Original Research Article

Determinants of Market Participation among Smallholder Common Bean Farmersin Eswatini (Former Swaziland)

ABSTRACT

Purpose: Promoting small-scale farmers' market participation is perceived to be a motivation of transforming peasantry subsistence farming to commercialization for improved rural livelihoods especially in developing countries like Eswatini. Despite efforts by the government and other stakeholders the transformation process is too slow or stagnant mostly on non-traditional export food commodities including common beans in Eswatini. The drivers of small-scale common bean farmers 'market participation and level of market participation in Eswatini are not known, hence this study.

Objectives: Themain objective of the present study is to find out the determinants of market participation among the smallholder common beans farmers in Eswatini.

Research Method: This study used secondary data accessedfrom Eswatini Agricultural Development Enterprise (ESWADE) under the Smallholder Market Lead Project was used. The data was cleaned and a total of 164common bean farmers were considered for this study. The data was analysed using descriptive statistics and Heckman two-stage selection model.

Findings: The results generated indicate that most respondents were females (63%).The results further show that there is a significant difference of 1.396 in the number of family size helping in farming between participant and non-participants. About 84.8% of the farmers depend on rain to water their beans. Gender, knowing size of land, method of watering and householdfarm labour size werefound to be the determinants of common bean farmer's choice and intensity of participation in the market.

RECOMMENDATION: It is recommended that farmers should consider irrigating their crops, participate fully in farming activities and know their size of land because these factors has been proven to increase the intensity of market participation of bean farmers and the government should take initiative to provide more extension officers to conduct effective training and incentives that will encourage the middle age group to participate in sugar bean farming.

Originality/ Value: This paper highlights the determinants of market participation among the smallholder common beans farmers in Eswatini as well as establishes the socio-economic characteristics of the small scale common bean farmers.

Keywords: Market participation, Eswatini, Heckman two-stage model, Smallholder common bean farmers

1. INTRODUCTION:

Increased agricultural production and commercialisation of especially food crops among small-scale farmers in developing countries and provision of sufficient and adequate nutrition is one of the top most prioritised development objectives [1]. Traditional food crops including maize and beans are mostly produced at a subsistence level rather than commercialisation among small-scale farmers despite of high demand created by increasing global population. Among factors deterring millions of smallholder farmers throughout Africa to participate in commercial farming is poverty which limits their access and utilization of sustainable productive enhancing modern technologies to meet rising human food needs.Promotion of farmers' market participation is an important step of transiting the subsistence economy of the rural population in developing countries to commercialised one. If attained, small-scale farmer's commercialization is key role in creating jobs on farms, markets and throughout the farm-to-table food chain, improves food security, poverty reduction and reduces on income inequality among the population of a country. Among the most important food crops grown worldwide includes common beans, sold when fresh from the farm or processed canned. Beans are among such horticultural crops adopted and several farmers are practicing crop trade-off in Eswatini. Given the advantages of generating more income as they are regarded as high market value product, horticulture accounts for over 70% of smallholder farmers' total production[2-3].

In Eswatini, sugar beans are grown in all four of the regions (Hhohho, Manzini, Shiselweni, and Lubombo regions), but the Middleveld (Manzini region) produces more compared to other regions because of its ideal climatic conditions. Therefore, the country's largest producer and consumer of sugar beans is the Manzini region. In the metropolitan regions of the Manzini region, small-scale farmers and agricultural businesses grow sugar beans for market. The sugar beans are regarded as the most expensive leguminous crop grown in the nation, and currently the average price of sugar beans per tonne is approximately E30, 335 in Eswatini. According to Eswatini FAO-UN reports of 2009, sugar bean production varies from year to year depending on mainly weather/climatic conditions [4]. During the drought season of 2016 Eswatini produced 700 metric tonnes of sugar beans and the production was reported low. The drought effects were also felt in years 1983 and 2007 where low production of beans were reported, respectively. In year 2019, Eswatini exported 55 tonnes of beans. When compared bean export between year 2017 and 2019, there was an observed decline of about -28% resulting in US$0.1million loss to the country [5-6]. The production of beans in Eswatini has been declining over the years. The production of beans in Eswatini in 2019 was 5425 tonnes which was projected to have declined by 3%. The country had proximately 11,487 hectares under beans cultivation. Eswatini's leading destination for beans are Switzerland, Malawi, Netherlands, South Africa, and Mozambique. Eswatini imported 7625 tonnes of beans in 2019 [5]. This has resulted to the country being highly dependent on international markets for its basic food needs [7]. According to Tsabedze (2022), 364 farmers were trained, and 243.5 hectares was allocated to them as means of boosting bean production as part of efforts made by the government of Eswatini [8]. Although accessed literature indicate a decline in bean production and exports as a result of droughts, less explains other factors responsible for declining small-scale farmers' market participation.

