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Research Article

Bananas Value Chain Analyses the Case of Southern Ethiopia

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Abstract:

Banana (Musa spp.) is a multi-purpose crop in terms of food security, income generation, job opportunities, and animal feeding in Ethiopia. On the other hand, not all banana producers can capture the benefits associated with producing and marketing a premium quality banana product. Therefore, this study was conducted and documented to examine the value chain of bananas and to identify existing challenges and opportunities among smallholder banana producers in the case of Wonago district using 176 samples of participants. Structured questionnaires, group discussions, and interviews were applied to collect qualitative and quantitative data types. Descriptive data analysis techniques were used for primary data collected from a sample of the farmers. Necessary secondary data were collected from different published and unpublished documents. The result of the study revealed that the lack of a properly organized market, the occurrence of diseases, and the unavailability of improved varieties were challenges and setbacks banana value chain in the study area. On the other hand, suitable agroecology for the production of bananas is an opportunity for banana producers in the study area. It is therefore recommended that improvement in storage methods and materials needed to be upgraded to reduce product losses. Creating awareness of the fast information flows should be encouraged as the most effective ways performed by all primary and secondary actors involved in the bananas value chain

Key words: banana; value chain; wonago; challenges; and opportunities

1.Introduction

1.1 Background of the Study

Banana (Musa spp.) is a multi-purpose crop in terms of food security, income generation, job opportunities, and animal feeding in Ethiopia. Bananas production in Ethiopia increased from 122,372 tonnes in 2001 to 898,355 tonnes in 2020 growing at an average annual rate of 12.64% (knoema.com, 2020). According to Zinabu et al., (2019), banana in Ethiopia covers about 53,956.13 hectares of the total fruit area with 478,251.04 ton of the total fruit produced and about 2,574.035 of the total fruit-producing farmers. On the other hand, about 68.72% (37,076.83) hectares of land are covered by bananas, about 77.52% (370,784.17) tons of the banana production, and 22.38% (1,504,207) of the banana producers in Ethiopia (CSA, 2014).

Bananas are a significant contributor to the economic development of Ethiopia. The smallholder banana producers' market access is currently limited due to low levels of production, poor harvesting, processing, and handling practices, adulteration, weak bargaining power, little market information, low market supply, and market barriers (WWAO, 2021). Linking smallholder farmers to the nearest market can embrace a whole range of activities and it requires the development of long-term business relationships.

Value chain analysis is supposed to be the current approach in studies of determining challenges and strengths of the chain from the input supply up to the final disposal level of the product. Agricultural value chain studies are strongly recommended as possible intervention strategies for increasing the farmers' competitive position to increase their economic benefits from the products and services they deliver (Dent et al., 2017; Kaplinsky & Morris, 2000). The bananas value chain analysis in Ethiopia also enables us to understand the relationship among input suppliers, producers, processors, distributors, brokers, and consumers.

The Southern part is the main banana-producing area in Ethiopia (Temesgen, 2014). Wonago district is one in the Gedeo zone facing high challenges in terms of shortage of land and disintegrated landholding system. Bananas production in the area is below potential due to lack of extension service, lack of improved varieties, high cost of production, slow down inputs supply, and lack of storage materials. Farmers also lack information about prices in nearby markets, lack cost-effective means of transportation, and have the low bargaining power to sell their products at an appropriate price (WWANRO, 2021). The production of bananas in the Wonago district is not well organized and actors involved in the banana value chain are not appropriately identified. However, not all banana producers can capture the benefits associated with producing and marketing a premium quality product. Nevertheless, a banana value chain in the Wanago district has not yet been conducted and documented systematically. To this end, this study was conducted to analyze the

banana value chain in the Wonago district and to determine the constraints and opportunities within the study area.

2. Research Methodology

2.1. Description of the study area

This study was conducted in the southern Ethiopia wonago district. The district has a distance of 368 Km south of Addis Ababa and 98 Km from Hawassa. Wenago district is bordered on the southwest by Yirgachefe, on the northwest by the Oromia Region, on the northeast by Dila Zuria, and the southeast by Bule. Wonago district is located at N 6° 20' and E 38° 19' It is approximately 248 sq. km (24,790 ha) and comprises 19 Kebeles.

