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Soybean Value Chain Assessment Study in Northwestern Ethiopia, Metekel Zone

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Authors' contributions

This research work was carried out in the collaboration between both authors. Both authors read and approved the final manuscript.

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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, traders, 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 Paw town. The FGD program had comprises fifteen members brought from three districts in Metekel zone. Before focus group discussion program, we have interviewed twenty-two respondents from Pawe, Danger, Mandura, and Debate districts by prepared checklists to assess the capacity of a local organization and the casts of value chain actors at producers and traders level. Our assessment study results showed that farmers and other large-scale growers produced soybean for three purposes; one for income, two for household consumptions and three for rotation

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with cereal crops to improve soil fertility. 90% of soybean was produced for income generating, 3-4% for home consumption and the rest around 5% as a seed source. In 2010/2011 main cropping season in Metekel zone 11, 008.79 ha arable land was covered by soybean. From our result soybean central wholesalers, processors, and exporters determined transaction price. During our assessment study, we have evaluated the contribution of unions and cooperatives; fortunately, they have no significant contributions on value additions, except Qua union in Burie district. The inter-linkage of soybean value chain actors in this area was still yet not well organized. Therefore, from our research result, we deduced and noted that this area needs further value chain research work to create strong linkage between stakeholders and to enhance the benefit of local farmers who being deployed on soybean cultivation, because this area is the potential region of soybean production.

Keywords: EIAR; Pawe research center; Metekel; soybean; value chain; business model canvas.

1. INTRODUCTION

In Ethiopia, soybean research was started in 1950's by introduced genotypes with the main emphasis on 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 peoples' 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, suitable for cropping systems and source of income.

Soybean considered as either a short or a day neutral plant it requires 25 to 30℃ temperature for growth and proper modulation [2]. Soybean is also a medium altitude crop well adapted to an altitude varying from 1300 to 1800 masl (meter above sea level) receiving the 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 [3].

Since the 1970s, soybean production had raised over around the world. The major leading producers were; U.S.A, Brazil, Argentina, and China where they have been accounted 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 whereas U.S.A was the leading producer and accounts 40% with the total area of 28.9 million ha [4]. In 2009, soybean ranked first from major oil crops with total area coverage of 99.5 million ha in the world [5]. The world's average productivity of 1977 and 1987 was 1.608 and 1.906 ton/ha respectively; while it was 2.057 and 2.270 ton/ha for U.S.A [6].

According to the Ethiopian Central Statistical Authority (CSA), data of 2010/11 main cropping season production survey a total area of 11,822,786.19 ha were covered by grain crops (cereals, pulses, and oilseeds) with the total production volume of 20,348,528.834 tons were produced under private peasant holdings. Out of the total grain crop area coverage, 81.97% (9,690,733.96 ha) and 11.48% (1,357,522.68 ha) have covered by cereals and pulses respectively. Cereals contributed 87.29% (about 17,761,336.584 tons) and pulses contribute 9.6% (1,953,193.501 tons) of grain production in Ethiopia. The private peasant holders cultivate various kinds of crops for own consumption and/ or economic benefits. Farmers being produced pulse crops in all regions of the country after cereals for the purpose of to maintain soil fertility and enhance production and productivity. Pulses grown in 2010/11cropping season accounted 11.48% (1,357,522.68 hectares) of the grain crop area and 9.6% (about 1,953,193.501 tons) of the grain production was drawn from the same crops at the country level. According to the Ethiopian Central Statistical Authority (CSA) data of 2010/11, main cropping season soybean was planted to about 11,261.12 ha with a total production of 15,824.422 tons in Ethiopia.

