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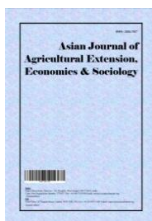
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## **Marketing Chain and Structure, Conduct and Performance of Sesame: The Case of Kafta Humera District, Western Zone of Tigray, Ethiopia**

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### **Author's contribution**

*The sole author designed, analysed, interpreted and prepared the manuscript.*

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### **ABSTRACT**

This study analyzed marketing chain and structure, conduct and performance of sesame in Kafta Humera district of Tigray region, Ethiopia; using primary and secondary data obtained from field survey and desk review using a semi-structured questionnaire. Multistage random sampling technique was used to draw 128 and 126 small and, large-scale sesame producers, respectively. Also, a total of 44 assemblers, 5 cooperatives, 13 exporters and one processor were interviewed. Applying the descriptive statistics method and market observation of the researcher; the major sesame market chain actors were producers, assemblers, cooperatives, exporters and processors. The concentration ratios of the first four and eight large local assemblers and exporters indicated that there was a weak oligopoly market structure. It is also found that there were entry barriers, information asymmetry and collusion in price-setting; indicating that sesame market was deviating from the norms of competitive market structure. Considering free on board of hulled sesame price; the gross marketing margins of 5%, 12% and 45% and net marketing margins of 1%, 3% and 17% obtained by assemblers, exporters and processors, respectively. But, Considering the free-on-board price of raw sesame; the gross marketing margins of 7%, 18% and about 75% and net marketing margins of 1.13%, 4.41% and 4.85% obtained by assemblers, exporters and producers, respectively. All these indicating that the sesame market was being poorly performing. Depending

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on the results found this study recommends, it will be better if the focus is given to value-added product export, securing competitive market through minimizing entry barriers, strengthening timely updated market information and formal credit access, hiring marketing experts at market centres to control collusion of traders in price setting.

**Keywords:** *Market conduct; kafta humera; market chain actors; market structure; market performance and sesame.*

## 1. INTRODUCTION

### 1.1 Background and Justification

In Ethiopia, agriculture has contributed to livelihoods of about 85%, employing about 85% of the labour force, accounts for about 45% of GDP and foreign exchange currency of about 86% [1]. Accordingly, the government of Ethiopia has taken initiatives such as agricultural growth, an agricultural transformation that could be assured by improving efficiency and market performance. Of the major crops cultivated in Ethiopia, sesame is one of the six priority crops [2]. which performs best on well-drained, moderately fertile soils of light to medium texture with temperature ranging between 20-35°C [3]. In Ethiopia, sesame accounts for 3.35% of total area and 1.1% of the total grain production which is being produced as a cash crop by more than 867,347 small-scale farmers who cultivate 0.42 million hectares of land to produce 0.29 million tones. Besides, it is also produced by large-scale producers who cultivate about 0.28million hectare of land to produce more than 0.22 million tones [4]. Since sesame is cash crop more than 70% of the national sesame harvested (accounting for over 90% of the values of oilseed export) was marketed at the international market generating about 427 million USD [5]; where more than 68% of the total national supply is contributed by North Gondar and Western Tigray lowlands [4]

In Tigray region, more than 176,030 small-scale [4] and more than 1130 large-scale producers [6] were engaged in sesame production that supplied 88.7% of the total production in the region [7]. In the Western zone of Tigray particularly Kafta Humera district, sesame own majority and the leading economic importance [8]. It also employed 370,000 seasonal labourers coming from other zones of Tigray, Amhara, Oromia and SNNP regions [9]. The study area took the lion share in the region's sesame area (76.33%) and total production (76%) for the average productivity estimated to be 7Qt/ha [4]. Sesame market in Ethiopia particularly in Kafta

Humera is characterized by the chain from production, local collectors and exporters. The sector's market chain was faced by challenges such as information asymmetry, barriers to entry resulted from different sides and imperfection in the interaction of market actors [10]. Sesame is the second agricultural product that earns foreign exchange currency for Ethiopia's economy [4] and it is the major crop grown in the study area exported to China, Israel, Jordan, Turkey, Saudi Arabia, Greece, Yemen, United Arab Emirates, Japan, UK, Egypt and others [11].

### 1.2 Problem Statement and Purpose of this Study

Even though the study area has remarkable potential for sesame productivity and the benefits obtained from the crop, it suffers by low productivity by far lower than the FAO estimated potential (which is about 16 Qt/ha) [3]. Also, through farmer's practice, the productivity was ranging from 2 to 13.75 Qt/ha [9,12]. So conducting this study will help in improving the chain and so improving productivity. Here also regardless of the considerable international market demand for Humera type sesame which is produced in the study area, it was constrained by many factors such as lower price, weak market linkage and lack of market information [10]. So, analysis of sesame marketing provides knowledge on identifying the actors of sesame market chain and their role, conducting behavior of market participants and structure and performance of the market.

### 1.3 Objectives

Generally, this study was designed to assess the sesame value chain with its major actors and its marketing performance in Kafta Humera district, Western zone of Tigray region.

#### Specific objectives

Specifically, this study was proposed to:

- Identify the major actors participating in sesame markets and their roles in the study area until the *fob* port.

- Analyze the sesame marketing structure, conduct and performance in Western zone Tigray.

## 1.4 Hypothesis

The null hypothesis of this study was that there is a perfect sesame market performance where the price was set through negotiation in and no barriers to entry in the study area. It also hypothesized that actors obtain fair market share. While the alternative hypothesis was there is imperfect sesame market performance with full of barriers to entry, biased price setting and weak market infrastructures.

## 2. RESEARCH METHODOLOGY

### 2.1 Description of the Study Area

The study was conducted in Kafta-Humera district; Western Zone, Tigray Regional State. The western zone of Tigray Region has four districts: Setit Humera (town), Kafta Humera, Welkayt and Tsegedie [9]. The study covered the lowland areas of Kafta Humera district. Kafta Humera district is bordered by Eritrea from North, Sudan from West, Tsegedie district from South, Welkayt district from East, and Northwestern zone from Northeast. The study area has 24 kebeles all of which have the potential for sesame production. The district has a population of 53,945 male, 49,792 female and total of 103,692 with 26,352 households covering an area of 4,542.33 square kilometres with 396,852 ha cultivable land [13].

The district is an investment area identified by the government where there are more than 1,130 large-scale producers who cultivate sesame [8]. In the district, there are a total of 17 sesame market centres having a total of about 356 assemblers [14]. The study area is known for the cultivation of various cereals predominantly sesame and sorghum. These crops were the district's important marketable crops as the reports of [12] and KHARDO [13]. In addition to crop production; the district population keep/rear special breed called *begait* cattle, goat and sheep to the greater share. The study area lies in the Latitude (°N) of 14°15' to 13°36' and Longitude (°E) 36°37' to 36°41'.

### 2.2 Data Types, Sources and Methods of Data Collection

Both primary and secondary data sources were used in this study. Primary data sources are

collected using formal survey procedures from small-scale and large-scale sesame producers, assemblers, exporters and processors in four randomly selected sesame producing kebeles as in Fig. 1, district and zonal markets applying semi-structured questionnaires; rapid market appraisal (RMA) and focus group discussion. Data were also collected from different governmental and non-governmental offices. While the secondary data was collected from the selected kebeles agricultural development office, primary cooperatives, district offices (agriculture and rural development, land administration, custom and revenue), large-scale producers' cooperative, HuARC, western zone zonal office, ECX Humera branch and different published and unpublished reports. The secondary data on the price of sesame grain for four years (2012-2016) was obtained from ECX main office.

### 2.3 Sampling Procedure and Sample Size

The study used a multi-stage sampling technique for selecting sample sesame producers and assemblers. First, from Western zone Tigray, Kafta Humera district was selected purposively because of the availability of both small-scale and large-scale sesame producers in the same location and its potentiality to sesame production. Then, producers were clustered into small-scale and large-scale producers. Secondly, four kebeles (Mai Cadra, Baeker, Adebay and Rawyian) were selected randomly (Fig. 1 and Table 1). These kebeles represent the district's sesame potential kebeles as owing society having a similar culture, economic status, climatic condition, agroecology, farming system, topography and geographic arrangement, soil type, etc. These kebeles also share similar administrative bodies and expertise support from the district. The average distance from one kebele to the other next kebele is about 19 Km. The kebeles' average distance from Humera town ranges between 7 to 50 Km.

Then depending on the probability proportional to the size of sesame producers from each sample kebeles, the specified numbers of respondents were obtained based on random sampling technique. The intended total sample size was determined based on the formula developed by [15]. Considering the confidence level of 90% and accepting the error (e) of 9%,

$$n = \frac{N}{1 + N(e^2)} \quad (2.1)$$

Where  $n$  = sample size,  $N$  = total households of the district that is equal to 26,352 and 1,130 for small and large-scale producers respectively. Based on the calculation, 128 small-scale and 126 large-scale sesame producers were sampled (Table 1).