According to literature accessed by the researchers, market participation of smallholder farmers in several developing countries is affected by numerous factors, including socio-economic factors, institutional factors, market factors and external factors such as political stability of the nation and natural disaster. These factors could have negative and positive effects, which could either improve or cause a decline in the welfare of the farmers [9-12]. A research carried out by Lizzen (2015) in Zambia indicated that education level of household head, assets owned by household (ownership of livestock for traction and a working radio), institutional factors (access to price information prior to selling and being a member to a farmer organization), price level and quantity of output produced had a positive and significant relationship with farmers' choice to participate or not to participate in the rice market [12]. The intensity of market participation among rice farmers was positively influenced by size of land owned, access to credit, quantity of output produced, access to price information prior to selling and being a member to a farmer organization.

2. METHODOLOGY:

The study was conducted around Eswatini in all the four ecological regions, Hhohho, Manzini, Lubombo and Shiselweni. Eswatini is a land locked country in Southern Africa. It is boarded by Mozambique to its northeast and South Africa to its north, west and south-east. The country covers an area of about 17364 km^2 and population of about 1.17 million [13]. Eswatini's agricultural sector is second largest contributor to the economy after manufacturing sector about 70% of the rural population in Eswatini practice subsistence farming [14]. The study was quantitative in nature. The researcher used secondary data sourced from ESWADE under the Smallholder Market Lead Project of Eswatini.During data management of the present study, 164 common beans farmers' data set from the four regions had complete information needed for this study. Descriptive statistics including means, percentages, standard deviation and frequencies were employed establish the socio-economic characteristics of the farmers. A two staged Heckman model was used to analyse farmers' decision to participate in the market and the intensity of market participation.The two-step statistical approach offers means of correcting non-randomly selected samples and considers the behavioural relationships as specification error.

Aprioriexpectations

Marketed output (Y_i): This is the dependent variable and measured by the produce sold over the yield produced. It is assumed that it is determined by all the explanatory variables (socio-economic factors) included in the model.

Gender (X_1): Positive relationship is expected between male farmers and market participation because they are normally stronger, and they are the bread winners in most families.

Household size labour (X_2): Household size labour has been described as the most important determinant of labour investment for family farms because it is a source of labour. A positive relationship is expected between household size and the intensity of participation.

Farmer's age group (X_3): This represents the knowledge that the farmer has supposedly acquired in farming of beans over the years. Experience comes with age and therefore, a positive relationship is expected between age and market participation.

Awareness on size of land (X_4): Knowledge in size of land for production increases the chances of having enough farming inputsthus increasing yield. A positive relationship is expected between the size of land used for bean production and the decision to participate in the market.

Access to training (X_5): Producers that are in contact with extension agents have better understanding on new technologies such as better seed varieties and other better production practices, which increases their likelihood to produce more hence a positive relationship between access to training and decision to participate in the market is expected.

Method of watering (X_6)- Method of watering describes whether the farmer rain feed or irrigate the crops. Water is essential for the growth of crops hence a positive relationship between method of watering and participation in the market is expected for farmers who irrigate their crops.

Experience (X_7) - This presents the number of seasons a farmerhas been growing beans. A positive relationship between the number of seasons planted and the decision to participate in the market.

Member of Association (X_8) - Producers that are members of an association have better access to knowledge, farming inputs and contact with extension officers. They also have better understanding on new technologies such as better seed varieties and other better production practices, which increases their likelihood to yield more hence a positive relationship between members of associations and decision to participate in the market is expected.

