

Original research paper

Soybean Value Chain Assessment Study In Northwestern Ethiopia, Metekel Zone

Abstract: This field assessment research has been carried out to identify the main value chain actors of soybean and their key roles in the product flow. In Metekel zone the main soybean value chain actors were producers (small scale farmers and investors), traders/grain merchants, unions, truck owners, drivers and input suppliers. The supporting services of soybean value chains were Research Centers, BoA, Commercial Bank of Ethiopia, NGO's, unions, rural saving and credit cooperatives and other governmental offices. This field research work has been conducted by arranged one day focus group discussion (FGD) program venue at Pawe town. The FGD program had comprises fifteen members bring from three districts in Metekel zone. Before, focus group discussion program we have been interviewed twenty two respondents from Pawe, Dangure, Mandura and Dibatie districts by prepared check lists to assess the capacity of local organization and the casts of soybean value chain actors at producers and traders level in the specified areas. Our assessment study results showed that farmers and other large scale growers produced soybean for three purposes, one for income generating and two for household consumptions and three for rotation with cereal crops to improve soil fertility. 90% of soybean was being produced for income generation, nearly about 3-4% for home consumption and the rest around 5% as a seed source for next cropping season. In 2010/2011 main cropping season in Metekel zone 11, 008.79 ha arable land was covered by soybean. From our result soybean transaction price was determined by central whole sellers, processors and exporters. During our assessment study we have evaluated the contribution of unions and cooperatives by interviewed; fortunately they have no significant contributions on value additions, except Qua union in Mandura district. So, during our assessment study the inter linkage of soybean value chain actors in this area were still yet not well organized. Therefore, we deduced and noted that from our assessment result this area needs further value chain research work on soybean and other commodities to be-created-a link between stakeholders, to enhance the benefit of local farmers who being deployed on soybean cultivation, because this area is the number one potential belt region of soybean production than the rest part of the country.

1. INTRODUCTION

In Ethiopia, soybean research was started in 1950's by introduced genotypes with main emphasis of identifying adapted lines for the potential areas of the country, replacing imported soybean flour, compromising into the existing cropping systems and improving the diet of the poor farmers' life [1]. Soybean is the best alternative crop both under small and large landholder families due to its increased demand for oil and food purpose, potential in cropping systems and source of income generation.

Soybean is considered as either a short or a day neutral plant it requires 25 to 30°C temperature for growth and proper nodulation [2]. Soybean is also a medium altitude crop well adapted to altitude varying from 1300 to 1800 masl (meter above sea level) receiving annual rainfall of 900 to 1300 mm and it also well adapted at 1900 masl having 550 to 700 mm annual rainfall [1]. The crop has a wide range of soil adaptation, but performs well on light textured, loams and medium black clays with pH ranges of 6.5 to 7 in Ethiopia [3].

Since 1970s, soybean production has been raised over around the world. The major leading producers were; U.S.A, Brazil, Argentina, and China where they accounts 90% of the world's product. However, Asia, excluding China, and Africa had only 5% contribution in world production volume. In 2005, the world's total area coverage was 91.4 million ha where as U.S.A is the leading producer and accounts 40% with total area of 28.9 million ha [4]. In 2009, soybean ranked first from major oil crops with total area of 99.5 million ha in the world [5]. The world's average productivity of 1977 and 1987 was 1,608 and 1,906 kg/ha respectively; while it was 2,057 and 2,270 kg/ha for U.S.A [6].

According to the **Ethiopian CSA (Central Statistical Authority) (CSA)** data of 2010/11 (2003 E.C.) **main cropping season** production survey a total area of 11,822,786.19 ha were covered by grain crops (cereals, pulses and oilseeds) with total volume of 203,485,288.34 quintals of grains were produced under private peasant holdings. Out of the total grain crop area, 81.97% (9,690,733.96 ha) covered by cereals and 11.48 % (1,357,522.68 ha) under pulses respectively. Cereals contributed 87.29 % (about 177,613,365.84 quintal) and pulses contribute 9.6 %

(19,531,935.01 quintal) of grain production in Ethiopia. The private peasant holders grow various kinds of crops for own consumption and/ or economic benefits. Pulses being produced in all regions of the country after cereals [this sentence is incomplete](#). Pulses grown in 2010/11 (2003 E.C.) cropping season accounted 11.48 % (1,357,522.68 hectares) of the grain crop area and 9.6 % (about 19,531,935.01 quintals) of the grain production was drawn from the same crops at the country level. According to the Ethiopian CSA (~~Central Statistical Authority~~) data of 2010/11 (2003 E.C.) main cropping season soybean was planted to about 11,261.12 ha with a total production of 158,244.22 quintals in Ethiopia.

Soybean was introduced into Benishangul Gumuz National Regional State during the massive resettlement program during the Derg regime in 1985 (1977/78E.C.). Since then, farmers grow it on small scale level as sole crop primarily for its economic merit like income generating and home consumption. According to the Ethiopian CSA (Central Statistical Authority) data in 2010/11 main cropping season Benishangul Gumuz region agricultural sector the total area coverage and production of pulse crops were 11,008.79 ha and 162,002.69 quintals respectively. In this region soybean commodity takes more proportions next to common bean, both in coverage's and production. In Assosa zone, soybean was the most dominant pulse crop with total area coverage and productivity of 1,080.8 ha and 0.9 t/ha, respectively [7]. According to CSA (Central Statistical Authority) survey [7] the productivity of soybean was 0.8 and 1.6 t/ha in Assosa, and Maokomo areas respectively. Now a day's, soybean production is highly raised in the region due to its increased demand of the farmers and investors. **The aim of this assessment research study was to scout and distinguish the challenges and opportunities of soybean value chain process** in this specified zone. In Metekel zone still almost no soybean value chain researches were carried out, so far our research objectives were; (1) To assess local organizations basically deployed and focused on soybean production and developments, (2) To identify the main soybean value chain actors in the area, (3) To identify the most soybean production constraints and causes, (4) To construct soybean business model map and set up of future prospective value chain researches.