Sesame market centres in the district were also selected purposively. Then from the above randomly selected kebeles, a total of 44 local assemblers (10% of the total assemblers) were selected using random sampling technique from the total local sesame assemblers in four market centres PPS (Table 1). Besides, a total of 4 primary cooperatives from the above-selected kebeles and one additional large-scale producers' cooperative were sampled. A total of 13 exporters and one processor were also interviewed. Regarding the sampled sesame assemblers and cooperatives in the district; these selected kebeles cover about 42% of total assemblers in the district.

## 2.4 Data Analysis

This study used descriptive statistics such as mean, frequency/ratio, and range for analyzing market margin, analyses of concentration ratio (CR) and amount of the commodity handled. The S-C-P approach is also used for describing and presenting the concentration of the market actors, characteristics of the market players, organizational structure of market actors and margins obtained.

**Market structure:** It is measured by analyzing the concentration ratio, barriers to entry and exit to/ from market and vertical coordination/ integration of actors in the market chain. Concentration ratio (C) measures the proportion of sesame grain amount accounted by 'r' large traders in assemblers and exporters considering as  $s_i$  = Market share of  $i^{th}$  firm and  $r$  = number of firms owning the largest share.

$$C = \sum_{i=1}^r S_i, i= 1, 2, 3, \dots, r \quad (2.2)$$

Even though there were no clear cut limit points for the indication of market structures, the commonly used points were as: No concentration ( $CR_4=0\%$ ) means perfect competition; low concentration ( $CR_4$  ranges from 0 to 50%) means competitive with weak power; medium concentration ( $CR_4$  ranges from 51 to 80%) means an oligopoly; high concentration ( $CR_4$  ranges from 80 to 100%) means from an oligopoly to monopoly; total concentration ( $CR_4 =$

100%), a monopoly [16,17]. Barriers to entry and exit to/from market are analyzed through systematic physical observation in the markets focusing on product differentiation, availability of market infrastructure, capital requirement and competition and government policies. The vertical coordination/integration of market participants are also analyzed systematically observing the linkages among different actors along the sesame market chain.

**Market conduct:** Many research results showed that there is no fixed way of analyzing market conduct but uses a systematic way of reasoning and evaluation. Similarly, this study was designed to analyze and evaluate based on the systematic way of observation on the pricing strategies, collusive behaviour of market participants and mergers (the combination of market participants).

**Market performance:** It could be analyzed using price stability, profitability and market margin obtained and costs incurred to the market participants. But, in this study, the market margin obtained by each market actors were used to measure the performance of sesame market in the study area.

**Market margin:** As explained by Mendoza et al. [18] market margin is calculated by finding price variations at different segments and then comparing with the final price to (consumer price). As the price differences at each exchanging stage are going to take its share from the final selling price paid by the consumers, then the consumer price is the base or the common denominator for all marketing margins.

$$TGMM = \frac{CP - FP}{CP} \times 100 \quad (2.3)$$

$$GMMP = \frac{CP - MGM}{CP} \times 100 \quad (2.4)$$

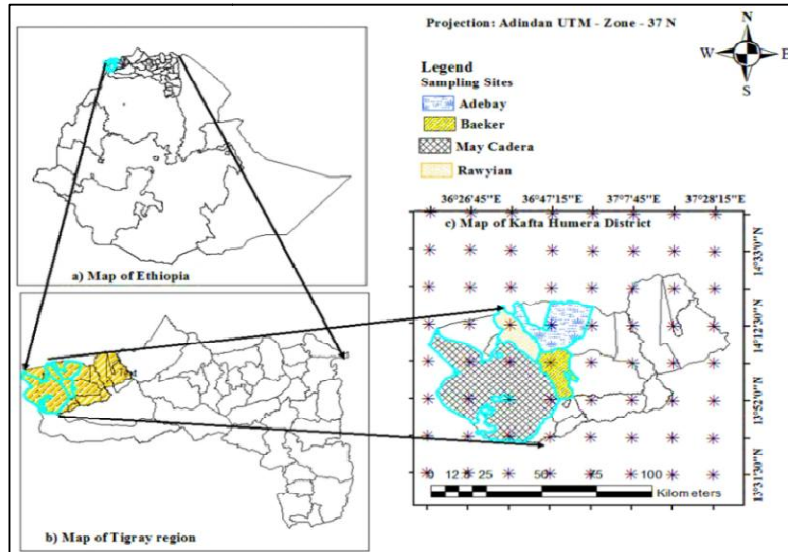
$$NMM = \frac{GM - MC}{CP} \times 100 \quad (2.5)$$

Where: CP= Consumer price; FP= Farmer's price; GM= Gross Margin MC= Marketing Costs; GMMp = Gross Marketing Margin of Producers, NMM = Net Marketing Margin; TGMM = Total Gross Marketing Margin, Gross Margin is a profit divided by sales revenue or gross profit divided by net sales revenue, expressed as percentage. But here in this study, the consumer price would be changed by the *FOB* price as it was the exported commodity considering the raw and processed sesame exported.

**Table 1. Number of sampled small and large-scale producers from each kebele**

Kebele	Large-scale			Small-scale			Assemblers		
	Total pop.	Sample	percent	Total pop.	Sample	Percent	Total pop.	Sample	percent
Adebay	98	16	12.7	2817	36	28.13	19	7	15.91
Baeker	149	25	19.84	1953	24	18.75	26	9	20.45
Mai Cadra	409	68	53.97	3526	45	35.16	59	20	45.45
Rawyian	107	17	13.49	1805	23	17.97	51	8	18.18
Total	763	126	100	10101	128	100	155	44	100

Source: For small-scale [13]; for large-scale [6]; for assemblers [14]

**Fig. 1. Map of the study area; Kafta Humera district, western zone Tigray**

### 3. RESULTS AND DISCUSSION

#### 3.1 Actors of Sesame Market

The major sesame grain market actors in Kafta Humera district up to export level were; producers (both small-scale and large-scale), local market assemblers, cooperatives, processors and exporters. This result is similar to the result found by several authors [19,20,21]. In addition to these explained major actors, there were also service providers in supplying materials, storage, balance, cleaning machine, transportation service, information access and training, controlling the regular market performance and commissioning activities.

##### 3.1.1 Characteristics of the major market actors and their role

###### a. Sesame producers

In Kafta Humera district there exist two types of sesame producers, small-scale and large-scale who supply the Humera type sesame grain to the international and national markets. According to

the study results in Table 2, small-scale sesame producers from Kafta Humera district supplied 99.1% of their sesame grain produced in 2015/16 to sesame markets, while they kept 0.86% for seed and 0.04% for their home consumption. Regarding the large-scale sesame producers in the district also, they supplied 98.9% of their produce in 2015/16 to sesame market, while they kept 1% for seed for the next production season and 0.1% for home consumption (Table 2). The percentage of sesame grain supplied to the market is in-line with the results revealed by several authors [19,20,22]. According to the result obtained from the survey and supported by FGD, sesame market in the area was characterized by unfair price decided by buyers where it takes place in the market centres (Table 3).

###### b. Buyers of sesame from producers

According to the institutional regulation of the Ethiopian government, sesame marketing was designed and controlled by ECX where sesame could not sale out of market centres.

Holding these rules and regulations, as shown in Table 3, about 40% and 33% of the sampled small and large-scale producers sold their sesame product to assemblers; while 47% and 14% sold to cooperatives and the remaining 13% and 24% sold to both cooperatives and assemblers respectively. Besides, about 29% of the large-scale producers sold their sesame product to exporters. The study results further showed that 33% and 67% of sesame produced by small-scale sesame producers is supplied to local assemblers and cooperatives, respectively (Table 3). Regarding the large-scale sesame producers also about 12%, 9% and 79% of their total sesame produce have supplied to local assemblers, cooperatives and exporters respectively (Table 3). Generally, buyers of sesame grain from small-scale producers in the study area were only local assemblers and cooperatives. Then these buyers further supply to cooperatives, exporters, and/or processors that finally export to the international market. But large-scale producers can directly supply their sesame produce to exporters or they export themselves. The result found is in-line with the results found Dawit [23] and Sorsa [24]. Here the buyers of sesame from sesame producers were:

**Local market-level sesame assemblers:** These were the traders at local sesame market centres, who collect sesame from small and large-scale sesame producers. According to the study result, local assemblers only bought sesame for trade to supply to exporters. As it is presented in Table 4, assemblers bought 97.5% of the total amount from small-scale, while 2.5% from large scale producers and sold about 20% to cooperatives, while about 80% to exporters through ECX.