Analytical framework

The study employed the Heckman's two step procedure because of its ability to handle the anticipated problem of selection bias in the sample. The Heckman two-step uses the probit model in the first stage to determine the probability of selling in the market as shown in equation 1;

$\Pr(Z_i = 1 \mid w_i, \alpha) = \Phi(h(\boldsymbol{w}_i, \alpha)) + u_i$ ..... (1)

Where, Z_i is an indicator variable equal to unity for household that sold common beans, Φis the standard normal cumulative distribution function, $\boldsymbol{w}$is a vector of factors affecting market participation , $\boldsymbol{\alpha}$is a vector of coefficients to be estimated, and u_i is the error term assumed to be distributed normally with a mean of zero and a variance σ^2. The variable Z_i takes the value 1 if the marginal utility household i gets from participating is greater than zero and zero otherwise, as shown in equation 2;

$Z_i^* = \alpha w_i + v_i$ ..... (2)

Where Z_i^* the latent variable of utility the household is gets from participating in the common bean market and the error term is assumed$V_i \sim (N, 1)$, so we have

$$\left.\begin{array}{l} Z_i = 0 \text{ if } Z_i^* > 0 \\ \leq Z_i = 0 \text{ if } Z_i^* \leq \end{array}\right\} \underline{0} \quad \text{..... (3)}$$

The second stage uses a regression model as shown below;

$Y_i = X_i\beta + {}_i$ ..... (4)

Where$\boldsymbol{X}_i$ represents a vector of explanatory variables determining market intensity, $\boldsymbol{\beta}$ is a vector of coefficients and **i** the error term. The regression model yields biased results when run using OLS because the error terms for the probit model and regression models are correlated with$\text{corr}(u, \varepsilon) = \rho$. To correct for the bias, an inverseMills' ratio is introduced in the regression model calculated from the probit model. That is, the Mills' ratio is included as an explanatory variable and the regression model becomes:

$E[Y_i Z_i \boldsymbol{\gamma} > 0] = X_i \beta + \rho\sigma_\varepsilon \lambda_i$, ... (5)

Where$\boldsymbol{X}_i$ represents a vector of explanatory variables determining market intensity after correction for selection bias, $\boldsymbol{\beta}$ is a vector of coefficients, σ_ε and $\sigma_u$are standard errors for the random terms for the regression and selection models respectively. $\lambda_i$represents the inverse Mills' ratio, given as [15]

$$i = \frac{\emptyset(\frac{Z_i\gamma}{\sigma_u})}{\Phi(\frac{Z_i\gamma}{\sigma_u})} \quad \text{.....(6)}$$

Where Φ and Ø are represent the standard normal cumulative function and standard normal distribution.

Model specification

Stage 1 of the Hackman's model

$Z_i^* = \alpha w_i + v_i$

$Z = \alpha_0 + \alpha_1 W_1 + \alpha_2 W_2 + \alpha_3 W_3 + \alpha_4 W_4 + \alpha_5 W_5$

Z =dependent variable defined as (1= participant 0= non-participant)

W_1 - age of farmer in years

W_2 - household size (number of members in homestead)

W_3 - gender of respondent (1 = female, 0=male)

W_4 - member of a group (1= yes, 0= no)

W_5= Training (1=yes, 0 = no)

W_6 – farm land size (ha)

W_7 - Irrigation (Rain-fed = 1, 0 =irrigation)

W_8 – number of family members helping in farming (number)

W_9 - number of seasons

Stage 2 of Henchman's model

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \ldots\ldots\ldots + \beta_n X_n$

Y_i dependent variable (Y = output sold/output harvested)

X_1 - age of farmer in years

X_2 - household size (number of members in homestead)

X_3 - gender of respondent (1 =Female, 0= male)

X_4 - member of a group (1= yes, 0 = no)

X_5= training (1=yes, 0 = no)

X_6 – farm land size (ha)

X_7 - irrigation (Rain-fed = 1, 0 = irrigation)

X_8 – number of family members helping in farming (number)

X_9 - number of seasons

3. RESULTS AND DISCUSSIONS:

Socio-economic characteristics

Socio-economic characteristics of any society are vital not only giving understanding of the type and nature of respondent's livelihoods but also understanding qualities based on gender, ageand knowledge on farming, how farmers irrigate their crops, how long have they been farming and other characteristics of the chosen population which distinguish them from other farmers. In total 164 farmers were analyzed of which 122 farmers did not participate in the market whilst 42 of them participated in the market.