Soybean was introduced into Benishangul Gumuz National Regional State during the massive resettlement program of the Derg regime in 1985. Since the then, farmers grow on a small-scale level as a sole crop primarily for its economic merits such as income generating and home consumption. According to the Ethiopian CSA (Central Statistical Authority) data in 2010/11 main cropping season Benishangul Gumuz region, the agricultural sector the total

area coverage and production of pulse crops were 11,008.79 ha and 16,200.269 tons 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 Central Statistical Authority (CSA) survey [7], the productivity of soybean was 0.8 and 1.6 t/ha in Assosa, and Maokomo areas respectively. Now a day's, the production is highly raised in the region. The aim of this assessment research study was to scout/spy out, 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 and overhaul the capacity of local organizations deployed and focused on soybean production,
(2) To identify the main soybean value chain actors,
(3) To identify soybean production constraints and causes,
(4) To construct soybean business model map canvas, and set up of prospective value chain researches.

2. MATERIALS AND METHODS

2.1 Stakeholders' Selection

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

2.2 Soybean Value Chain

The economic viability of soybean was 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 was dominant in the world market; it accounts about 30% of the whole total produced vegetable oils in the world. In the global market, its oil share is estimated about 44% and ranked first among the major oil crops such as rapeseed, peanut, 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 peanut 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% staric acid (18:0), 18% oleic acid (18:1), 55% linoleum acid (18:2), and 13% linolenic acid (18:3), respectively.

The nutritional value of soybean is primarily lying 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 tons consumed annually in the World; nearly about 50% of supply was from the USA. Many studies had been showed that consuming soybean product has reduced the 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, is better than other legume crops. On average soybean can fix over 75 kg nitrogen per hectare per season [11]. Many people have limited access to animal products; probably children are suffering from malnutrition. Soybean is a cheap protein source for poor people in order to struggle undernourishment. The crop is a promising proposed for the 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 interest. 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].

3. RESULTS AND DISCUSSION

3.1 Production Information Interviews

Soybean producers in Metekel zone have been interviewed and responded that "the average farm land size of per household was 0.75-5 ha", which is very small, but investors had 200-3,000 ha, especially Pawe district farmers had no enough farm land due to densely populated in the reason of massive resettlement program during the Dreg regime since 1985. In this area soybean farmers plow their land 2-3 times, but most probably it depends on the condition of the land, and the draught power of the farmers were Ox and Donkey sometimes they used Mule, but investors used mechanized farming used different tractors. The seed sources of those farmers deployed on soybean cultivation were Pawe Agricultural Research Center, they got the seed in different extension systems like; technology demonstrations, pre-scaling up and scaling up activities with the collaboration of zonal and district BoA offices. The cultivars used by growers were; Belesa-95, Ethio-Yugoslavia and Wegayen, those three cultivars currently available on farmers hand and cultivated wide areas. The amount of seed rate applied by farmers was varied from district to district, some farmers used proper recommended seed rate and others they did not use the recommendation amounts, however, in this area farmers used seed rate was 60-100kg/ha, but the right seed rate recommended by research centers was 60-80kg/ha, the seed rate variation depends on seed size and the fertility status of the given farmlands. In this area farmers input application system was seldom, particularly in Gumuz community, but other ethnic groups used chemical fertilizers such as; DAP 50-100 kg/ha and some few model farmers also used bio-fertilizers, for instances; legume fixer and Mar-1495, the sources of those fertilizers were BoA, cooperatives and unions and bio-fertilizers from Pawe Agricultural Research Center just given for technology popularization and demonstration. The farmers said that they bought the seed ETB15/kg from Pawe Agricultural Research Center which was supported by Ethiopian government just like revolving seed source systems and another seed sources were from model farmers deployed on seed multiplication, certified seed producer fellow farmers in their community basically they had seed certification given by Pawe Agricultural Research center after laboratory check up by seed scientists in the seed quality test measurements. The following table gives some information about soybean production;

Table 1. Soybean production basic information in Metekel zone

S/No.	Production resources	Amounts & types
1	Land size	0.75-5 ha
2	Seed rate	0.6-1 t/ha
3	Seed class	Certified-1, 2 and local
4	Fertilizer type	DAP & Bio-fertilizers
5	Fertilizer rate	0.5-1t/ha
6	Seed prices	ETB 10-15/kg
7	Productivity	<1 t/ha
8	Home utilization	3-4% of total production
9	Self-saved seed	<5%
10	For market	>90%

3.2 Local Market Information and Key Informant Interviews

We have been collected local market information by prepared checklists, and then we interviewed key informants each one by one, which was just like informal survey. During interviewed time, we have had select respondents in a systematic way to avoid biasness, for instance we were chosen respondents from traders, farmers' small-scale, large-scale, and private commercial, unions, and cooperatives. However, the answer of the respondents was a little bit similar. We stated and understood from key informants; response, market information in some extent had been decentralized.