**Cooperatives:** As the report obtained from KHCRO [14], in Kafta Humera district there are multi-purpose primary cooperatives in each kebele, one union and one federation; that participate in sesame buying and selling activities. As reported by the sampled cooperatives authorities, they bought sesame from their members (small-scale farmers, large-scale producers and assemblers). Financial source of these cooperatives were banks, their own and buyers, especially processor. The study result shows that about, 46% of the sesame bought by cooperatives was from large-scale producers, about 39% from small-scale producers and 15% from local assemblers (Table 4). According to personal observation and survey results, local assemblers and large-scale producers supplied their product to cooperatives for the reason that cooperatives offer a premium

of birr per Qt of 70 to 90 compared to others. As this price difference paid by cooperatives is in favour of assemblers as they simply buy and transfer it to the cooperative with lower marketing costs. But the ECX regulation did not allow this transaction for minimizing the length of the marketing chain. Understanding the ECX regulations, assemblers and large-scale producers sold their product to the cooperative by making reasonable as it was their production. Generally, even though the market bylaw does not allow assemblers and large-scale producers to supply sesame seed to cooperative and/or to other traders at the same status, this additional price attracts them to supply to the cooperative reasonably.

**Exporters:** Sesame exporters were the last marketing chain link in the domestic sesame marketing chain. They were relatively well equipped with the necessary capital, facilities and knowledge. They have the composition in the national wise as they could buy and export the commodity produced in any of the sesame producing parts of the country; even there are companies from abroad (from India). Most of these exporters did not have cleaning machine rather clean by paying per Qt.

**Processors:** This is one of the actors of sesame market chain that bought pure (free of chemical) sesame grain from producers through cooperatives in the study area. As reported by the company managers, it did not simply buy; rather check for being free from chemical and other mixes that could result in loss of its organic nature; by monitoring from sowing time to the end of harvesting. By conducting these activities; the company assures traceability of the commodity to be supplied internationally. They also make a trademark while the cooperatives bought from member producers then if there would happen any failures after the laboratory checkup that product would be returned to the producer.

As the data obtained from KII of processors, in 2015/16 sesame hulling company bought 61.53% of the total sesame sold by the sampled cooperatives in the district. As the company report shows, all of them bought sesame grain could not be supplied to the international market; rather about 20 per cent of the bought amount could not be exported for the reason that 75% was the husk cover which sold for livestock feed by birr 19 per Kg, 16.6% was lower quality sesame grain used for oil extraction sold by birr 10.00/Kg. The remaining 8.8% of the un-



exported remain amount was the loss incurred during re-cleaning and transporting activities. The hulled high-quality sesame was supplied to the international market for the world's high-quality sesame product demanding countries of South Asia, Central America, Middle East, Oceania, Eastern Asia, South Asia, and Western Europe. However, most of the sesame exported to the international market in raw product form was supplied to China that focused on the cheaper price. Thus, it is important to focus on partial processing (hulling).

### 3.1.2 Service providers of sesame marketing chain and their role

The service providers in sesame market in Kafta Humera district were those that support the marketing transaction but not participate in handling (taking the risk) of the commodity traded. In the study area, the services provided by governmental organizations were related to extension service, training, improved seed, marketing consultancy, issuing and implementing the rules and regulations of sesame marketing. The individual support service providers were such as the transportation service providers, suppliers of packaging sack, sheet used during

threshing and re-cleaning, tailors, garages and spare part shops, fuel and lubricant shops, tractors and storage renting service providers and weighting balance service providers. There were also financial service providers by banks, a microfinance institution (DCSI), cooperatives and informal money lenders. The detailed explanation will be as follow:

**Input service providers:** These services include mostly the production inputs such as inorganic fertilizer and improved sesame seed. Fertilizer was only supplied by the hand of MPP cooperatives found in each kebeles. The other input supplied by the input service providers was improved seed supplied by HuARC, KHARDO. Besides the governmental source of sesame improved seed, there were also seed obtained from the producers themselves which were selected for seed during the harvesting time observing its performance.

**Tractor renting, garage and fuel and lubricant supply service providers:** The tractor service is provided mostly by the large-scale producers who own for ploughing their farm. So, they rented out on an hour base either after they had ploughed their farm or simply rent out on a

**Table 2. Amount and share of sesame produced and allocated for different purposes**

Purpose of sesame produced	Small-scale				Large-scale			
	Total (Qt.)	Mean (Qt.)	%	Std. Err	Total (Qt.)	Mean (Qt.)	%	Std. Err
Sold	1806.7	14.12	99.1	0.002	37284.5	295.91	98.67	0.0013
Seed	0.75	0.124	0.86	0.002	48.00	3.6	1.2	0.0007
Consumption	15.84	0.006	0.04	0.0003	453.25	0.38	0.13	0.0003

Source: Survey result, 2016

**Table 3. Marketing characteristics of small and large-scale sesame producers**

Market characteristics		Small-scale		Large-scale	
		Freq.	Per cent	Freq.	Per cent
Who decides on sesame price	Buyers	124	96.88	126	100.00
	Producers	4	3.13	--	--
Buyers of sesame	Assemblers	51	39.84	42	33.33
	MPP cooperatives	60	46.88	18	14.29
	Exporters	--	--	36	28.57
	MPP cooperatives and assemblers	17	13.28	30	23.81
	No, unfair	119	92.97	126	100.00
Fairness of the price decided	Yes, fair	9	7.03	--	--
Buyers were obtained through/at	Market centre	110	85.94	82	65.08
	On-farm	5	3.91	3	2.38
	Friends	13	10.16	9	7.14
	Commission agents	--	--	32	25.40
Amount of sesame sold to	Assemblers	581.3Qt (33.05%)		4378Qt (11.74%)	
	MPP. Cooperatives	1177.7Qt (66.95%)		3285Qt (8.8%)	
	Exporters	--		29649Qt (79.46%)	

Source: Survey result, 2016



**Table 4. Amount of sesame bought by local assemblers and sold to different buyers**

<b>Actors (sources) from whom sesame was bought</b>	<b>Amount bought by local assemblers at the local market</b>		
	<b>Observations</b>	<b>Total bought (Qt.)</b>	<b>Per cent</b>
From small-scale	44	60850.00	97.53
From large-scales	44	1538.00	2.47
Total	44	62388.00	--
The sesame bought by local assemblers in 2015/16 were sold to			
Actors to whom sesame sold	Observation	Total sold (Qt)	Per cent
To exporters	44	59693.65	79.55
To MPP Cooperatives	44	1836.82	20.45
Total	44	61530.47	--
Amount bought by cooperative at the local market			
Actors (sources) from whom sesame was bought	Total (Qt.)	Mean amount bought per individual (Qt.)	Per cent
From small-scale producers	17900.00	3580.00	38.68
From large-scales	21318.00	4263.60	46.07
From local assemblers	7054.00	1410.80	15.24
The sesame bought by cooperative in 2015/16 were sold to			
Actors to whom sesame sold	Total (Qt.)	Mean amount sold per individual (Qt.)	Per cent
To exporters	1778.000	352.60	3.84
To Union Cooperatives	2722.00	545.50	5.88
To processors	28472.00	5694.40	61.53
Directly export	13300.00	2660.00	28.74

Source: Survey result, 2016

monthly bases, while they plough their land by renting from others on hour bases. The garages also provided the service of repairing the tractors (to be used in ploughing and transportation), trackers (to be used in transporting sesame grain). It was provided by different garages found at Mai Cadra and Humera towns. These garages hardly work especially during production season (April to July). The fuel and lubricant supplier shops also play an important role in supplying fuel for tractors and trackers. Without this input, the farm could not plough and the sesame grain would not be transported so that these shops were also accounted as service providers of the commodity obtained.

**Agricultural tools, food preparation utensils, packaging sack and threshing sheet suppliers:** The agricultural tool that was used in the sesame farm in the study area includes axe, sickle, ploughshare and other related tools are mostly done by carpenters and sold in local markets. The food preparing and consumption utensil which are used in the sesame farm by the sesame production activity workers are also bought from the traders at local market centres located in each kebeles. The packaging sack is a material used for packaging the sesame grain which was mostly supplied by cooperatives located at each kebeles. But it was also supplied

by the individual traders who were not specific to supply only that material rather they supply the packing material on the seasonal bases.

The material sheet for threshing cleaning and re-cleaning activities was also supplied to producers and traders by individual traders in Humera and other Kebeles residences. Here the tailors also provide the production support service by tailing the sheets used for the threshing purpose who are located in Humera and the kebeles residences.

**Labourers hired in sesame production, loading/unloading and re-cleaning activities:** According to the information from [2] the workers hired in the western zone with the greater share in the Kafta Humera district. This is indicating that; production, loading, unloading and re-cleaning activities require a higher number of workers.

