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Factors Affecting Rural Women's Participation in Cash Crops Markets -Economic Development in Gode District, Somali Regional State, Ethiopia

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ABSTRACT

Cash crops like fruits, onion, potato etc are very much significant for earning little monetary benefits for farmers because of all time market demands for changing of food consumption pattern of people and also short fall in production thereby market supply mismatched.. This study examined the factors that affect rural women in participation in cash crop market for their economic development in Gode district, Somali Regional State. The specific objectives were to examine the perception of rural women's participation in cash crop market to develop their economic condition in Gode district. A community based cross-sectional study were conducted this study. A multi-stage sampling technique was employed was used to select 309 sample respondents including 113 cash crop grower households and 196 non-growers and 127 participants in cash crop marketing, and 196 non-participants. Both primary and secondary data were used. Secondary data were collected from review of related literatures and documents. Quantitative data were collected using a structured questionnaire. Qualitative data were collected through focus group discussions, interview schedule and observation. Descriptive and inferential statistics were used to summarize the characteristics of sample or data as well as to compare participant and non- participant of women household in cash crop production and marketing with respect to explanatory variables. In addition, binary logit regression model was used to examine the determinant factors that influenced the participation of women in cash crop production and marketing. The results of binary logit regression model showed that, education, average annual income, frequency of extension contact, training participation, and access to market information were found to be significantly and positively affected the women participation in cash crop production and marketing while age, distance from the nearest market, access to roads, time spent on domestic activities, and limited irrigation were significantly and negatively influenced women participation in cash crop production and marketing. Therefore, the study findings suggest that stakeholders and the District Agriculture and Natural Resources Office should prioritize enhancing women's educational attainment, developing and expanding rural infrastructure to improve access to agricultural inputs, and enabling more effective engagement with extension services.

Key Words: Perception; Determinants; Women; Participation; Binary logit; Gode

1. Introduction

Global demand for cash crops has kept increasing during the recent past. The production of cash crops, such as commercial fruit, onions, tea, palm oil, and nurseries, has become a widespread worldwide trend, particularly in tropical and subtropical nations. Nonetheless, there is disagreement regarding how cash crop production benefits societal welfare, economic growth, and environmental preservation. One reason is that cash crop production has sped up local economies' integration into global economies and is recognized as a vital source of export revenue for the producer regions (Li et al., 2018).

For most farmers in central east Africa, cash crop farming is their primary source of income. However, as a means of boosting farm revenues, horticulture crops have grown to be an essential component of women farms due to the ongoing drop in the pricing of traditional cash crops (Kanyua et al., 2015).

Within Ethiopia, women farmers provide almost 95 percent of the nation's agricultural output, according to a 2015 report by the Ministry of Agriculture and Rural Development. Building market-oriented cash crops is a top priority for the nation's development policy and strategy in order to boost women farmers' family incomes. Farmers are encouraged to switch from subsistence to commercial farming through the use of cash crops for market sales (Guja, 2020).

Cash crop is considered as one of the most important cash crops produced by women farmers In Ethiopia. It is the main relish item and has high nutritional value. It also has high economic importance for the value chain actors such as producers, traders as well as the national economy. The area under cash crop is increasing from time to time mainly due to its high profitability per unit area and ease of

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production, and the increases in small-scale irrigation areas . Commercial growers and women farmers in Ethiopia have grown cash crop, a high-value bulb crop, for both domestic and international markets. Out of all the vegetable crops, it was the second most productive, just behind tomatoes, which are mostly grown in the country's central rift valley, especially around Lake Ziway and the upper Awash. Due to the fact of cash crop is an important cash crop in Ethiopia daily diet and people's livelihood .

Women are the main force behind the production and selling of cash crop in the horticultural subsector. In addition to creating jobs for women and young people, the involvement of women in the cash crop market as business owners will boost the country's economy. There are two ways to distribute onions to the market: direct marketing and indirect marketing. In order for rural communities and especially cash crop producers to succeed in the marketplace, they must embrace new technology, have access to new kinds of information, and develop new entrepreneurship skills once more. This will enable them to assess and seize new opportunities as they present themselves (Sanyang, 2014).

The Shebelle river basin along the Gode district is one of the most suitable areas for the production of Cash crop. Gode cash crop growers have recently begun using irrigation to produce onions for both cash crops and domestic use. The majority of farmers in Gode raise cattle, with a small number having lately transitioned to sedentary farming. Because of this, the majority of crops, including tomato, cabbage, and onions, have low production because of subpar agronomic and management techniques (Gessesew, 2021). Therefore, the emphasis of this study lies on the participation of rural women in cash crop production and marketing in Gode district.