3.3 Soybean Value Chain Assessment Interpretations

Metekel zone is one of the three zones in Benishangul Gumuz national regional state, which is known to be the most pulse producing belt area followed, by Assosa zone. According to CSA (Central Statistical Authority) data of 2010/11, the total area coverage of pulse crops under this zone was 11,008.79 ha whereas the total production amount about 16,200.269 tons that 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 level. The survey was also given a clue

for identifying key production problems prevailed at target survey areas. Among the few problems such as; lack of improved technologies, low extension approaches, input scarcity (particularly untimely input supply), moreover market access, and grain price were some of the problems related to soybean production.

At the area production potential, huge amount of soybean products supplied by Pawe, Mandura, Debate, and Dangure, districts of Metekel zone. However, informal communications and interviews have been done with the stakeholders who participated in focus group discussion we have been confirmed that nearly about 400.0 ton soybean products were supplied per week from only Pawe district. 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.

Table 2. Soybean value-chain main actors and functions

Actors	Functions
Producers	⇨ Manage farm level production process
	⇨ Determines quality of grains during seed selection and production process especially threshing
	⇨ Pack and stored
	⇨ Deliver it either to local traders or local wholesalers
	⇨ Commercial farmers delivered their product to central market traders in Addis Ababa or processors or exporters
Local traders	⇨ Collect, measure and pack the products
	⇨ Pay cash on delivery
	⇨ Store grain
	⇨ Deliver to local wholesalers
	⇨ Sell seeds to local consumers
Regional traders	⇨ Provide loan when crops are harvested: The products are sold to the wholesaler at the harvesting time price and the rest of the product will be sold to the wholesaler at the prevailing price when the farmer wants to sell.
	⇨ Pay cash on delivery to the collectors or farmers who sell products to them
	⇨ Deliver the product to central markets in Addis Ababa or sell it to processors in the regional market
Brokers	⇨ Receive products/seeds transferred to it by the local/regional wholesaler. Such a transfer is arranged by telephone whereby the driver name, license plate number of the truck, type of product and quantity is informed to the commission agent;
	⇨ Facilitate selling of the products
	⇨ Negotiate with buyers about the price and effects of the selling
	⇨ Deduct unloading cost and own services from sales values;
	⇨ Transfer the balance to the local/regional wholesaler through commercial Bank of Ethiopia and other available banks
Central wholesalers in Addis Ababa	⇨ Negotiate with the commission agents.
	⇨ Pay cash to the commission agents on delivery of the product when received
	⇨ Export or sell to processor factories
Exporters	⇨ Maintain the quality of the product and pack it
	⇨ Deal with export clearance
	⇨ Pay necessary fees for export
	⇨ Export the product and remit the income
Processors	⇨ Buying products from producers or wholesalers
	⇨ Process the seeds (extract oil/livestock feeds or cakes etc.)
	⇨ Sell the processed product to retailers/supermarkets, or directly to consumers.
Consumers	⇨ Farmers eating soybean in the form of bread made by mix with maize and wheat grains to made mix flour, soymilk etc…
	⇨ Ultimate users of the product when processed ones both urban and rural people in the form of oils, FAFA soy flours and consume it.