2. METHODS AND MATERIALS

2.1. Stakeholders Selection

Fifteen stakeholders were selected and invited for focus group discussion (FGD) workshop which was held at Pawe town in soybean value chain development program. The stakeholders participated on focus group discussions were selected from trader's category (rural assembler, rural whole sellers and district/ urban whole sellers), small and large-scale producers, microfinance, district unions, cooperatives, and experts of the bureaus of agriculture in Pawe, Mandura, and Dangure districts. The proportion of male and female gender consideration participant was 86.7% and 13.3 %, respectively. The residences of respondent farmers were from different districts found in Metekel Zone. "The participants ~~were~~ raised different issues regarding to the production, productivity, marketing problems as well as finance sources that must be solved in order to maximize soybean production and value in Metekele zone". "The distances of the respondent's house ~~from all weather roads were cost took~~ from 10 minutes to 2 hours" ~~to be arrived the market by~~ on foot. The maximum age of the respondents was 46, while the minimum was 27.

The following table showed ~~that~~ Soybean value chain assessment study ~~participated~~ stakeholders' information

S/N	Participant's	FGD Participants	Interviewed	Position
1	Adane Melak		✓	Pawe Research Center, Director
2	Nigussie Bekele	✓	✓	Trader & Producer
3	Tafete Fentaye	✓	✓	Trader
4	Erimias Bora	✓	✓	Producer & Trader
5	Girma Getahun	✓	✓	Trader
6	Mohammed Yimer	✓	✓	Producer
7	Merga Dargie	✓	✓	Pawe district BoA expert
8	Werku Mulatu	✓	✓	Pawe district Microfinance Officer
9	Tagese Lalito	✓	✓	Gilgal ICEP NGO Extension expert
10	Erighetie Munaw	✓	✓	Pawe town Mama union Officer
11	Shibabaw Tarekegn	✓	✓	Metekel Zone BoA Extension expert
12	Amisalu Nega	✓	✓	Metekel Zone Cooperative Expert

13	Zinabu Nigussie	✓	✓	New Hope Private farm Agronomist
14	Yeshiwas semaneh	✓	✓	Mizizgo Madura, Agricultural expert
15	Gufa Aderie	✓	✓	Producer
16	Abebech Kanbila	✓	✓	Producer
17	Abera Abebe		✓	AgSE Dibate, Program Director
18	Abebe Yalew		✓	CPAR Dibate, Project Manager
19	Nega Hailu		✓	JAVA Private Farm Manager
20	Tekabe Abebe		✓	Tracon Trading P.L.C. Farm Manager
21	Seifu		✓	Mizizgo Mandura, Project Officer
22	Silesh		✓	Pawe district Cooperative officer

3. SOYBEAN VALUE CHAIN

The economic viability of soybean is determined by commercial utilization of both sub products; oil, and meal, which accounts one and two third of the crop economic value, respectively.

Soybean oil is dominant in the world market; it accounts for about 30% of the whole total produced vegetable oils in the world. In global market, its oil share is estimated nearly about 44%, and ranked first among the major oil crops such as rapeseed, groundnut, and sesame [8]. There are different studies conducted on soybean seed composition, particularly protein and oil contents are major seed components extensively investigated. Soybean has high protein (40 to 42%) than any food crops, and it is second to groundnut in terms of oil content (18 to 22%) [9]. The oil is composed of five polyunsaturated fatty acids, which on average contains 10% palmitic acid (16:0), 4% stearic acid (18:0), 18% oleic acid (18:1), 55% linoleic acid (18:2), and 13 % linolenic acid (18:3), respectively.

The nutritional value of soybean is primarily lies in its quality protein and oil content which is free of cholesterol [9]. Soybean is also nutritious and healthy due to the composition of carbohydrate, fiber, vitamins, and minerals [10]. In 2008, 221 million ton was consumed in the World; nearly about 50% of supply was from USA. Studies had been showed that consuming soybean product was reduced risk of cancer, heart, and chronic disease [10]. The crop is also highly important in cropping system thereby enriching soil fertility through biological N fixation

from the atmosphere in symbiosis relationship with rhizobium bacteria which is better than other legume crops. On average soybean can fix over 75 kg nitrogen per hectare per season [11]. Most people have limited access to animal products; probably children are suffering from malnutrition. Soybean is cheap protein source for poor people in order to struggle undernourishment. The crop is a promising proposed for alleviation of acute protein source and oil shortage. Therefore, industrial import substitution, domestic production of enough, and quality soybean would be able to fix food security problems furthermore by considering the rapidly growing population and malnutrition. In Ethiopia, now a day's soybean is highly utilized in nutrition industries for both food and feeds. Soybean seed physical traits, chemical composition and processing qualities are important traits for industrial demand and utilization [12].

4. ~~INTERVIEWS OF STAKEHOLDERS~~RESULTS AND DISCUSSIONS

4.1. Production Information Interviews

4.1.1. Erimias Bora

Erimias Bora is one of the model farmers live at Pawe district of village-5 who participated on the focus group discussion workshop held at Pawe town; having a total of 4.5 hectares farmland sizes where 2 ha are rented. The tillage frequency of soybean cultivation farm land was two times where plowing done traditionally by oxen. The variety used by the respondent is Bellessa-95, obtained from Pawe Agricultural Research Center. The seed rate used by the respondent was ranged from 80 to 100 kg/ha, where the seed price of this variety was 15 Eth.birr/kg. However, biological nitrogen fixing bacteria or inoculants namely Legume fixer also used which he was given from Pawe Agricultural Research Center as free gift in order to demonstrate. On the other hand, both DAP and Urea fertilizers at a rate of 75 and 30 kg/ha with a price of 15 and 13 Eth. birr/kg respectively were used, where they supplied by Pawe district microfinance bureau. “The productivity of soybean under applications of those inputs is estimated around 20, 14, and 13 quintals per hectare for production years of 2011, 2012 and 2013 respectively” Mr Erimias said that (this sentence is incomplete). From respondent, “it has been understood that among service providers found at the target value chain development survey areas Pawe Agricultural Research Center, and Pawe district BoA are few partners’ plays in the extension intervention, where Pawe Agricultural Research Center also works few activities in connecting producers with processors

and central market traders”. In order to have profit opportunities, farmers store his/her product for about 3 to 4 months until profitable market opportunities will be occurred. Moreover, the most important prevailing production constraints at the target value chain study areas are many, but, few of them are lack of timely input supply, productivity declining due to soil fertility declining, low market price, grain market slump down as well as market inconstancy and poor market demand were the major challenges one that taken into under consideration.