Gender of respondents: Results presented in Table 01 compares gender by participation and these indicate that most of bean farmers in the study area were women compared to men. Overall, 63% of farmers interviewed were female and only 37% were males. Further results indicate that 62% of non-participants were female and 38% of the same groups were males. About 63% of farmers participating in the market were females and only 37% were males. The chi-square P-value suggests that there is no significant difference in the choice of participation by gender. Literature indicates that male farmers are mostly attracted to enterprises that earn more incomes while letting little earning enterprises to females. Beans are viewed as some of such enterprise with little earnings. Furthermore, it is thought that in most families, men leave for non-farm work and women are left with the task of agricultural activities.

Farmer Age Group: Table 01 indicate that only a few of the youth (19 – 35 years) and the elderly group (70 years and above) participate in farming of common beans. Most of the common bean farmers are aged between 36 and 69 years. Further, the results show that 6.7% of the farmers were aged between 19 and 35 years. About 46% of the farmers are between the ages of 36 and 54 years. Approximately 40% of the farmers were aged between 55 and 69 years, and only 7% of farmers were aged 70 years and above. This implies that common bean farming is mostly carried out by middle aged farmers ranging between 36 and 54 years (46.3%) and is still categorized as economically active. The middle aged group is thought to have a significant influence in decision making related to agricultural practices along the value chain.

Received Trainings from an NGO: Table 02, producers are received training and in regular contact with extension agents have better understanding related to new technologies including improved seed varieties,and this is thought to improve on their incomes and general livelihood. Additionally, they may also have increased access to market information on the output price and available markets due to their interaction with extension workers. Siziba et al. (2010) found that access to extension training among cereal production positively influence the intensity of market participation among cereal producers in Sub-Sahara Africa (SSA) [15]. However, it did not influence the probability of market participation. In this study, access to extension services was hypothesized to be positively related to the market participation among common bean farmers. The results show that most common bean farmers have received training from an extension farmer through an NGO. The results revealed that 37.8% of the total farmers have not received training while 62.2% of the same farmers received training from an NGO.

Comparing participation by Member of Association: The observation in Table 03shows that most common bean farmers belong to a certain association. A total of 95 farmers belonged to association which is 57.9% of the total sampled farmers and about 42% of the same sampled farmers did not belong to any association and are thought to be disadvantaged to accessingextension services. Maow, (2021) revealed that agricultural extension is an important tool for the production, marketing and promotion of food security through providing basic community trainings, regular farmer's mobilizations and agricultural extension services to farmers in the target areas [16]. Being a member of association also allows producers to reach economies of scale [9].

Comparing participation by Farmers' awareness of size of farm land: The population is dominated by people who do know their size of land. The results shows that 30 farmers do not know the size of their farm land but could estimate how much it takes to plough and 134 farmers do know their size of land (TABLE 04). Measuring your land will tell you how much of a crop you can plant. The area of land available for farming should be measured because farmers need to know its size for budgeting and cash-flow needs. The results revealed that 18.3% of the farmers do not know their exactfarm land size but could estimate how long it takes to plough the fields and 81.7% farmers did know their size of farm land as shown in Table 05.

Method of watering: Table 05 shows that most farmers depend on rainfall to water their crops. The results showthat only 15.2% of the total farmers irrigate their crops and the remaining 87.8% depend on rainfall to water their crops. Ideally farmers who irrigated their crops are most likely to harvest more beans than farmers who depend only on rain.

Comparing means by number of seasons between the two groups: Table 06revealed that there's no significant difference in the number of seasons between the two groups (participants and non-participants) with a probability 0.5842. This means that the number of seasons a farmer planted did not influence the participation in the market. However, according to Seng, (2016) participation in the market can allow farmers to improve productivity and enhance household earnings. The mean for non-participants was 8.828 and the mean for participants was 9.857 respectfully. Upon comparing both groups there was a mean difference of -1.028 [17].

