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ANALYSIS OF SOYBEAN VALUE CHAIN IN BUNO BEDELE ZONE, SOUTH WESTERN ETHIOPIA

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Abstract
In Bunno Bedelle zone, soybean is a major cash crop which is mainly produced by smallholder farmers. The study was undertaken with the objective of mapping value chain actors, estimating share of actors' margin, identify major constraints and opportunities and identifying market channel of soybean by smallholder farmers. Multi stage random sampling techniques were employed to select a total of 218 farmers from nine Kebeles. Data were collected from both secondary and primary sources. Descriptive, SWOT analysis and value chain mapping methods of data analyses were used to analysis the data. Soybean value chain analysis of the study areas revealed that the main value chain actors were input suppliers, soybean producers, wholesalers, retailers, collectors, processors, exporters and consumers. The major constraints identified are low access to improved inputs, collateral problem to get credit, poor storage facilities, low price of produce, and low negotiation (bargaining) power of producers. Therefore, improving extension services, sharing of experience among soybean farmers, increase land allocation and market information dissemination are require to improve productivity and profitability of soybean farming in the region and Ethiopia at large.

Key Words: *Soybean, Value chain, Benefit share, Profit share*

Introduction

Soybean is one of the world's most important pulse crops. Soybean, a short-day plant, is a very important oil and protein crop. It can grow on all types of soil, but deep fertile loam with good drainage is most suitable for growth. It is an annual crop, fairly easy to grow, that produces more protein and oil per unit of land than almost any other crop. It is a versatile food plant that, used in its various forms, is capable of supplying most nutrients. It can substitute for meat and to some extent for milk. It is a crop capable of reducing protein malnutrition. Soybean is an alternative protein source to the rural families and can be utilized at home in various forms and the surplus can be sold to other consumers and manufacturers for income Soybean is among the major industrial and food crops grown in every continent (FAOSTAT, 2011).

In the major producing countries and particularly in Brazil, Argentina, Paraguay

and the USA soybean contributes significantly to the total value added by the agricultural sector. In these countries, soybeans and its sub-products also occupy an important position in total export earnings (Jagwe and Owuor, 2004). In Ethiopia, regions with high potential for soybean are Benishangul-Gumuz and SNNPR. High potential areas for upgrading of commercial soybean production are Bedele, Chewaka and Jimma zone (Oil Seeds Business Opportunities Ethiopia, 2009).

Even if soybean is benefiting the society at both micro and macro level of the economy, its marketing operation is challenged by lack of information and/or absence of business oriented agricultural production system, limited or no access to market facilities infrastructure which hinder market arrangement and fair share of profit margin among the stakeholders (FAO, 2011). Bezabh (2010) also identifies that, agriculture continues to face a number of problems and challenges. The major ones are lack and/or absence of business oriented agricultural production system, limited or no access to market facilities resulting in low participation of the smallholder farmers in value chain or value addition of their produces. Cultivation and production of soybean is currently constrained by a lack of awareness about the crop by farmers and private sector and by a lack of knowledge on its potential uses and processing methods. Moreover, there is a lack of linkages between the small produce of farmers and soybean demand from factories (Gurmu, 2010). The Ethiopian soybean value chain is essentially full of challenges yet replete with opportunities. It is constrained by a number of factors. Hence, this study was focused on analysis the constraints, challenges and opportunities faced in the soybean value chain, and identify the benefit share of smallholder producers which are not yet well studied.

Objective of the Study

The general objective of the study is aimed at analyzing soybean value chain in the study area. The specific objectives of the study are:

- To identify soybean marketing channel in study area
- To map the value chain and estimate the share of profit of actors along the chain
- To identify major constraints and opportunities of soybean value chain in study area.

Study Area

Chewaka, Didessa and Gechi districts are located in Buno Bedele zone. **Chewaka** is located 600 kilometres west of Addis Ababa. It has 28 administrative kebeles (villages). The total land area of the district is about 52,227 hectares, and the population is estimated to be 78,783 (CSA, 2008). **Gechi** is one of the district in the Buno Bedele Zone, is bordered on the south by Didessa, on the east by the Jimma Zone, on the north by Bedele, and on the east by the Didessa River which separates it from the Jimma Zone. The 2007 national census reported a total population for this district of 70,478, of whom 35,307 were men and 35,171 were women; 5,442 or 7.72% of its population were urban dwellers. **Didessa** is one of the districts in the Oromia Region of Ethiopia. It is named after the Didessa River, a tributary of the Abay River. Part of the Buno Bedele Zone, Didessa is bordered on the south by the Didessa River which separates it from the Jimma Zone, and on the north by Gechi. The major town in Didessa

is Dembi. Soybean is an important cash crop of this district.