The household consumption of soybean product was not significant due to the awareness limitation about food preparation and utilization methods. However, even if home consumption is limited, the household consumption like; bread, qolo and as mixed ingredient with other cereal floor is estimated to be nearly about 2.5% of his/her total annual production. On the other hand, the proportion for seed and market purpose are estimated nearly about 10 and 87.5% respectively. However, among all others, the proportion of the products delivered to market was exceeding much more than others allocated for home conception and seed purpose. The varietal selection criteria were depending on different purposes where farmers primarily focused on productivity and market demand. Moreover, varieties Belesa-95 and Eth-Yugozlavia are the most demanded by respondent stakeholder due to their best productive on black soil. Furthermore, farmers use Belesa-95 because of its easily milling, good tasty, colorful, and valuable market demanded by the different customers (Traders, Consumers, and more on processors).

4.1.2. Java Farm

Java private limited farm owner manager mister Solomon Sisay is one of the large scale soybean producers at Dangur district of Jimtya Kebele, where he sold his product to urban whole sellers, central market, and processors. However, the total farmland size of Java plc was around 3,000 hectares, where the frequency of tillage for soybean cultivation was three times and the land preparation method is founded to be modernized by tractor plowing. The varieties namely Belessa-95 and Wegayen were under cultivation by the stakeholder which was accessed from Pawe Agricultural Research Center. As of the respondent, “the seed rates for these varieties were 60 kg/ha, where the price of these varieties was 7 Eth.birr/kg”. Furthermore, DAP fertilizer at a rate of 100 kg/ha and with a price of 1,300 Eth.birr per quintal (13 birr per one kg) were applied

during the time of sowing where supplied by Adis Abeba traders. However, the total areas under cultivation for 2012 cropping season was about 50 hectares and the amount of yield produced is 519 quintals, and the productivity for this season was nearly 1,000kg/ha, which is below the potentials yielding of those varieties namely Belessa-95 and Wegayen. The problems of soybean production under value chain survey areas were lack of opportunities of extension interventions and access of finance sources. However, supporting organizations are limited in number and in their services provisions. According to the interviewed respondent, revealed that “Pawe Agricultural Research Center has been conducted different field researches like; demonstration and also doing different activities at all stages of producer’s level (under all smallholder and large scale production oral information) has been provided many services”. Pawe Agricultural Research Center has also intervened and done extension services by demonstration, technology scale up, monitoring and evaluation and tried to connect producers to market access at whole stage. Pawe Agricultural Research Center has proceed more in networking all the stakeholders in each stages of value chain in marketing where connect the producers with central market and processors. The producers were should cleaned, sorting, sieving, and drying their products to maximize the quality and finally got good profits and also to create market opportunities for next products. The Java farm owner was storing his products on hands at a maximum of one month because he needs cash/money since he participated on other investment programs (constructions and other business); so the capital on hand shared to other investments.

Among the more prevailed production constraints, but few of listed by respondent were unexpected market price slump down but, not demand, lack of skilled man power related with agronomic activities, financial shortage since the owner participated on other different investment programs. As to the respondent, “there is no home consumption ~~trained training~~ due to awareness limitation about dietary importance of soybean in this area crop”. However, the primary objective of this investor was to earn money or focused on market supply. Therefore, the proportion of products used for seed and market purpose are 0.77, and 99.2 % respectively, out of total production 514 quintals or 51400kgs. Furthermore, among all others, the product proportion delivered to market was taken in to account 99.2 % of total produced yield. The varietal selection was primarily based on market oriented both namely Bellesa-95 and Wegayen.

However, Belesa-95 is the most demanded variety by respondents due to its good seed size, productivity on red soil type, and attractive color of the seed.

4.1.3. New Hope Mechanized Farm

New Hope Mechanized private limited farm is a large-scale soybean producer and he live at Pawe district of village-2 community, but he is not attended on focus group discussion workshop held at Pawe town but, he was among one of interviewed respondents. The total farmland size of the producer was 288 ha. The tillage frequency for his soybean cultivation farm land was two times where, plowing was done using tractor. The variety used by respondent was Bellessa-95 obtained from Pawe Agricultural Research Center. The seed rate he was used 80 kg/ha, where the price of this variety was 8 Eth.birr/kg. On the other hand, DAP fertilizer at a rate of 100 kg/ha was applied with a price of 15Eth.birr/kg, supplied by cooperatives of Pawe district bureau of agriculture. The total yield he produced was 252 quintals or 25200kg where as productivity was 5.6 quintal per hectare for production year of 2013 under applications of those inputs. However, the total area under production of this year was around 45ha. However, according to the interviewed respondent during field research conducted at the target survey area revealed that “there were some service providers like; commercial bank of Ethiopia, construction bank as finance sources or loan accessed for him”. Moreover, Pawe Agricultural Research Center was intervened in providing extension service like; monitoring and evaluation and also involved in market privileged in the target area of value chain studies. Pawe Agricultural Research Center was attempting to create a linkage between all stakeholders in each stage with processors and exporters.

From among many economically important production constraints, few were high labor costs due to high weed infestation in this area (high cost of production), water logging problem due to lack of resistant variety, and market price was slump down, due to those mentioned challenges increased production cost, so feasibility becomes under questionable, finally producers tried to stop soybean cultivation. The consumption trained of soybean is limited. However, the objective of production was mainly to earn cash by supplying for markets. Therefore, the proportion of produces used for seed and market supply was 48 and 168 quintals with 19 and 66.66%, respectively from total production volume 252 quintals. Furthermore, among all others, the

remaining 36 quintals estimated around 14.3 % currently found in his store (on hand) from total volume of 252 quintals of under production. The selection of varieties (Belesa-95) is primarily focused on market demand. Moreover, as to stakeholders, the target of one variety over the other variety is based on its performances on different soil types (Belesa-95), productivity, and market value (Belesa-95). Furthermore, farmers usually use Belesa-95 because of its easily milling, seed color, seed size, and valuable market demand by the different customers (Traders, Consumers and processors).