Comparing means by land size between participants and non-participants: The findings from the study area shows that the mean for non-participants in size of land was 2.537 and the mean for size of land for participants was 2.677. The mean for the total sampled respondents was 2.573. However, the mean difference between the two groups was -0.140. Furthermore, the independent t-test analysis revealed that there's no significant difference in mean size of land between participants and non-participants (Table 07).

Comparing means by common bean harvested: To assess whether the total yield had any significant difference in the amount of common bean harvested between the two categories of farmer's t-test was used to analyze data. The results show a highly significant difference of $Pr(|T|>|t|) =0.0000$. It is thought that for a farmer to participate in the market they must have a great harvest hence the greater the harvest, the greater the chances of the farmer to participate in the market vice versa (Table 08).

Comparing means by common bean sold: As expected,the non-participants did not sell anything in the market. Table 09shows that the mean participants are 139.286, the results show a significance difference of 0.000.

Number of family members helping in Farming Activities: One of the socio-economic factors of farmers was the size of household labour. Table 10revealed that there's a significant difference in the number of family members. It is assumed that the more family members are helping in the production of beans the higher the probability for the farmer to participate in the market. The results further showed that the mean for non-participants was 3.245 and the mean for participants was 4.643. The mean for the whole population was 3.604. Upon comparing the two groups there was a mean difference of -1.40.

Determinants of Farmers' decision to participate in the market and Determinants of Farmers' intensity of market participation: The Chi-Square test indicates the correlation is very significant (p>0.000). Hence, the researcher used Heckman's technique. The Mills lambda is significant with a positive sign which suggest that the error term in the selection and outcome equations are positively correlated. Determinants of farmers' choice of market participation tend to be associated with how crops are watered (irrigated or rain-fed). Results from the Heckman two step model are presented in Table 11. The first part of Table 11presents the determinants of participating or not participating in beans selling and these determinants include gender, awareness about farm size, whether irrigate or rain fed farming, and number of family members participating in farming activities. With exception of farm size awareness which affects decision to participate negatively, gender, irrigation, and household farm labour have a positive and significant influence on decision to participate in beans market.

Gender Comparison: The results show that gender significantly and positively influenced the decision to participate in the market, it shows a significant (p=0.092). Being a female farmer increases the probability of participating in the market by 30%, all other factors held constant. This suggest that Female farmers are more market oriented than males hence they participant more in the market foe cash crop like beans. However, this finding contrasted the views of held by Mutayoba and Ngaruko, (2015) who reported that male headed households are most likely to participate in marketing cash crops [18]. The authors argued that males responsible for providing cash income to households and to accomplish this, they grow high value cash crops.

Awareness on size of land: Land owned by the household as expected, positively related positively to the decision to participate in the market and was significant at (p=0.070). Land is a crucial factor in production and the larger the size of productive land the producer owns, the higher the production levels are likely to be due to larger hectares produced and subsequent the quantity sold. This shows the importance of size of productive land available in enabling a household to produce a market surplus and be able to not only participate but also sell substantial amount of produce.

The quantity of common beans sold: Quantity produced is critical for semi-commercial farmers who first of must produce for home consumption and only sell surplus. Therefore, higher output enables to have marketable surplus [19]. The result in Table 12 shows that the number of family members helping has a positive impact on the decision to participate in the market. Observations showthat household labour was significant at (P>|z| =0.05) for the decision to participate. The researcher assumes that as family members help, production cost reduces and hence the probability to participate in the market and the intensity increases.

Method of watering: The results showed a significant value of P>|z|=0.0.40 and positively related to the farmers decision to participate in the market. Most farmers are smallholders who can hardly afford the cost related to irrigation and hence opt for rain-fed bean farming. The results suggest that smallholder farmers depending on rain-fed farming are more likely to participate in selling beans compared to their counterparts who irrigate their crops. Although science theory indicates that irrigation helps to grow agricultural crops, maintain landscapes, and re-vegetate disturbed soils in dry areas and during periods of less than average rainfall. Irrigation also increases the chance of getting high yield and hence increasing the chances and intensity of participating in the market.