**Store renting, re-cleaning machines and weighing balance:** Except few sesame producers and traders, most of them do not own store. In this case, even though some of the small-scale producers stored in their residence, the remaining small-scale producers and large-scale producers used rented store. Most of the assemblers in the study area also use every

month rented store. The exporters use the sesame store in the store rented by ECX. So, it is possible to conclude that store renting takes place at all stages of the chain in the production year. Besides to the above, in the study area, there were only 13 sesame grain re-cleaning machines that perform re-cleaning service for the exporters where most of the exporter used rented in sesame grain re-cleaning machines on per quintal bases. In the study area, the number of track load weighting balance are only two which perform measuring the load weight or weighting balances provide service to large-scale producers, assemblers and exporters.

**Institutional support services:** The services provider institutions are ECX (Humera branch), KHARDO, research centre (HuARC), custom and revenue office and land administration office. The ECX Humera branch is mainly structured to control the marketing aspects of sesame targeting the benefits of the stockholders by issuing rules and regulations, implementing and follow up of these designed rules and regulations.

ECX Humera branch also provides the standardization by taking the sample and gives the standard for the sesame grain to be exported. It is a strict regulation that as a means of trade provisions regulation enforcement, nearly all of the country's sesame should be traded through ECX. But some drawbacks in standardization, timely performing the duties like, limiting the number of days allowed for storing sesame grain entered to the store of ECX (which is only 30 days), lack of timely information, too limited coverage while the supply was too vast, limitation in utilization of standardized laboratory technology and lack of owning standardized store.

The KHARDO is implementing different activities in improving the productivity of sesame as it is the major crop in the study area. Some of the activities undertaken by KHARDO were supporting sesame producers and traders through extension service and training provision. Besides, the office implemented field days, demonstration of best practices and field-based support system. Regarding sesame marketing also the office had a position to follow up the daily transaction and store availability (during licensing). But even though it was important to control the traders' market transaction, that was limited to purchasing price, controlling the transaction not to takes place out of sesame

market and follow up was for a limited time not beyond spot walk.

However, for the marketing part it would be better if the office incorporates monitoring of markets the whole day, covers the focus of evaluation to as who opens and who did no and further for what reason of not opening the purchasing office, the regular participation of the trader in the sesame market centre in purchasing activities, what problems had facing the producers at the market and also the problems facing traders. Also, it would be better if the office evaluates the ownership and utilization of store for the sesame assemblers. This is because even the assemblers rented store, they did not use for storing the commodity, rather they store in the office at the market centre with a lower standard for storing.

The research centre (HuARC) is providing support service starting from production to export. These services are improved seed generating and demonstration, training, filed level support service and consultancy services. But, this has a limitation in reaching to a large number of producers, training is mostly on production aspect not on marketing and demonstration of improved seed is a slow rate. Custom and revenue office of Kafta Humera in collaboration with agriculture and rural development office and trade and industry office provides license, monitoring the performance of sesame marketing centres, collects tax revenues. The land administration office of Kafta Humera district also provides service of follow up on utilization of cultivable and non-cultivable land as per the rules and regulations. But, it has limitations in effective follow-up and monitoring the rules and regulations.

**Financial and accounting service:** Sesame sector is higher finance requiring sector for performing its activities. In most of the stockholders' case, this financial requirement could not be fulfilled from their equity. So, the credit is sourced from microfinance institutions (DCSI), cooperatives, banks and informal money lenders (IML).

**Transport service providers:** These are the mode of transmission sesame grain among the producers, assemblers and exporters. In the district's local market centres there are good road facilities to take the collected sesame to ECX for standardization and storage until it is sold.

**Table 5. Mode of transportation used by the sampled producers**

Mode of transport		For small-scale producers		For large-scale producers	
		Freq.	Percent	Freq.	Percent
From farm to Storage	Cart	90	70.31	10	7.94
	Tractor	38	29.69	114	90.48
	Truck	0	0	2	1.59
	Mean payment per Qt.	24.85 birr		34.63birr	
From Storage to market	Cart	128	100	84	76.66
	Tractor	0	0	24	19.05
	Truck	0	0	18	14.29
	Mean payment /Qt.	9.36 birr		14.51birr	

Source: Own survey result, 2016

**Table 6. Mode of transportation used by sampled assemblers and payment of commission agent**

Mode and cost of transportation		For local assemblers		
		No. traders	%	Mean
From the local market centre to Storage	0 (do not transport)	29	60.42	--
	Cart	19	39.58	--
	Total	48	100	--
	Transport cost /Qt.	--	--	1.33birr
From Storage to ECX store	Truck	48	100	--
	Transport cost /Qt.	--	--	19.72birr
Payments for commission agent	% Per total return	--	--	0.4
	Per Qt (Birr)	--	--	8.2 birr

Source: Survey result, 2016

The number of days sesame grain can stay at ECX for levelling determined the transportation cost of assemblers. According to the study result, most small-scale producers (70.31%) used cart to transport from their farm to store. But, most of the large-scale producers (90.48%) used tractor for transporting the sesame grain from farm to store (Table 5). All small-scale producers used car to transport their stored sesame grain to market. Regarding the large-scale producers also most of them (76.66%) had used cart, to transport their product to market as in Table 5. As it is presented in Table 6, 60.42% of the assemblers did not transport the sesame they bought to store rather they store in the market centre and directly take to the ECX. But the remaining sampled individuals took to store using cart (39.58%).

For transporting sesame grain from farm to store, producers paid the average price of 24.9 and 34.6 Birr per Qt; while in transportation from store to market the average price was 9 and 14.5 birr/Qt for small and large-scale producers, respectively (Table 5). The sampled assemblers also paid the average transportation cost of 1.33 birr/Qt to transport from the market to their store

and 20 birr/Qt to transport from their store to the ECX (Table 6).

**Commission Agents:** These categories of market actors are common in sesame marketing that is monitored by ECX and works their commissioning activities at ECX. They did their commissioning by discussing with their clients. These agents got on average 0.4% of the total return obtained or 8.2 birr/Qt (Table 6).

### 3.1.3 Figurative representation of sesame marketing chain

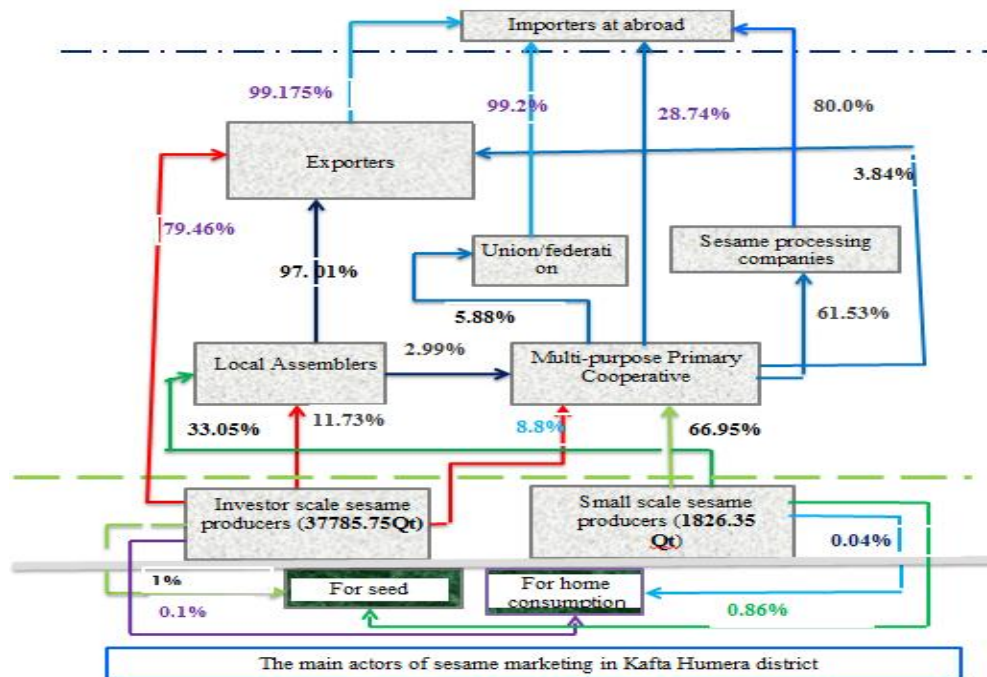
Sesame marketing chain is stretched from producers to consumers abroad. But, this study is focused on the chain from producers to the export level (*fob*). It is restricted for the reason that to go beyond, it requires more resource and time. Figuratively the market chain can be presented as in Figs. 2 and 3. According to the result of this study, the initial links for sesame marketing channels were producers (both small-scale and large-scale) and the final destinations in the country were exporters. In between intermediaries; such as local sesame assemblers, cooperatives and unions and

processors exist which play significant roles for the movement of the product to its final destination. The figurative representation of sesame market chain is so depicted from the bottom-up structure that producers are at the bottom (base) then to intermediaries and then to processors and exporters so exported as the head of the arrow shows (flow from→to). The magnitude of the sesame hold amount by these channel participants is measured based on the 2016 business transaction from the production in 2015/16 production season.