2. Materials and Methods

2.1. Description of the Study Area

Goday is one of the eight districts of Shebelle Zone. It is located in south-eastern region of Ethiopia and south east of Somali Region. It shares borders with East Imay district in the north, Qallafo district in the south, Adadley district in the west and Dhanan district in the east. The city was the capital of the Somali Region until 1995 when Jigjiga became the capital. Based on 2010 figures from the Central Statistical Agency of Ethiopia (CSA) Gode has an estimated total population of 950,782, of whom 488,235 were males and 442,089 were females. Gode is the second largest town in the in the Somali region beyond Jigjiga. Gode has a hot arid climate with uniformly very hot weather and scanty, extremely variable rainfall. Although Gode is mainly arid, the crops grown in this woreda include maize, vegetables such as peppers, tomatoes, carrots, onion, and fruits such as mango, papaw, guava, banana and lemon along the Shebelle. Further back from the river, sorghum and maize are cultivated using the seasonal river flooding or by digging small channels from the streams to the crop production areas; a limited amount of vegetables is produced in this area. Shortly after its founding, the Regional government established a farm of

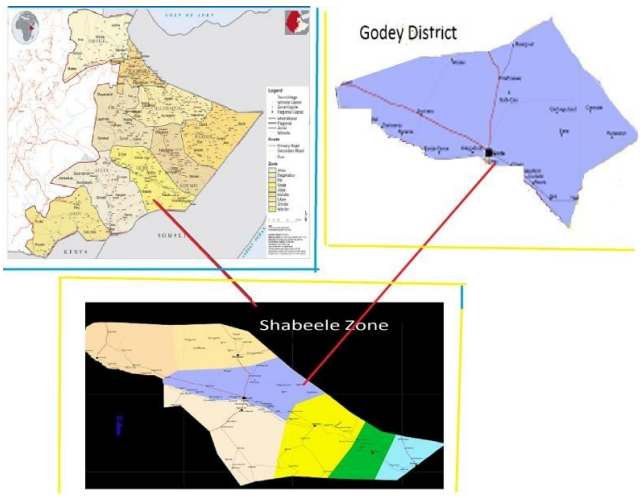

Figure 1: Study area map, source (legend)

752 ha in west Gode, located 60 kilometers from the town of Gode, in a different locality than the old Godey State Farm (now in Adadle). In the irrigation scheme the crops grown by the Regional Irrigation Bureau include maize and beans; vegetables such as onions, beetroot, carrot, cabbage and tomato; and fruits such as papaya, mango and guava.

2.2. Study Design

A community based cross-sectional study were used, considering the goals and nature of the study topic. This study was employed mixed method approach of quantitative and qualitative.

2.3. Sampling Procedure and Sample Size

Gode district has a total of 21 kebeles of which 10 are agro-pastoral and 11 are pure pastoral. The sampling procedure that was employed for this research was multi-stage sampling techniques. A three-stage sampling procedure was employed to select sample respondents from Goday district. In the first stage, Godey district was purposively selected due to its cash crop production and marketing. In the second stage, out of 10 agro-pastoral kebeles, four kebeles were purposely selected, namely: Kayane, Badilacad, Barsan and Godirey. In the third stage, the total population of selected four kebeles is 1350. From the total population 309 sample respondents were selected randomly based on probability proportional to size.

2.3.1. Sample Size

There are several ways for determining the sample size and for this study were used a simple formula from to determine the sample size.

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

Where: n= is the required sample size N= is population size in the study area e= Margin error

$$n = \frac{N}{(1 + N(e)^2)} = \frac{1350}{(1 + 1350(0.05)^2)} = 309 \quad (2)$$

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2.4. Methods, Sources and Types of Data Collection

Both primary and secondary data were used. Primary data for this study were obtained through three data collection tools these are: Structured questionnaire, key informant interviews (KII), focus group discussion (FGD) were used based on the factors identified through literature review.

2.5. Method of Data Analysis

2.5.1. Quantitative data analysis

Both descriptive and econometric statistics were used for data analysis and interpretation. The data collected thorough questionnaire were processed for data analysis with the help of Epi-data and SPSS software.

Descriptive and inferential statistics Descriptive statistics such as mean, standard deviation, percentages and frequency of occurrence were used to explain different demographic and socio-economic characteristics of the sample respondents. In addition, inferential statistics such as t-test and chi-square test were employed to test statistical significance of continuous and dummy variables, respectively, among participants and non-participant women.