Types and Sources of Data

Both primary and secondary sources were used. Primary data sources were soybean producer/farmers from six purposely selected Kebeles and soybean traders (wholesalers, retailers, and local collectors). Secondary data was collected from different sources, such as: District Agricultural Office, District Trade and Market Development Office, District Cooperative Promotion Office, ECX, reports, bulletins and websites.

Sampling Procedure and Sample Size

Multistage sampling technique was employed to select soybean producer households for the study. In the first stage, three highest soybean producing districts were purposively selected. Nine highest soybeans producing Kebeles were selected randomly from three districts in the second stage. In the third stage, simple random sampling technique was used to select the households. Probability proportional to size (PPS) was used to determine the number of farmers. The sample size determination was resolved by means of Yamane (1967) sampling formula with 95 percent confidence level.

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

n = sample size for the research use
N = total number of households in four soybean producing Kebeles
e = margin of errors at 5%

As a result, 218 soybean producer farmers were selected for the purpose of the study.

Methods of Data Collection

Enumerators who have college diploma were recruited and trained to implement data collection using structured questionnaire. Data was collected under continuous supervision of the researchers. Descriptive, value chain and SWOT analyses were used for analyzing the data collected from farmers and traders in the study area.

Result and Discussion

Soybean Marketing Channels

Soybean passes through various channels until it reaches the final consumers. Around six channels are identified in the soybean value chain. The shortest channel occurs when producers directly sell the product to consumers. This occurs when farmers bring small quantity of the product to market and when the farm is close to urban centres. This result is similar to Kotler and Armstrong (2003), identify that the marketing channels refer to the routes taken by from producers to consumers.

The channel in Addis Ababa is not continuation of the channel in the study area, because in the study area the raw product is traded but in Addis Ababa the processed one is preferable by consumers. The Marketing channels of soybean in Bunno Bedelle were identified below:

Channel 1: Producer ⟶ Consumer
Channel 2: Producer ⟶ Retailer ⟶ Consumer
Channel 3: Producer ⟶ Wholesaler ⟶ Retailer ⟶ Consumer
Channel 4: Producer ⟶ Local Collector ⟶ Wholesaler ⟶ Retailer ⟶ Consumer
Channel 5: Producer ⟶ Local Collector ⟶ Wholesaler ⟶ Exporter
Channel 6: Producer ⟶ Local Collector ⟶ Wholesaler ⟶ Processor ⟶ Retailer Consumer ⟶

Value Chain Analysis

Mapping of Soybean Value Chain in Buno Bedele Zone

The value chain map depicts the flow of soybean in the market, activities carried out at each stage of the value chain, the structure of actors and the support involved in the value adding process. This result similar to Schmitz (2005) identified that, value chain mapping enables to visualize the flow of the product from conception to end consumer through various actors. Consequently, the current value chain map of soybean in Bunno Bedelle zone is depicted in figure1below.

Input suppliers

Input Suppliers are the first actors involved in the soybean value chain. Farmers in Bunno Bedelle zone generally, responsible to supply agricultural inputs like fertilizers, herbicides, pesticides and farm implements, which are essential inputs at the production stage. For all soybeans produced in Bunno Bedelle zone, soybean producers used from local market, cooperatives and NGO.

Actors and their Functions in Soybean Value Chain

Table 1: Source of soybean input for sample respondents

Source of input	Numbers of Households	Percent
Local market	90	41.3
Cooperatives	82	37.6
NGO	46	21.1
Total	218	100.0

Regarding fertilizers, some farmers used only organic fertilizer (manure and compost) while some farmers used both inorganic and organic fertilizers depending on the land size allocated to soybean type produced and the soil fertility status as perceived by the farmers. Most private vendors supply pesticide.

Producers

Soybean producers are the first link in the marketing channel and the second actors in the soybean value chain. They are the major actors who perform most of the value chain functions right from farm inputs preparation on their farms or procurement of the inputs from other sources to post harvest handling and marketing. The major value chain functions that soybean producers perform include land ownership, production, yield and quantity sold.

