mapping exercise core problems and opportunities were identified that warrant further research by Africa RISING. The strengths, weaknesses and gaps were also noted and these were further analysed in the study.

2.3 Detailed market assessment

Based on the value chain mapping, actors and service providers were selected for the rapid market assessment survey. The market assessment survey took place during the month of February 2014.

Questionnaires were used as the key tool to collect data. Field pretesting exercises were carried out across all the sites to assess the relevance of the questions for different value chain actors. Also by carrying out the pretesting of the questionnaires, the survey team was able to validate the findings of the value chain mapping exercise which had been conducted earlier and to also conduct sample selection of the actors.

Actor sampling was based on the potential actors who were identified during the mapping exercise. The sample selected was composed of the team sample of actors and service providers who were significant to work with in implementing the interventions suggested. For crop enterprises the actors sampled for interviews included seed suppliers, seed producers, farm implement suppliers, crop chemical suppliers; wheat, faba bean, potato traders and processors.

For livestock enterprises the value chain actors included; large and small butchery/restaurant, dairy agribusiness, dairy restaurants, livestock feed supplier, large and small ruminant traders, Abattoir and veterinary drugs/ services suppliers. A total of 67 and 44 actors were interviewed for crop and livestock enterprises value chain survey, respectively (Tables 2 and 3).

Table 2. Detailed sampled of number of crop actors interviewed in Sinana district

	Actors	Number
Fertilizers	Primary cooperative	5
	Union	1
Chemicals	Primary cooperative	2
	Union	1
	Private shops	3
Seeds	Primary cooperative	0
	Union	1
	Government institution—Research Centre and State Farm	2
	Seed producer cooperatives	3
Farm implements	Government institution—BOA	0
	Private shops	3
	Union	1
Input suppliers subtotal		21
Wheat traders	Wholesalers	5
	Retailers	5
Faba bean traders	Wholesalers	1
	Retailers	5
Potato traders	Wholesalers	3
	Retailers	5
Traders subtotal		25
Wheat processors	Bakeries	3
	Private company	5
	Cooperative	1
Faba bean processors	Private processor	1
	Hotels and Restaurant	2
	Cafes	4
Potato processors	Hotels and Restaurant	5
Processors subtotal		20
Total		66

Table 3. Detailed livestock sampled number of actors

Agribusiness/ Value Chain	Actors	Sinana
Feed	Feed shops	5
	Pulses/ traders	4
	Cooperative feed processing factory	2
	Primary cooperatives—cooperatives	3
Veterinary drugs/ services	Private veterinary drug shop/service	5
	Public sector (district)	2
Abattoir	Cooperative abattoir	1
	Privately owned dairy collection/processing/selling	1
	Restaurants	5
Large and small ruminant agribusinesses	District traders large ruminants—large traders	5
	District traders small ruminants—large traders	5
	Butcheries	1
	Restaurants—Hotel/ restaurants	4
Total		44

2.4 Data collection

This value chain/market assessment builds on earlier studies done in the Africa RISING project, specifically the telephone survey and PCA which were conducted in 2013. Following this, a value chain mapping exercise was done by conducting interviews with a few key informative actors, talking with the key informative people in the community, getting information from government data, journals and other secondary data.

To verify the findings of the value chain mapping and also understand the six enterprises value chains in detail, a market assessment study was carried out in February 2014 through interviewing input and output market actors. For this detailed market assessment, primary data was collected, analysed and consolidated with the other findings to produce interventions for each research site.

2.5 Data analysis methods

Data entry, cleaning and analysis were done in March 2014. Using the SPSS statistical package data was divided into livestock data and crop data which was entered in different data templates. Descriptive statistics such as mean, frequency tables and ranges were used to analyse the data.

2.6 Report writing

After data analysis, the site coordinators and partners met in a writing workshop to interpret the results and came up with this report. The key objective for the writing workshop was:

- 1) Sharing market value chain results
- 2) Writing up the value chain report for the Africa RISING project
- 3) Discussion and documentation of the best bet interventions for the project
- 4) Developing protocols for the value chains and market work for the project.

3 Crop value chains

3.1 Crop value chain findings and results

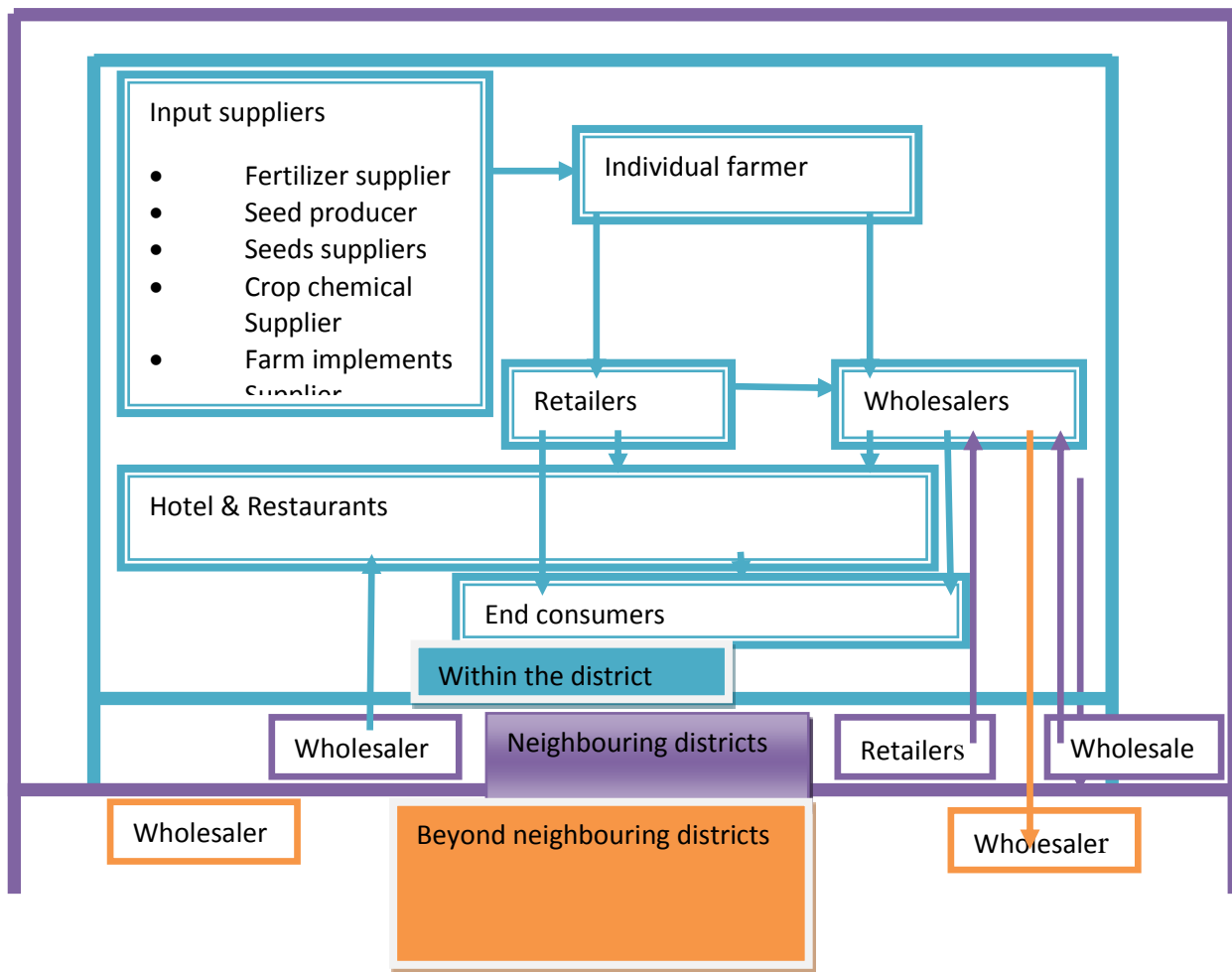
This chapter presents the findings of the value chain/market assessment study for crop enterprises for potato, faba bean and wheat as well as input supply chain; fertilizer, chemical, seed and farm implement. Value chain actors are classified as those individuals who take ownership of a product, through the exchange of money or equivalent goods or services during the transaction process of moving the product from conception to the end user. Those individuals or firms providing a service without taking ownership of the product are classified as service providers. The primary actors in the value chain are traders and processors. In this study, the service providers interviewed were input suppliers for fertilizers, seed, crop chemical and farm implements while the traders include both retailers and wholesalers. Each of these actors adds value in the process of changing product title and form.

The main processes of assessed value chains include input supply, processing and trading. Input suppliers involve those that supply fertilizer, crop chemical, seed and farm implement to the farmers. The seed suppliers also comprised the seed producers. Trading involves wholesalers and retailers who are in the business of buying and selling the crop products without carrying any change in the form of the good. The processing activities involved any transformation of the form of the product to a different product. The traders who purchased crop product and carried out any process to change the form before selling the commodity to other traders or end consumers were considered as trader processors. They consist of traders, hotel restaurants, cafeterias and road side (street) processors.

3.1.1 *Potato value chain*

The processes and general actors in the potato value chain in Sinana district and the subsequent market outlets along the chain are shown in Figure 3.

Figure 3 Potato value chain map in Sinana district.



The sampled trade businesses were established between 1992 and 2010. All the three wholesale businesses interviewed were licensed sole proprietors, owned by male entrepreneurs and had attained secondary school education. The five retailers were not licensed and three of them were owned by female with the rest owned by male traders. The five hotels and restaurants surveyed were also potato businesses. The hotels and restaurants started their businesses between 2003 and 2013 (Table 4).

Table 4. Potato value chain map in Sinana district

Business type			
	Potato traders		Potato processors
	Wholesaler (N = 3)	Retailer(N = 5)	Hotel and restaurant (N = 5)
Business ownership (No): Sole proprietor	3	5	5
Gender of the owner: Male	3	1	3
Female	0	4	2
Education of the owner: Primary	0	2	2
Secondary	3	3	3
Year started	1999–2008	1992–2010	2003–2013

3.1.1.1 Potato traders and processors: Purchases and sales

Individual farmers, retailers and wholesalers supply both cleaned and non-cleaned potatoes to traders and processors. Supplies are sourced from Robe, Goba, Dinsho, Adaba, Kofale and Shashemene from within, neighbouring and beyond neighbouring districts. Traders and processors use hired vehicles, non-motorized transport and delivery by suppliers to the business premise at a cost range of ETB 0.4 to 0.7/kg depending on the location of the market (Table 5).