The support service provided by different sesame market chain participants is also depicted in Fig. 2. In this figure, the arrowhead indicated the direction of the service from the service providers to the service receivers. The service providers are depicted in both sides (left

and right), whereas the service receivers are in the middle to receive the service from both sides. It is important to understand that the colours and line type in the two market chain figures do not imply with the chain rather it is used for the easier identification of the flow.

Regarding the possible market channel, this study identified that there are ten possible marketing channels for the sesame grain from the level where it is produced to reach the level where it is exported. The shortest channels are channel number 3 and 7; while the longest channels here are Channel number 5, 8 and 10. According to the report from respondents, the most common/familiar channels are channel 2 and 7. Channel 8 is the special characteristics of large-scale producers who have the opportunity to supply to the exporters directly through ECX.



**Fig. 1. Major sesame market chain actors in Kafta Humera district**

The identified market channels depicted in Fig 2 are:

1. Producer→ Primary Cooperatives→ Union→ Importer
2. Producer→ Primary Cooperative→ Exporter→ Importer
3. Producer→ Primary Cooperative→ Importer
4. Producer→ Primary Cooperative → Processor→ Importers
5. Producer→ Assembler→ Primary Cooperative → Processor→ Importers
6. Producer→ Assembler→ Exporters → Importers
7. Producer→ Exporters → Importers
8. Producer→ Assembler→ Primary Cooperative → union→ Importers

9. Producer → Assembler → Primary Cooperative → Importer  
 10. Producer → Assembler → Primary Cooperative → Exporters → Importers

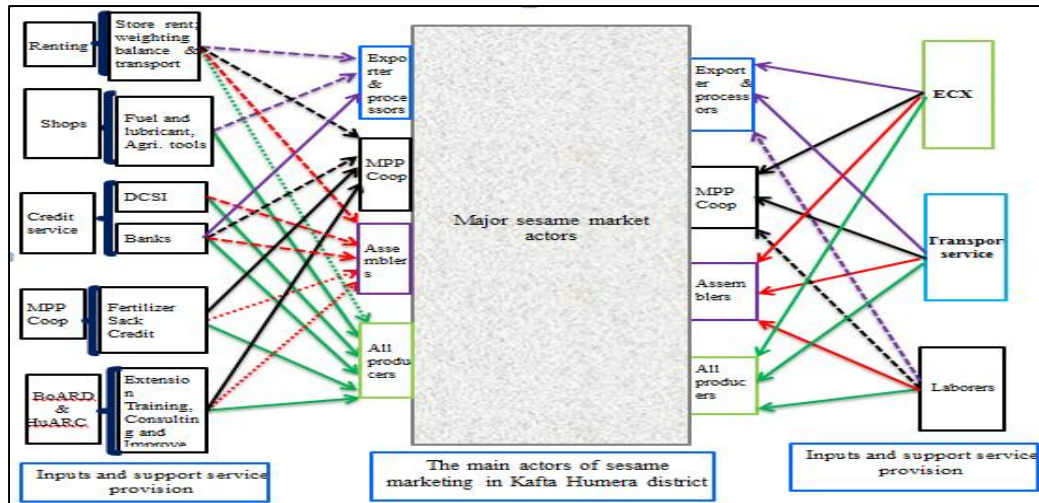


Fig. 2. Sesame market chain support service providers in Kafta Humera district in 2016

### 3.1.4 Structure, conduct and performance of the sesame market

#### 3.1.4.1 Sesame market structure

As sesame was the second agricultural commodity to earn export exchange, the government policy selects and groups with the export earner cash crop commercial commodity. Sesame producers in the target area also know this strategy and allocate for selling except few who deduct for seed and consumption. According to the research findings, sesame export price did not significantly affect by the domestic factors. The existing reality was that international prices could significantly affect the export price and in turn, it affects the producers' and traders generally national and regional price. This enables us to say sesame market is characterized as the Buyer's market. The study revealed that the most common actors of sesame market in Kafta Humera district are producers (both small-scale farmers and large-scale producers), Cooperatives (primary and Union), local assemblers, Processors and exporters.

**Measurements of sesame market structure:** The market structure is measured by analyzing the level of concentration ratio, barriers to entry and exit to market and coordination/integration of the sesame market chain participants. These measures are presented and discussed as follows:

#### Measures of sesame market concentration ratio:

There are local assemblers, cooperatives and exporters in the study area who are limited in their respective level. Concentration ratio (CR) is calculated from assemblers and exporters to estimate the power of market chain actors. Regarding the measure of market structure, this study analyzed the CR for local market assemblers and exporters.

The CR<sub>4</sub> measure of local market assemblers shows that the top four assemblers only controlled 38.7% of the total sesame purchased amount in 2015/16 (Table 7). In a similar calculation, the CR<sub>8</sub> measures of local market assemblers indicated that the top eight assemblers had only control 51.03% of the total purchased amount in 2015/16 (Table 7). The CR<sub>4</sub> and CR<sub>8</sub> result of local market assemblers indicated that assemblers had weak/low power to control sesame market. Thus, sesame market structure of the local market centres is a weak oligopoly. The results of HHI for the first four and eight assemblers (HHI=1640), also shown that the sesame market concentration was moderately concentrated.

The CR<sub>4</sub> measures of sesame exporters shown that the top four of the exporters only controlled 46.54% of the total sesame exported amount in 2015/16 (Table 8). In a similar calculation, the CR<sub>8</sub> measures of the power of exporters indicated that the top eight exporters only controlled 63.24% of the total exported amount

in 2015/16 (Table 8). According to the result of  $CR_4$  and  $CR_8$  of exporters found in this study, exporters had weak/low power to control sesame export market. The results of HHI for the first four and eight exporters (HHI=1570), also shown that the sesame market concentration was moderately concentrated. Thus, the export market structure is a weak oligopoly. In both cases (assemblers and exporters), the result of  $CR_4$  and  $CR_8$  was in line with the result found by Bosena [25]; but, in contrast with what Kindie [22] has found.

As it is presented in Table 7 and 8, the top four assemblers and exporters of sesame hold individually only 7.4% and 8.8% of the total marketed sesame, respectively. Similarly, the top eight assemblers and exporters individually covering/own only 2.31% and 2.77% of the total marketed amount respectively. To sum up, applying the measure of concentration ratio (CR) for the top four and eight sesame market actors in both assemblers and exporters, sesame market structure in the study district is a weak oligopoly.

**Barriers of entry to sesame market:** Sesame market in the study area is faced different barriers of entry that prevent market participants not to enter or not to continue in the market chain. According to the personal observation (RMA), reported by the governmental organizations in the district and report of the respondents at different levels; the major sesame market entry barriers were capital, governmental policies and infrastructural access. These sesame market entry barriers will be discussed as follows:

**Capital barrier:** The sesame marketing sector requires huge capital, which prevents individuals with lower capital from entering to the chain. As the systematic personal observation and report obtained from governmental organizations in the district and sampled respondents, the newly entering individuals to the sesame market chain requested to have a store, office at the market centre, office tools, weighing balance and initial cash at least half a million birr. Being these, individuals who did not have this minimum capital could not enter to the sesame market chain. However, as is presented in the concentration ratio section in the study district there are large numbers of individuals who fulfil the minimum required capital. The study is so indicating that even though there is a capital barrier since there are large numbers of individuals who fulfil the

minimum requirement, sesame market is weak oligopoly market structure.

**Governmental policy barriers:** These barriers are the policies and strategies designed by the government that prevent individuals who cannot fulfil the requirements from entering to the market participation/ transaction. The policies also withdraw individuals who cannot fulfil the requirements which enable them to continue in the chain. As the report obtained from governmental organizations such as custom and revenue office and office of agriculture and rural development of the district, the major governmental barrier of sesame market is licensing.

- a) **Licensing barrier:** All the sampled traders have specified trading license, unlike the condition during the study conducted by Kindie [22] where traders were having general not specified and specialized license. The informal observation and discussion of the researcher also proved the absence of trader working in the market centre without a license. According to the report from KHCRO [14], there were restrictive entry criteria to sesame markets as bylaw/regulation of sesame marketing. The sesame market entrance is restricted for the reason that individuals who want to enter trade should fulfil the criteria for being licensed. As the report of KHCRO [14], some of the criteria's for being licensed are the availability of standardized store, weighing balance, office at the market centre and capital not less than half million birr. For those who already licensed also the requirements are raised during license renewal performed yearly. These restrictions are followed up by the governmental organizations of the district; KHARDO and KHCRO in collaboration.