4.1.4. Mohammod Yimer

Mohammod Yimer is live in Pawe district of village-23/45 rural community found to be one of model farmer produced soybean as a main crop majorly for marketing purpose for income generation. This farmer was selected, to be the source of database for soybean value chain study from Pawe district of major soybean producers. However, the stakeholder was invited to be a part of focus group discussion workshop held at Pawe town. The farm size of the respondent was 5 hectare where he was plowing three times for soybean cultivation. As to the respondent, “the improved varieties – he had been planting were Belesa-95 with seed rate of 60kg/ha”, where he given seed from Pawe Agricultural Research Center. The market prices of this improved variety usually Belesa-95 was found to be around 600 Eth.birr/quintal at local market. The other most important soybean productivity maximizing input is nitrogen fixing bacteria / bio-fertilizers namely Legume fixers used with the rate of 6 packets for one ha which is free of charged given by Pawe Agricultural Research Center for extension intervention approaches. One more input where used by the respondent farmer was also DAP fertilizer applied at a rate of 100kg/ha where he accessed by Bureau of Agriculture, cooperatives, and microfinance of Pawe district with the price of 1,500 Eth.birr/qt (15 birr/kg). The production of soybean under application of those inputs was 15, 15, and 5 quintals/ha where as productivity was 20, 15.8, and 13.5 qt/ha in production years of 2011, 2012 and 2013 respectively.

From respondent he has been confirmed that among services providers found at the target value chain survey areas Pawe Agricultural Research Center and Pawe district Bureau of Agriculture were few partners’ play in the extension intervention role. For profit maximization opportunities of the product was stored for about 7 months at the farmer level on hand until profitable market

opportunities had been obtained. The most prevailing production constraints at target value chain study area are many, but few of them were market problems particularly inconstancy, insect pest on red soil type, and improved seed shortage (high seed demand, and lack of optional varieties) were the most important limiting factors in soybean production. The household home consumption of soybean is different but, mostly farmers consumed as qolo, bread and milk, which is estimated about 60kgs/year, accounted estimated about 4 % out of his product. The proportion for seed and market purpose estimated to be around 4.7 and 91.33% respectively. Moreover, among all others, the proportion of product delivered to market was highly exceeding than home conception and seed purpose. Varietal selection for different uses is primarily focused on market purpose for income generation (Belessa-95). However, variety Belesa-95 is most demanded varieties by respondent stakeholders due to its shattering resistance, high productivity, and market demand. Furthermore, farmers use Belesa-95 because of its easily milling, good tasty, color, and valuable market demand by customers.

4.2. Local Market Information and Key Informant Interviews

4.2.1. Pawe Mama Multipurpose Union

Pawe Mama multipurpose union is one of the union found at Pawe town of village-7 where buying soybean from producers, and small farmers unions. The interviewed respondent confirmed that “30% of the producers ~~were-sell~~sold their product immediately after harvest (November to January) where as 60% of producers were provide their products from February to May when there ~~is-was~~ cash needed to have a money for holyday, fertilizer and purchase purposes”. Only 8 % was sold by keeping high price from June and July where they are aware of high value market and delivering their product to valuable market. The rest 2 % of the products were sold from September to October. The farmers were sell at their village, and nearby town where traveling 10 minute at their village and 1 hr at nearby town. The minimum product quantity delivered for sell was from 20 to 40 kg usually delivered by people caring, where as the maximum product quantity is 1500 kg where traveled by Horse/Mule wagon. The farmers have information about the high market value and they were few farmers deliver their product, but in some cases particularly for loaned or loan take farmers where enforced to sell by union determined price; they did not wait for high price seasons. According to the interviewed respondent, “among common buyers individual households, local traders, cooperatives / union

were take approximately 25 %, 5% and 70 % (Assosa unions)” respectively. The market price is important for the farmers selling decision-making. For the buyers the price, product quality, and product quantity were the main factors for making the buyers decision particularly product volume for central market suppliers. On the other hand, product quality and product quantity are the primary criteria for the traders buying decision since urban whole sellers 400 quintals to supply for central market. This is why; because of the 22-wheel track, travelling cost per quintal was 75 Eth. birr where reduced by 25 % than FSR ISUZU track price since unit price is 100 Eth.birr./qt. The capital on hand also had has high value for buying decision-making process. The minimum soybean price was 820 Eth.birr per quintal or per 100kg, whereas the maximum was 900 birr per quintal, where the difference is made only 80 birr per quintal. The interviewed respondent assured that “the market price was determined by whole sellers and the amount of product volume supplied”. The communication channels in keeping up the value chains in the market network is by used phone communication and direct contact as well as through brokers where they received 5 Eth.birr per quintal. The local traders were follow different strategies in order to maximize their profits where they hold their products maximum of 2 months. At the local market level, the service providers were found to be play a great role in financing and market linking opportunity like; Pawe Agricultural Research Center. Among the many important constraints at local market level, the sources of finance, market price and awareness about the importance of the crop and its market value issue is still limited.

4.2.2. Tafete Fentaye (Large Scale Trader)

Tafete Fentaye is one of the largest soybean trader at Pawe town of village seven where he buying from producers, rural assemblers, rural whole sellers, and unions. The interviewed respondent confirmed that “70% of the producers were sold their products immediately after harvest (November to January) where as 20% of their products provided when they needed cash to have a money for holydays, fertilizer and any purchasing purposes. The rest 10 % were used for self saved seed and the left 10% they sold by keeping high price, when they are aware of high value market and delivering their product to valuable markets. Farmers were deliver their products approximately 200 to 1500 kg per farmer, usually to their home villages and Pawe town Saturday market transporting by Donkey pack, Mule cart, and head carry as a means of transportation. As to the respondent, “the product is supplied in to different markets but, he also