Table 5. Potato purchases and sales

Details	Traders			Processor
	Wholesaler (N = 3)	Retailer (N = 5)	Hotel and restaurant (N = 5)	
Form of product purchased	Cleaned and non-cleaned	Cleaned and non-cleaned.	Cleaned and non-cleaned	
Type of supplier	Individual farmers, Retailers	Individual farmers	Individual farmers wholesalers, retailers	
Source	Within, neighbouring and beyond the neighbouring districts	Within and neighbouring districts	Within, neighbouring and beyond the neighbouring districts	
Average quantity purchased per week (kg)	7917	120	87	
Purchase price range(ETB/kg)	2.00–3.50	1.50–3.40	1.00–6.50	
Sales				
Products sold	Cleaned and non-cleaned	Cleaned and non-cleaned ¹	'Wot', soup and chips	
Buyer	Retailer, other wholesaler processors	End consumer	End consumer	
Average quantity sold/week(kg)	4750	110	87	
Selling price / kg	3.00–4.90	3.10–3.60	Not known ²	

N.B: 1. Cleaned potato means that the soils have been reduced from potato

2. Processed potato products are not sold alone they are mixed with other foods thus price not *known*

Raw potatoes are processed into *wot*, soup and chips before they are all sold to end consumers within the district. High demand of potato is experienced between January and May because of low supplies in the market and the Christian fasting period. High supplies of potatoes are recorded in the months of June, July, August, September and October. Traders and processors use hired vehicles, non-motorized transport to bring their purchases from within, neighbouring and beyond the district to their premises.

Wholesalers sell about half of their products to processors, retailers and other wholesalers from within, neighbouring and beyond the district, while retailers sell all their products to end consumers only from within the district. From their sales, wholesalers charge a price range of ETB 3.00 to 4.90/kg. This margin is wide compared to retailers who sell at price range of ETB 3.10 to 3.60/kg. Potatoes are stored for a period of less than two weeks before sale to avoid spoilage, rodents attack and to create more space due to poor storage facilities.

The major problems affecting potato traders and processors include; Shortage of potato during dry season, poor quality supply, absence of appropriate market place, illegal traders, market price fluctuation, seasonality of production and low market linkages, transportation problems, potato diseases, lack of sufficient storage facilities and credit.

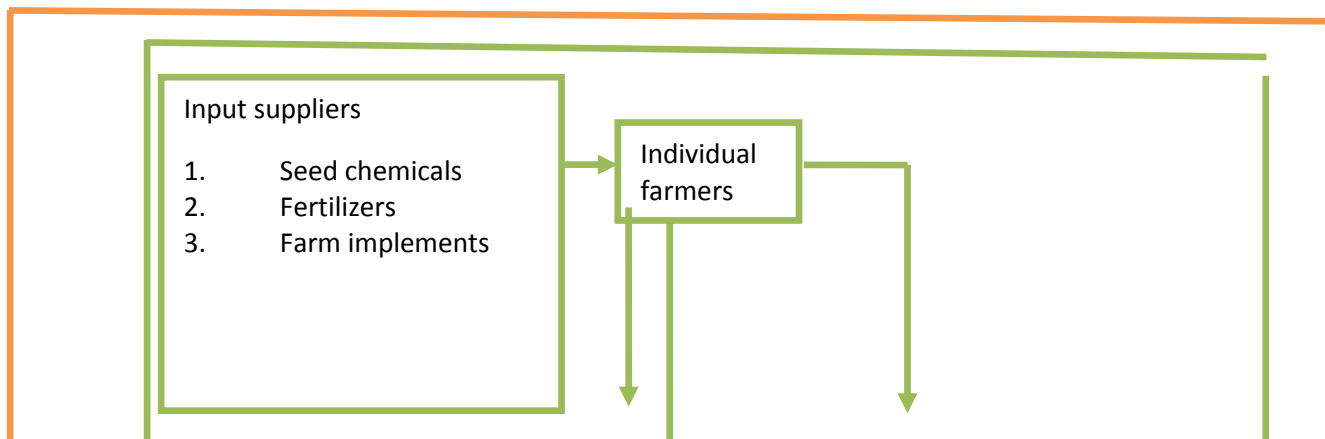
Suggestions

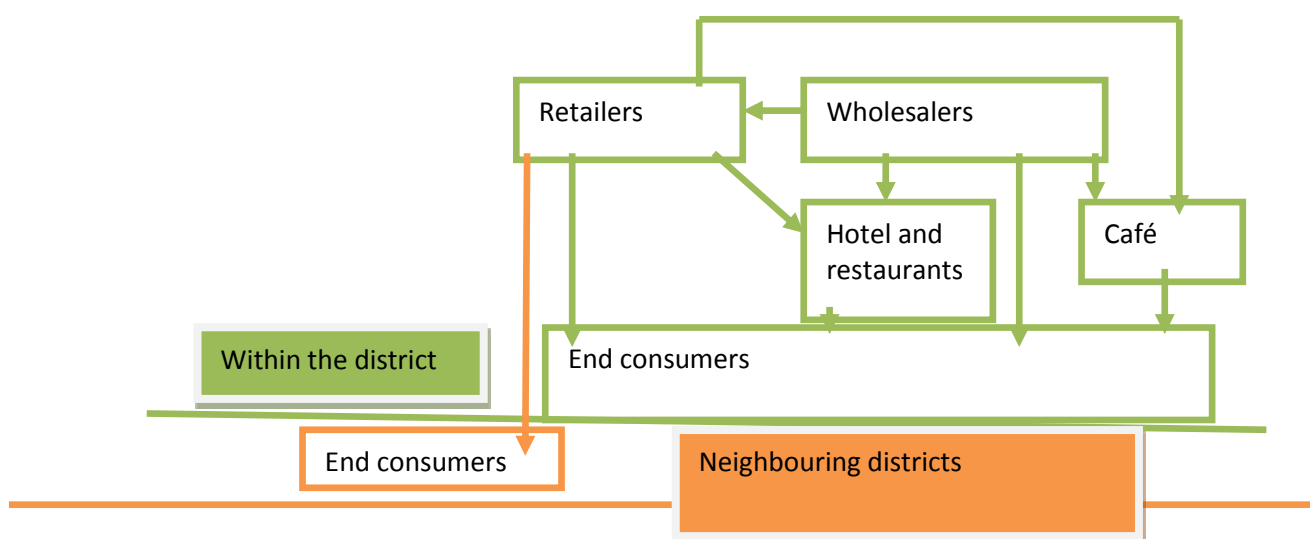
- The government should control illegal traders, improve road networks and designate appropriate market place. Policy sensitizations may play a key role here.
- Farmers should also use irrigation to ensure steady supply of potatoes, improved varieties which is disease tolerant and can give high yield and use pesticides to fight pests affecting potato production. In the district, it is found that potato seed is planted at the same time as the ware potato and thus seed is usually not available during planting time. Exploring irrigation for seed multiplication businesses will contribute to availability of quality seed at the right time.
- On the side of traders, they should improve potato storage to avoid wastes caused by spoilage. To improve quality of potatoes supplied; farmers need to be trained to offer quality supplies. Bulking of potatoes through farmer agribusinesses will contribute to steady market supplies. However, this has to be done in association with post-harvest management to maintain quality potatoes for buyers.
- Potato is a relatively new crop in the district and has potential for generating incomes for producers when production is well organized and market linkages established.

3.1.2 Faba bean value chain

The processes and general actors in the faba bean value chain in Sinana district and the subsequent market outlets along the chain are shown in Figure 4.

Figure 4 . Faba bean value chain map in Sinana district





Faba bean value chain actors interviewed is one wholesaler, five retailers, one hotel and restaurant, four cafes and one trader processor. The interviewed sample male dominantly operate retail shops and one wholesale shop is operated by a female. The sampled faba bean processors in the region were four cafes, one hotel and one trade processor and all the owners attained secondary education. The wholesaler and the five retailers only attained primary education or less. Both wholesalers' and retailers' businesses are licensed and were started between 2008 and 2013.

3.1.2.1 Purchases and sales of faba bean traders

The wholesalers and retailers purchased dried grains from individual farmers. The major market places where faba bean is traded in and around the district are: Robe, Ilu-Sanbitu, Selka, Hisu, Alemgana, Shallo, Homa, Ali and Agarfa. The produce is then transported using hired vehicles and non-motorized transport.

Table 6. Faba bean traders' purchases and sales

Details	Wholesaler (N = 1)	Retailers (N = 5)
Gender of the owner (No.): Male	1	4
Female	0	1
Education of the owner: Primary	1	4
Purchases		
Form of product purchased	Dried grain	Dried grain
Type of supplier	Individual farmers	Individual farmers
Average quantity purchased per week in kg	800	560
Average purchase price (ETB/kg)	6.00	5.50–7.30
Product form sold	Dried grain	Dried grain
Sales		
Buyer	Retailers, other wholesalers	End consumer, Retailer, Hotel and restaurants, Processor, cafe
Average quantity sold in kg/week	800	330
Selling price range (ETB/kg)	7.20	5.60–9.30

The highest supplies in the market are available in the months of January, February, March, July and August. The lowest supplies, on the other hand spread on months of May, June, September, October and November. High demand of grains is between March and April and this is because of fasting period for Orthodox Christians. Cleaning of the dried grain is the only value addition activity practiced by one retailer at cost ETB 0.0080/kg. Wholesaler stores the grain for an average period of 90 days while retailers store for an average of 20 days before selling to end consumers, retailers, hotel and restaurants, processors and wholesalers from within and neighbouring districts. During storage period quality deteriorates and rodents and pests attack poses a challenge. Other challenges include; lack of capital, low supply of faba beans, over taxation, unfair market competition and high purchase price.

Suggestions

A key observation in the faba bean enterprise processing methods is not well developed, so processing relies mostly on roasting and splitting. This is an area that can be improved if better methods can be developed. Improving production and productivity of faba bean in terms of quality and quantity is affected by inadequate seeds of good quality and variety. In this regard, good seed supplies are necessary whose sustainability will hinge more on its commercial orientation. The seed supplies must be sustainably availed through commercial seed multiplication system supported by credit services for traders and producers. The seed supply must also be linked to the producers to meet their specific seed needs.

3.1.2.2 Faba bean processors purchases and sales

Trader processors and cafes buy dried grain, unroasted and split grain supplied by individual farmers, retailers, wholesalers, collectors and small and micro enterprises from Robe town. Hired vehicles and non-motorized transport are used to deliver faba bean grain to the cafes, hotels and restaurants. Trader processors clean, roast, split and sometimes change faba bean into flour to mix with field pea flour to make 'shiro'. Cafes and hotels/restaurants process it into 'full' and sell to end consumers within the district. Some cafes buy grain of faba bean, clean, roast, split and process into 'full' and sell to end consumers within the district. The average quantity sold per week is about 17 kg with high demand occurring in March and April while low demand is experienced in January and February (Table 7).