The population density of Woreda is 702 persons per km at a national growth rate of 1.07 percent. As the agricultural sector is the dominant means of livelihood for the majority of people, out of the total of 24,790 hectares of land, 22,871 hectares are known to have the potential for agriculture.

Annual crops cover 5.03 percent; perennial crops are 84.77 percent, uncultivable land is 0.65 percent and others are 3.52 percent. The rainfall distribution of the study area is bimodal. The main rainy season is from June to September ('Kiremt' or Mahar') and the short rainy season is from February to April ('Belg'). The average annual rainfall is 107.72 mm and, the mean annual average temperature of the Woreda is 20°C. Wonago district has three main agroclimatic zones dega, woyn dega, and kola with topography ranging from wide flat valley bottoms to steep mountain slopes (WWAO, 2005). Annual crop covers 5.03 %; perennial crop 84.77%, uncultivable land 0.65 % and others 3.52 %. 1000199737377.

2.2. Sampling Procedure and Sample Size Determination

The researcher followed a multi-stage sampling procedure to select the sample respondents for this study. In the first stage, banana-producing kebeles were selected purposively due to their better market integration and they are the leading banana producers in the district. In the second stage, three kebeles from bananas producing kebeles were selected randomly. In the third stage, a total of 176 farmers in the selected kebeles were selected by simple random sampling method based on probability proportionate size sampling technique. To select the required sample size from banana-producing farmers in the study area Taro Yamane formula was used (Yamane, 1967).

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

Where n is the sample size, N is the number of households in the district and e is the desired level of precision. Accordingly, the required sample size at a 95% confidence level with a degree of variability of 5% and a level of precision equal to 5% is used to obtain a sample size required which represents a true population.

$$n = \frac{N}{1 + N(e^2)} = \frac{1650}{1 + 1650(0.07^2)} \approx 176$$

Where, n = sample size, N= population size (sampling frame) and e = level of precision considered 7%.

2.3 Data Types, Sources, and Methods of Data Collection

For this study, quantitative and qualitative data types were gathered to answer the research questions and meet the objectives of the study. Both primary and secondary sources of data were collected.

Primary data was collected using a structured questionnaire, interview, and group discussion from sampled banana-producing farmers. The questionnaire was designed firstly in the English version and translated into Gede'uffa.

On the other hand, the secondary sources of data were gathered and collected from different sources such as books, annual reports, journals, the district agricultural office, the district office of the cooperative, the office of trade and industry, websites, and documents through reading.

2.4. Method of Data Analysis

Stata 14.2 version statistical software was used to analyze data collected from sampled participants. Descriptive data analysis methods such as percentage, mean, frequency, and standard were used to analyze collected data. The identification of actors and their roles and the identification of opportunities and challenges were analyzed by qualitative data. Personal observation and interviews were conducted to gather qualitative data types and interpreted n narrative ways.

3.Result and Discussion

3.1. Socio-economic and Demographic Characteristics of the Sample Participants

The sample of the respondents was collected from both male and female-headed households. Based on the result in table 1 below, 14.47% of the respondents were female-headed and 85.23% of the respondents were male-headed households. Among respondents, 89.20% of the respondent were married and 10.80% of the respondents were widowed. A total of 14.77% sample of the respondents had no formal education, and 85.23% of the sample respondents had formal education. An average of 75% of respondents obtained extension services and 25% of the respondents didn't obtain extension services. About 41.48% of the participants were involved in off-farm activities and 58.52% were non-participants in off-farm activities to earn additional income for their lively hoods improvements. About 69 (67.65%) of the respondent produce bananas for income generation purposes and the remaining 33 (32.35%) of the respondents produce bananas for consumption purposes. Most of the smallholder farmers produced bananas for income generation purposes rather than home consumption. This shows the significance of the fruit crops for the household livelihood income improvement in the study area.

Variables		Frequency	Percentage
Sex	Male	150	85.23
	Female	26	**14.77**
Marital status	Married	157	89.20
	Widowed	19	10.80
Education	Illiterate	26	14.77
	Literate	150	85.23
Extension services	Yes	132	75.00
	No	44	25.00
Off-farm participation	Yes	73	41.48
	No	103	58.52
Production Purposes	Income	67	67.65
	Consumption	33	

Table 1: Socio-economic and demographic characteristics of the participants

The mean age of the sample respondent was 43 years. From the total sample of the respondent, the average number of the person living in the house was 5. The distance to the nearest market for the sample respondent was 6.42 km. The farmers in sampled kebeles owned about 0.187 hectares of land. A total of 10 years was spent by farmers on bananas producing activities. On average 0.11 hectares of land was covered with bananas in the study area.