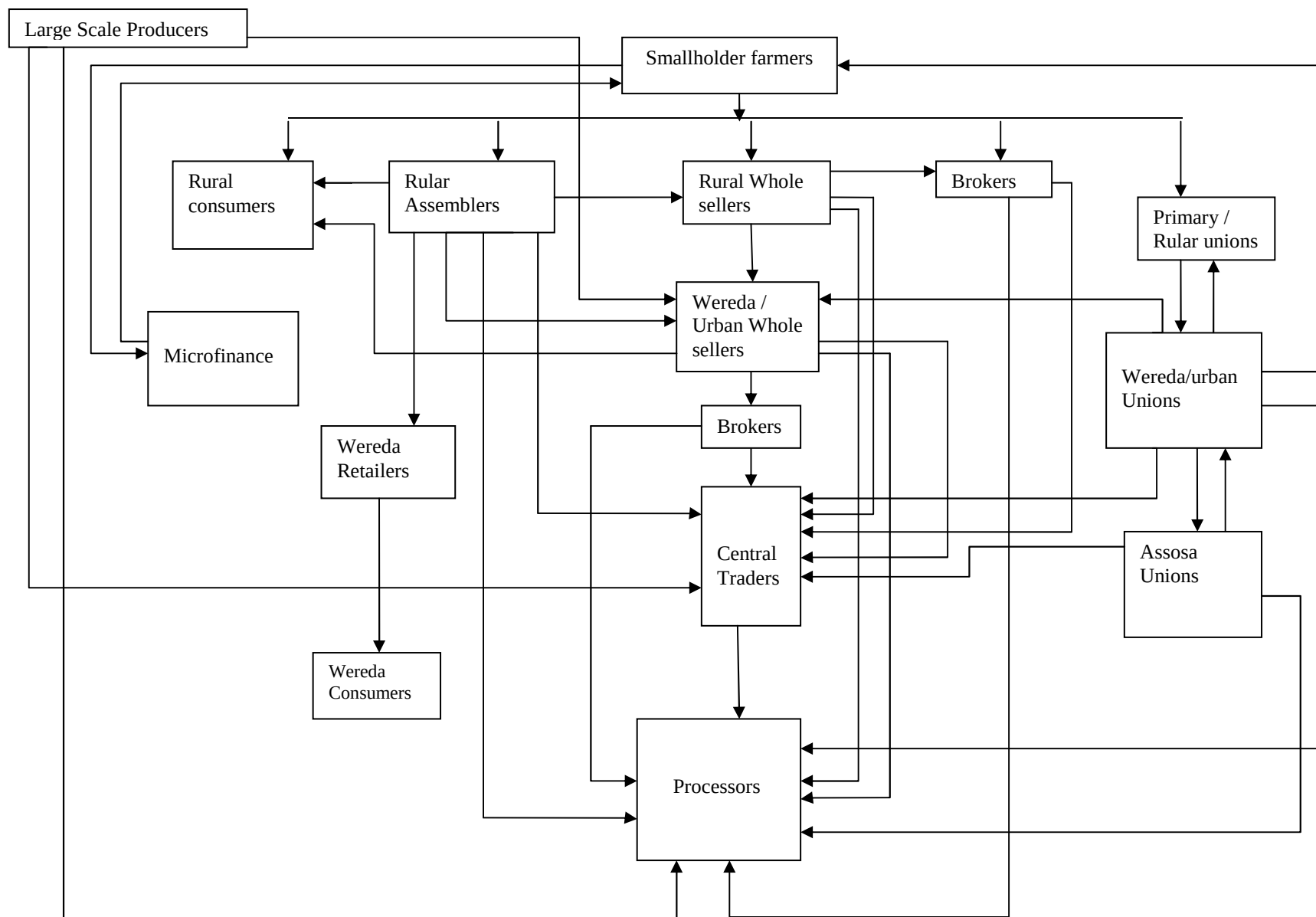
sold around 10,800 quintals for local traders like; Goraw and others”. For the farmers the primary selling decision is price but sometimes information also had a role of selling decision making process. On the other hand, product quality and product quantity are the primary criteria for the traders buying decision and price determination, especially larger traders / urban whole sellers need a minimum of 400 quintal for supply to central markets. This is why; because of the 22-wheel track per quintal price were reduced (75 Eth.birr/qt) by 25 % than that of FSR ISUZU track price since unit price was 100 Eth.birr. The minimum soybean price was 740Ethbirr/qt whereas the maximum was 780Eth/qt. However, this soybean market price usually determined by central market traders. The communication between the market runners of traders in each value chain stages somewhat modernized where they exchange information by cell phone and sometimes direct contact through brokers that paid commission fee 2Eth.birr/qt. In order to have required profits the local traders hold the product for about 5 months before sell. This enables the traders to have good market opportunities. There are not any service providers at the local market level, moreover the district traders working by self linking in any aspects but, collaborate in money sharing, and information share about current market situation. On the other hand, the commercial bank of Ethiopia Pawe district branch, serves as used for money transfer. The major problems at local market level are weight loss due to poor quality, market price slump down and demand inconstancy or changeability were among the top critical challenges in soybean marketing systems at the target survey areas.

4.2.3. Erimias Bora (Medium Scale Trader)

Erimias Bora is one of medium soybean trader at Pawe district of village-5 where he buying from producers, and rural assemblers. The interviewed respondent confirmed that “30% of the producers are sold their products immediately after harvest (November to January) where as 40% of the producers were provided their products when they need cash for holydays, fertilizer and any purchase purposes. Only 10 % was sold by keeping high price where they are aware of high value market and delivering their product to valuable markets. The rest 20 % was delivered for used planting seed for next cropping season and any others”. The farmer was delivering his/her product approximately 500 to 3000 kg per individual to their near village grain collectors and Pawe town Saturday market by used Mule wagon as a means of transportation. The trader was sold one quintal to individual household for instance; Lanchisile and Roman to local resident for

bread making, where as nearly 90 to 300 quintals sold for advanced local traders (Tafete and Essa those are found Pawe town village-7) respectively. However, others around 400 quintals were sold to the central traders found at Mesalemia and Kality in Addis Ababa city. Farmers primary trait was price and many of them need had a role for selling decision. Since larger traders / urban whole sellers need a minimum of 400 quintals due to transport cost to supply for central markets. This is why; because of the 22-wheel track per quintal price were reduced (75 birr) by 25 % than that of FSR ISUZU tracks price since unit price 100 Eth. Birr/qt. The minimum soybean price was 720Ethbirr/qt and the maximum was 800Ethbirr/qt. The communications among traders in each value chain stages somewhat modernized where they exchange information from and to central market by direct contact through brokers paid for commission fee 10Ethbirr/qt. Soybean market price in this case study assessment area was determined by the central market demands, and large traders. In order to have required profits the local traders hold the product for about 6 months before sell. The major problems at local market level were grain weight loss up to 10 % due to poor quality product; market price slump down and demand inconstancy are among the top critical challenges in soybean marketing. The other problems related with the local producers were a lack of transport access.

