

Research Article

Analysis of Gender Role on Soybean Market Participation in Bambasi District Benishangul - Gumuz Regional State, Ethiopia

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Abstract

This paper examines the role of gender in soybean market participation, focusing on the factors that influence the involvement of male- and female-headed households in the soybean market. It also explores the challenges and opportunities associated with market participation. The study is based on data collected from 140 soybean-producing households in Bambasi district, located in the Benishangul-Gumuz Region of Ethiopia. Using a structured questionnaire, data were gathered and analyzed through both descriptive and inferential statistical methods. Findings indicate that female soybean farmers are less active participants in the soybean market compared to their male counterparts. The descriptive analysis identified key factors affecting women's market participation, including access to market information, educational level, cooperative membership, non-farm income, and farm size all of which were found to be significant. Major constraints faced by soybean producers in the area include limited market access, low selling prices, lack of credit, inadequate market information, high transportation costs, and security concerns. Women were over burden in reproductive activities. The result indicated that in MHH, men took the higher position in making the decision of the household. In the same manner in FHH, women made the major decision of the household. In conclusion the role of men and women are different, and the significance of women role is not equally valued. The study recommends ensuring that women farmers have easy access to markets, market information, and productive resources to enhance their market participation. The government and other stakeholders should prioritize addressing gender-specific issues and disparities, particularly for soybean sellers and women farmers in general.

Keywords

Gender Role, Soybean, Market Participation

1. Introduction

Soybean is an industrial crop which used for human food, animal feeds, soil nutrient improvement and raw material for agro-industries [1]. Production of this crop is vital in Ethiopia to overcome food insecurity and malnutrition and can

substitute the relative expensive of animal protein. Potentially, it grows in Benishangul Gumuz, Oromia, Amhara, Tigray and South Nation and Nationalities people and become the main source of income for smallholder farmers [5].

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Gender relates to socially assigned roles and behaviors attributable to men and women. Gender is useful in analyzing the role, responsibility, opportunity and constraints of different ecological zone, ethnicity, religion, culture, different economic classes and cultural attributes. In almost all societies, women and men differ in their activities and undertakings, regarding access to and control over resources and participating in decision-making [13].

Roles and relationships shaped by gender within agricultural marketing and households influence how men and women access productive resources, financial services, and income control. These gender-based disparities lead to varying degrees of involvement, production techniques, and marketing strategies for cash crops, ultimately affecting women's potential success in growing high-value crops [6].

The marketing of agricultural products like soybeans is closely linked to agricultural production and plays a vital role in boosting both production and consumption, while also driving overall economic growth. For smallholder farmers, active participation in markets is crucial, as it can significantly increase household income and create more employment opportunities. Transitioning from subsistence farming to more commercialized, high-yield production is essential for smallholders aiming to break the cycle of poverty. In many developing countries, however, women farmers often face unequal participation in agricultural output markets compared to men. This disparity is largely due to unequal access to resources and persistent cultural barriers that limit their involvement and opportunities in the agricultural sector.

Numerous research studies and case analyses on gender and soybean cultivation have been carried out across various countries. However, the majority of these works primarily concentrate on gender roles in soybean production, often overlooking market participation and related aspects. For instance, a study by [7] explored gender roles and decision-making in soybean production and management practices, revealing clear differences between men and women in both responsibilities and decision-making power. Similarly, [11] investigated the determinants of gender differences in soybean production in Bambasi District, Benishangul-Gumuz Regional State. The findings indicated that male-headed households achieved higher levels of soybean production, largely due to better access to agricultural inputs compared to female-headed households.

Furthermore, a study by [2] examined the factors influencing market participation among women soybean farmers in Nigeria. The findings revealed that household education level, non-farm income, soybean prices, access to credit, farming experience, cooperative membership, and extension services all had a significant and positive impact on women's participation in the soybean market. Additionally, [3] evaluated the impact of adopting improved soybean varieties on yield and net revenue, while also analyzing gender-based differences. The results highlighted a gender gap in soybean net revenue, with men generally earning more than women in

Nigeria's soybean sector.