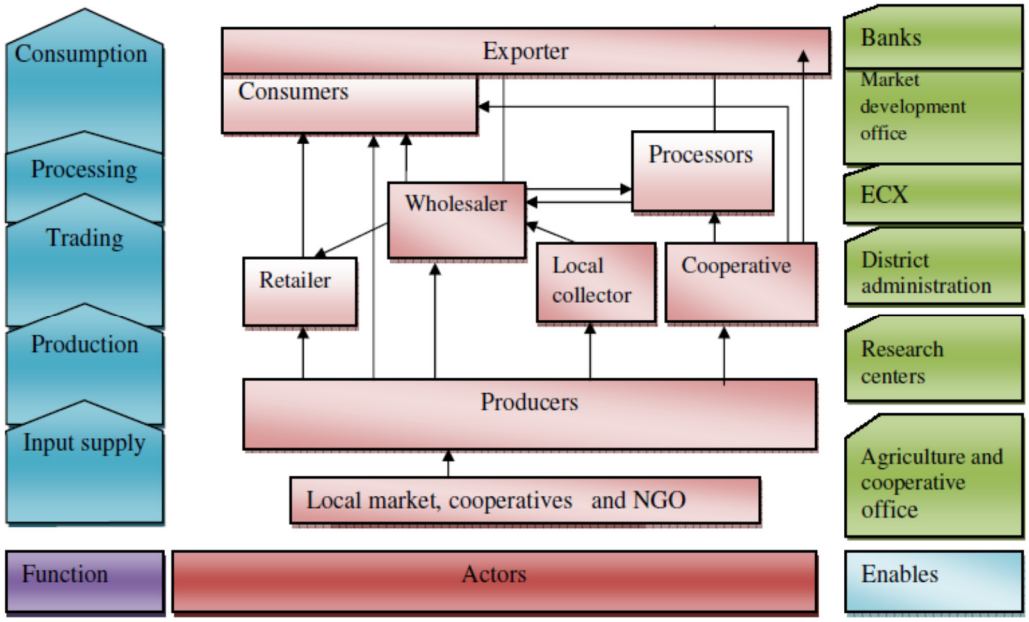

Fig. 1: Value chain map of soybean in Bunno Bedelle Zone

⟶ Represents physical flow of inputs and products

As indicated in table 2, the average land holding size of farmers who have participated in the production of soybean in 2017/2018 production season is found to be 1.17 hectare per household.

The average soybean yield is estimated to be 27.97 qt/ha in the study area (Table 2). The yield show much variation among the zones because those farmers who produce in Bunno Bedelle zone frequently doesn't access extension services and support in training and advisory from Bunno Bedelle Cooperative promotion and Agriculture Office. They are also beneficiaries from the NGO in accessing bio fertilizer and improved soybean seed variety.

Table 2: Land holding and average yield of soybean

Variables	N	Mean	Std. Deviation
Land size in hectare	218	3.1	2.3
Land size used for soybean	218	1.17	1.60
quantity of soybean produced	218	27.97	33.84
quantity supply to the market	218	23.025	28.005
Quantity of soybean sold	218	22.76	28.34
Quantity of soybean consumed	218	1.16	0.95

As it stated in table 7 above the average marketed supply of soybean by producers was 22.76 quintals in 2017/18 production season with maximum of 142 and 0.25 quintals. As indicated in table 2, the maximum and minimum quantity of soybean supplied to the market in 2017/2018 production season was found to be 142 and 0.25 qt respectively.

Local Collectors

It is the first link between producers and other traders. According to Bezabih

(2010), these are small trading individuals who collect the product in small quantity directly from producers and resell to brokers/wholesalers, oil millers and exporters in a more marketable quantity. They act as intermediaries who do not add value but merely snatch the benefit that could have accrue to the producers. They use their financial resources and their local knowledge to bulk soybean from the surrounding area. They play important role and they do know areas of surplus well. Collectors are the key actors in the soybean value chain, responsible for the trading of soybean from production areas to wholesale and retail markets in the Bunno Bedelle zone.

Wholesalers

They are larger suppliers who have better capacities in terms of finance and other facilities. They provide both price information and advance payments for selected reliable clients. They have better storage, transport and communication access than other traders do.

Retailers

Retailers are also important primary actors in the soybean value chain in the study area. Their duty is to buy the product from farmers, collectors and wholesaler one and store it to their temporary storage. Then by sorting and packing they sell raw soybean to nearby consumers by negotiation.

Union and Cooperatives

One sales outlet of the small-scale farmer is the cooperatives and unions. Unions collect soybean from each farm household through their member cooperatives. The cooperatives in turn collect the soybean mainly from their member farmers. The unions store and clean the soybean and look for export sale outlets. The unions prefer to participate in the ECX marketing framework as buyers rather than as sellers. This is because they have developed the necessary financial and organizational capacity to export. The government and/or concerned governmental organizations are doing their best to encourage unions to undertake high-value addition activities, including export and import of commodities and inputs.