Variables	Mean	Standard deviation
Age	43.39	6.87
Household size	5.198	1.67
Experiences	10.34	4.97
Distance to nearest Market	6.432	2.34
Total Land owned	0.187	0.088
Land allocated for Bananas production	0.11	0.076

Table 2: Socioeconomic and demographic characteristics of the participants

3.2 Actors in Banana Value Chain and Their Roles

There is a different actor involved in the agricultural product in the chain. Getahun et.al (2017) identified primary actors and secondary actors involved in the fruit chain. Primary actors are actors having a straight effect on the production processes and supplying products to final consumers but, secondary actors were those having in some way affected the fruit chain.

The following are actors involved in the banana market in the study are:

Producers are those farmers involved in banana production on their farmland in selected kebeles. Most of the functions like land preparation, growing/planting/, protection (from weeds, pests/diseases, and animals), maturity checking, harvesting, and transport were performed by smallholder farmers. They were also responsible for postharvest handling activities. The farmers in the study area deliver their products by using donkeys, and motor bicycles, and by carrying them to the village and or district market after harvest. They are the major actors in supplying bananas to the market.

Local Collectors are those individuals engaged in the village or farm gate level by gathering the banana and selling it to the retailers, processors, and wholesalers in the study area. They are village-based middlemen who collected freshly harvested bananas from the farmers and sell them to retailers, processors, and wholesalers operating around Dilla, Yirga Cheffe, Guangua, and Kochore towns with their own money.

Retailers are individuals delivering the bananas product to the consumer. They purchase bananas either straight from producers, local collectors, and wholesalers and deliver them to consumers. Retailers have limited financial and information capacity to purchase and handle products. They purchase and sell bananas to the Wonago market directly

Brokers purchase bananas from producers and local collectors. They involved producers and other actors to earn profit and were located around the Wonago market.

Wholesalers purchase bananas from producers, brokers, or local collectors and supply the product to retailers and other wholesalers in other places. They bought and sell a large number of bananas to the Dilla, Yirga Cheffe, and Guangua markets. They have the role of carrying and packing bananas in green banana leaves and or in vehicles to move bananas to their preferred market

Consumers buy banana products from farmers, retailers, wholesalers, local collectors, and brokers to satisfy their consumption demand. They range from small individuals and households to big restaurants consuming bananas.

3.3 Marketing Channel for banana

For this study, major actors who participated in banana production and marketing activities were taken as a sample from three kebeles. Farmers, local collectors, retailers, brokers, wholesalers, and consumers were the sample of this study.

Channel I: Producers -Local collector. This channel covered 21.22% of the total bananas marketed in the study area. This channel is the shortest and the second channel in which a high amount of bananas product was marketed. The farmers supply their fresh bananas to the local collector at the farm gate.

Channel 2: Producer-Local Collector-Retailer. according to the result, 17.75% of the total banana product is marketed in this channel and the second-largest channel in the chain. The retailers operating around Wonago town collected the banana products both from farmers and local collectors.

Channel 3: Producer-- Brokers-Wholesalers—Consumer. This channel represented 12.08% of the total banana product marketed in the study area. This channel is the longest and the individual consumer obtained the bananas product from the wholesalers collected from brokers and farmers.

Channel 4: Producers-Local collectors- wholesales- Retailers-Consumer. It is the first channel in which a large amount of the banana product is marketed about 32.14% is marketed in this channel.

Channel 5: Producers-Wholesalers-Consumers. A channel with 11.56% of the banana product was marketed.

Chanel 6: Producer-Consumer. This was a preferable channel by the consumer however only 5.25% of the banana was marketed This is the channel in which a small number of banana products were marketed.

3.4 Challenges and opportunities of Bananas Value Chain in Study Area

This study aimed to address the challenges that the smallholder farmers encountered in the banana value chain and the opportunities they explained. From this point of view, efforts were made to identify both the challenges and opportunities using open-ended questionnaires and group discussions for the target participants. The following challenges and opportunities were identified in the study area.