Table 7. Faba bean processor purchases and sales

Business type	Hotel/Restaurant = 1 (Sole proprietor)	Cafe= 4		Trader processor = 1
		Sole proprietor (2)	Small and micro enterprise (2)	
Gender of the owner (No.): Male	1	2	N/A	1
Education: Primary	0	0	N/A	0
Education: Secondary	1	2	N/A	1
Purchases				

Products purchased	Unroasted and splitted	Unroasted and splitted	Dried grain	Unroasted and splitted	Dried grain
Type of supplier	Retailers	Retailers	Retailers	other micro enterprises	Individual farmer, retailers
Average quantity purchased per week (kg)	10	2–25	5	15	10.40
Price range per ETB/kg	27.50	15–30	7.5	18	7.50
Sales					
Product sold	'Full'	'Full'	'Full'	Unroasted, split and flour	
Buyer	End consumer	End consumer	End consumers	Hotels and restaurants, End consumers	
Average quantity in kg sold per week	10	2–25	3.5	15	10.0

Faba bean processors engage in a number of processing activities towards value addition which include cleaning, sorting, splitting, roasting and splitting, processing to flour and food preparation. These activities are done by the owners of the businesses, hired labour and private mills. The constraints faced by the faba bean processors include low preference for food prepared from faba bean, low quality of products, lack of credit, shortage of labour and 'full' preparation materials.

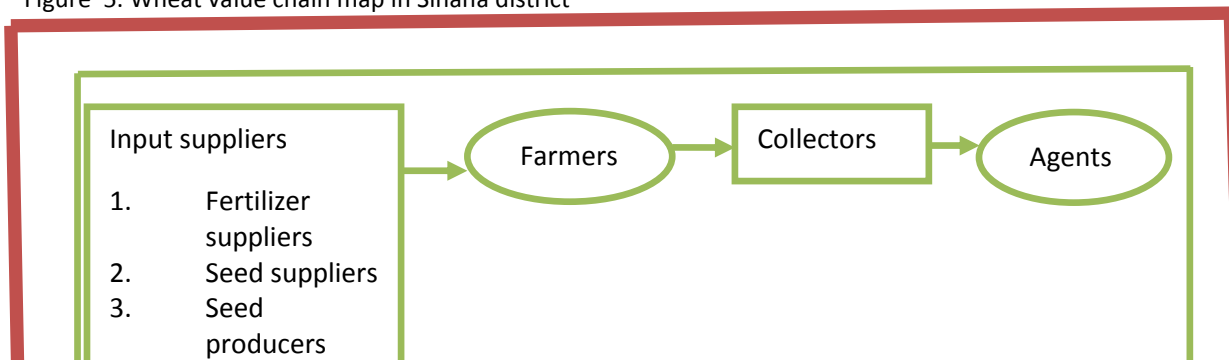
Suggestions

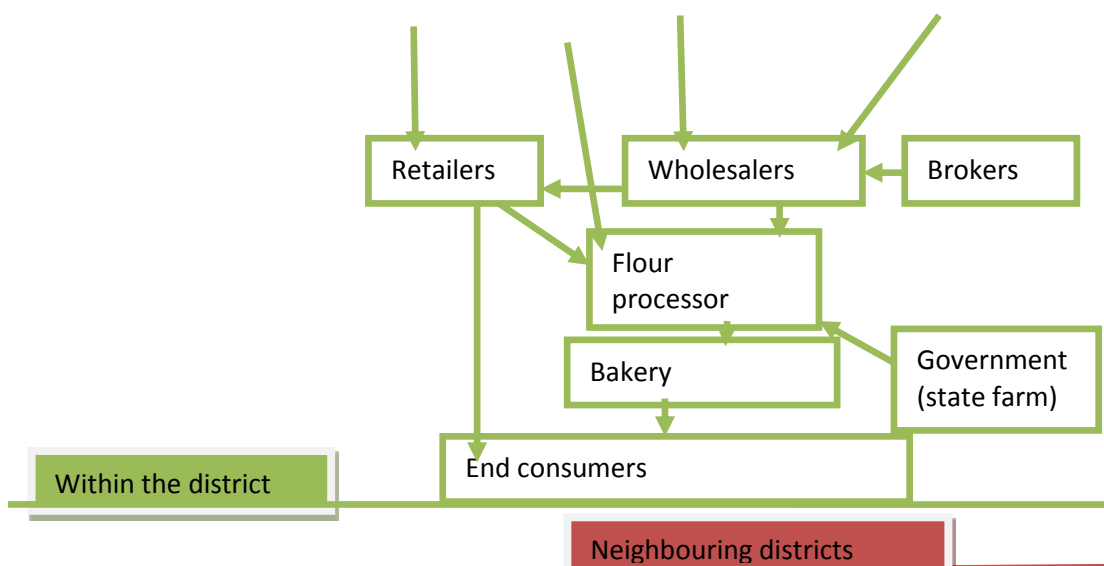
Faba bean products are not well known by potential consumers raising the need to create awareness on the nutritional value of faba bean. In addition, information on improved faba bean varieties which is suitable for processing (for splitting and cook ability) through strengthened research and training of processors on preparation of different food items from faba bean is required. Farmer–processor linkages should be improved as well strengthening farmer producer organizations to facilitate marketing. Processors also require good access to credit services.

3.1.3 Wheat value chains map in Sinana district

The processes and general actors in the wheat value chain in Sinana district and the subsequent market outlets along the chain are shown in Figure 5.

Figure 5. Wheat value chain map in Sinana district





The characteristics of actors from sampled respondents on wheat value chain are presented in Table 8. Wheat traders (retailers and the wholesalers) attained levels of education ranging from primary to college level. Private companies, primary cooperative and private processors are engaged in wheat processing with seven out of nine actors having attained secondary education and above. All the value chain actors interviewed have licensed businesses with males as the major actors in wheat value chain.

Table 8.Characteristics of actors on wheat value chain

Details	Wheat traders N=10		Wheat processors N = 9	
	Wholesaler (5)	Retailer (5)	Flour processor (5)	Bakery (4)
Ownership (No.): Sole proprietor	5	5	3	3
Company			2	
Small and micro enterprise				1
Gender owner: Male	5	5	2	3
Female			1	
Education owner: Primary	3	3	2	
Secondary	2	2		3
College/University			3	
Year started	1997–2011	1988–2001	2000–2006	2009–2012
Licensed	All	All	All	All

N.B: One of the bakery interviewed was a small and micro enterprise. It is composed of 10 members.

3.1.3.1 Wheat traders

The major market places where wheat traded in and around the district are: Robe, Ilu-Sanbitu, Selka, Hisu, Alemgana, Shallo, Ali, Maliyu and Homa.

Wholesalers buy wheat grain mainly from individual farmers, some collectors/small traders and a few other wholesalers within the district and districts around the business. On the other hand, retailers interviewed

buy from individual farmers and wholesalers within and from neighbouring districts market places. Table 9 describes wheat traders' purchases and sales.

Table 9. Wheat traders' purchases and sales

Details	Wholesaler (N = 5)	Retailer (N = 5)
Form of product purchased	Wheat grain	Wheat grain
Type of supplier	Individual farmer, collectors, retailers, agents	Individual farmers, wholesalers
Average quantity purchased per week (kg)	6700	2140
Average purchase price (ETB/kg)	6.20	6.04
Buyer	Processors, other wholesalers and retailers	Wholesaler , processors, end consumers
Average quantity sold per week (kg)	5000	3030*
Average selling price (ETB/kg)	6.75	6.50

* Includes quantity remained in stores.

Wheat traders sell unprocessed wheat to individual farmers, collectors and wholesalers from within the district and other districts. Wholesalers charge an average of ETB 6.75/kg which implies a price margin of ETB 0.55/kg. They sell an average of 5000 kg/week compared to retailers who sell an average of 2140 kg at a lower margin of ETB 0.46kg. The traders predominantly sell wheat on cash basis occasionally accepting credit. The farmers delivered wheat products at traders' premises except some wholesalers who use hired vehicles. There is high demand for wheat grain in July, August and September mainly due to low supplies experienced in that season. On the other hand, low demand is experienced in high supply months of January, February and March.

Wheat grain is stored for about 4–45 and 10–150 days by wholesalers and retailers respectively. During storage period, traders face numerous challenges such as; quality deterioration, rodents and pest attacks, lack of credit to expand and improve quality of their storage facilities.

Constraints

Major challenges facing wheat business include: Intrusion of the market by illegal traders who usually are not registered thus gaining unfair advantage over registered ones. Traders also face poor credit access to be able to expand or capitalize their businesses. There are also regular market fluctuations and supply of poor quality products, shortage of storage facilities in addition to poor transportation and lack of market information.

Suggestions

To address the above mentioned constraints, the following measures are suggested: enforcement of trader registration by Government authorities for all traders through policy engagement with the authorities. There is also need to provide sufficient seed of improved varieties to farmers to increase production, farmers should also be trained to improve quality and quantity of production through application of different crop management practices; timely market information delivery and detailed market demand studies. Government and/or non-governmental organizations should provide affordable credit to traders.

3.1.3.2 Wheat processors

The surveyed flour processors purchase wheat grain from individual farmers, wholesalers, state farm, university and agents/brokers within the district and the surrounding districts (Table 10).

Table 10. Wheat processors purchases

Details	Flour processor = 5	Bakery = 4
Form of product purchased	Grain	Flour
Type of supplier	Individual farmer, wholesalers, retailers, government (state farm and university)	Flour factories and retailers
Source	Within the district, from surrounding districts	Within the district
Average quantity purchased per week in kg	36,940	1,500
Average price in ETB/kg	5.95–8.00	9.80–13.00

On average 36,940 kg is purchased per week per flour processor. Grains are transported from Sinana, Gasera, Goro, Agarfa, Gindhir and Adaba districts by suppliers who use hired vehicles. Some processors pick wheat grain from suppliers using own vehicles. Bakeries purchase flour from Robe town which is within the district and transport to the business premise using hired vehicles, non-motorized transport and sometimes flour processors deliver flour to bakeries using their own vehicles. An average cost of ETB 0–0.10/kg is charged for transport within Robe town.

The highest grain supplies to flour processors are made in January and February while the lowest supplies are experienced from June to November. Processors engage in grading, labelling and packaging before selling the products. The value added is reflected by the differences in prices charged per kilogram of baked products (ETB 10.75/kg).

3.1.3.3 Wheat processors product sales

Flour processors process grains into flour as well as wheat bran before selling to end consumers, retailers and wholesalers. On the other hand, bakeries process flour into bread, cakes, and/or cookies and then sell to end consumers, all within the district (Table 11).

Table 11. Wheat processor sales

Details	Flour processor= 5		Bakery = 4		
Product form sold	Flour	Wheat bran	Bread	Cakes	cookies
Buyer	End consumer	Retailer, peri-	End	End	End

	Wholesaler , retailers	urban/urban and rural farmers	consumer	consumers	consumer
Average quantity sold per week/kg/sack	24,800 kg	10–24 sacks	2016 pieces	315 pieces	0–5 pieces
Average selling price per kg/sack/No.	7.00–10.50	150–240	2–3	7–10	23

NB: 1. The quantity of bread produced by small and micro enterprise is not included in the average quantity of bread indicated above. The enterprise produces 33,699 pieces of bread per week which is sold in the university.

2. 100 kg normally produces 717 pieces of bread of 140 gm.

3. Wheat bran is sold per sack.

In the district there is no significant difference in demand for bread (No high or low demand because most consumers use it often as part of the meals). Another feature is that most communications by processors is done through mobile phones and face to face methods.