Table 3. Key challenges & opportunities of soybean production, utilization & marketing

Supply chain	Challenges	Opportunities
Production	⇨ Poor Production System ⇨ Only use traditional agricultural inputs ⇨ High weed infestation ⇨ Lack of alternative improved technologies ⇨ Productivity declining and poor working habits ⇨ Lack of awareness about modern agronomic practices ⇨ High diseases and insect pest (termite) infestations ⇨ Unavailability of enough input access ⇨ Lack of post -harvest technologies	⇨ Pawe and Assosa Agricultural Research Centers established in BGR, they attempted to support or delivered improved varieties like Belesa-95, Eth-Yugoslavia and Wegayen those are suitable for Metekel zone agroecology ⇨ Government policy is supportive of increasing production and productivity ⇨ Metekel zone is the most potential area for crop production especially oil crops ⇨ Most of the farmers willing to expand and produce high market value crops especially, soybean sesame and peanut
Marketing	⇨ Low Market prices and demand ⇨ Poor market information system ⇨ Lack of legal procedures between commission agents and traders ⇨ Poor product quality/grain deteriorations ⇨ Declining of Market prices ⇨ High Market fluctuation and instability ⇨ Poor storage shelf life and high weight loss ⇨ Poor financial capacity of local unions and Cooperatives	⇨ Local consumers and market demands increased from time to time. ⇨ Export demands increased
Processing	⇨ Lack of quality product supply from local farmers and traders, it contains high inert matter Value addition along the supply chain was limited	⇨ Amount of grain supply was increasing ⇨ The number of factories and processors increasing from time to time ⇨ Number of ultimate users demand was arising from time to time

As indicated in the value chain flow chart diagram section 5 the main soybean product suppliers were large-scale producers, and smallholder farmers they were marketing their products to the rural assemblers and grain collectors, rural wholesalers, local consumers, and retailers, urban wholesalers, 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 value chain process of soybean were producers, assemblers, wholesalers, 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 dimension started from producers into regional and central city wholesalers and processors like; FAFA, Mesalemia, Ehilberenda marketplaces with no inter-linkage series connections between stakeholders. Many farmers provided their products to rural assemblers, primary farmer unions, urban unions, rural wholesalers, and district traders, urban wholesalers. However, in the case of the large-scale producers, the products were supplied to the urban wholesalers, central market traders, and occasionally directly to the processors. Urban wholesalers were also collecting the products from any suppliers such as; producers, rural assembler, rural wholesalers 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. Assosa unions also had good experiences in soybean transaction process where they collect the products and finally sold to the central markets and processors.

3.3.1 Legends of value chain map

3.3.1.1 Producers

Soybean producers are local farmers and commercial farmers like; Java, New hope, and so on.

3.3.1.2 Unions and cooperatives

The role of unions and cooperatives are collect soybean grains from farmers and local assemblers, for example, Qua union in Madura district was one of actively playing a role to collect soybean grains from rural unions and send products directly to its head office Burie district Qua union, finally they made sorting, sieving, grading, packing and deliver quality products for wholesalers and processors to maximize profit margins.

3.3.1.3 Local traders

Local traders have distributed loans and sacks before harvesting season, finally, they have been collect grains around the community and sell products for advanced local traders.

3.3.1.4 Brokers

Connecting local traders and central wholesalers or processors by given commission fees, their role is a connection bridge between local and central customers to facilitate grain transaction process. And, access to currently determined grain prices for local traders.

3.3.1.5 Wholesalers

Most probably wholesalers found in Addis Ababa city and some regional cities like; Assosa and Bahir Dar, their role is buy grains from traders such as; Metekel,Assosa, and Kemashi zones and collect the huge amount of grains finally, they sold to processors and exporters.

3.3.1.6 Processors

The role of processors were buy and collect quality grains from traders and sometimes directly from farmers. Some of the soybean processors found in Ethiopia are (FAFA, Hlena, Guts Agro, Healthcare, Akaki AF, Alem AF etc… in Addis Ababa city)

3.3.1.7 Exporters

The role of exporters like; EPOSPEA buy and collect soybean grains from different wholesalers and making quality assurance processing finally sold to other overseas, in the previous year 2% of soybean products were exported.