5. VALUE CHAIN FLOW CHART



5.1. Soybean Value Chain Assessment Interpretations

Metekel zone is one of the three zones in Benishangulumuz national regional state which is known to be the most pulse produced belt area followed by Assosa zone. According to CSA (Central Statistical Authority) data of 2010/11 (2003 E.C.) the total area coverage of pulse crops under this zone were 11,008.79 ha where as the total production amount about 162,002.69 quintals which contributes significant role to the gross agricultural national production with high changes to the national economy. Soybean is one of among the most widely grown pulse crops next to Haricot bean in the region. During the value chain survey held at Metekel zone Pawe town have been confirmed that soybean produced under both large-scale and smallholder farmer's level. The survey was also given a clue for identifying key production problems prevailed at target survey areas. Among the few problems are lack of improved technologies, low extension approaches, inputs scarcity and providing (particularly untimely input supply), moreover market access, and price were some of the problems related to soybean production.

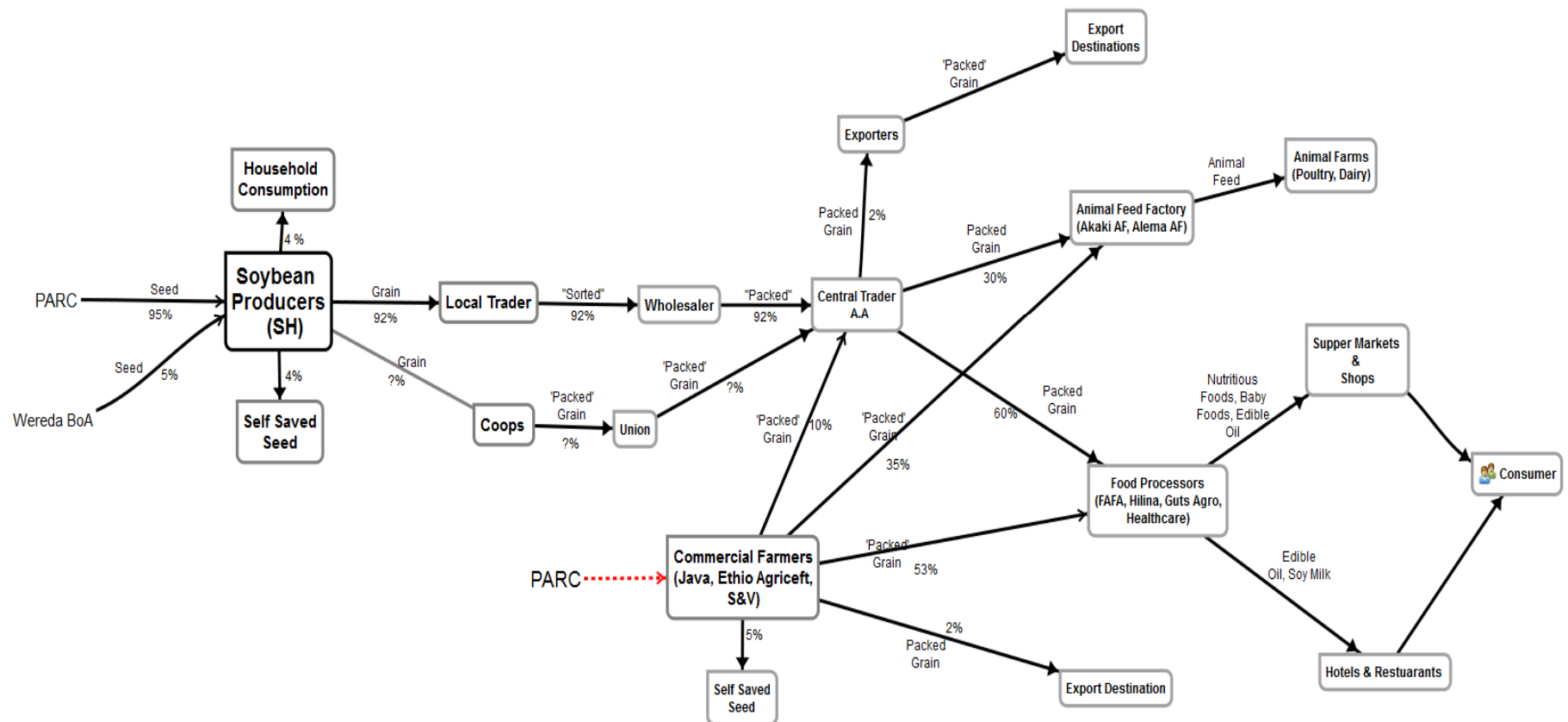
As it's the area production potential, a huge product supplies are observed from different potential districts of soybean producers where they are Pawe, Mandura, Dibate, Dangure and more districts of Metekle zone. However, informal communications and interviews have been done with the stakeholders who participated on focus group discussion we have been confirmed that nearly about 4,000 quintal soybean products were supplied per week from Pawe district only. Therefore, this indicated that the present potential for soybean production in this area was very high. The value chain field assessment research indicated that the presence of networking or connection between all stakeholders (main actors) were still very low.

As indicated in the value chain flow chart diagram section 5 the main soybean product suppliers were large-scale producers (private producers) and smallholder farmers they were marketing their products to the rural assemblers and grain collectors , rural whole sellers, local consumers, district consumers and retailers, urban whole sellers, primary / farmer rural unions and urban unions, and sometimes processors directly took products from producers. The relationships between the processors and the producers have no significantly robust. The main actors in the soybean value chain process in this locality are producers, rural assemblers, rural whole sellers, district/ urban whole sellers, central traders, and processors and the products flow in this fashion,

just it looks like; supply chain rather than value chain, the produced yield flows without supporting forces because, the products flow only one direction/dimension started from producers in Metekel zone to be ended regional and central city Addis Ababa whole sellers and processors like; FAFA, Mesalememia and Ehilberenda market places with no series inter linkage connections between stakeholders in different stages, we have understood from section 5. Many farmers provided their products to rural assemblers, primary farmer unions, urban unions, rural whole sellers, and district traders, urban whole sellers. However, in the case of the large scale producers, the products were supplied to the urban whole sellers, central market traders, and occasionally directly supplied to the processors. Urban whole sellers were also collecting the products from any suppliers like; producers, rural assembler, rural whole sellers and unions then they sold to central market traders, processors and sometimes to the district retailers and private consumers. Proxy agents or brokers are available at different stages in the value chain process, where they connect the producers with the local markets or local traders as well as they also connect the traders with the processors. In this value chain processes different service providers are available including microfinance in giving cash loan to the local producers as well as regional city like; Assosa unions that provided loan and received the product. Assosa unions also have a potential and experiences in soybean transaction process where they collect the products and finally selling to the central markets and processors.