All processors have stores with capacities of 360,000 kg for flour processors and 280,000 kg for bakeries. With respect to training, less than half of traders have participated in training on wheat storage and processing between 2006 and 2013.

Constraints

The main business challenges processors faced include: lack of uniformity in quality of flour for bread, cakes and cookies all which do not have standards established for them. There are also high production costs relative to selling price, unstable prices of flour, unfair competition from illegal traders also pose challenge to the registered traders, and finally frequent electric power and water interruptions.

Suggestions

Utility bodies that are concerned with electric power and water will need to stabilize these services. Similarly, regulatory authorities need to address issue of illegal traders. Closer interactions among the processors and suppliers of raw materials need to be cultivated in order to achieve affordable products for consumers. This can be achieved if processors are well organized into trader or processor associations.

3.1.4 Crop services provided

3.1.4.1 Chemicals suppliers

The main crop chemical suppliers in the region are sole proprietors, unions and primary cooperatives that started between 1993 and 2012. They are all licensed to sell crop chemicals. Unions deal with herbicides and fungicides only while sole proprietor and primary cooperative trade in herbicides, fungicides and pesticides. Herbicides are supplied by private companies and unions to sole proprietors and primary cooperatives. They are bought from within the district, and from importers in Addis Ababa. The purchased chemicals are then transported by hired vehicles; public transport while other outlets do not use vehicles. The major buyers of herbicides are individual farmers, primary cooperatives, NGOs and government institutions where only cash

terms of payments are used. Suppliers set price plus commission to determine the selling price in the market but prices are largely guided by the market forces.

The unions purchased the following crop chemicals: 2, 4-D, Pallas, Topic and Tilt from private companies in Addis Ababa. The unions purchased all their requirements in Addis Ababa. The average quantity of 2, 4-D, Pallas, Topic and Tilt purchased was 2395 litres, 974 litres, 6796 litres and 300 litres/year, respectively. Their respective purchase prices were ETB 78, 2000, 600 and 300, in that order. They used a hired vehicle as a means of transport from Addis Ababa to Robe.

Both Selka and Shalo primary cooperatives purchased Pallas from the union within the district. The average quantity purchased ranged from 45–200 litres/year with purchasing price ranging from ETB 2000–2100. Topic was supplied to Salka through a newly established union called 'Sofumer' which was organized by a local NGO known as HUNDEE. The respondent reported that the purchase price was ETB 1115/litre.

Batu Agro chemical, Yerosan Pest control and Biyolesa private shops were interviewed. Among these, Yerosan Pest Control was a wholesaler in Robe. They were supplying Pallas, 2, 4-D, Topic, Tilt, Rexoudo, Mankozeb, Helarate, Malathine, Bumper and Novofil. Their major suppliers of these chemicals (100%) were private companies in Addis Ababa. The average quantity purchased per year varied among the private shops depending on their capital and availability of the market.

Pesticides and fungicides are also supplied by private shops within the district, neighbouring and other distant districts. Besides selling chemicals, chemical suppliers do other services such as supplying farm implements, vegetable seeds, and advices on chemical application to farmers.

Constraints

Most common challenges facing crop chemical suppliers are competition from illegal traders, lack of credit, and high cost of chemicals, untimely supply and shortage of chemicals.

Suggestions

Similar measures that apply to non-registered traders apply to chemical suppliers. This will ensure quality chemicals are supplied to users. Credit service should be available to enable suppliers buy these high priced chemicals.

Seed producers and suppliers

Five seed producers and suppliers, one union, two primary cooperatives, one state farm and one agricultural research centre, were interviewed in the district. The source of seed for the union comes from Ethiopia and Oromia Seed Enterprises, Bale Agricultural Development Enterprise, and Sinana Agricultural Research Center. The union delivers seed to primary cooperatives and farmers. There are also wheat seed producer primary cooperatives (one is involved in production and one is on processing of seeds) that serve farmers in the area. Some of wheat varieties produced and supplied are Digelu, Danda'a, Tusi, Madawalabu, Ejersa, Bakalcha, Obsa and Sofumar. In addition, Sinana Research Center supply seeds of faba bean (Shallo and Mosisa) and potato varieties (Hunde and Ararsa).

Constraints

The most common challenges facing seed suppliers include: high seed prices, shortage of seeds, shortage, lack of disease resistant/tolerant varieties, storage problem, untimely supply, shortage of basic seed, lack of clear demand, lack of row planters and seed cleaners, inadequate monitoring and supervision of seed quality.

Suggestions

Credit provision will help strengthen the input supply systems. However, creating linkages with buyers or user institutions would go a long way in ensuring that seeds supplies are matched with seed demand in the markets. This will go hand in hand with developing user demanded disease resistant/tolerant varieties, and supplying them on timely basis. On the other hand, continuous monitoring of seed quality will contribute to quality assurance for the seeds and inputs.

3.1.4.2 Fertilizers suppliers

Cooperatives and unions are major suppliers of fertilizer. These organizations were started between 1997 and 2006 with an average of 395 members. Government (National Input Supply Enterprise) supplies to the unions with DAP and Urea fertilizers and then the unions can either sell to primary cooperatives, state farm, university, national and international research institutions or sell directly to investors who are engaged agricultural activities (Table 12).

Table 12. Purchases and sales of fertilizers

Business type	DAP		UREA	
	Union (N=1)	Primary cooperative (N =5)	Union (N=1)	Primary cooperative(N =5)
Fertilizer supplier	Government	Union	Government =1	Union =5
Average quantity purchased in kg/year	6,384,500	232,050	200,000	45,025
Purchase price (ETB/kg)	15.64	16.10	12.94	13.33–13.47
Average quantity sold per season in kg	5,112,950	221,850	197,850	25,925
Average selling price (ETB/kg)	15.72	15.82–16.23	13.04	13.33–13.47

NB: 1. Fertilizer purchase price is the same for all primary cooperatives because they are supplied by the union. Primary cooperatives sell the fertilizer at a price that includes set price, transport cost and commission. Therefore selling price difference by cooperatives is due to transport cost (no profit margin).

2. The primary cooperatives receive a commission after selling fertilizer. The commission by primary cooperatives ranged from ETB 0.07–0.09/quintal while for the union is ETB 0.04/kilogram.

Business related to fertilizer supply system by cooperatives and unions were started more than 10 years ago. Apart from selling fertilizers unions and cooperatives engage in other activities. These activities include supplying improved seeds varieties and crop chemicals, renting farm machines like tractor and harvesters, training primary cooperatives and supplying other consumption goods.

Both union and primary cooperatives interviewed use cemented stores to store fertilizers before sales for an average period of 210 days and 586 days respectively. Training on fertilizer storage, handling and usage were offered to unions and primary cooperatives in 2005 and 2006.

Constraints

Some of the challenges that affect businesses include; Untimely supply of fertilizers, high prices of fertilizers, lack/ shortage of storage and offices, shortage of capital, lack of access to credit.

Some of the interventions to overcome these constraints include, access to credit services, establishment of warehouses or stores, improving capital of primary cooperatives through participating in income generating activities such as grain trading, improving institutional linkages, demand and timely based supply of fertilizers.

3.1.4.3 Farm implements suppliers

Four farm implement suppliers were interviewed in the district; one union and three shops which are licensed. Most shops that supply farm implements in the district started their business between 2011 and 2014 while the union started in 2003. Common farm implements that are supplied by private shops and local blacksmiths from within and beyond the district and sold by different traders include sickles, pick axes, hoes, shovels, ploughs, polythene tubes, watering cans and machetes. The union provides BBM (Broad Bed Maker) for sale and tractors for hiring in the district. The suppliers make less than 5% profit margin and sell within the district to individual farmers. The prices for different farm implements are charged based on prevailing market prices.

Table 13. Purchasing and selling of Farm implements by the sole proprietors (traders)

Farm implement	Quantity purchased per season	Buying price(ETBper item)	Selling price (ETBper item)	Quantity sold per season
Sickle	240	50	54	15
Hoe	36	64	75	18
Pick axe	36	75	85	18
Fork	52	50	55	52
Shovel	70	50	75	25
Plough	50	50	60	25
Tractor	4	450,000	(Not sell but rent out)	N/A
Watering can	83	75	79	42
Machete	108	70	77	103
'Wegela'	40	22	29	25

Constraints

Some of the constraints mentioned by the actors were: high cost of implements, poor quality of implements and high prices of rent house to be used for shop.

Suggestions

The possible opportunities to address the challenges mentioned include: improving quality farm implements to be sold, working further on improving farm implements and agricultural machineries, create alternative source of income generation and providing farm implements according to farmers demand.

3.2 Crop value chain analysis and potential interventions

Some of the interventions to support value chain actors in marketing include are summarized here:

1. Establishment of warehouse especially for potato which will be an avenue for farmers to store and sell potatoes at a later date when prices are expected to be higher. Furthermore, warehouses will enable consistent supply of produce year round between the producers and traders.
2. Enhance market linkages among the actors in the value chain. Stronger linkages all the way from the input suppliers to the end consumers will lead to a more efficient value chain where inputs will be available to ensure proper production of the necessary products. In addition, demand signals will be clearly communicated to the producers.
3. Supply quality seed suitable for processing. Quality seeds should be supplied to farmers along with knowledge on how to maintain them accordingly. This will be a key step in bridging the yield and quality gap between current and potential production.
4. Improved post-harvest management practices (post harvesting and handling).
5. Seed system (Community seed production) and linking it with seed producing cooperatives especially for faba bean.
6. Strengthen market linkage for producers and primary cooperatives (seed as a business) in wheat production.
7. Establishment of irrigation facilities for the research centre to produce potato seed and improved varieties suitable for the processing.
8. Capacity building intervention for research centre, seed producer and marketing cooperatives (SPMS).
9. Training on how to use farm implements, sensitization and linkages with producers plat forms.
10. Improving the linkages of seed producer with seed suppliers' enterprises and agricultural research centres to get improved seeds.
11. Introducing cost effective row planter and seed cleaner.
12. Identifying the potential buyers of the crop produce and create linkage with the farmers

4 Livestock value chains

4.1 Livestock value chain results

4.1.1 Dairy value chain

Milk is produced by 68,049 local cows and 1,850 cross breed cows in Sinana district. Most cross breed cows are kept by farmers in urban and peri-urban areas where they are used to produce fresh milk for urban consumers and the dairy related businesses. Local cows are found in rural and (peri-) urban areas. While the milk produced from these cows is usually processed into butter, in Sinana district, this milk is mainly used for home consumption. This is probably due to the fact that a large portion of the population is Muslim and used to drink milk in their tea and coffee. Part of the milk from local cows in peri-urban areas is also sold as fresh milk, especially during peak demand periods.

In Sinana, no dairy processing businesses are found; however, one dairy café, some breakfast cafes and hotel/restaurants which use/serve dairy products, are found in Robe town. Butter traders in Sinana that focus on the purchase and sale of butter from other districts were not interviewed.

All sampled businesses are privately owned by individuals which have secondary education or more. Owners are mostly male and started their licensed business < 10 years ago.