However, as a solution for the absence of store and cash on hand; traders fulfil it by renting store and borrowing money from different loan providers. Here what was observed as the problem is that some of the traders who rented store did not use it (they rent for obtaining the license); rather they store in the office at the market centre. This is for the reason that to reduce the transporting cost from the market centre to store.

- b) **Place restrictions:** it is a government policy that sesame is only sold and bought

in sesame market centres by only the licensed assemblers and/or multi-purpose cooperative. Thus, anyone who sells and buy sesame out of the market centres will be punished. As the report of KHARDO [13], in each kebeles there was one market centre; where selling and buying of sesame out of it is unlawful.

- c) **Level restrictions:** It is one of the government policies that restrict local assemblers to buy from producers only and to sale to exporters through the ECX channel. This restriction also limits exporters to only buy the sesame labelled (standardized)by ECX; from the ECX store only by bidding at ECX.

**Infrastructure access barriers:** This is related to the availability of road infrastructure availability and information access barriers which prevents market participants from entering to or continuing in the market chain.

- a) **Types of markets (typology of markets):** The sesame market centres are formal market places that regularly authorized gatherings of individuals who have a license to buy or sell sesame and regularly followed by government organizations. According to the report of KHCRO [14], the formal sesame markets in Kafta Humera district existed in 17 kebeles in which these market centres were opened every day and interested buyers and sellers meet to transact exchange. These local market centres in the district are located at a closer distance to the residence of sesame producers, on average not more than 7 Km distance. This enables the sesame producer well accessed to the market centre.

- b) **Market information:** It is the weapon for producers and traders in their production and marketing decisions. According to the systematic personal observation and report of the sampled respondents, there was no regular and updated source of market information in the study area. Producers did not have any regular source of market information; rather they mostly obtained from neighbours and buyers that may not be regular and timely (Table 9). It is found that 52% of the sampled small-scale producers obtained market information by own (themselves) searching the market centres (Table 9). It is also found that about 96% and 17.5% of the sampled assemblers and large-scale producers, respectively obtained market information through commission agents (Table 9).

Generally, there is sesame market information asymmetry (not common and timely updated information) in the study district. This information asymmetry negatively affects the profitability of sesame market participants. Thus, it also acts as an entry barrier to sesame market.

**Coordination/integration:** As the systematic personal observation and the report of the sampled respondents, some local sesame assemblers coordinated/integrated with producers. It is found that assemblers in all market centres coordinate to obtain the supplied sesame without competition. This coordination was performed by former relationships of friendship, formerly loan provision with free/lower interest rate and formerly negotiate with the producer while at their home; as the trader is

**Table 7. The concentration ratio of sesame grain assemblers in Kafta Humera district**

Traders	Cumulative % of traders	Purchased amount (Qt)	Cumulative purchased (Qt)	CR		HHI	
				The percentage from the total (%)	cumulative percentage	Merge exclude %Share	(% Share) <sup>2</sup>
1	2.04	13300	13300.00	12.29	12.29	24.08	580.00
2	4.08	11000	24300.00	10.17	22.46	19.92	396.75
3	6.12	9580	33880.00	8.85	31.31	17.35	300.93
4	8.16	8000	41880.00	7.39	38.70	14.48	209.85
5	10.20	4392	46272.00	4.06	42.76	7.95	63.25
6	12.24	3500	49772.00	3.23	45.99	6.34	40.16
7	14.29	2953	52725.00	2.73	48.72	5.35	28.59
8	16.33	2500	55225.00	2.31	51.03	5.52	20.49

Source, the Computed result of the data obtained from EIXCC (2016)



going to add some price beyond others (covering the transportation cost) so to the sale for him (not to sale to others). As the result of their integration; during the time that the producers want to sale, he/she call to make ready for his/her coordinated buyer and the assembler buy with no competition (by expressing as he is already bought, saying that 'this is mine'). Thus, coordinated assembler bought free of any competition. Generally, as observed from the above statements it is possible to conclude that the sesame market structure deviates from the norms of the perfectly competitive market due to presence of barriers to entry as well as coordination of assemblers with producers. But the market concentration ratio calculated at assemblers and exporters' level confirms the weak oligopoly power.

### 3.1.5 Sesame market conduct

This includes how market participants behave in the market. Market conduct is measured by indicators such as pricing strategies, combination/mergers and collusion behaviours. These indicators were measured systematically by personal observation at the market level and discussion with the sampled market participants. It is also important to discuss the market behaviour of producers and traders.

**Producers' market behavior:** The study result shows that all the sampled sesame producers (small-scale and large-scale) supplied their sesame production to the sesame market. This indicates sesame being the most important cash crop in the district. Yearly sesame product starts supplied to market during October and reaches its peak in December to February and declines after February. So, the Critical periods for sesame purchase were December to February.

The frequency of supplying sesame to market depends on the production level. Small-scale sesame producers supplied their sesame to market on average twice in a year (Table 10). It is also shown that 46% of the small-scale sesame producers supply only once a year; while 37.5%, 14.84% and 1.56% supplied two, three and four times a year, respectively (Table 10). Regarding large-scale sesame producers, they supplied their sesame to market on average about three times a year (Table 10). As it is presented in Table 10, 38.89% of the large-scale producers supplied their sesame produce three times a year; while 15.08%, 27.78% and 18.25% had supplied in one, two and four times, respectively. As it was reported by the sampled respondents, their sesame supplied amount is by terms for the reason of lower price and expecting that it may be raise latter. However, due to the supplier's fear of lowering the price and shortage of finance, they were forced to sell partly even at a lower price. Thus, minimize the risk of price change.

**Price setting strategies:** As it is presented in Table 3, more than 97% of the producers responded that producers' selling price was decided by buyers. That is about 97% of the sampled small and all large-scale producers reported that those were buyers that decide on sesame selling price from producers. This price-setting power of the traders is emanated from lower competitiveness of the market.

**Combination of sesame market participants:** As the study result showed, sesame market participants at different stages were combined for their benefits. It was personally observed that some traders combined themselves to kick out few others; so reduces competition. The sampled

**Table 7. The concentration ratio of sesame grain exporters from Kafta Humera district**

Cumulative of traders	Cumulative % of traders	Purchased amount (Qt)	Cumulative purchased (Qt)	CR		HHI	
				The percentage from the total (%)	Cumulative percentage	Merge Exclude %Share	(% Share) <sup>2</sup>
1	2	102600.00	102600.00	13.34	13.34	21.08	444.68
2	4	97652.00	200252.00	12.69	26.03	20.07	402.83
3	6	90070.00	290322.00	11.71	37.73	18.51	342.71
4	8	67780.00	358102.00	8.81	46.54	13.93	194.07
5	10	42180.00	400282.00	5.48	52.03	8.67	75.16
6	12	38000.00	438282.00	4.94	56.96	7.81	60.99
7	14	26980.00	465262.00	3.51	60.47	5.54	30.75
8	16	21279.50	486541.50	2.77	63.24	4.37	19.12

Source, the Computed result of the data obtained from [26]

respondents also reported that, exporters were combined with commission agents to obtain market information. Further, sesame exporters combine each other and decide not to compute for the case that bidding becomes among few for the specified period. Thus, a lower competition which further reduces sesame selling price.

**Collusion in price setting:** According to the personal observation and discussion with sesame market participants, assemblers in local market centres (except in Mai-Cadra) open their marketing office not more than three days per week. It is also found that assemblers discuss in deciding the price by how much to buy so not to buy beyond that fixed level. This was because, assemblers colluded and discussed to arrange time table of purchasing among themselves. Hence, lower competition and no more price negotiations with the producer. The personal discussion with assemblers and producers also indicated that, exporters collude among themselves not to compute while bidding at ECX. Thus, lowers the selling price which directly hurts

producers and assemblers. Therefore, as there is un-negotiated price setting, combination and collusion of sesame market participants, it is possible to conclude that the conduct of sesame market in the study area deviates from competitive market norms.

### 3.1.6 Sesame market performance

The sesame market performance of the study district is evaluated based on the level of profit and marketing margins obtained by different market actors.

#### a. Cost structure and profitability of sesame producers

The profit obtained by sesame producers from sesame production is calculated taking the difference between total return obtained from the commodity and the total cost incurred for it. For the sesame traders also the profitability was calculated taking the difference between the total return obtained in trading the commodity and total marketing transaction costs.