Econometric Analysis Descriptive statistics often fails to predict the combined effect of the explanatory variables on the dependent variable. Thus, this gap was bridged by selecting and running appropriate econometric models for inferential purpose. Econometric model was used to study determinants of participation of rural women in cash crop production and marketing. The dependent variable is whether or not the woman participates in cash crop production and marketing. The dependent variable in this case is a dummy variable (binary), which takes a value of 1 for participants and 0 for non-participants. Binary logistic regression model the relationship between a set of predictors and a binary response variable. Therefore, a binary logistic model was employed to identify determinate factors that influence rural women farmers' participation in cash crop production and marketing. The factors that influence participation of rural women in cash crop production are referred to as explanatory or independent variables. So that:

$$Yi = 1if\,Xi'\beta > YiORYi = 0if\,Xi'\beta < Yi \quad (3)$$

Where $Yi\ *$ is a latent variable and represents the unobserved level of participation in cash crop production and marketing. By the application of probability theory, the probability that a given woman participates in cash crop production is given by

$$P = Prob(Yi = 1) = f(Xi'\beta) \quad (4)$$

and the probability that a given woman does not participate in cash crop production is given by

$$1 - P = Prob(Yi = 0) = 1\lambda f(Xi'\beta) \quad (5)$$

In this study, binary logit was employed to estimate the probability of participation in cash crop production. The logit model specified for the study is stated as

$$L = \log[pi/(1 - pi)] = \beta_0 + \sum \beta LXiUi \quad (6)$$

Where: pi = the probability that women actively participate in cash crop production, the binary variable, pi = 1for participant women and pi=0 for non–participant women; β_0= the constant term; β_i= a vector of β unknown coefficients of the determinants of participation in cash crop production and marketing; Xi= a vector of independent variables that determine participation in cash crop production and marketing; Ui is the stochastic error term and i = 1, 2, 3…N observations

3. Results and Discussion

3.1. The Socio-Economic Characteristics of Respondents.

The descriptive statistics was run to highlight the potential relationships between variables and to provide basic information about variables in dataset. (Table 1)

The result shows (Table 1) that the majority of respondents are married, with 87.6% of participants and 74% of non-participants, making up 79% of the total sample. This indicates that married women are more likely to participate in cash crop production and marketing.

Widowed and divorced women are less likely to participate, with 11.7% of non-participants being widowed compared to 4.4% of participants, and 10.2% of non-participants being divorced compared to 4.4% of participants.

The Pearson chi-square test value (8.926) is significant at the 5% level, indicating a significant association between marital status and participation in cash crop production and marketing. Married women's higher participation may reflect better access to resources and support. (Table 2) shows about age as an important factor influencing participation in cash crop production and marketing. The results indicate that the average age of participants was 32.03 years, while non-participants had a significantly higher average age of 44.87 years. The negative t-value (-10.990) at the 1% significance level suggests that younger women are more likely to participate in cash crop production and marketing. This could be due to younger women being more energetic, adaptable, and open to new agricultural practices compared to their older counterparts.

Education plays a critical role in determining the adoption of improved agricultural technologies and participation in cash crop production. The mean education level for participants was 2.74 years, significantly higher than the 0.98 years for non-participants. The positive t-value (9.561) at the 1%

Table 1: Marital Status of Respondents

Variable	Category	Participants		Non-participants		Total sample		Pearson chi-square
		Freq.	%	Freq.	%	Freq.	%	
Marital Status	Unmarried	4	3.5	8	4.1	12	3.9	8.926*
	Married	99	87.6	145	74	244	79	
	Divorced	5	4.4	20	10.2	25	8.1	
	Widowed	5	4.4	23	11.7	28	9.1	
Total		113	100	196	100	309	100	

* Indicates significance at the 5% level.

Table 2: Continuous Explanatory Variables of Respondents

Variables	Participants		Non-participants		T-value	Total Sample (N=309)	
	Mean	Std. Deviation	Mean	Std. Deviation		Mean	Std. Deviation
Age	32.03	7.42	44.87	11.07	-10.990***	40.17	11.663
Education	2.74	1.83	0.98	1.38	9.561***	1.63	1.771
Household size	6.27	2.10	6.47	2.12	-0.839	6.40	2.109
Average annual farm income	142,025.66	94,905.65	36,745.92	30,493.91	14.316***	75246.28	80270.804
Average annual non-farm income	6,101.95	9,920.14	3,432.53	6,395.02	2.873***	4,408.72	7,958.365

***, ** = significance level at 1% and 5%, respectively.

significance level indicates that participants had significantly more years of education than non-participants.(Table 2) This suggests that better-educated women are more likely to engage in cash crop production and marketing, possibly due to their ability to better understand and adopt new farming techniques.