Table 14. Sampled dairy value chain businesses in Sinana district

Indicator	Dairy café/shop	Restaurants	
		Breakfast cafe	Hotel/restaurant
Sample size	1	4	1
Ownership	Private owner	Private owner	Private owner
Gender	Male	Male = 3 Female = 1	Male = 1
Education	Secondary	Sec = 2 >Sec = 2	>Secondary
Year started	<10 years	1>10 years 3<10 years	<10 years
Licensed	yes	Yes (4)	yes

4.1.1.1 Dairy processing business

The privately owned small scale dairy business in Robe town can be classified as a dairy cafe/shop. It purchases milk delivered to the business by urban and peri-urban farmers. The bulk of the milk purchased is morning milk which is not tested.

Part of the unprocessed milk is sold to outside customers, the other part is processed as irgo and served to customers in the small café restaurant.

Peak supply months are July–September when feed is abundantly available, while low supply months are experienced during the dry season (February–April).

Table 15. Purchase and sales data of sampled dairy cafés

Indicator	
Sample size	1
Purchase	
Litres of milk/month: low–peak period	840–1050
Purchase price/litre	7

Suppliers	Farmers (urban, peri-urban)
Evening milk purchased	yes
Test method used	none
Sales	
Litres of raw milk/month: low–peak period	150–150
Sales price raw milk	11
Buyers	Outside consumers
Litres of irgo/month: low–peak period	720–900
Sales price irgo	21/litre, (7 per cup)
Buyers	Consumer in the café Outside consumers

The business owner mentioned low quality supply and inadequate supply during dry season. Training for farmers is proposed to increase supplies.

4.1.1.2 Hotel/restaurants

Dairy products are used in breakfast cafes and hotel/restaurants. Most businesses purchase milk from farmers in the district, part is delivered by traders from neighbouring Goba district. Quantities are small and vary from 280 to 1400 litre/month. Beside purchasing milk, these customers also buy butter for the preparation of meals. All butter is purchased from outside the district (Gassera, Kokosa, Robe market) and supplied through small and larger traders/shops. Prices vary and are high during the dry season, holidays and, origin of the butter also influences the price—Gassera butter reportedly fetch higher prices. ‘Ayeb’ (soft cheese) consumption is reportedly minimal.

Areas which require attention include credit, elimination of intermediate traders, increased milk production, especially during low supply seasons.

Table 16. Purchase and sales data of sampled dairy serving businesses in Sinana district

Indicator	Café	Hotel/restaurant
Sample size	4	1
Purchase		
Litres of raw milk/month; low–peak periods	1400, 280, 700, 336	1120
Purchase price/litre	8.5, 9.0, 11, 12	8
Suppliers	Farmers (3) Traders (2) Own production (1)	Farmer (1) Traders (1)
Source	From district, including Goba (2)	From district (1)
Kg of butter/month	1.5, 5, 8, 40	40
Purchase price per kg (ETB)	110–150	150
Supplier	Trader/shop	Trader (whole sale)

4.1.2 Small and large ruminants value chain

The number of oxen and bulls in Sinana district total 96,598. The number of small ruminants includes sheep (47,621) and goat (11,006).

Businesses involved in trading small and large ruminants/products include private traders and hotel restaurants, which have their own butcheries. The abattoir furthermore provides slaughtering services for large ruminants.

All sampled businesses are privately owned by males. Most businesses owners have secondary education or more, except for some traders which have primary education only. Most businesses were established < 10 years ago.

Table 17. Sampled large and small ruminants value chain businesses in Sinana district

Indicator	Trader		Restaurants	
	Small ruminants	Large ruminants	Small ruminants	Large ruminants
Sample size	5	4	2	5
Ownership	Private owner	Private owner	Private owner	Private owner
Gender owner	Male = 5	Male = 4	Male = 2	Male = 5
Education	Prim = 4 Sec = 1	Prim = 3 >Sec = 1	Sec = 2	Primary 1 Sec = 2 >sec = 2
Year started	5< 10yr	2>10yr 2<10yr	2<10yr	5<10yr
Licensed	Yes = 4 No = 1	Yes = 3 No = 1	Yes = 2	Yes = 5

4.2.1.1 Small and large ruminant traders

Sampled traders in small ruminants purchase their animals for slaughter from traders in the district. They sell them to end consumers, hotel/restaurants and larger traders, who usually buy in bulk for sale outside the district. Most traders buy young animals—6 to 12 months old. None of the sampled traders seem to sell

animals for fattening or reproduction. Since fattening of sheep with purchased animals reportedly does take place, it may be concluded that most trade in these animals is between farmers.

Sampled traders in large ruminants purchase their animals from traders inside and outside the district and sell to hotel/restaurants and other traders in and outside the district. Some large ruminants are sold to consumer groups, usually for special occasions. Age of purchased animals for slaughter varies from 36–96 months. One of the 5 sampled traders, also purchases and sells large ruminants for fattening, i.e. lowland breeds which are sold to Nazareth, where they are fattened in feedlots. The Arsi Bale breeds which are predominant in Sinana district are fattened in the district itself.

An interesting observation with regard to sale practices is trade between traders, where bulk purchase of animals is common. Good and high quality oxen are sold in a batch for an average price/animal. Such a practice usually results in a relatively higher profit for the poor quality animals, as compared to the profit margin for the higher quality animals.

Table 18. Purchase and sales data of sampled animal traders in Sinana district

Indicator	Small ruminants trader	Large ruminants trader
Sample size	5	4
Animal for slaughter		
No of traders involved	5	4
Range age of animals in month	6–12 (3), 6–24, 5–24	60–84, 60–96, 48–96, 36–48
No of animals/month	22–40, 24, 28, 20–36, 8–18	20–24, 10–12, 30–32, 32
Suppliers	Farmers (4) Traders (1)	Traders (2) Farmers (4)
Origin	From district (5) Outside district (Goba, Dinsho)	From district (4) Outside district (3) (Agarfa, Gassera, Goba, Dinsho)
Buyers	Consumers (5) Traders (2) Hotel/restaurant (2)	Consumers (group) (2) Hotel/restaurants (4) Traders (1)
Destination	Within district (5) Outside district (1) (Adaba, Dodola, Shashamene, Lume (Mojo), Addis)	Within district (4) Outside district (1) (Goba, Adama)
Price margin/animal: purchase/sale	800–1200/850–1250 600–900/650–950 700–1500/750–1550 500–800/650–850 500–800/550–850	4000–10000/6500–missing 8000–10000/8440–10440 8000–12000/10000–12000 7000–13000/8000–14000
Animals for fattening	Reproduction/fattening	Ploughing/fattening
No of traders involved	0	1
Average age of animals in month	0	48–72
No of animals/month	0	68–160
Suppliers	0	Farmer (1) Trader (2)
Origin	0	Within and Outside district (Berbere and Goro)
Buyers	0	Trader
Destination	0	Within and Outside district (Dera and Adama)
Price margin/animal: purchase –	0	10,500–11,000

sale		
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Trade is subject to seasonality resulting in variations in number of animals traded and prices paid. Peak months for slaughter animals coincide with festivities (religious, cultural and weddings) in January, February, April and September. In general, drop in the number of animals traded during the low period is higher than the drop in price/animal (see Table 19).

Table 19. Seasonality of animal trade in sampled animal traders in Sinana district

Indicator	Small ruminants traders	Large ruminants traders
Sample size	5	4
Animal for slaughter		
Peak months	Jan (3), Feb (1), March (1), April (5), Sept (5), Dec (2)	Jan (3), Feb. (4), March (2), April (3), Sept (2), Dec (2)
Percentage of animals traded low–peak periods	44%, 40%, 16%, 43%, 30%	33%, 63%, 67%, 20%
Percentage price low–peak months	57%, 71%, 65%, 77%, 83%	67%, 78%, 40%, 68%

Traders mentioned fluctuating and low supply of animals, lack of market space, and lack of feed to keep animals, illegal trade, and lack of credit as bottlenecks.

4.2.1.2 Butchery restaurants

Hotel/restaurants in Sinana district purchase their small and large ruminants from farmers, traders and agents mostly from within the district. Age of small ruminants purchased by sampled restaurants ranges from 12–32 month and large ruminants from 36 to 60 months.

Small ruminants are slaughtered/butchered by the restaurant operators, while large ruminants are slaughtered in the district abattoir and butchered in the restaurants.

Meat is mostly (90%) prepared/served in the restaurant, while the rest is sold to customers for home consumption or small retailer cafes/restaurants. Peak demands coincides with holiday periods

Bottlenecks mentioned are illegal middle men, lack of quality control (small ruminants), and low supply during some seasons

Table 20. Purchase and sales data of sampled restaurants in Sinana district

Indicator	Restaurant	
	Small ruminants	Large ruminants
Sample size	2	5
Suppliers	Farmers (2) Traders (1)	Farmers (5) Traders/agents (3)
Origin	From district (2)	From district (5) Outside district (2)
Av age purchased animals	12–24, 25–32	36–60, 48–60, 48–60, missing (2)
Av number of animals/month: low/peak	8–12/32, 40/56,	4/12, 8/20, 8–12/16–20, 20/40–60, 8–12/24
Price/animal	700–1200, 400–700	8000–10000, 5000–7000, 12000–15000, 6000–14000, 8000–12000
Percent meat served in	98%, 100% (individual consumer)	90% (4), 92% (individual consumers)

restaurant		
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4.1.3. Livestock service/input providers

Four service providers support the dairy and large ruminants value chain actors i.e. the district abattoir, livestock feed producers/traders, veterinary services and AI services.

4.1.3.1 Abattoir

The government owned abattoir only slaughters large ruminants for restaurants and some end users. Peak months are around Christian and Muslim religious days and low during fasting periods (February, March). Most slaughtered animals were above 4 years of age

Table 21. Slaughtered animals in district abattoir

Type of animal	Total number animals/year	Peak months ¹	Daily number in peak period	Low months ¹	Daily number in low period	Slaughtering charges	Customers ² (can be more than one—start with highest %)
LR	2980	4, 9,12	27	2, 3	5	182	3, 1

1. Month: 1 = January; 2 = February, 3 = March; 4 = April; 5 = May; 6 = June; 7 = July; 8 = August; 9 = September; 10 = October; 11 = November; 12 = December

2. Customers: 1 = End users 2 = Butcheries 3 = Hotel/restaurants

4.1.3.2 Livestock feed producers/traders

During both seasons, the total land covered by wheat crop was 47,223 ha from which a total wheat production of 174,702 t was registered in 2013. The major pulse crops cultivated by farmers in the district were faba bean, field pea and lentil. A total of 5,831 ha of land was covered by these three pulse crops from which a total production of 5,841 t was obtained. From the total of 3,911 ha of land, 5,016.5 t of flax seeds was also produced in 2013. The commercial processing of these 3 crops can contribute to the supply livestock feed in the form of agricultural industrial by-products.

In Sinana district, livestock feed is produced by flour and oil processing factories and feed is traded by feed shops. All sampled business are privately owned by individuals or companies, which are mostly headed by males.