**Table 8. Source of market information for sesame producers and local assemblers**

Source of market information	Large-scale		Small-scale		Traders	
	Freq.	Per cent	Freq.	Percent	Freq.	Percent
Neighbours	8	6.35	21	16.41	2	4.17
By own search the market centre	13	10.32	67	52.34	--	--
From radio and television	6	4.76	3	2.34	--	--
From buyers	12	9.52	10	7.81	--	--
From neighbours and own market search	4	3.17	12	9.37	--	--
From buyers, neighbours and own market search	29	23.02	11	8.59	--	--
From radio and television and neighbours	3	2.38	4	3.13	--	--
By own market search and from buyers	23	18.25	--	--	--	--
From ECX commission agent	6	4.76	--	--	47	95.92
From ECX commission agent and by own market search	22	17.46	--	--	--	--
Total	126	100	128	100	49	100

Source: Own survey result, 2016

**Table 9. The frequency of sesame grain selling by the sampled small and large-scale producers**

Number of selling batches	Small-scale		Large-scale	
	No. of respondents	Per cent	No. of respondents	Per cent
1	59	46.09	19	15.08
2	48	37.5	35	27.78
3	19	14.84	49	38.89
4	2	1.56	23	18.25
Total	128	100	126	100
Mean frequency	1.719 (0.068)*		2.60 (0.085)*	

\*The value in parenthesis is for the standard error Source: own survey (2016)

As it is presented in Table 11, small-scale sesame producers in 2015/16 production season earn a net return of on average 319 birr/ha or 113 birr/Qt. regarding large-scale producers also, in 2015/16 production season, they could not cover the cultivation cost per-ha (6644.4 birr), which were lagged by 813(-) birr (Table 11). The reason that makes small-scale to be profitable may be relatively higher productivity and the lower cost of production/ha and per Qt, compared to that of the large-scale producers. The reasons for the failure to make a profit for large-scale producers may be their lower productivity and decrease in price (Table 11 and Fig. 4). Even small-scale sesame producers; who were in a better position than large scale producers in profitability level, also generated lower profit as compared to the preceding years that may be due to decline in selling price of the commodity.

As it could be understood from Fig. 4, sesame price was raising continuously before two years (before, 2014), but after the mid of 2014 it sharply declines to the level below 2000birr/Qt in 2015/16. Given an increase in wage rate and a decrease in the market price of sesame since mid of 2014, large-scale sesame producers become unprofitable from sesame production. This all production and marketing disincentive was in-line with the result found by FAO (2015). According to the personal observation and information obtained from the sampled respondents, due to the failure in achieving profit from sesame production; there were large numbers of producers that fail to pay back their loan taken for sesame production.

#### **b. Marketing margins obtained by sesame market chain actors**

Marketing margin measures the share obtained by individual market actors from consumer price paid for the commodity. In this study, it is the share of producers, assemblers, exporters and processors from *fob* price. Thus, consumer price here is the *fob* price. The net marketing margin was also obtained by calculating the net return obtained from the transaction and divided by the export price at *fob*. It will be discussed as follows:

**Total costs, return, the gross and net market margin of sesame assemblers:** The survey result as presented in Table 12 implied that considering the raw-sesame grain TGMM in the complete distribution channel is 25.39% that is calculated by taking the *fob* price of 2332 birr/Qt and the purchase price of 1732.3 birr/Qt.

Regarding assemblers, the total return obtained from sesame trading is 171.75 birr/Qt, while they incurred the total marketing cost of 122.87 birr/Qt and faced a loss in return of 22.23 birr/Qt. Thus, they obtain the net return of 26.43birr/Qt. The highest share of assemblers' sesame trading cost was accompanied by yearly payments for different services (municipality, TOT and accounting report) that accounts for 15%, followed by cost of standardization (14%), and transportation cost (13%) (Table 12). Considering the *fob* price and the purchasing price, the net marketing margin (NMM) and GMM obtained by assembler was 1.13% and 7.36% respectively (Table 12).

**Total return, total cost, gross and net market margin of exporters:** As it is presented in Table 12, exporters of sesame grain in Kafta Humera district obtained a total return of 420 birr/Qt by committing the total cost of birr 301.75/Qt. These actors also faced a total return loss of 15.75birr/Qt. Taking all these returns and costs the net return obtained by exporters is 102.85birr /Qt (Table 12). From Table 12, the NMM is so calculated considering the *fob* price of the unhulled seed of 2332 birr/Qt is 4.41%. Following the same calculation, the GMM obtained by the exporters was 18.03 per cent. As it is presented in Table 12, the net return per Qt obtained by processors is higher than what exporters had obtained and exporters obtained higher net return as compared to assemblers.

**Total cost, return, the gross and net market margin of sesame processors:** Sesame processing was being infant not yet widely introduced to Ethiopia even though it has an important implication to the production of the commodity as it creates good ground for the purchasing price and increases its shelf life. The chain was that cooperatives collect organic sesame grain (free of chemical, fertilizer was not applied in production) from member producers and supply to the company. During purchasing time there were also workers hired by the hulling company to control the purchasing of chemical-free sesame and tag code for traceability control. According to the data in Table 12, the average purchasing and selling price of the hulling companies was birr 1898.80 and 3445 per Qt, that lead to the total return and net return per Qt of birr 1546 and 594, respectively. As in Table 12, the total value-added cost and the sesame grain loss during hulling and re-cleaning activities were also higher to swallow more gross return of the company.

**Calculating marketing margins (considering the raw sesame fob price):** The GMM of producers was 74.61% of fob price while the remaining 25.39% was shared by other market participants other than producers. The GMM of assemblers was 7.36%; indicating that the share of fob price that assemblers obtained before any deduction. The exporters also shared the GMM of 18.03% from the fob price before making any deduction of cost.

TGMM (complete distribution channel) =25.39%

GMM (Assemblers) % = 7.36%

GMM (Exporters) % = 18.03%

GMMp (producers' participation) % = 100% - 25.39% = 74.61%

**Calculating net marketing margin (considering the raw sesame fob price):** Considering the raw sesame fob price, the NMM obtained by exporters was 4.41 percent. This indicates that the net share obtained by exporters from the total export price (fob price) of the commodity was 4.41 percent that is the net received to the exporter's pocket. The NMM obtained by sesame assemblers from the export price received by the exporters was 1.13 percent. It is implying that assemblers only received 1.13 percent of the sesame export price for their participation in a sesame marketing transaction. The NMM obtained by producers was categorized into two. These were the NMM obtained by small-scale and large-scale sesame producers. Small-scale sesame producers obtain NMM of 4.85%; while large-scale producers face net loss. The result of net return obtained by small-scale producers implied that covering all costs they additionally obtain 4.85 percent of the fob price.

NMM (exporters) =4.41%

NMM (assemblers) from Fob price =1.13%

NMMp small-scale (small-scale producers) = 4.85%

However, large-scales did not gain the net gain rather they have exercised the net loss as discussed above.

Generally, the NMMs obtained by local assemblers is fair because it was the return which enables them to continue in the marketing transaction system otherwise, they would not continue. An indication of unfairness was the

higher share of exporters and the net loss of large-scale producers. Thus, the sesame market performance is unfair and deviate from the norms of the competitive market.

**Calculating gross and net market margin considering the fob price of processed sesame grain:** In this section let's see the difference in the share of the different actors engaged on sesame considering fob price of hulled sesame grain. All the steps followed in calculating the share while considering the raw sesame fob price would be followed. But what is differentiated is the fob price and addition of one actor; the processor (hulling company). The result obtained on the share of actors in the chain from fob price of hulled sesame calculated following similar way is described as:

**Gross marketing margin (considering the hulled sesame price):** From the total hulled sesame fob price 62% which is more than the producers' share was obtained as the TGMM of. As it is observed from the calculation, processors had greater GMM (45%), followed by exporters (12%) and lastly assemblers (5%). Surprisingly producers obtain only 38% of their products share as it is sold processed that is an indication of poorly performing market.

TGMM (complete distribution channel) % = 62.00%

GMM (Assemblers) % = 5.00%

GMM raw (Exporters) % = 12.00%

GMM (processors) % = 44.88%

GMMp (producers' participation) % = 100% - 62.00% = 38%

**Net marketing margin (considering the hulled sesame price):**

NMM (processors) % = 17.23%

NMM (raw exporters) % = 3.00%

NMM (assemblers) from Fob price % = 1.00%

NRp small-scale (small-scale producers) % = 3.28%

As the performance of the market is also evaluated taking the NMM of actors from fob price; processors take the highest share (17.23%), followed by exporters who hold the share of 3% and then by assemblers (1%). As a

comparison, small-scale sesame producers had taken the share of 3.3 per cent, while large-scale producers did not share any net profit rather net loss. The processing companies obtained NMM more than five times of the NMM obtained by small-scale producers and beyond the other actors. The reason for this fact may be that the top-quality hulled sesame has higher market demand with a too much higher price than the raw sesame. The difference between the raw sesame export price from hulled sesame was 1113.00 birr/Qt. So, for the future, it will be better if higher encouragement either through financial supporting and/or consultancy for the greater

number of processing (hulling) companies to be planted so that hulled sesame would be supplied to the market where there is relatively higher demand.

Generally, this study concludes that the sesame market performance deviates from the norms of the competitive and from efficiently performing market. It is in the direction in contrast to the share obtained in the competitive market. Thus, the sesame market is poorly performing market which did not afford the satisfaction of the producers the base of the commodity.