In general, most existing studies have focused primarily on examining gender roles in soybean production, with only a limited number addressing gender dynamics in soybean market participation and those few were mainly conducted in Nigeria, not Ethiopia. As a result, there is a noticeable gap in research specifically exploring the role of gender in soybean market participation in Bambasi District, Assosa Zone, within the Benishangul-Gumuz Region. This study aims to fill that gap by analyzing gender differences in soybean market participation in the area. It focuses on identifying the factors influencing market participation among male- and female-headed households and examines the gender-specific challenges and opportunities faced by soybean producers in Bambasi District.

2. Methodology

2.1. Description of Study Area

Bambasi District is one of the seven districts within the Assosa Zone of the Benishangul-Gumuz National Regional State. It is situated approximately 625 kilometers from Addis Ababa. The district receives annual rainfall ranging between 1,350 and 1,450 millimeters and experiences an average temperature of 28°C. Agro-ecologically, the area is predominantly lowland, comprising about 85% of the district, while the remaining 15% consists of highland zones. The major crops cultivated in the district include maize, sorghum, soybean, finger millet, niger seed, and haricot bean. Livestock commonly raised by local residents include cattle, sheep, goats, donkeys, mules, and poultry [4].

2.2. Sample Size Determination and Sampling Techniques

A multi-stage sampling technique was used to select the sample households for the study. In the first stage, Bambasi District was purposively selected due to its significance as one of the major soybean-producing areas in the region. In the second stage, 10 kebeles were purposively chosen from the district's 44 kebeles, based on the intensity of soybean production and market activity. From these, 5 kebeles were randomly selected using simple random sampling. At the final stage, households within the selected kebeles were stratified into male-headed and female-headed categories. Using household lists from each kebele, 94 male-headed households (MHHs) and 46 female-headed households (FHHs) were selected for comparison, following a probability proportional to size sampling method. In total, 140 households were selected using Yamane's (1967) formula, with a 95% confidence level and a 5% margin of error, and the final selection was done through simple random sampling.