Most businesses were started < 10years ago and operated by managers which have at least primary education.

Table 22. Sampled livestock feed production/trade businesses in Sinana district

Indicator	Feed shop	Feed producers	
		Wheat millers	Oil miller
Sample size	5	5	5
Ownership	Private	Private (3), Company (2)	Private
Gender	Male = 4 Fem = 1	Male = 2, 2 not applicable, Fem = 1	Male = 5
Education	Prim = 2 Sec = 3	Prim = 2 Diploma = 1	Prim = 2 Sec = 2 Diploma = 1
Year started	1 > 10 year 4 < 10 year	1>10year 4<10year	2>10year 3<10year
Licensed	Yes = 5	Yes = 5	Yes = 5

Wheat and oil millers

The sampled wheat and oil millers produce respectively wheat bran and oilcake. They sell these industrial by products in and outside the district to farmers and traders/shops. Both feeds are used for dairy cows and large ruminants. Sales vary considerable during peak and low demand months. Peak demand months coincide with months of lack of green feed (dry season), while demand is low during months that green fodder is available.

Most businesses prefer to sell in bulk and therefore restrict buying of minimum quantities to feed shops/traders, large farmers, and or groups of farmers. The latter is apparently not common. Prices vary considerably which is often a reflection of quality of the feed and seasonality in demand.

Feed businesses mentioned power and water supply problems and fluctuating demand and supply and prices and lack of credit as bottlenecks. Increasing demand by creating awareness by farmers is recommended.

Table 23. Production and sales data of sampled wheat bran and oilcake producers in Sinana district

Indicators	Flour factory	Oil millers
Sample size	5	5
Product	Wheat bran	Oilcake
Buyers	Urban and peri-urban and rural Farmers (5) Feed shops (5)	Urban and peri-urban and rural Farmers (5) Feed shops (4)
Destination	Within district (5) Outside district (3) (Goba, Goro, Dinsho, Agarfa)	Within district (4) Outside district (2)Goba, Goro, Dinsho, Agarfa)
Use by type of animals	Dairy cows, oxen and small ruminant	Dairy cows (5), oxen for fattening(5)
Av quantity sold/month: low and peak period(sack)	20–80 22–100 28–120 50–140 20–60	8–20 8–60 8–80 60–100 60–80
Sales price /sack for wheat bran, sales price/kg for oilcake	180–220, 230, 200–260, 100–200, 160–320	7.1–8.6, 3–5, 3–5, 3–5.5, 4.30–5.30
Peak demand month	Months shortage green feed (5)	Months shortage green feed (5)
Low demand months	Months with available green feed (5)	Month with available green feed (5)

It is noted that wheat and pulses for home consumption is processed at home or in small mills. The milling process does not yield significant quantities of by-products. The by-products resulting from such processing are sometimes used to pay part of the cleaning fees, sold (15–20 ‘tasa’ for ETB 10), or used for his/her animals. Some mill owners also collect small quantities of left over flour which is sold at ETB 3 to 4/kg.

Feed shops

The five sampled feed shops purchase wheat bran (all 5) and oil cake (3 of the 5) from the flour factories and oil millers. They sell to dairy farmers in small quantities and horse cart owners, which ‘fuel up’ their horses on a daily basis. Similar as for the wheat and oil milling factories, peak demand is noticed when green feed is scarce, while demand is low during months that green feed is available.

Prices vary considerably between feed shops/traders which reportedly is a reflection of the quality of the feed, seasonality and the location of the shop (rental price and transportation cost to mills)

Unavailability of credit, fluctuating demand/prices and lack of knowledge on use of concentrates at farm level are mentioned as bottlenecks for the businesses.

Table 24. Purchase and sales data of sampled feed shops in Sinana district

Indicator	Wheat bran	Oilcake
Supplier	Flour mills (5)	Oil mill (3)
Origin	Within district (5)	Within district (3)
Buyers	Rural, urban and peri-urban farmers (3) Horse owners (2)	Rural, urban and peri-urban farmers (3)
Destination	Within district (5)	Within district (3)
Use by type of animals	Dairy cows (2), large ruminants, small ruminants, horse	Dairy cows (2) large ruminants, small ruminants
Quantities sold/month: low–peak periods, wheat bran (sack), oil cake (kg)	12–20 14–36 16–40 20–40 86–100	280–280 560–1200 400–1200
Purchase–sales price/kg	2.40–2.55/2.48–2.60 2.60–2.70/2.70–2.80 2.50/2.55–2.60 2.00–2.50/2.10–2.60 2.50/2.70	5.00/5.10 6.00/6.50 4.50–6.00/5.00–6.10

4.1.3.3 Veterinary services, drug supply

Veterinary services and drugs in Sinana district are provided by the public as well as private sector businesses.

The sampled service providers are managed by well trained professionals and were established within the past 10 years.

Table 25. Sampled public and private veterinary services and drug supplies

Indicator	Public sector		Veterinary shop
	District	PA	
Sample size	1	1	5
Ownership	Public	Public	Private owner
Gender	NA	NA	Male = 5
Education	College/Un	College/Un	Diploma = 2 University (DVM) = 3
Year started	1<10r	1 < 10yr	1>10yr 4<10yr
Licensed	Yes = 1	Yes = 1	Yes = 5*

* Only to sell drugs, not to provide services.

The district's animal resource development and health agency is supported by Agricultural Growth Program (AGP) to provide veterinary services and drug supply. It has one 'B' type animal health clinic at Robe town and six 'D' type clinics at rural *kebeles*. The 'B' clinic is better in terms of materials and human resources and provide services mainly in Robe town and the surrounding rural *kebeles* (about five). It is staffed with one lab technician and five senior animal health assistants (AHA).

One 'D' type clinic was established to provide vet service for three rural *kebeles* having at least one animal health assistant. For the six clinics a total of ten animal health assistants are currently providing services to 17 *kebeles*.

The livestock agency collects the district level demand for vet drugs and directly contacts Oromia livestock agency. The regional livestock agency directs the request for vaccines to DebreZeit NVI. Other drugs are purchased through a bidding process. The money (budget) allocated for buying vet drugs revolves every year. The role played by the zone is mainly facilitation in compiling need assessment at zone level and sometimes providing vehicle for transportation.

The district supplies vet drugs to clinics in each PA depending on the number of cattle available. In case when there is high disease prevalence at PA level, they report to the district livestock agency for support. Then, the district will give them support in terms of human and material resources.

The private shops purchase drugs from traders/importers, mostly from outside the district (4) and sell them to farmers and other veterinary drug retailers.

Public sector ranks use of antibiotics highest, followed by antihelmets, while 3 of the 5 sampled private vet shops rank use of antihelmets highest, followed by antibiotics. Vaccines are reportedly only provided by the public sectors.

Drugs supplied by the public sector are sold at cost price, while the private sector adds a margin over the cost price.

Drugs supplied by the public sector are mainly used for dairy cows and large ruminants/oxen. Private drug suppliers also sell drugs for small ruminants.

Table 26. Purchase and sales data of public and private drug suppliers in Sinana district

Indicator	Public veterinary services	Private vet. sops
Rank/use	1 Antibiotics 2 Antihelmets 3 Vaccines 4 Supplements	1 Antihelmets 2 Antibiotics 3 Supplements
Antibiotics		
Price margin antibiotics: purchase–sales	60 -60	22–24 (1.09) 31–34 (1.10) 32.50–37.50 (1.15) 42.50–46 (1.08) 47.50–52.25 (1.10)
Type of buyer	Farmer (PA 1, Dist. 1)	Farmer (5) Vet. retailer shop(4) Others (sometimes NGOs = 1)
Type of animal	Dairy =1 Oxen = 1 Small ruminants	Dairy = 5 oxen =5 Small ruminants = 5
Peak months	April, May, June, July, Aug, Sept.	May (5), June (5), July (5), Aug (5), Sept (5) = rainy season
Antihelmets		
Price margin antihelmets	2.05–2.05	60–62 (1.03) 58.5–64.35 (1.10) 31.5–35 (1.11) 2.86–3.25 (1.14) 0.79–1.63 (2.06)
Type of buyer	Farmers	Farmers (5) Vet. retailer shops (4) Others (NOG = 1)

Type of animal	Dairy =1 Oxen = 1 Small ruminants	Dairy = 5 Oxen=5 Small ruminants = 5
Peak demand months		May (5), June (5), July (5), Aug (5), Sept (5), Oct. = rainy season
Vaccines		
Price margin (purchase–sale)	0.93–0.93 (1)	
Type of buyer	Farmers	
Type of animal	Dairy and oxen	
Peak demand months	As needed	
Supplements		
Price margin purchase–sales	250–250 (1)	47.5–52.25 (1.10) 52.5–57.5 (1.10) 85–100 (1.18) 98–100(1.02) 1100–1200 (1.09)
Type of buyer	Farmers	Farmers (5) Vet. retailer shops (4) Others (sometimes NGOs =1)
Type of animal	Dairy Oxen Small ruminants	Dairy = 4 Oxen =5 Small ruminants = 4
Peak demand months		May, June, July, August, September, October

The public veterinary service provided at PA level are simple diagnosis, drug prescription and vaccination. The service delivery is limited and the demand of the farmers could not be addressed due to shortage of animal health technicians, distance from clinics and shortage of budget to supply adequate vet drugs.

Public sector mentions poor supply of drugs during some seasons as a problem, while private shops complained about illegal traders, lack of credit, taxation and unbalanced supply and demand.

4.1.3.4 AI services

There are only two AI technicians at district level providing service mainly to Robe town and the surrounding five rural *kebeles*. There is high demand from the farmers' side but, the service is very limited due to lack of budget for transportation, shortage of technicians, longer distance from the source and shortage of semen. In order to satisfy the demand to some extent, hormone assisted mass insemination has been practiced with help of AGP. In 2013, three rural *kebeles* namely, Horaboka, Shallo and Hawusho were addressed. In 2014 another three *kebeles* (Salka, Obora and Nanorobe) were also covered. The district is planning to extend the service to Hisu, Kabiratemolsulemona and Ilu-Sanbitu *kebeles* for the coming year (2007 E.C/2015). Last year 2013, 528 hormones assisted AI were provided and 236 or 45% reported effective, i.e. 99 females and 137 male calves were born. The experts reported that the reduction in the number of effective hormone assisted AI was due to health problem of the dairy cows and cultural belief. The farmers believed that the new born calves will die if exposed to experts or strangers to the area. The demand is very high but, due to shortage of skilled man power and longer distance from Robe, the farmers are forced to use their own local bulls.