Exporters

The major operator in the soybean market is the exporter. These are the largest buyers of soybean from the wholesalers. These large-scale exporters, mostly located in Addis Ababa, have their own buying branches. These buyers buy most of the exported soybean using different instruments. They buy on the spot market, on cash from anyone willing to sell, competing merely on prices. According to the study result, all of producers of soybean do not directly export their produce themselves. They instead sell their produce to different types of traders, which constitute the different sale outlets for the farmer.

Supporting Actors

Such actors are those who provide supportive services including training and extension, information, financial and research services. Access to information or knowledge, technology and finance determines the state of success of value chain actors. Primary cooperatives, micro finance, NGOS and Trade and Market Development Office are main supporting actors who play a central role in the provision of such services.

Table 3: Proportion of households accessing services

Variable	Categories	Percent
Access to market information	yes	57.3
Membership to cooperative	yes	45.0
Access to extension services	yes	46.7
Participate in agricultural extension package program	yes	54.1
Non/off farm activities	yes	43.6
Credit access	yes	16.5

Access to Extension Services

The survey result revealed that 46.7% of the sampled have been taken advice service on the soybean value chain in Bunno Bedelle zone. OoA through its DA backed by the zone subject matter specialists is the major actor who provides information and advisory service on soybean production and management practices. In addition, the contact of development agents with producer farmers was not frequent and regular. Furthermore, sample farmers indicated that they are getting information particularly of input availability and price from primary cooperatives and Kebele administration.

Access to Market Information

More than 57.3% of the sampled households have accessed market information with significant difference in access among farmers in the different PKAs. This study testified that almost all soybean-marketing actors (producers to exporters) had market information access though timeliness and quality of information is questionable.

At local level friends, client traders, personal visit of the market and nearby farmers, and rarely radio served as the sources of market information. Despite the availability of these formal sources, none of the studied individuals neither producers nor traders responded using this channel of information (radio and newspapers) as a source. The main reasons are suggested as; the information is not timely and reliable. Some producers tried to get scanty and outdated price information from their respective cooperatives. Even there are times to change the price within a day. Soybean exporters had better access to all information through electronic media, the internet and played significant role in price decision. In the existing marketing system, cooperatives and small traders followed the price trends of big institutional buyers and exporters in their price setting. Marketing costs and benefit shares of actors in soybean value chain. Table 4 indicates different types of marketing cost related to the transaction of soybean by collectors, wholesalers and exporter; and the benefit share of each marketing actors.

Table 4: Price of soybean at different market level, 2017/18

Item(birr/qt)	Producer	Collector	Wholesaler	Exporter	Hori.sum
Purchasing cost	-	691.60	746.10	879.50	2317.20
Production cost	550	-	-	-	350
Marketing cost					
Material cost	10	10	10	10	40
Transporting cost	10	15	25	25	75
Communication cost	-	10	25	25	65
Loading/unloading	-	-	10	10	20
Tax	-	-	2	2	4
Cleaning	-	-	20	-	20
Total marketing cost	20	35	72	67	194
Total cost	570	726.6	818.10	946.5	3061.20
Average selling price	691.60	746.10	879.50	1100	3417.20
Gross margin (value added)	141.60	54.5	133.4	220.5	550
Market share margin (%)	25.8	9.9	24.3	40	100
Profit margin(net margin)	121.60	19.5	61.4	153.5	356
Share profit %	34.2	5.5	17.2	43.1	100

Note: 1$(USD) =27.5 Ethiopia birr

Each of the soybean value chain actors adds value to the product as the product passes from one actor to another. In a way, the actors change the form of the product through improving the grade by sorting, cleaning or create space and time utility. Compared to farmers, traders' operating expense is much less but their profit margin is more than that of farmers. That means by simply buying from the farmers and selling to consumers, traders took above 76% of the total profit margin. While farmers, doing all the work of producing soybean and bearing the associated risks, took only 34 % of the profit margin. This disproportionate share of benefits is the reflection of power relationship among actors.

Major Constraints and Opportunities of Soybean Value Chain

Major Constraints of Soybean Value Chain

Almost all soybean producer farmers responded that there were market problems in the study area. The major soybean marketing constraints are related with non-availability of market/limited access to market, low price of product, and lack of storage, lack of transport, low quality product demand and lack of packaging material. The major soybean marketing constraints mentioned by traders are related with the limited power of price setting, the problem of supply shortage, lack of storage facility, problem in information flow, low product quality and lack of support from concerned bodies.