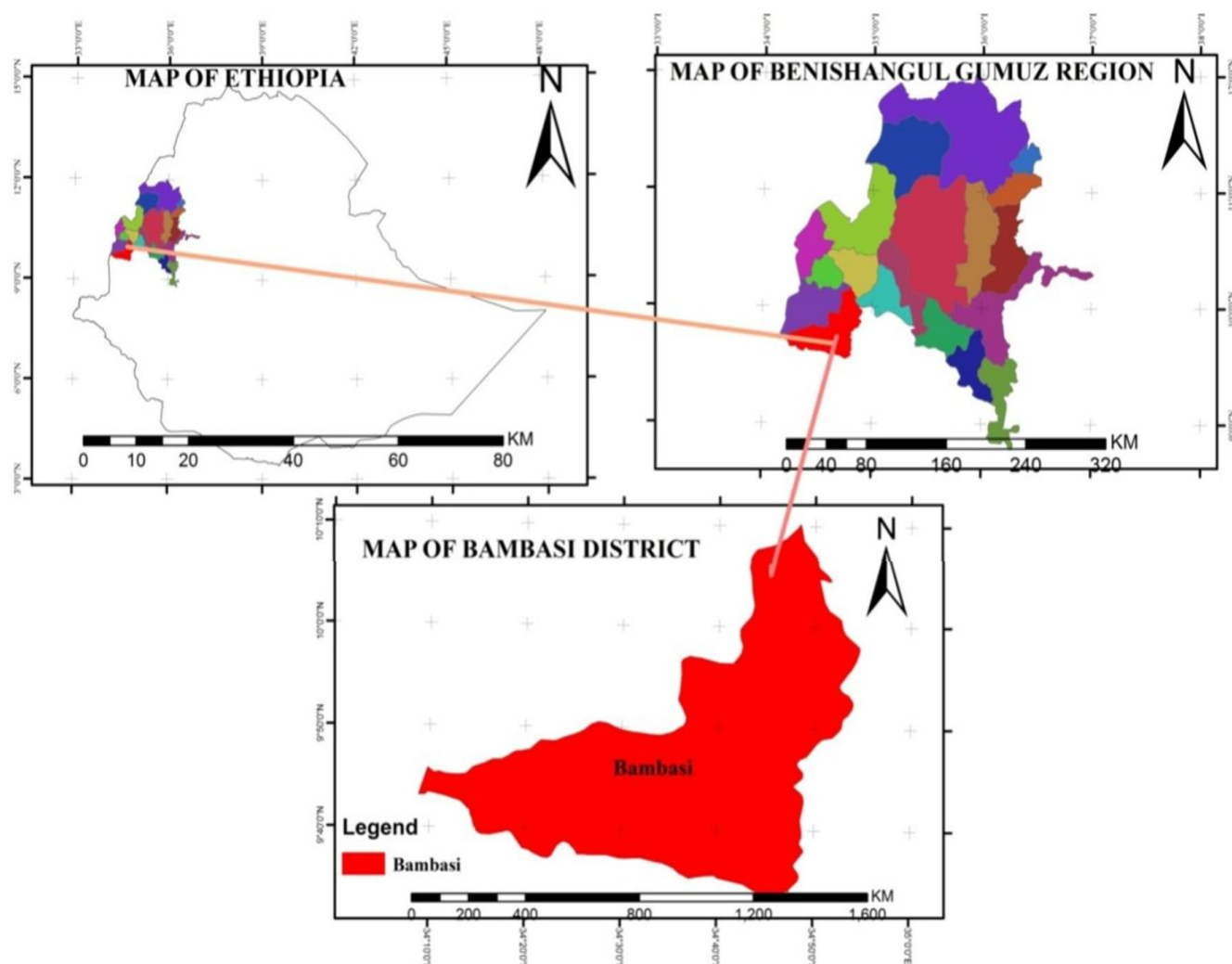


Figure 1. Map of the study area.

2.3. Sources and Methods of Data Collection

This study utilized both primary and secondary data sources. Primary data focused on personal, socio-economic, and institutional factors, along with other relevant information. It was collected primarily through a quantitative household survey. Additionally, qualitative methods such as in-depth open-ended interviews were conducted to gain deeper insights. Focus group discussions and key informant interviews were also held to gather farmers' perspectives, experiences, and views on soybean market participation and the main challenges they face. To complement the primary data, secondary information was obtained from both published and unpublished sources, including reports from relevant organizations. Regular statistical reports from institutions such as the Bureau of Agriculture and CSA were also

consulted. Other secondary sources included books, academic journals, and online materials relevant to the study.

2.4. Method of Data Analysis

Both descriptive and inferential data analysis methods were applied to summarize and interpret key variables in the study. Descriptive statistics, including means, percentages, and frequencies, were used to draw meaningful insights from the sample respondents. In addition, chi-square and t-tests were employed to compare and contrast different groups within the sample. To examine the factors influencing farmers' decisions to participate in the soybean market, a Bivariate Probit model was utilized, allowing for the analysis of the simultaneous decision-making process and the interdependence between participation variables.

Table 1. Explanatory variables and their hypothesized effects on market participation.

Variable	Type	Definition and measurement	Expected sign
Market info	Dummy	1 if get information 0 otherwise	+
Education Level	Continuous	Years of schooling	+
HH Size	Continuous	Household size	+
Non-farm Income	Continuous	Non-farm income	-
Credit access	Dummy	1 if get credit 0 otherwise	+
Dist. Mkt	Continuous	Mean. Dist to nearest mkt in min	-
Coop memb	Dummy	1 if member of coop 0 otherwise	+
Ext. contact	Continuous	Frequency of extension contact	+
Farm size	Continuous	Farm size in hectar	+

3. Results and Discussion

The descriptive and econometric results are presented in this chapter. The first section deals with the descriptive statistics of the survey results while; the second section provides the econometrics result regarding the determinants of soybean market participation.