The Factors Affecting the Intensity of Market Participation Common Beans

To determine the factors affecting the intensity of market participation common beans, OLS regression was estimated in the second step of the Heckman outcome equation. The second of part of Table 11 presents the determinants of intensity of participation in beans selling and these determinants include awareness about farm size and number of family members participating in farming activities. Whereas awareness on farm size has a negative and significant influence on level of market participation, number of family members involved in farming variable had a positive and significant influence on level of the same.

Awareness on farm size: The results revealed that awareness on size of land negatively related to the intensity of market participation. The resultsrevealed that most farmers did know their size of land which was practically supposed to affect level of participation positively. The researcher assumes that farmers may have no access to improved technologies and their land might be too large and their investment in is small hence the harvest become low. Even though the effect was negative farm size awareness was found to bevery significant. The findings of this study align with that of Wiredu et al., (2013) who observed that farm size has a negative impact on participation and it was non-significant. The authors assumed that farmers have a large farm which they cannot afford to nurse properly [20].

Size of Household farm labour: As expected, the observation showed that the number of family members helping affected the intensity of participation positively and was very significant (P>z= 0.000. This suggests that, the more the number of family members helping during farm production, the more likelihood of high yield hence the higher the probability to have a greater proportion to sell. The larger the household size labour helping in production, the more the intensity of market participation increases.

4. CONCLUSION:

There is a significant difference in productivity of farmers who are participants and non-participants in the market.The size household farm labour has a positively influence on the intensity of farmers' market participation. The researchers established the determinants of farmers choice to participate in the market were gender, knowledge about farm land size, method of crop watering (rain fed or irrigation) and the size of household farm labour. However, only awareness about size of farm land and size of household farm labour positively affected the intensity of market participation. Thus a farmer knowledgeable about his farm size and has more cheap family labour are more likely to participate in selling their beans and those with less knowledge about farm size and no family free labour are likely not to participate in the selling of the produce.

5. RECOMMENDATION:

From these results it is recommended that farmers should consider irrigating their crops, participate fully in farming activities these factors has been proven to increase the intensity of market participation of bean farmers. On another note, the government should take initiative to provide more extension officers to conduct effective training and incentives that will encourage the middle age group to participate in sugar bean farming as it has been shown by the results that age and training positively affect productivity.

it is recommended that farmer organizations should implement a program that will formulate techniques which will encourage farmers to sell their produced common beans. Such programs could be agricultural competition and incentives like having access to inputs on credit, less labour intensive technologies and contract farming. These activities could affect the level of participation and the intensity of participation positively since productivity is likely to increase.

Conflicts of Interest:The authors have declared that they have no conflict of interest that is relevant to the content of this study.

COMPETING INTERESTS

Authors declared that no competing interests exist.

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Table 01. Comparing gender and age by market participation

Comment [A3]: Titles must stand along. Provide further information about location and tables content

Variable	Non-participant		Participant		Overall	
Gender	**Freq.**	**%**	**Freq.**	**%**	**Freq**	**%**
Male	46	37.7	15	36.6	61	37.4
Female	76	62.3	26	63.4	102	62.6
Total	122	100	41	100	163	100
Pearson Chi2 (1) = 0.0164, Pr = 0.898						
Age						
19-35	08	6.6	03	7.1	11	**6.7**
36-54	57	46.7	19	45.2	76	**46.3**
55-69	50	41	15	35.7	65	**39.6**
70& above	07	5.7	05	11.9	12	**7.3**
Total	122	100	42	100	164	100
Pearson Chi2 (3) =1.8737, Pr = 0.599						

Table 02. Received training from an NGO

Comment [A4]: Please collapse tables 1 to 5 into only one table

	Non-participant		Participant		Overall	
Variable	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Not received	49	40.2	13	31	62	37.8
Received	73	59.8	29	69	102	62.2
Total	122	100	42	100	164	100
Pearson Chi2 (1) = 1.1275, Pr = 0.288						