4.2 Livestock value chain analysis and interventions

The analysis presented in this section is based on a review of the linkages described and the present status/performance of the agribusinesses and their supporting businesses/services. Potential interventions are identified through comparison (gap analysis) of these findings with other districts and projects. Potential

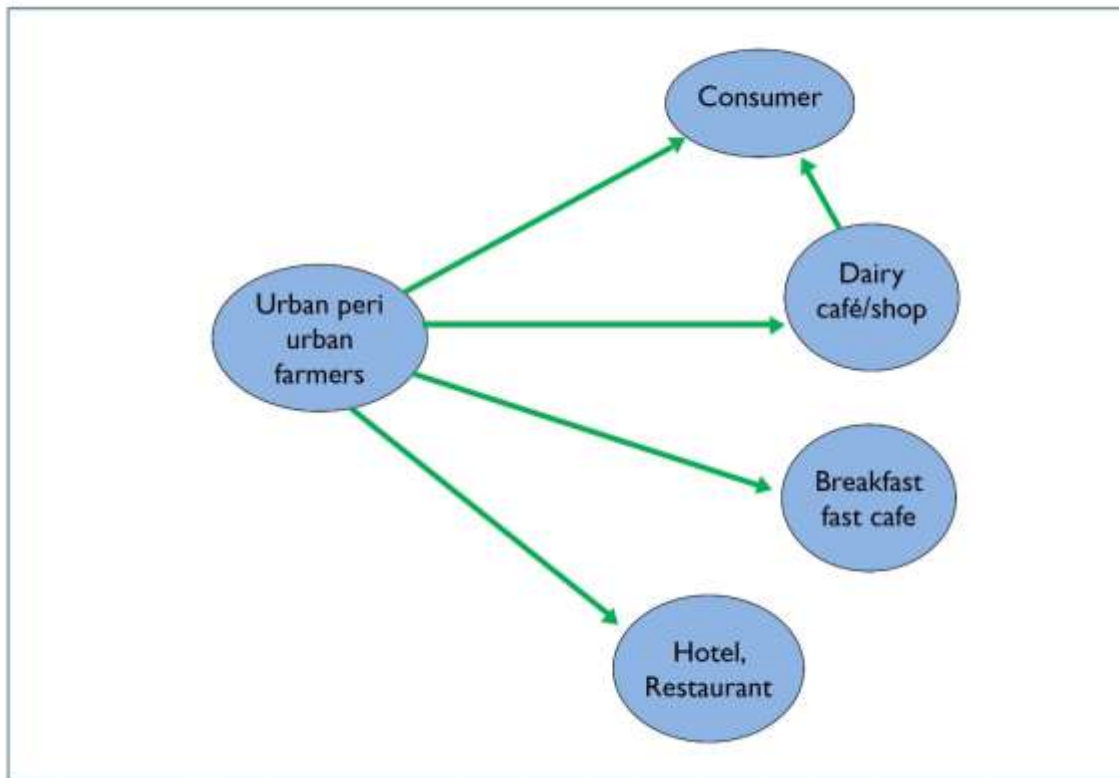
interventions are subdivided into those which may contribute to increased demand and those which may contribute to increased supply of the raw product.

4.2.1 Fresh milk value chain

4.2.1.1 Value chain businesses

The fresh milk value chain in Sinana focusses mainly on the peri-urban production system. As indicated in the result section, no businesses are involved in the rural milk production system, since milk is mostly consumed at home. For the processing and sale of fresh milk in the peri-urban system, only a few businesses are involved. Most milk is sold directly from producers to consumers (see Figure 6)

Figure 6. Fluid milk value chain business linkages Sinana



The dairy product range in Sinana district is limited and only includes preparation of ‘irgo’ (natural yoghurt) by the dairy café.

- A consumer demand study is proposed to explore (present and future) local demand for milk by individual consumers, hotel/restaurants, hospitals offices and schools. Such a study may contribute to increasing commercial demand for milk, in part replacing the producer–consumer channel by producing/supplying better quality milk, but also by increasing demand for new products by different consumer categories.
- Based on the outcome of the consumer demand study, it is proposed to expand the processing and sale of dairy products, especially in the dairy café/shop, including the testing of new dairy product for youngsters. Also additional dairy processing businesses may be initiated
- It is also proposed to improve the quality of the ‘irgo’ produced in the dairy cafe by reducing bacterial infection using heating/pasteurization methods. It is understood that souring of heated/boiled milk may have to be stimulated by adding pasteurized yoghurt culture (the consumer demand study may identify consumer preferences, using blind-tasting methods)
- To improve the performance of the business involved in the purchase of milk, milk marketing groups are proposed to supply to specific outlets such as dairy cafes, breakfast restaurants or hotel restaurants—thus reducing the marketing cost/unit of milk for individual group members. Alternatively, milk collectors may be used as intermediaries to buy milk from individual farmers for selling to the specific outlets. It was noted that such a system appears to exist from milk purchased from neighbouring Goba town. The dairy café/shop presently also plays a role as milk trader, however it only sells a small quantity of unprocessed milk to individual consumers. They could expand the sales linkages to include hotel restaurants and other institutional buyers (based on the outcome of the demand study).

4.2.1.2 *Input/service supply businesses*

Results show that veterinary drugs for peri-urban dairy farmers are available from the public and private sector. It is noted that veterinary services are only delivered (officially) by the public sector.

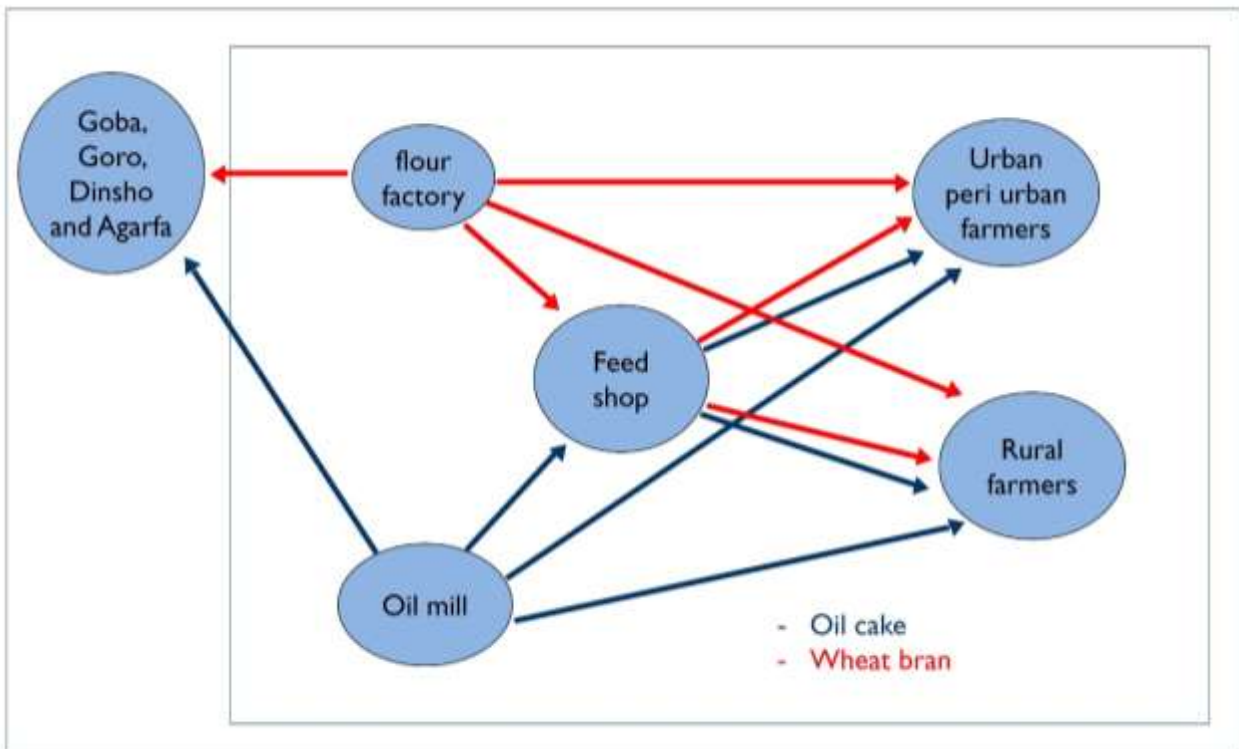
- To expand the delivery of veterinary services, it is proposed that private sector drug suppliers are licensed to provide veterinary services, once the necessary qualifications are met.
- It is also proposed that linkages between public and private sector for supply of veterinary drugs, are strengthened, which may require review of the rules governing the use of the revolving funds.

For the genetic improvement of dairy animals, peri-urban dairy farmers are relatively well served with public AI as compared to rural farmers. However it was noted that the attempts to increase the number of AI through hormone assisted mass insemination with mobile teams still requires fine tuning.

- It is therefore recommend that the present performance of the hormone assisted mass insemination by mobile teams, is studied in order to introduce additional measures to improve effectiveness and efficiency.

Agro Industrial by-products are abundantly available from the wheat factory and oil millers and feed shops/traders. Small quantities of pulses by-products and other milling by-products are available from the mills in urban and rural areas. It is noted however that these milling by-products are not (yet) available through commercial business channels, since they are used by farmers directly themselves and or used/sold by the women cleaning the processed pulses and cereals. The linkages between the peri-urban dairy farmers and the feed businesses are shown in Figure 7.

Figure 7. AIB feed supply business dairy producers Sinana



While the products are available, use is limited and seasonal, partly because of lack of knowledge, partly because of cost and partly because of seasonal availability of other feed resources.

- To stimulate demand, it is proposed to create awareness and demonstrate the beneficial effects of locally mixed AIB ingredients for dairy cows.
- Since mixtures for dairy cows are not available, it is recommended that appropriate mixing of the ingredients is introduced through traders and the extension services, especially for farmers in the rural areas. Farmers reportedly already mix several AIB components with crop residues.
- Since most ingredients for dairy mixes are available in the district, it is recommended to establish a feed processing company, which can commercially produce dairy and fattening mixes.
- Most farmers buy the ingredients individually. It is therefore proposed that collective buying of the AIB components takes place by groups of dairy farmers, especially for farmers in the rural areas. Such groups can be linked to specific factories to negotiate lower prices because of bulk purchases.
- A special assessment should be made of the by-products from milling services in urban and rural areas and how they are used and can be commercialized. It is noted that the quantities of by-products which could be produced if all grains were processed commercially, are quite substantial i.e. 15% wheat bran from 174,702 t of wheat grain and 15% of pulses bran from 5841 t of pulses.
- To increase production of individual farmers, new management interventions for health, genetics and feeding should be introduced.²It is noted that milk production in the rural areas can also benefit from such interventions to increase supply of milk for home consumption or sale directly to consumers

2. These production interventions are not discussed here since they are (hopefully) addressed by the Africa RISING production research.

4.2.2 Large and small ruminants value chain

4.2.2.1 Large and small ruminants value chain businesses

The reported number of animals in the district suggest that there should be a considerable supply of large and small ruminants for consumption/sale. Assuming that oxen/bulls on average will be used for 4 years, the estimated number of animals for consumption/sale would be 24,150 annually. Assuming an average slaughter age of small ruminants of 1.5 years (see data), the number of sheep and goats for consumption could be estimated at respectively 31,747 sheep and 7337 goats annually.