3.1. Descriptive Results

Before conducting the econometric analysis, it is important to present the socio-economic, institutional, and demographic profiles of the sampled households. Descriptive statistics such as frequencies, percentages, means, and stand-

ard deviations were used to summarize and compare the explanatory variables between male-headed and female-headed soybean-producing households.

3.1.1. Soybean Market Participation Status in the Study Area

Table 2 presents the status of market participation, showing that 71.4% (100 out of 140) of the surveyed households engaged in the soybean market. When disaggregated by gender, 89.4% of male-headed households (84 out of 94) participated in soybean marketing, whereas only 34.7% of female-headed households (16 out of 46) were involved. This indicates a significantly lower level of market participation among female-headed households compared to their male counterparts.

Table 2. Soybean market participation status among female and male headed household.

Outcome variable	Male HH (94)		Female HH (46)		Combined (Total) (140)		Chi-Square value
	N	%	N	%	N	%	
Participant	84	89.4	16	34.7	100	71.4	6.866***
Non-participant	10	10.6	30	65.3	40	28.6	
Total	94	100	46	100	140	100	

***, ** and * significant at the 1, 5 and 10 percent probability levels

3.1.2. Descriptive Statistics of Continuous Explanatory Variables

Education plays a crucial role in addressing various life challenges. The knowledge gained through formal education significantly influences household decision-making and en-

hances the social and economic well-being of individuals. In this study, the average educational attainment of household heads was 5.4 years of schooling. Specifically, male-headed households had an average of 6.02 years of schooling, while female-headed households averaged 4.82 years. The t-test results revealed a statistically significant difference ($p < 0.1$)

between the two groups, indicating that male household heads had, on average, more years of formal education than their female counterparts. This finding aligns with the study by [12] in northwest Ethiopia, which also reported that female-headed households tend to have lower levels of education compared to male-headed households.

The average family size, measured in adult equivalents, among the surveyed households was 5.88. Female-headed households had a smaller average family size of 5.61, compared to 6.22 in male-headed households. The t-test results indicated that this difference in average family size between male- and female-headed households was statistically significant at the 10% probability level.

The average landholding size among the sampled households was 1.06 hectares. Male-headed households owned an average of 1.14 hectares, slightly more than female-headed households, which averaged 1.01 hectares. However, the t-test results indicated that this difference was not statistically significant.

The average walking time to the nearest market for all surveyed households was 28.32 minutes. Male-headed households had an average walking time of 25.1 minutes, while female-headed households had a longer average of 30.94 minutes. The t-test results revealed a statistically significant difference ($p < 0.01$) between the two groups, indicating that female-headed households are generally located farther from the nearest market compared to male-headed

households.

The average annual income from non-farm activities among the surveyed households was 12,567 birr. Male-headed households earned an average of 16,756 birr, while female-headed households earned 9,456 birr. Although the t-test showed that the difference in mean income between the two groups was not statistically significant, the results indicate that female-headed households generally earn less from non-farm activities compared to their male counterparts in the study area.

The average number of extension contacts among the surveyed households was 4.32. Male-headed households had a higher average of 6.23 contacts, while female-headed households reported a lower average of 3.21. The t-test results showed a statistically significant difference ($p < 0.01$), indicating that female-headed households had significantly fewer extension contacts compared to their male counterparts. This variation highlights a gap in access to agricultural extension services between male and female household heads. These findings align with those of [9], whose meta-analysis of 22 case studies across Africa identified limited access to extension services as a major barrier for farmers particularly women hindering their ability to adopt new agricultural technologies. Even among those who do receive support, concerns remain about the quality and relevance of the information provided.

Table 3. Descriptive Statistics of continuous explanatory variables.