Table 03. Comparing participation by Member of Association

	Non-participant		Participant		Overall	
Variable	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Member	67	54.9	28	66.7	95	57.9
Not Member	55	45.1	14	33.3	69	42.1
Total	122	100	42	100	164	100
Pearson Chi2 (1) = 1.7695, Pr = 0.183						

Table 04. Comparing participation by awareness of size of land

	Non-participant		Participant		Overall	
Variable	**Freq.**	**%**	**Freq.**	**%**	**Freq**	**%**
Do not know size	1	1	29	69	30	18.3
Know size	121	99	13	31	134	81.7
Total	122	100	42	100	164	100
Pearson Chi2 (1) = 97.3087, Pr = 0.000						

Table 05. Comparison by method of watering

	Non-participant		Participant		Overall	
Variable	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Irrigate	14	11.5	11	26.2	25	15.2
Rain-fed	108	88.	31	73.8	139	84.8
Total	122	100	42	100	164	100
Pearson Chi2 (1) = 5.2363, Pr = 0.022						

Table 06. Comparing means by number of seasons between the two groups

Group	**Observation**	**Mean**	**Standard Error**
Non-Participant	122	8.828	0.958
Participant	42	9.857	1.579
Combined	164	9.091	0.816
diff		-1.029	1.877
t= -0.584 Ha: diff!=0			
degrees of freedom= 162 Pr (|T| > |t|) = 0.5842			

Comment [A5]: Please collapse tables 6 to 10 into only one table. In the taxt, change mention to tables accordingly

Table 07. Comparing means by land size between participants and non-participants

Group	**Observation**	**Mean**	**Standard error**
Non-Participant	122	2.537	0.176
Participant	42	2.677	0.280
Combined	164	2.573	0.150
Diff		-0.140	-0.34
t= -0.4096 Ha:diff !=0			
Degrees of freedom= 162 Pr(|T| > |t|) = 0.6587			

Table 08. Comparing means by common bean harvested

Group	**Observation**	**Mean**	**Standard Error**

Non-Participant	122	53.971	6.674
Participant	42	186.071	28.326
Combined	164	87.801	9.832
Diff		-132.100	20.072
t= -6.5813 Ha:diff !=0			
degrees of freedom= 162	Pr(|T| > |t|) = 0.0000		

Table 09. Comparing means by common bean sold.

Group	Observation	Mean	Standard Error
Non-Participant	122	0	0
Participant	42	139.286	26.183
Total	164	35.671	8.175
Diff		-139.286	8.175
t= -9.1203 Ha:diff !=0			
degrees of freedom= 162	Pr (|T| > |t|) = 0.0000		

Table 10. Comparing means by household size labour

Group	Observation	Mean	Standard Error
Non-Participant	122	3.245	0.209
Participant	42	4.643	0.563
Combined	164	3.604	0.216
Diff		-1.396	0.484
t= -2.8807 Ha:diff !=0			
degrees of freedom= 162	Pr(|T| > |t|) = 0.0045		

Table 11. Comparing the Farmers decision to participate in the market and the intensity of market participation

Choice to Participate				
Variables	**Coeff.**	**Std. Err.**	**z**	**P>|z|**
Gender (1 =female; 0= male)	0.306	0.181	1.69	0.092
Land size known (1= yes; 0= No)	-0.820	0.452	-1.81	0.070
Method of watering (1=rainfed;0=irrigated)	0.367	1.778	2.06	0.040
Household size labour	0.566	0.028	1.96	0.050
Intensity of Participation				
Variables	**Coeff.**	**Std. Err.**	**z**	**P>|z|**
Gender (1= female; 0 male)	-0.145	0.281	-0.52	0.696
Land size known (1=Yes; No)	-2.676	0.387	-6.91	0.000
Method of watering (1= rainfed; 0= irrigated)	0.503	0.321	1.56	0.118
Household size labour	0.240	0.059	4.06	0.000

mills lambda	0.697	0.251	2.77	0.006
Number of obs.= 164	wild Chi2 (4) = 41.72			
Censored obs.= 122	Prob > Chi2 = 0.000			
Uncensored obs.= 42				