6. SOYBEAN VALUE CHAIN BUSINESS MODEL MAP FROM 2011-2013 CROPPING YEARS

Soybean Value Chain Mapping - BG



Legends of value chain map:

1. **Producers:** in this business model soybean producers are local farmers and commercial farmers like;Java,Newhope, and so on.
2. **Unions and cooperatives:** in the above business model the role of unions and cooperatives are collect soybean grains from farmers and local assemblers, for example Qua union in Mandura district is one of actively playing a role to collect soybean soy bean grains from rural unions and send products directly to its head office Burie district Qua union, finally they make sorting, sieving, grading, packing and deliver quality products for whole sellers and processors to maximize profit margins.
3. **Local traders:** the role those local traders are distribute loans and sacks before harvesting season, finally they have been collect grains around the community and sell products for advanced local traders.
4. **Brokers:** those bodies play a role to connect local traders and central whole sellers or processors by given commission fees, their role is a connection bridge between local and central customers to facilitate grain transaction process. And also access to currently determined grain prices for local traders.
5. **Whole sellers:** most probably whole sellers found in Addis Ababa city and some regional cities like; Assosa and Bahir Dar, their role is buying grains from provincial or zonal traders like; Metekel, Assosa and Kemashi Zones and collect huge amount of grains finally they sold to processors and exporters.
6. **Processors:** the role of processors, buy and collect quality grains from traders and sometimes directly from farmers. Some of soybean processors found in Ethiopia are (FAFA, Hlina, Guts Agro, Healthcare, Akaki AF, Alem AF etc... in Addis Ababa city)
7. **Exporters:** the role of exporters like; EPOSPEA buying and collect soybean grains from different whole sellers and making quality assurance processing finally sold to other overseas, in the previous year 2% of soybean products were exported.
8. **Service providers:** In this are there are some service providers like; Pawe Agricultural Research Center providing 95% pure foundation seed for growers and also being gave training, demonstration, consulting and other services, BoA, Micro finance, Cooperatives, Agri Service Ethiopia, Canada Physician Aid Relief Ethiopia(CPAR), World Vision, Mizizogo Mandura project, GILGAL ICP self empowerment program Pawe and Dibatie districts, Commercial Bank of Ethiopia, Construction and Business Bank and so on organizations provide different services for local farmers and other growers deployed on crop production.

7. SOYBEAN PRODUCTION BUSINESS MODEL CANVAS MAP (PRODUCERS)

6. Key Partners - PARC - Brokers - Pawe and Mandura Wereda BoA - Cooperatives and Unions - Microfinance - Assosa Unions	7.Key Activities - Production (seed and inputs preparation, land preparation, planting, weeding, harvesting, threshing), cleaning, sorting, sieving, storing, and Marketing (transporting and selling)	2.Value Propositions - Cleaning, sorting, sieving and drying - Quality product supply - Product Volume - Productivity, Seed color and Seed Size (Market demand) - Market quality / Value	3.Customers Relationships - Input supply - Product supply - Money transaction - Positive relations through quality product supply - Mutual Benefits	1.Customers Segments - Rural assemblers - Rural / urban whole sellers - Retailers - Consumers - Brokers - Central market traders / Addis Abeba traders - Cooperatives and Urban unions - Primary / farmers unions - Processors - Assosa Unions
	8.Key Resources - Land, inputs, labors, - Extension - Technologies - Infrastructures - Product volume and product quality - Finance source (unions, cooperatives and microfinance)		4.Channels - Animal back - People caring - Horse wagon - Tracks (FSR and 22 wheel track for large scale producers) - Phone communication - Direct contact - Brokers / Agents	
9.Cost Structures - Production cost - Seed and fertilizer (inputs) cost - Communication cost - Land tax cost and land preparation cost - Cleaning, sorting, sieving and drying and storing cost - Transportation costs (For large scale producers)			5.Revenue Streams - Grain selling - Straw selling	

7.1. Soybean Production Business Model Canvas Interpretations

According to the interviews conducted by bringing different participant stakeholders during focus group discussions, the main actors / customer segments in soybean production business model canvas map identified were rural grain assemblers, retailers, rural whole sellers, district level or urban whole sellers, consumers, brokers, central market Addis Ababa traders, cooperatives, farmer unions, urban unions, and processors. These are among the stakeholders where they are in the marketing and connection networks in each stages of value chain process. However, among the value addition propositions like cleaning, sorting, sieving, and drying are few activities to be implemented in deriving forces of the customers need of satisfying. Quality product and amount of supplied volume, physical seed color and size (generally market demand) and market quality / value addition are the main characters in value proposition of soybean products which is identified by interviewed respondents during value chain field assessment research studies. Moreover, the productivity also found to be the main trait or limiting factor in the value propositions. The other key issues of business model canvas of value chain studies were customer's relationship. The core relationships among the customers are mainly focused on mutual benefits where they networked in value chain in order to having common advantages in input supply, product supply, money transaction in each phases of value chain mainly on production and marketing activities. Above all, the relationships of customers among main actors seem to be positive through good quality product supply, mutual benefits and others. The smallholder producers or farmers were supplied their products mainly used animal back, people carrying by their head and back, and rarely horse/mule wagon when they selling their products either at village or nearby towns. However, occasionally, they were used small cars like those that Isuzu NPR tracks when they think and suspect of high price at nearby town markets. Tracks (FSR ISUZU and 22 wheel big Tracks for large scale producers). The relation channels among customers were a little beat modernized where they use mobile phone communication, direct contact (at community level) and more through proxy agents or brokers in getting current market price information and also demand proportion information. The revenue streams are mainly grain and straw sold. The key, but few activities under go value chain network are production where those are seed and input preparation, land preparation, planting, weeding, harvesting, threshing, cleaning, sorting, sieving, storing, and marketing (transporting and selling). On the other hand,

the key points obtained during interviewed respondents key resources found on ground were farmland, inputs, labors, extension interventions, availability of improved technologies, infrastructure for product transporting, finance source or loan access (from unions, cooperatives and microfinance) and moreover product volume and quality are major resources found to be play roles and enables producers in their customers need satisfaction. Even if present as a system, these organizations are not enough strong to be overcome their responsibilities/ duties efficiently. Therefore, they required more support in human resources capacity building programs (e.g data handling systems for unions / cooperatives), in financing and awareness creation capacity building (about take part in their duties and responsibilities) to be have enough potentials in achieving their objectives where they stand through tangible service providing. The other most important points concerned with soybean production are cost structures which included production cost, seed, and inputs cost, cleaning, sorting, sieving, drying and storing costs. Moreover, others costs required to customers need satisfaction were also land tax cost and communication cost. The transportation costs or fee (for large-scale producers) are one of the main cost structures when they delivered their produces to urban whole sellers, central market traders and processors.