Continuous Variable	Male HH (94)		Female HH (46)		Combined (Total) (140)		t-value
	Mean	S. D	Mean	S. D	Mean	S. D	
Education level of the household head	6.02	4.88	4.82	4.73	5.36	4.83	1.95*
Household size (AE)	6.22	2.38	5.61	2.45	5.88	2.43	1.96*
Non-farm inc	16,756	10.24	10,456	7.15	9456	8.48	1.61
Land size	1.14	0.78	1.01	0.56	1.06	0.67	1.54
Dist to nearest mkt	25.1	6.05	30.94	6.49	28.32	6.32	-7.22***
Frequency of extension contact	6.23	3.23	3.21	1.43	4.32	2.45	2.45**

***, ** and * represents significant at 1% ($p < 0.01$), 5% ($p < 0.05$) and 10% ($p < 0.1$) significant level respectively.

3.1.3. Descriptive Statistics of Dummy Explanatory Variables

As indicated in Table 4, accesses to market information were significantly associate with market participation. However, membership in the cooperative and credit utilization were have no significant association with market participation.

Regarding access to market information, 62.8% (88 out of 140) of the surveyed households reported having such access. A significantly higher proportion of male-headed households 82.9% (78 out of 94) had access to market information, compared to only 17.1% (16 out of 46) of female-headed households. The chi-square test indicated a statistically significant association between market participation and access to market information at the 1% probability level.

Out of the total 140 sampled households, 61 (43.5%) re-

ported receiving credit, while the remaining 79 (56.5%) did not. Among those who accessed credit from formal institutions, 52.1% were male-headed households, whereas only 26.1% were female-headed. Although male-headed households appeared to benefit more from credit services, the chi-square test revealed no statistically significant association between market participation and credit utilization. This suggests that while female-headed households may be capable of managing financial risks, they often lack the necessary collateral to access credit services. The credit provided was in cash and varied across households. These findings align with those of [8], who noted that access to agricultural credit and financial services in Ethiopia remains limited especially for female-headed households, who frequently struggle to secure credit, making it difficult to obtain essential farm in-

puts.

Out of the 140 sampled households, 66 (70.6%) reported being members of cooperatives. Specifically, 57.4% of male-headed households and 43.6% of female-headed households were cooperative members. However, the chi-square test indicated no statistically significant association between market participation and cooperative membership. This suggests that despite the active involvement of some female-headed households, they were not treated on equal footing with male-headed households, as services provided often favored the latter. Similarly, a study in Mozambique by [10] highlighted notable gender disparities in cooperative membership and leadership roles, with women being less likely to participate or hold managerial positions in mixed-gender groups and organizations.

Table 4. Descriptive Statistics of dummy explanatory variables.

Variables	Dummy value	Male HH (94)		Female HH (46)		Combined (Total) (140)		Chi-Square value
		N	%	N	%	N	%	
Market info	Yes	78	82.9	10	21.7	88	62.8	10.19***
	No	16	17.1	36	78.3	52	37.2	
Coop membership	Yes	54	57.4	20	43.6	74	70.6	0.058
	No	40	42.6	26	56.4	66	29.4	
Credit utilization	Yes	49	52.1	12	26.1	61	43.5	0.204
	No	45	47.9	34	73.9	79	56.5	

***, ** and * represents significant at 1% ($p < 0.01$), 5% ($p < 0.05$) and 10% ($p < 0.1$) significant level respectively.

3.2. Challenge and Opportunities in Soybean Market Participation

3.2.1. Challenge to Market Participation

Table 5. Distribution of respondents based on challenges to Market participation.

Constraints	Frequency		Percentage		Rank
	MHH	FHH	MHH	FHH	
lack of market access	74	32	78.7	69.5	1 st
Low market price at the time of selling	68	29	72.3	63.0	2 nd
lack of credit	53	26	56.4	56.5	3 rd
Lack of market information	46	23	48.9	50.0	4 th
High cost of transportation	41	21	43.6	45.6	5 th
Difficulties in setting prices	34	19	36.2	41.3	6 th
Low quality of produced soybean	29	15	30.8	32.6	7 th

Constraints	Frequency		Percentage		Rank
	MHH	FHH	MHH	FHH	
Insecurity	23	10	24.5	21.7	8 th

The challenges faced by male- and female-headed soybean farming households in the study area are outlined in Table 5 in order of significance. The findings show that poor market access was the most commonly cited issue, reported by 78.7% of male-headed households and 69.5% of female-headed households. Following this, 72.3% of MHH and 63% of FHH identified low market prices at the time of sale as a key constraint. Additionally, 56.7% of MHH and 56.5% of FHH pointed to lack of access to credit, while 48.9% of MHH and 50% of FHH highlighted limited market information as a major challenge. These constraints collectively hinder farmers' participation in the soybean market and negatively impact the income potential for both male and female producers in the area.