Accordingly, the lack of an organized market to sell the product was the challenge listed by the respondents. Due to the perishable nature of the product, bananas products required an interconnected and well-organized market but the marketing system in the study area was not well organized. Due to this, the producers are unable to supply the bananas product to the market at the right time in the required quality. The occurrence of the

disease is one of the challenges for the production of bananas in the study area. The occurrence of diseases during banana production was one of the significant factors raised by the farmers that minimize the quantity and quantity of bananas.

The unavailability of improved varieties is also another challenge for the production of bananas. The varieties adopted by the farmers were intolerant to the diseases and produce low yields. There were yield differences between different varieties adopted by farmers and improved varieties of the bananas regarding this farmers were interested to access and adopt improved banana varieties for increasing yield. According to the respondent's answers, lack of technical support for the production of bananas from agricultural development agents, woreda agricultural and natural resource offices, and non-government organizations on how to use the available traditional material for harvesting bananas, and farmers are exposed to the loss of the products. Road access is an important factor for the farmers to supply their product to the nearest market, obtain a better price for their product and incur high costs for transporting the products to the market. The majority of the respondents argued that there are road problems to supply their products to the market, especially during rainy seasons. Due to the product's nature, they are enforced to sell the product in the local market at a lower price and to consume the products.

Regarding the flow of information between actors in the channel, the majority of the respondents answered that poor information flow in the channel. Information is crucial to the performance of a value chain because it provides the basis on which value chain actors make decisions, and build a strong relationship. Lack of transparency among actors due to poor information flows creates mistrust between value chain actors.

Keeping the product in the required quality and quantity is the most important activity in marketing agricultural products. To preserve the product for a long period and to protect it from damage, packing, and storage materials have a significant impact on the bananas product. Based on the respondent's responses, they have storage difficulties Limited land size is one of the main challenges that hinder farmers' bananas production. The farmers allocated small land sizes for banana production.

The opportunities for banana production include increasing demand for bananas by consumers. The overall demand for bananas products is increased due to the consumption habits of the consumers. As admitted by the respondents, there is an increase in the demand for banana products in the village and central markets. The high demand for the products encouraged the farmers to increase their production. The agroecology for the production of bananas is suitable in the study area. This is a fantastic opportunity for farmers to boost the production of bananas.

4. Conclusion and Recommendations

Bananas provide different purposes for the farmers serving as a source of income, for home consumption, for creating job opportunities, improving food security, and used for the cattle as feed the residual part. The farmers in the study area produce the banana by intercropping with other crops on their farm. Most farmers harvest two times per year on average from bananas. The mode of production of bananas in the study area is almost year-round.

Five marketing channels were identified in the study area from which **Producers-Local collectors-** wholesales- Retailers-Consumer covered around 32.14% of the product marketed in this channel followed by **Producers -Local collectors covered 21.22%. Among the available channels,** producer-consumer covered only 5.25% of the total product flow in the market and the consumer bought a small amount of the product from the producers directly. Farmers faced numerous challenges in the production of bananas product including the lack of an organized market to sell the product, occurrences of disease, unavailability of improved varieties, lack of technical support for the production, poor road quality,

and poor information flow between actors, and unavailability of the storage materials.

Therefore, working on those challenges to optimize farmers' capacity is the expected task from both government and non-government organizations around the study area. The following recommendation is recommended based on the result of the study. It is essential to move agricultural products from farm to market as well as to the final consumer through different channels. Hence, it is important to build, maintain and strengthen appropriate channels for the bananas product flow. Maintaining the quality of the product enables the farmers and traders to obtain a better price for the product.

It is therefore recommended that improvement in storage methods and materials needed to be upgraded to reduce product losses.

The flow of information between actors about product price, quality, and production methods creates transparency and accuracy between actors about the products. Therefore, creating awareness of the fast information flows between actors should be encouraged as the most effective way performed by all primary and secondary actors involved in the bananas value chain.

Market information systems, improved agronomics and the establishment and strengthening of new and existing linkage between marketing agents have to be considered by policy and decision-makers.

Preparing and organizing workshops, and field days at a suitable time to allow farmers to understand, share experiences, and become more well-known about banana production and marketing. Conducting more research on the value chain analyses of bananas and the impact of banana production on the farmer's welfare should need high attention from different stakeholders

Conflict of Interest

The authors declare no conflict of interest regarding the publication of this article.

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