**Table 10. The summary of average per hectare sesame production costs of sesame producers**

Variables	Small-scale		Large-scales	
	Mean	Std. Err.	Mean	Std. Err.
Land preparation cost of labour	462.43	27.30	396.10	20.77
Sowing cost of labour	77.77	6.03	64.00	5.42
Weeding cost of labour	1022.86	16.99	2183.00	92.42
Total fertilizer cost	416.28	50.32	581.20	34.70
Sesame seed cost	143.55	5.27	146.95	12.63
Harvesting cost of labour	1080.11	47.38	1250.80	34.90
Threshing cost of labor	294.41	13.12	243.69	6.55
Ploughing cost	303.82	6.89	148.38	14.90
land rental cost	71.23	5.58	661.12	37.69
Personal transportation expenses	1.30	0.43	35.60	4.89
Sesame grain transport expenses	26.30	1.98	84.93	4.01
Store expenses	1.11	0.70	3.15	0.88
Expenses of getting buyers	1.64	0.60	16.16	3.15
Market information expenses	0.65	0.412	1.65	0.25
Re-cleaning expenses	4.12	2.245	18.10	2.90
Payments for maintenances and repair	0.00	0.00	146.99	13.09
Fuel &lubricant expenses	0.00	0.00	152.66	13.62
Payments for medical services	1.172	0.70	0.81	0.47
Agricultural tool cost	314.83	40.30	95.79	10.03
Cost of packing sack	31.36	1.34	10.75	0.07
Cost of rope for packing	1.26	0.07	0.95	0.05
Cost of loan (interest on capital)	460.30	44.86	353.02	16.96
Chemical cost	0.00	0.00	12.87	3.18
Tax payments	26.9	2.48	35.76	2.80
Total cost/ha	4743.402		6644.43	
NR/ha obtained	318.92		-1999.00	
Revenue/ha	5062.32	233.20	4645.39	127.4
Revenue/Qt. (price)	1795.15	25.66	1888.37	18.03
Average Yield	2.82	0.12	2.46	0.07
Cost /Qt.	1682.06		2701.00	
NR /Qt	113.11		-812.63	
% NMMss profit	4.85%			

Source: Survey result; applying STATA, 13.0

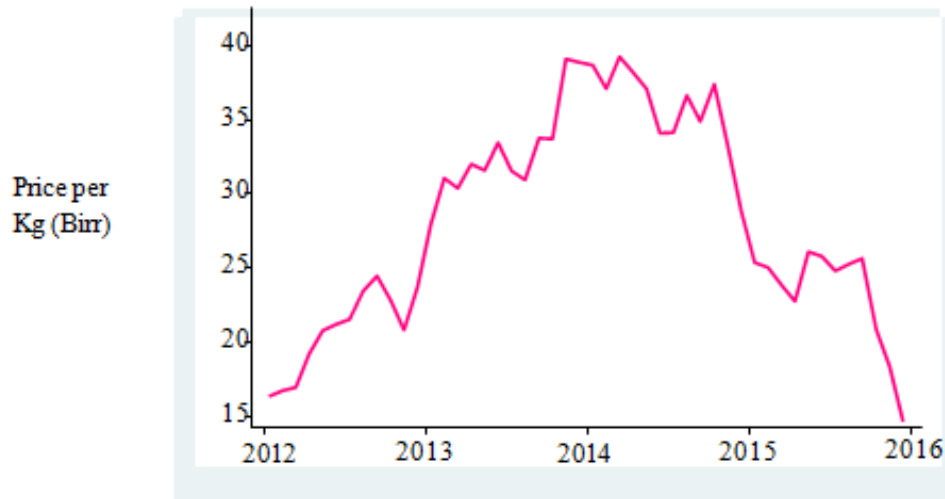


Fig. 3. The price series of Kafta Humera store, 2012-2016; source of data ECX, 2016

Table 11. Marketing costs of sesame assemblers, exporters and processors

Cost encored in	Processor	Exporters	Assemblers
	Mean /Qt. (Birr)	Mean /Qt. (Birr)	Mean /Qt. (Birr)
Purchase Price	1,898.80	1909.00	1732.30
Raw Material	172.18	0.30	0.48
Wages and salary	105.49	16.00	21.31
Travelling expenses	12.31	0.50	0.38
Utilities	9.11	0.10	3.75
Fuel, oil and lubricants	12.34	0.00	0.00
insurance	1.99	0.00	0.00
Repair & maintenances	9.95	0.00	0.73
Stationery	1.82	0.27	0.31
Audit fee	6.64	0.83	0.40
Transportation expenses	112.12	180.00	15.62
Land expenses	22.18	0.00	0.00
Depreciation	8.09	0.00	0.29
interest rate	28.48	0.00	15.1
Yearly Payments (Tax)	79.20	53.18	15.15
Load/ Unload	12.00	12.00	13.76
Market information and facilitation	18.58	18.58	23.19
Sack price	15.00	15.00	9.18
Municipality cost	7.00	5.00	3.30
Selling price (Fob Price)	3,445.00	2332	1903.83
Total return-bought cost (GMM)	1,546.20	420.35	171.53
Sum processing and marketing cost (TC)	634.49	301.75	122.87
Trade total return (TR)	911.71	118.6	48.66
Total net return loss by sesame grain	318.06	15.75	22.23
Loss			
Net return (profit) per Qt	593.65	102.85	26.43

Source: own calculation applying STATA, 13.0

## 4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Summary and Conclusions

Sesame is the major cash crop for both small and large-scale producers and other actors in the value chain in Kafta Humera district. The multi-stage sampling procedure was followed to draw sample respondents so that; a total of 128 small-scale and 126 large-scale producers, 44 local assemblers, 5 cooperatives, 18 exporters and one processor were sampled from whom the primary and secondary data were collected. The data were analyzed applying descriptive statistics and also evaluated by using S-C-P approach.

As per the study results found, the major actors of the sesame market in Kafta Humera district were producers, cooperatives, assemblers, processors and exporters. These were supported by input suppliers, commission agents and government organizations. Small and large-scale producers supplied 99.1% and 98% of their produce respectively. Local assemblers sold 80% and 20% for exporters and cooperatives respectively; while cooperatives sold 3.84% to exporters, 5.88% to Union, 61.53% to processor and 28.74% direct export themselves. CR<sub>4</sub> of assemblers and exporters indicated that the top four assemblers and exporters is lower than 50% (38.7% and 46.54% respectively) which indicate as sesame market in the study district was weak oligopoly.

The total production cost/ha of small and large-scale produces are birr 4743 with average revenues/ha of birr 5062 and 4645 obtaining the average productivity of 6644 respectively. Sesame market assemblers obtained the return of 172 birr/Qt and net return of 26 birr/Qt. Exporters also obtained the total return of 420.35 birr/Qt and net return of 102.85 birr/Qt. Similarly, processors obtained the total return of 1546 birr/Qt and net return of 594 birr/Qt. Considering the raw fob price, the TGMM equals to 25.4% with the share of 7.36%, 18% and 74.6% for assemblers, exporters and producers respectively; while the NMM shared as 4.41%, 1.13% and 4.85% for exporters, assemblers and small-scale producers.

Based on the study results found this study concludes that the major actors were producers, assemblers and exporters. There were also

service providers such as governmental and non-governmental institutions and individual business actors. As per the result indicated by S-C-P, it could be concluded that sesame market deviates from the norms of competitive structure and poorly performs. This is justifiable that even though there were many assemblers and exporters that their individuals' share of the traded sesame amount is lower; there are market barriers such as information asymmetry, government policies in-licensing and capital that lead sesame market to deviate from competitive norms. The sector also lacks market infrastructure which leads to market imperfection.

There is also collision and combination in price setting. Further, traders are price makers not on the bases of negotiation. The profit margins obtained by actors also indicate that the market is poorly performing market that damage producers. It could be also concluded that the hulled sesame is best demanding at a higher price as compared to raw sesame.

### 4.2 Recommendations

Based on the results found market information is one of the factors affecting market efficiency, so to improve the performance of sesame market it is important to access market information through ECX board and related sources; otherwise, the price fluctuation could not be observed and adjusted. It is also found that sesame grain was sold at a lower selling price set by buyers that the market was buyers oriented market structure. So it could be improved and pooled to the price-setting by negotiation if governmental and other stakeholders provide attention to plant hulling industries and fulfilling traceability conditions for the hulled seed to be supplied to the international market as the product is an exportable commodity. The hiring of marketing experts to follow, evaluate and manage the market situation at each market centre will also be important to overcome the collusion of traders in price setting, and to improve daily service provision of all market centre assemblers; to improve market performance.

### COMPETING INTERESTS

Author has declared that no competing interests exist.



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