Household size reflects the availability of labor within the household, which can influence participation in cash crop production. Participants had an average household size of 6.27 members, while non-participants had a slightly larger household size of 6.47 members. The t-test result (-0.839) indicates that there is no statistically significant difference between participants and non-participants in terms of household size. (Table 2)This suggests that household size may not be a critical determinant of participation in cash crop production. Farm income is a key factor influencing the adoption of improved agricultural practices. Participants had a significantly higher average annual farm income (142,025.66) compared to non-participants (36,745.92). The t-value (14.316) at the 1% significance level indicates a significant mean difference between the two groups. (Table 2).This suggests that higher farm income enables participants to invest in improved farming inputs, such as seeds, fertilizers, and irrigation, which are critical for cash crop production.

Non-farm income provides an alternative source of livelihood for rural women. Participants earned an average annual non-farm income of 6,101.95, which is significantly higher than the 3,432.53 earned by non-participants. The t-value (2.873) at the 1% significance level indicates a significant difference between participants and non-participants.(Table 2) This suggests that participants may have better access to non-farm income opportunities, which could complement their involvement in cash crop production and marketing.

Participants with access to market information are better positioned to plan their production and negotiate fair prices for their produce. Non-participants, however, may lack the information needed to connect with buyers or respond to market demands, discouraging them from growing onions. To address this, efforts should focus on improving market information systems, such as mobile platforms, farmer cooperatives, or extension services, to ensure women are informed about market opportunities.

In the study area, women accessed market information through various sources, including development agents, traders, neighbor farmers, cooperatives, and media. Out of 147 respondents, 78 participants (46.9%) and 69 non-participants (53.1%) reported receiving market information. The most common source for both groups was traders, with 51.7% of participants and 48.3% of non-participants relying on them. (Table 3).Neighbor farmers were also frequently cited, particularly by 59.3% of non-participants. However, cooperatives and media were more commonly used by participants (78.3% and 83.3%, respectively), reflecting their reliance on formal and structured sources. Development agents were the least utilized source, with only 2 participants (50%) and 2 non-participants (50%) citing them, indicating a limited role in providing market information. Strengthening cooperatives, media, and development agent involvement could improve access to reliable market information, particularly for non-participants (Table 3).

The majority of respondents rated the environmental conditions for cash crop production as favorable, with 102 participants (38.2%) and 165 non-participants (61.8%) agreeing. The Pearson chi-square test ($^2 = 8.467$) indicates a significant association, suggesting that perceptions of environmental conditions differ between participants and non-participants. This highlights the need for ongoing improvements in environmental support for cash crop production, particularly for women.(Table 4)

A significant portion of respondents 224 (72.5%) believes that cultural norms support women's participation in cash crop production, with 87 participants (38.8%) affirming this. However, the chi-square test ($^2 = 3.243$) shows no strong association between cultural support and participation.

Table 3: Market Information about Market received by Respondents

Source of market information	Participants		Non-participants		Total	
	Freq.	%	Freq.	%	Freq.	%
Development Agents	2	50	2	50	5	100
Traders	31	51.7	29	48.3	60	100
Neighbor farmers	22	40.7	32	59.3	54	100
Cooperatives	18	78.3	5	21.7	23	100
Media	5	83.3	1	16.7	6	100
Total	78	46.9	69	53.1	147	100

Table 4: Perception of Rural Women for Participation in Cash Crop Production and Marketing

Variables	Categories	Participants (113)	Non-participant (196)	Total sample (309)	Pearson chi-square
		Freq. %	Freq. %	Total. %	
Environmental conditions	favorable	102(38.2)	165(61.8)	267(100)	8.467 ***
	Very favorable	11(39.3)	17(60.7)	28(100)	
	Unfavorable	14(100)	0(0)	14(100)	
	Very Unfavorable	0	0	0(100)	
Cultural Practices	Yes	87(38.8)	137(61.2)	224(100)	3.243**
	No	4(50)	4(50)	8(100)	
	Sometimes	22(28.6)	55(71.4)	77(100)	
	Somewhat important	6(37.5)	10(62.5)	16(100)	
	Not important	2(8.3)	22(91.7)	23(100)	
Societal Response	Very positive	17(60,7)	11(39.3)	28(100)	17.847 ***
	Positive	87(37.7)	144(62.3)	231(100)	
	Neutral	7(14.9)	40(85.1)	47(100)	
	Negative	2(66.2)	1(33.3)	3(100)	
	Very negative	0(0)	0(0)	0(100)	

, 1% and 5% significance, respectively.