3.2.2. Opportunities to Market Participation

The opportunities that support market participation for

both male- and female-headed soybean farming households in the study area are summarized in Table 6, ranked by significance. The data shows that 94.7% of male-headed households and 73.9% of female-headed households identified strong market demand as the most significant opportunity driving their engagement in the soybean market. Additionally, 77.6% of MHH and 60.8% of FHH reported high cash income from soybean sales as a key motivator. Other notable opportunities included the presence of cooperatives (70.2% MHH, 52.2% FHH), availability of financial institutions offering credit (70.2% MHH, 52.2% FHH), and rising soybean prices (55.3% MHH, 47.8% FHH). These factors collectively encourage greater market participation and have the potential to significantly increase income for both male and female farmers in the region.

Table 6. Distribution of respondents based on opportunities to Market participation.

Opportunities	Frequency		Percentage		Rank
	MHH	FHH	MHH	FHH	
High market demand	89	34	94.7	73.9	1 st
High cash income	73	28	77.6	60.8	2 nd
Presence of cooperatives	66	24	70.2	52.2	3 rd
Availability of financial institution	52	22	55.3	47.8	4 th
Increasing price of soybean	43	19	45.7	41.3	5 th
Existence of free market	36	16	38.3	34.7	6 th
Availability of mobile and radio	25	12	26.5	26.1	7 th

4. Conclusion and Recommendation

4.1. Conclusion

The study revealed notable gender disparities between male-headed households (MHH) and female-headed households (FHH) in several areas, including farm size, use of credit, frequency of extension service contact, educational attainment, access to market information, and cooperative

membership. As a result, MHHs were better positioned to engage in market activities and increase their income. Therefore, special attention should be given to women, who are often at a disadvantage, to enhance their participation in the soybean market within the district. MHHs earned higher income from soybean sales, partly due to better use of available market information. To address this gap, women in FHHs should be supported with better access to agricultural inputs and services to improve their market involvement and income generation. Data for the study were gathered using

structured questionnaires and analyzed through both descriptive and inferential statistical methods. Findings showed that women soybean farmers had lower levels of market participation. Key factors affecting their involvement in soybean markets included access to market information, education level, cooperative membership, non-farm income, and household farm size. Major challenges identified were limited market access, low selling prices, lack of credit, insufficient market information, high transportation costs, and insecurity. Additionally, women faced a heavy burden of reproductive responsibilities, further limiting their economic participation.

4.2. Recommendations

Based on the key findings of this study, the following recommendations are proposed:

- 1) Given that access to market information has a significant impact on soybean market participation, efforts should be made to enhance farmers' access to such information. This can be achieved by strengthening communication between farmers and extension agents, as well as utilizing platforms like radio and community notice boards. Providing timely updates on market prices and input costs would help farmers make better decisions and improve their incomes.
- 2) To support rural women farmers, the government should implement adult literacy programs that introduce them to modern agricultural practices and promote girls' education, thereby empowering the next generation.
- 3) Existing cooperatives should be reinforced, and new farmer groups should be established with support from the government, NGOs, and other stakeholders. These groups can help farmers gain knowledge, share resources, and access market information, allowing them to benefit from economies of scale and participate more actively in the market.
- 4) Additionally, the government should facilitate better access to agricultural services for women farmers by promoting extension support and creating microfinance institutions that offer low-interest loans, helping them invest in and grow their agricultural activities.

Abbreviations

FHH	Female-headed Households
MHH	Male-headed Households
CSA	Central Statistical Agency

Authors Contributions

Rahel Bacha is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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