The Ethiopian livestock master plan clearly identifies deficits of red meat for the local market at present and even more in the future. It is therefore expected that prices and profit margins in this sector will be high and therefore investments in the development of the small and large ruminants' value chain should be encouraged.

Production and sale of ruminants for meat consumptions involves producers, traders, and consumers, including institutional consumers like the restaurants. Based on the data summarized in the result section, the linkages between the small and large ruminants' agribusinesses in Sinana district are summarized in Figures 8 and 9.

Figure 8 Large ruminant value chain linkages Sinana

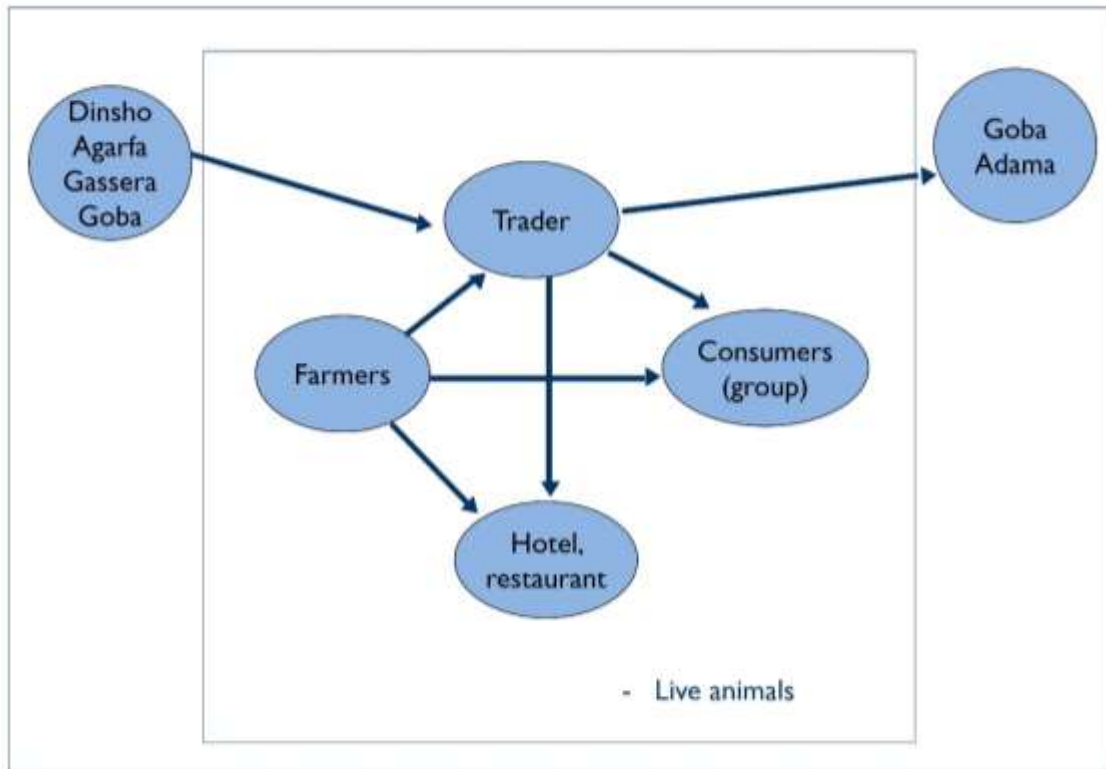
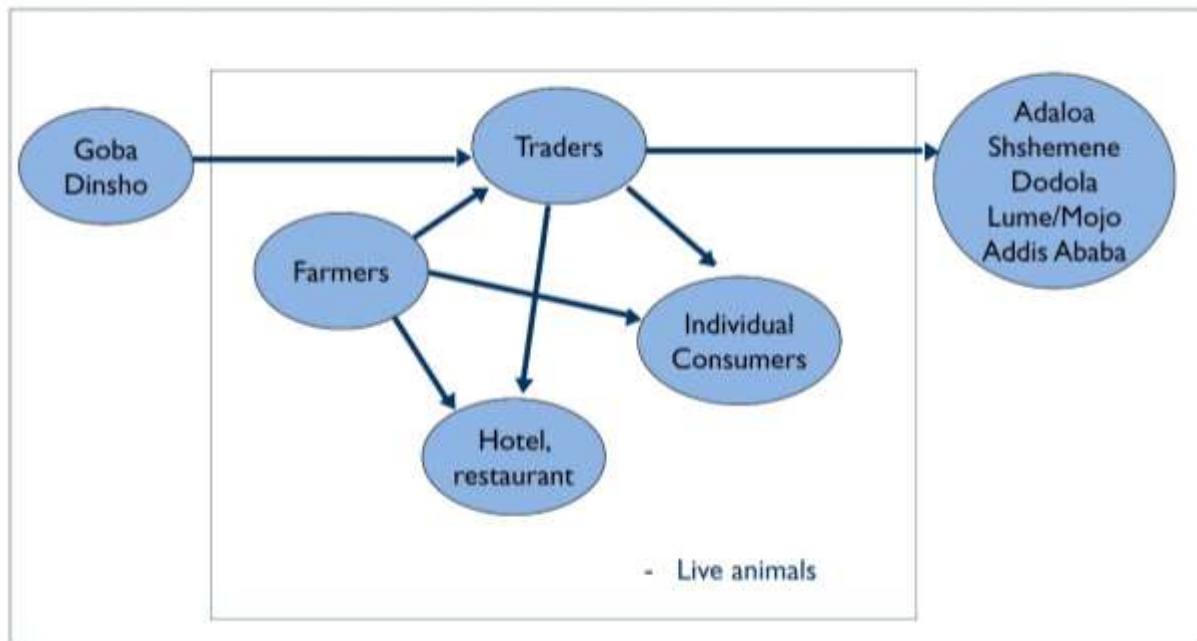


Figure 9. Small ruminant value chain business linkages Sinana



Restaurants in the district are major ‘consumers’ of the animals. Data from these businesses and the abattoir, which provides slaughtering services for large ruminants, suggest that demand is traditional i.e. farmers mainly produce for the cultural and religious holidays periods. It is however interesting to note that the data from traders and restaurants show considerable variation in the age of the animals for slaughter. Also, considerable price variation exists, indicating variation in the type of animals purchased (fattened, lean) by traders, hotel/restaurants. Also consumer groups reportedly have demand for specific type of (younger) animals. Furthermore, demand for younger animals (small and large ruminants) is increasing (including export market demand).

- It is therefore proposed to conduct a demand study within and outside the district for the type of small and large ruminants required by the different customers.³ Such a study should also consider demand for different types of animals during the year. The study would enable the establishment of linkages between producers/fatteners of animals and agribusiness and consumers to produce animals throughout the year based on market demand.

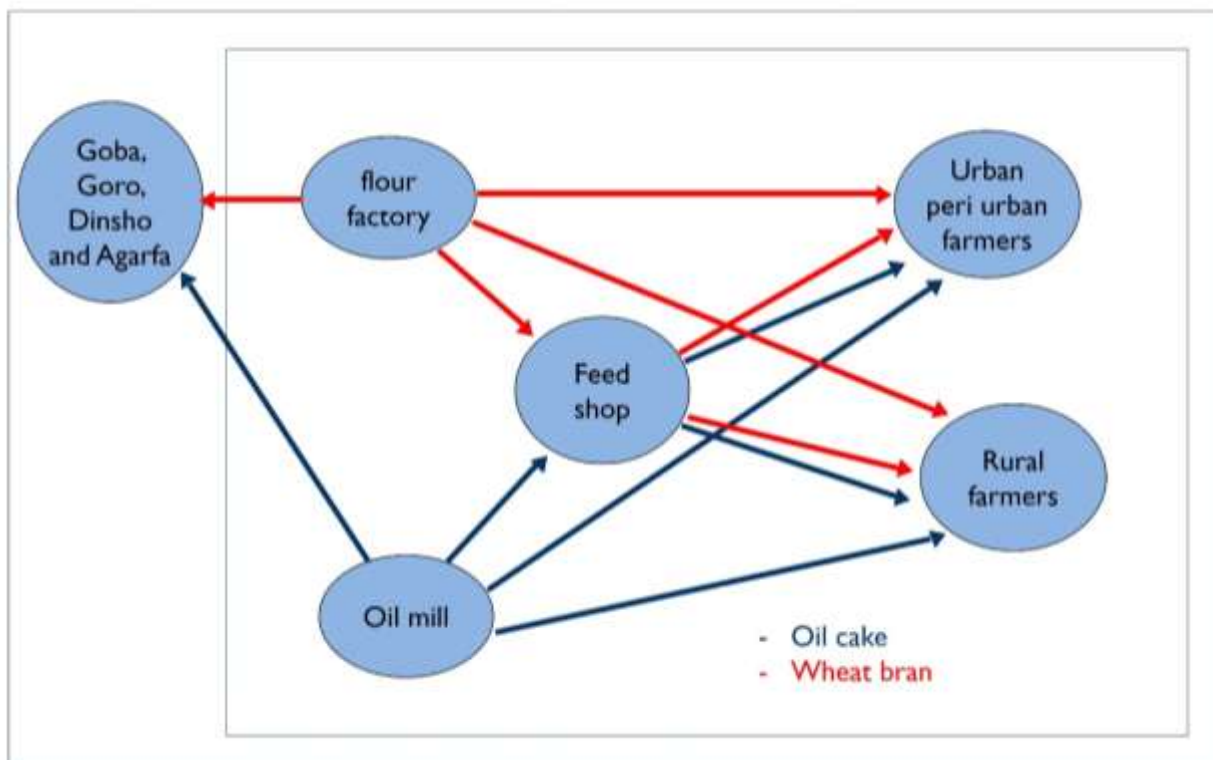
4.2.2.2 Input/services providers

- The abattoir which provides slaughtering services for large ruminants only, should be assisted in also providing slaughtering services for small ruminants in order to contribute to better quality meat (human health). Following the example of Basona Worena, privatization of the abattoir may also be explored.
- To support the production of specific type of animals by (groups of) farmers, linkages with veterinary services (at type D clinic level) should be established to receive (collective) services for treatment, especially for deworming animals for fattening. Interventions proposed for dairy also apply for veterinary services/drug supply for fattening animals.

Agricultural Industrial by-products for fattening are available for fattening in (peri-) urban and rural areas from the flour factory, oil mills, feed shops and the mills which process pulses and cereals. The linkages are shown in Figure 10.

3. It is noted that such a study has been carried out for small ruminants by Africa RISING–ICARDA in 2012.

Figure 10 Feed AIB supply business for small & large ruminant producers Sinana



- To stimulate demand and use of these AIBs for fattening, similar interventions as for dairy AIB feed supply are proposed i) bulk purchase by groups of fatteners linked to the factories, to reduce the cost, ii) awareness creation on the use of the AIBs for fattening, iii) advice on the appropriate mixing of AIB and crop residues for fattening and iv) commercial processing of AIBs for fattening mixes.
- It is noted that the Africa RISING–ICARDA value chain study for small ruminants conducted in 2012 also contains an analysis of the production system and potential interventions.