3.3.1.8 Service providers

There are some service providers for instance; Pawe Agricultural Research Center providing 95% pure foundation seed for growers and also being gave training, demonstration, consulting and other services, BoA, Microfinance, Cooperatives, Agri Service Ethiopia, Canada Physician Aid Relief Ethiopia (CPAR), World Vision, Mizizigo Mandura project, GILGAL ICP self-empowerment program Pawe and Debate districts, Commercial Bank of Ethiopia, Construction and Business Bank and so on organizations provided different services for local farmers and other growers deployed on crop production.

3.4 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, wholesalers, district 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 stage of value chain process. However, among the value addition propositions like cleaning, sorting, sieving, and drying were few activities implemented in driving forces of the customer's satisfaction. Quality product and amount of supplied volume, physical seed color and size (generally market demand) and market quality / value addition were the main characters in the value proposition of soybean products, which was identified by interviewed respondents during

value chain field assessment research studies. Moreover, the productivity also found to be the main limiting factor in the value propositions. The other key issues of the business model canvas were customer's relationship. The core relationships among the customers mainly focused on mutual benefits where they networked in the value chain in order to have common advantages in input supply, product supply, and grain transaction in each phase 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 a village or nearby towns. However, occasionally, they were used small cars; Isuzu NPR tracks when they think and suspect of high price at nearby town markets. Trucks (FSR ISUZU and 22 wheel trucks). 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 undergo value chain network were production where those are seed and input preparation, land preparation, planting, weeding, harvesting, threshing, cleaning, sieving, storing, and marketing (transporting and selling). On the other hand, the key points obtained from interviewed respondents were key resources found on ground those 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 play roles and enabled producers to satisfying their customers.. Therefore, they required more support in skilled human resources capacity building programs (e.g. data handling systems for unions / cooperatives), in financing and awareness creation (about take part in their duties and responsibilities) to have enough potentials in achieving their objectives where they stand through tangible service providing. The other most important points concerned with soybean production were cost structures, which included production cost, seed, inputs, and cleaning, sorting, sieving, drying and storing costs. The transportation costs or fees (for large-scale producers) were one of the main cost structures when they delivered their products to urban wholesalers, central market traders, and processors.

3.5 Soybean Marketing Business Model Canvas Interpretations

The interviewed stakeholders selected from different districts of Metekel zone those who participated in focus group discussions workshop held at Pawe town was to develop integrated value chain of soybean. Respondents, raised issues of value propositions were supply quality product, product volume, and market stability, collecting quality product from farmers, supply to wholesalers, processors, retailers, and consumers. The respondents were cleaning, sorting, sieving, and drying their products to have a good market price and access to the market. On the other hand, cultivar selection and productivity, seed color, and seed size (market demand) were also among value proposition characters to achieving the need for customer's interest. The key activities in soybean marketing were product collection from smallholder producers and large-scale producers then value addition activities have been 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 available in the targeting areas were presences of high product volume and, cheap labors forces, infrastructures like road for easy product transport, enough government rental warehouses in Pawe district, Alimu felege selam kebele that was construct before 30 years ago by Tana Belles project, finance sources, communication and transport access or opportunities for central market. As above-mentioned resources, despite there were problems encounter and challenged like the transaction process. However, among main cost factors; cleaning, sorting, and sieving, packing materials, storing**,** transport, and loading unloading costs were some of the cost structures for soybean traders. Tax / service cost, as well as communication costs, were few of cost structures data taken from stakeholders. After all of these costs, the revenue streams were earned by stakeholders from grain sold.