8. SOYBEAN MARKETING BUSINESS MODEL CANVAS MAP (TRADERS)

6.Key Partners - PARC - Brokers - Cooperatives and Unions - Producers / farmers - Assosa unions - Transporters (Track owners) - Trade Ministers	7.Key Activities - Product collection, cleaning, drying, packing, storing, transporting and selling	2.Value Propositions - Cleaning, sorting, sieving and drying - Quality product supply - Product volume - Productivity, seed color and seed size (market demand) - Market quality / value - Collecting quality product from farmers, supply to whole grain sellers, processors, retailers and consumers	3.Customers Relationships - Product supply - Money transaction - Positive relations through good quality product supply - Mutual Benefits	1.Customers Segments - Retailers - Consumers - Brokers - Rural assemblers - Addis Abeba Traders / Central Traders - District cooperatives/unions - Farmers unions - Processors
	8.Key Resources - Product / produces - Labors - Infrastructures - Product volume and quality - Money / sources of money/ loan from the high level traders - Communication and transport access		4.Channels - Animal back - People caring - Horse Wagon - Phone Communication - Direct Contact - Brokers - Trackers (FSR, and 22 wheel track)	
9.Cost Structures - Broker and communication cost - Packing Materials Cost (eg sacks) - Transportation plus loading and un loading Cost - Tax / service cost - Cleaning, sorting, and sieving cost - Storing cost			5.Revenue Streams - Grain Selling	

8.1. Soybean Marketing Business Model Canvas Interpretations

From field research value chain assessment was carried out interviewed stakeholders selected from different districts of Metekel zone those who participated on focus group discussions workshop held at Pawe town, to develop integrated value chain of soybean. From interviews of the respondents, raised issues of value propositions were quality product supply, product volume and market stability, collecting quality product from farmers, supply to whole grain sellers, processors, retailers, and consumers. The respondents were cleaning, sorting, sieving, and drying their products to have a good market price and access to market. On the other hand varietal selection and productivity, seed color, and seed size (market demand) are also among value proposition characters to achieving the need of customer's satisfaction. The key activities were in the soybean marketing are product collection from smallholder producers and large-scale producers then after value addition activities have been done through product cleaning, drying, and packing. Moreover, the product was stored, where they transport, and sold based on market values or prices. The key resources availed in the targeting areas for soybean marketing / trading are presences of high product volume and quality, cheap labors cost, infrastructures road for easy product transport, enough government rental warehouses in Pawe district, Alimu felege selam kebele which is construct before 30 years ago by Tana Beles project, finance sources (loan from high-level traders), communication and transport access or opportunities for central market. As above-mentioned resources, there are also problems where challenged the transaction process of soybean. However, among main cost factors, cleaning, sorting, and sieving, packing materials, storing, transport, plus loading unloading costs were some of the cost structures for soybean traders were working at research target areas. Similarly, tax / service cost as well as broker and communication costs were few of cost structures data taken from stakeholders. After all of these costs, the revenue streams were earned by stakeholders from the soybean trading only being grain sold.

9. GENERAL DISCUSSIONS AND CONCLUSIONS

Soybean research in Ethiopia has been started since nearly 1950's by introduced some few breeding lines/genotypes. Soybean is either short day or day neutral plant it grows best the temperature embodied between 25-30°C. In 2010/2011 Ethiopian CSA (Central Statistical

Authority survey reports indicated that the total soybean area covered was 11, 261.12 ha with total production of about 158,244.22 quintals under the Ethiopian level, but; when we come to Metekel zone soybean covered areas in 201/2011 main cropping season was 11,008.79 ha where as the total production amount nearly about 162,002.69 quintals which contributes significant role to the gross agricultural national production with high changes to the national economy of the country. For this assessment research work 15 participated stakeholders were selected from producers (four producers), two both trader and producers, two traders, seven service providers in different government offices and NGO's, based on their contribution in value chain development programs. Those stakeholders participated during our focus group discussion session said "majority of soybean products almost more than 90% produce for market use only to generate income". During our assessment survey production, utilization and marketing of grain, majority of respondents they have been share common idea; they produce soybean for market use more than 90%, for home consumption 3.5% and the rest 5.5% for self saved seed for next cropping season, especially investors soybean product almost all for market demand except for some few self saved seed for next cropping season. Those respondents have being used three types of soybean varieties primarily they given from Pawe Agricultural Research Center, those varieties are; Belesa-95, Wegayen and Ethio-Yugozlavia. Most of the respondents being used soybean cultivar is Belessa-95 which was released and registered by Pawe Agricultural Research Center before long time and the average productivity of this cultivar under farmers' field nearly about 15-16qt/ha, the producers bought the seed by the price of 15 Eth.birr/kg, so, this figure showed that the value of this commodity still very low. For some production majority of respondents being used production input like; DAP fertilizers, and some few farmers used legume fixer bio-fertilizers which they given from Pawe Agricultural Research Center for demonstration and technology scaling up in addition to chemical fertilizers, but, in Gumuze communities farmers still they were not apply any fertilizers due to technology laggardness. When we look at soybean grain market the price was determined by central whole sellers or traders, processors and exporters. Brokers play role as a channel or Bridge to connect local traders with central whole sellers, processors and exporters, sometimes the contributions of brokers affect the transaction process by misleading market information and some brokers are greedy and they were looking only their interests. Track owners and drivers also play a role to travelling and transporting grains from Metekel zone to central city Addis Ababa and some

regional whole sellers and processor with high expedition to harvest good income. The major production constraints of soybean mentioned by respondents in this area was “diseases and pests, input unavailability, untimely input supplying, market price slump down, unavailability of mechanized technologies, occasionally weather conduction fluctuation like; high rain fall or drought, lack of production techniques, sometimes labor shortage, high production cost and lack of infrastructures”. Therefore, this assessment report indicated that unveil of further value chain assessment research studies to be conducted and will be addressed to fill the gaps.

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