Community attitudes were rated positively, with 87 participants (37.7%) perceiving them as "positive." The chi-square test ($^2 = 17.847$) shows a significant association, indicating that participants are more likely to view community attitudes favorably compared to non-participants. This underscores the critical role of community perceptions in fostering an inclusive environment for women in cash crop production.

3.2. Econometric Results

The binary logit regression models for women's participation in cash crop production and marketing were analyzed separately, identifying key demographic, socio-economic, and institutional factors influencing participation. Several explanatory variables were found to have statistically significant effects at the% and 5% significance levels, providing valuable insights into the determinants of rural women's involvement in these activities. For cash crop production, six factors were significant: age, education, average annual income, older women were less likely to participate, while higher education levels and greater annual income positively influenced engagement.

The determinants of women's participation in cash crop production were analyzed using a binary logit regression model. Age of the respondents, measured as a continuous variable, negatively and significantly influence women's participation, with an odds ratio of 0.998 at the 1% significance level. This indicates that older women are less likely to engage in cash crop production and marketing activities possibly due to physical limitations or reduced energy for labor-intensive activities. (Table 5)

Education has a positive and significant effect on participation, with an odds ratio of 1.499 at the 5% level. Educated women are more likely to engage in cash crop production and marketing because education enhances their ability to access information, adopt innovative farming practices, and make informed decisions. Average annual income positively and significantly influences participation with an odds ratio of 1.000 at the 5% level. Women with higher household incomes are more likely to participate in cash crop production and marketing because they can afford better inputs, technologies, and hired labor.

Women with access to training opportunity are more likely to adopt modern agricultural techniques and engage in cash crop production.(Table 5)

4. Conclusion and Recommendations

4.1. Conclusion

Thus, from the study results it is possible to conclude that, even though there were potential conditions for cash crop production and marketing in the study area; women farmers are confronted with the problem of infrastructure, inadequate funds concerning cash crop production and input constraint.

The study identified key factors influencing women's participation in cash crop production and marketing. Institutional factors, such as extension services, access to training, frequency of extension contact, irrigation access, distance from nearest market, access to roads, and access to market information, significantly affect women's participation. Additionally, women's perception of cash crop production

Table 5: Probable Women Participation in Cash Crop Production and Marketing.

Participation of women in cash crop production	Odds Ratio	Std. Err	Z	P>|z|	[95% Conf. Interval]	
Age	0.998	0.001	-3.64	0.000***	0.997	0.999
Education	1.499	0.176	2.40	0.021**	1.062	2.116
Household size	0.900	0.145	-0.75	0.468	0.678	1.196
Average annual income	1.000	0.000	2.55	0.011**	1.000	1.000
Training participation	0.421	0.841	-1.26	0.303	0.081	2.189
Constant	5821.875	2.362	3.67	0.000***		

***, ** = significance level at 1% and 5% respectively

and marketing as a viable livelihood strategy was influenced by their level of education and exposure to agricultural information.

Therefore, it is concluded that intervention is required to improve the participation of women in cash crop production and marketing as well as to increase the efficiency of cash crop productivity and marketing and quality in the study area.

4.2. Recommendations

- Based on the study findings, the following recommendations are proposed to enhance rural women's participation in cash crop production and marketing:
- District educational offices should collaborate with local NGOs and community organizations to provide these opportunities, especially in remote areas. Moreover, functional literacy campaigns should be conducted to increase women's ability to understand and utilize agricultural extension materials effectively.
- Microfinance institutions and banks should offer low-interest loans to women farmers to help improve their purchasing power. In addition, capacity-building programs on financial management and saving strategies should be introduced to enhance women's ability to manage resources effectively.
- Access to market information was found to significantly influence women's participation in cash crop marketing. Therefore, it is important to establish efficient and accessible market information systems that provide real-time data on market prices, demand, and opportunities. Mobile-based platforms, community notice boards, and cooperatives should be used to disseminate this information.
- Specialized training on cash crop production techniques, pest management, and efficient resource utilization should be provided to women farmers regularly. Extension agents should also be trained on gender-sensitive approaches to ensure that women are given equal attention and support in agricultural development programs.
- Even though marketing responsibilities are often shared, more initiatives can be introduced to increase women's involvement in the marketing of onions.

Conflict of Interest

The authors declare that there is no conflict of interests involve in publishing this research paper.

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