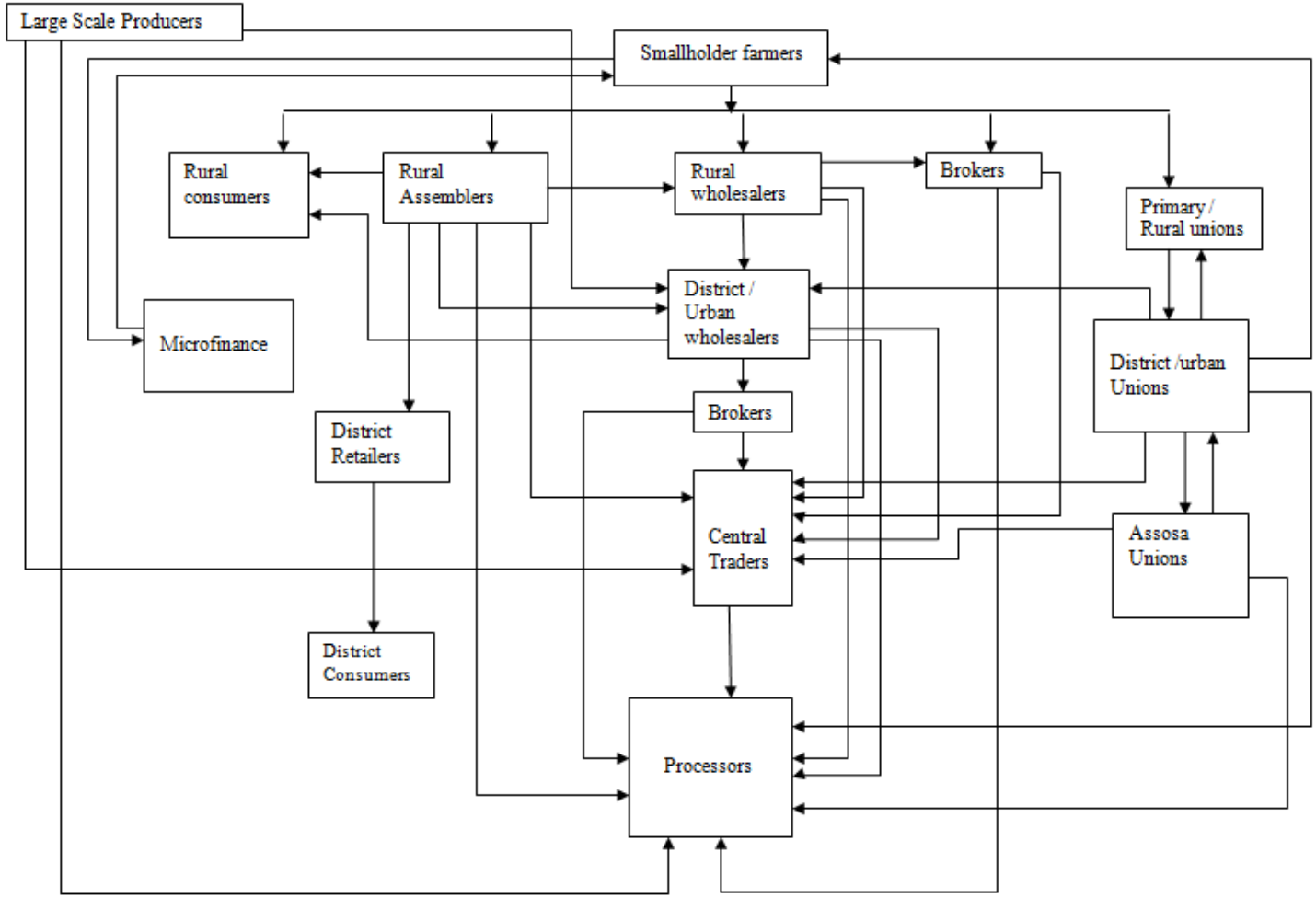

Fig. 1. Value chain flow chart

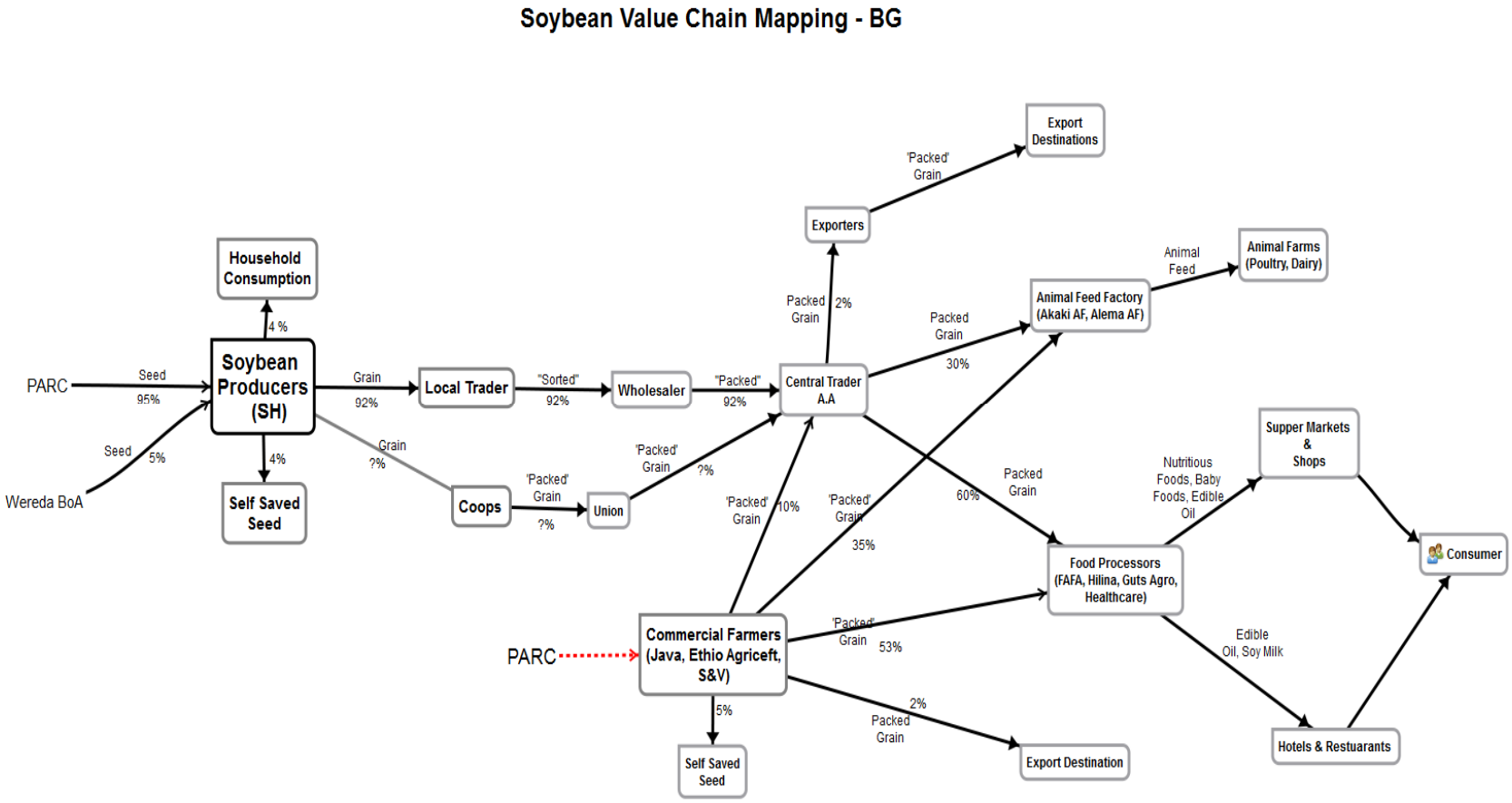

Fig. 2. Soybean value chain business model map from 2011-2013 cropping years

Table 4. Soybean production business model canvas map (Producers)

1. Customers segments	2. Value propositions	4. Channels	5. Revenue streams	7. Key activities
- Rural assemblers - Rural / urban whole sellers - Retailers - Consumers - Brokers - Central market traders/Addis Ababa - Cooperatives and Urban unions - Primary / farmers unions - Processors - Assisi Unions	- 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	- Animal back - People caring - Horse wagon - Trucks (FSR and 22 wheel truck for large-scale producers) - Phone communication - Direct contact - Brokers / Agents	- Grain selling - Straw selling **6. Key partners** - PARC - Brokers - Pawed and Madura Wired Boa - Cooperatives and Unions - Microfinance - Assisi Unions	- Production (seed and inputs preparation, land preparation, planting, weeding, harvesting, threshing), cleaning, sorting, sieving, storing, and Marketing (transporting and selling)