Table 5: Major constraints of soybean value chain (producers)

Major problem	Total household (218)	
	Number	Percent
Collateral problem to get credit	182	83.5
Low price of product	167	76.6
Lack of packaging material	155	71.1
Lack of storage	191	87.6
Lack of transport	120	55
Price fluctuation	169	77.5
Low access to improved inputs	176	80.7
Low negotiation (bargaining) power of producers.	127	58.7
Poor linkage with value chain actors	198	90.8

Low Selling Price of Soybean

Soybean production is associated with high cost of production. However, sells price of seed soybean is reported as low. The survey result indicated that 76.6% of the producers mentioned low sells price of soybean as one of the major problems in soybean marketing.

Packaging Material

The availability, cost and quality of packaging materials were serious issues considered by farmers during the survey. About 71.1% of the farmers mentioned unavailability of packaging material (sisal sack), from this, 34.4% of them reported high cost of packaging material (sisal sack) and 36.7% of them mentioned poor quality of packaging materials as their major problems on packaging materials issue.

Storage

About 87.6% of the farmers considered unavailability of storage facility as a problem. Among the respondents about 45% indicated it is costly for them to rent storage and 42.6% of them reported loss of products at storage as problems. Absence of modern warehouses in the nearby areas has resulted in mishandling of output. Producers are unable to build their own storage devices due to tenure insecurity.

Problems Related to Transport

Out of the major soybean producing areas, Bunno Bedelle zone is relatively good in terms of road condition, availability and transport rates. About 55% of the assemblers reported that they lack transport for marketing soybean. The rate of transportation was so high for localities away from the main road. This high transportation cost had implications on the price paid to producers. Beside, at local level there existed seasonal shortage of transport vehicles consequently created high transportation costs.

Major Opportunities of Soybean Value Chain

Production potential: The soybean is one of the most important food plants of the world, and seems to be growing in importance. Bunno Bedelle has the advantage of having good local varieties, favourable growing conditions, and vast suitable area for soybean growing. Soybean is a short-day plant. It can grow on all types of soil, but deep fertile loam with good drainage is most suitable for growth. It is an annual crop, fairly easy to grow, that produces more protein and oil per unit of land than almost any other crop.

Source of feed: It is a versatile food plant that, used in its various forms, is capable of supplying most nutrients. It can

substitute for meat and to some extent for milk. It is a crop capable of reducing protein malnutrition. Soybean is an alternative protein source to the rural families and can be utilized at home in various forms and the surplus can be sold to other consumers and manufacturers for income Soybean is among the major industrial and food crops grown in every continent. Regardless of what they are called, soybeans are a promising and proven source of plant protein and edible oil. Soybean is a source of edible oil (second most consumed oil in the world after palm oil) and is used to produce livestock feed. Many other products with a soybean basis are also directly used for human consumption (soymilk, soy yogurt, snacks, soya sauce, protein extract and concentrates, etc.) (FAOSTAT, 2011).

Availability of labour: Bunno Bedelle has the advantage of having cheap labour that is important manual harvest of soybean is few of the advantages we have at hand. Soybean production is labour-intensive and there is available labour force in the country. From this labour force, some are migrating to Bunno Bedelle in search of job opportunity. Therefore, it is possible to use this labour as major input in the production of soybean. It is possible to make labour an affordable input by increasing the productivity of soybean.

Access to foreign markets: As FAO STAT (2011), noted soybean is one of the world's most important pulse crops. Soybean is the leading oil seed crop and contributed about 35% of the world's vegetable oil production. It is also the world's primary livestock feed supplement. We can also take the advantage of the Israel market, which for political reasons cannot import from Arab countries such as Sudan.

Conclusion

Soybean value chain analysis of the study areas revealed that the main value chain actors were input suppliers, soybean producers, wholesalers, retailers, collectors, processors, exporters and consumers. Compared to farmers, traders' operating expense is much less but their profit margin is more than that of farmers. That means by simply buying from the farmers and selling to consumers, traders took above 76% of the total profit margin. While farmers, doing all the work of producing soybean and bearing the associated risks, took only 34% of the profit margin.

The local market, cooperative and agriculture office were the main sources of input supply for the soybean producers. The main supporters of the soybean value chain in the study areas are district agricultural office, District administrations, research centre, District trade and market development, ECX and banks. Constraints hindering the development of soybean value chain are found in all the stages of the chain in the study area.

Recommendations

Farmers do not have access to information on improved production practices, market intelligence, value addition, better post-harvest handling and demands on quality and standards in different markets. Such information may be included in state extension programs for dissemination to all stakeholders in the soybean seed value chain.

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