8. Key resources	9. Cost structures
- Land, inputs, labors, - Extension - Technologies - Infrastructures - Product volume and product quality - Finance source (unions, cooperatives and microfinance)	- 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)

Table 5. Soybean marketing business model canvas map (Traders)

1. Customer segments	2. Value propositions	4. Channels	5. Revenue streams	7. Key activities
- Retailers - Consumers - Brokers - Rural assemblers - Addis Ababa Traders / Central Traders - District cooperatives/unions - Farmers unions - Processors	- 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	- Animal back - People caring - Horse Wagon - Phone Communication - Direct Contact - Brokers - Trackers (FSR, and 22 wheel track)	- Grain Selling	- Product collection, cleaning, drying, packing, storing, transporting and selling

3. Customer relationships	6. Key partners
- Product supply - Money transaction - Positive relations through good quality product supply - Mutual Benefits	- PARC - Brokers - Cooperatives and Unions - Producers / farmers - Assisi unions - Transporters (Track owners) - Trade Ministers

8. Key resources	9. Cost structures
- Product / produces - Labors - Infrastructures - Product volume and quality - Money / sources of money/ loan from the high level traders - Communication and transport access	- Brokers' and communication fees - Packing Materials cost (sacks, sewing stitch…) - Transportation plus loading and unloading cost - Tax / service fee - Cleaning, sorting, sieving cost, and storing cost

4. CONCLUSIONS

Soybean research in Ethiopia has been started before sixty-six years ago 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℃. In 2010/2011 Ethiopian Central Statistical Authority (CSA) survey reports indicated that the total soybean area coverage was 11, 261.12 ha with total production of about 15,824.422 tons. but; when we come to Metekel zone soybean covered areas in 201/2011 main cropping season 11,008.79 ha whereas the total production amount nearly about 16,200.269 tons which contributed significant role to the gross agricultural national production with high changes to the national economy of the country. For this assessment research work, 15 stakeholders were selected from producers (four producers), two both traders and producers, two traders, seven service providers in different government offices and NGO's, based on their contribution to value chain development programs. Those stakeholders participated during our focus group discussion session and they have said: "the majority of soybean products almost more than 90% produce for market use only to generate income". During our assessment survey production, utilization and marketing majority of respondents they have been sharing common ideas; those were; they produced 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. Those interviewed respondents have been used three types of soybean cultivars primarily they had given from Pawe Agricultural Research Center, those were; Belesa-95, Wegayen, and Ethic-Yugoslavia. Most of the respondents used cultivar was 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 1.5-1.6t/ha, the producers bought the seed by the price of ETB15 /kg, so, this figure showed that the value of this commodity still very low. The majority of respondents being used production inputs were DAP fertilizers, and some few farmers used legume fixer bio-fertilizers, which they have been given, from Pawe Agricultural Research Center for demonstration and technology scaling up., but, in Gauze community farmers still they did not apply any fertilizers due to technology laggardness. When we have look at soybean grain market the price was determined by central wholesalers, processors, and exporters. Brokers play a significant role as a channel or bridge to connect local traders with central wholesalers, processors, and exporters, sometimes the contributions of brokers affect the transaction process by misleading market information and some brokers were greedy, egoist, and they were looking only their interests. Truck owners and drivers also play a role in traveling and transporting grains from Metekel zone to central city Addis Ababa and some regional wholesalers and processor with the high expedition to harvest good income. The major production constraints of soybean mentioned by respondents were; "diseases and pests, input unavailability, untimely input supply, market slump down, unavailability of mechanized technologies, occasionally weather conduction fluctuation, 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 the gaps.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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