Asian Journal of Agricultural Extension, Economics & Sociology

39(1): 123-135, 2021; Article no.AJAEES.64767
ISSN: 2320-7027

Participation, Income Effect and Challenges of Village Savings and Loans Program in Garu and Tempane Districts of the Upper East Region, Ghana

Gifty Sienso[1*], Abdul-Karim Khidir Nasow[1] and Munkaila Lambongang[1]

[1]Department of Agricultural and Resource Economics, Faculty of Agribusiness and Applied Economics, University for Development Studies, P.O.Box TL 1882, Tamale, Ghana.

Authors' contributions

This work was carried out in collaboration among all authors. Author AKKN designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors GS and ML managed the analyses of the study. Author ML managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2021/v39i130515
Editor(s):
(1) Dr. Zhao Chen, University of Maryland, USA.
Reviewers:
(1) Juan Carlos Núñez Guerrero, Universidad Nacional de Asunción, Paraguay.
(2) Walter Saraiva Lopes, Federal University of Maranhão (UFMA), Brazil.
Complete Peer review History: http://www.sdiarticle4.com/review-history/64767

Original Research Article

Received 14 November 2020
Accepted 19 January 2021
Published 05 March 2021

ABSTRACT

Village Savings and Loans Associations (VSLAs), have the aim of reducing poverty and creating assets to rural dwellers who have limited access to formal finance due to high collateral requirements. However, since the implementation of VSLAs in the Garu and Tempane districts for over a decade, there is inadequate evidence as to the impact of VSLAs on the lives of the participants. Not only that, there is the need to find out the current and anticipated challenges faced by the participants in the program. This study analyzed the effect of VSLAs on the income of households in Garu and Tempane districts. Data was collected from 100 respondents, 50 direct beneficiaries and 50 non beneficiaries from 3 and 2 communities in Garu and Tempane districts respectively. A Heckman treatment effect model was used to analyze the determinants of participation and the effect of participation on income. The results showed that participants of the VSLA program had an annual income of about GH₵ 2016.60 more than the non-participants. Decision to join VSLAs is mainly influenced by age, the years a respondent spends in the

**Corresponding author: E-mail: giftysienso@yahoo.com;*

community, the number of active labor force in a household and whether a respondent is a native or migrant. However, based on the challenges identified, it is recommended that the government and other institutions interested in rural development should institute appropriate policies that will help enhance participation in the program. Also, the associations should enforce tougher sanctions on members who absent themselves from meetings without prior notice.

Keywords: Village savings and loans associations; Heckman treatment effect model; upper east region; Ghana.

1. INTRODUCTION

Alleviating poverty is an indicator of economic development as is evident in sustainable development goals (1&2) which has the singular objective of ending hunger, achieving food security and promoting sustainable development. These first two goals aim at lifting the living standard of people and ensuring social protection for the poor and the vulnerable by 2030 [1]. However, the majority of the world's poor live in rural areas of developing countries with agriculture as their main source of livelihood [2]. Not only do they depend on agriculture solely as their main source of livelihood, but they are also characterized by; limited infrastructure, production uncertainty, weather dependency and longtime spans between inputs and outputs especially in the upper East Region of Ghana characterized by unimodal rainfall pertain which allows farming in only one season. For this reason, employing risk coping strategies becomes very important for households living under such conditions to get themselves out of abject poverty [3].

It is important to know that unlike other parts of the world, in Africa, while banks and microfinance institutions provide valuable financial services to the poor, they are most successful in urban areas where borrowing requirements are high and the cost of reaching clients is low. Most of the people that live in rural areas and urban slums receive no such services [4]. Thus, there is still a large gap between the needs of the poor for financial services and the ability of banks and MFIs to provide these services. Therefore, rural folks have no alternative than to generally rely on traditional savings techniques such as; susu boxes, bowls, under carpets, bags, among others which are often at the risk of theft [5].

Government and donor agencies for decades have been trying to create a viable financial system to meet the need for basic financial services in rural areas of Africa [6]. However, this goal has not been adequately met due to the high cost of creating such institutions and the difficulty in regulating them [7]. For example in Ghana, the Government of Ghana and Non-Governmental Organizations (NGOs) believe that providing the poor with financial resources could be the path to their economic empowerment [8]. Thus, in the past decades, policies, programs and projects such as; the creation of Microcredit and Small Loan Centre (MASLOC), the Free Compulsory Universal Basic Education (FCUBE), the School Feeding Program Livelihood Empowerment Against Poverty (LEAP), the National Health Insurance Scheme (NHIS), Planting for Food and Jobs, One District One Dam among others have been and are being implemented with the poor as the main target [7]. Evidence shows that some of these policies have resulted in poverty reduction as evident by productivity improvements in Ghana [2]. But same cannot be said for northern Ghana because even though, poverty rates dropped in all parts of the country over the years, northern Ghana still experiences a high incidence of poverty with the Upper East region being one of the worst affected among the five regions [9].

The lack of collateral that is usually a prerequisite for loans by most financial institutions in Ghana serves as a constraint to access to credit by the poor, particularly in rural areas [8]. Village Savings and Loans Associations (VSLAs) aim to address this problem that rural folks face by providing credit through building upon a model of rotating savings and credit associations (ROSCA) that create groups of people who can pool their savings to provide a source of lending funds by charging interests to grow funds, improve governance and management through the creation of internal by-laws and to ensure the safety of funds by proper record keeping method [10]. The model provides the economically vulnerable in society with an alternative to reduce poverty by combining ways of taking out loans and investing in their everyday lives as a means of alleviating poverty [11].

The Garu and Tempane districts have been a target for many microfinance interventions such as those mounted by NGOs such Care international, Presbyterian Agricultural Station (PAS) and World Vision International to provide services such as savings, loans, investment, equity funding, debt, build credit to help safeguard against uncertainties to reduce poverty in the area. Yet, the district is regarded as one of the poorest districts in Ghana [12]. Other studies have also shown that microfinance provides insurance to the vulnerable, diversifies and increases their revenue sources, which help to ease income volatility and sustain rates of consumption even in times of crisis. However, considering the high incidence of poverty and the difficulty involved in accessing credit from formal financial institutions, coupled with the scanty literature on the effect of participation in VSLA on income in the Upper East region especially Garu and Tempane districts, this study first and foremost sought to unravel the determinants of participation in village savings and loans associations and its effect on the income of the participants as well as the current and anticipated challenges faced by the respondents. When these are known, it will help guide policy decisions in improving rural folks' welfare through the institution of appropriate policies that will help shape their operations for the financial sustainability of the associations.

1.1 Formation and Management of VSLA Associations

Savings, loans, and credit access are a major component to fostering prosperous, resilient, and sustainable community livelihoods. Farmers are often challenged in access to financial capital before harvesting their crops; there is often the need for them to take loans to support themselves until the next harvest, yet, lack of information, high-interest rates, lack of collateral to take loans are barriers to farmers' ability to access financial resources. VSLAs associations provide an opportunity for communities without ready access to formal financial services such as microfinance and banks the opportunity to participate in savings and loan activities.

VSLAs are member-managed. But there are instances where VSLAs will have programmed staff and Village Agents (VAs) who will train members, but they never manage the VSLA, touch monies belonging to the group, or write in the passbooks [13]. Additionally, field officers (FO) or village agents (VA) are skilled to train other VSLAs. They train new VSLAs and assist trained VSLAs when they need assistance. This assistance includes; modifying the constitution, membership changes, and elections among others. They also help in resolving conflicts in the groups [13].

A group of thirty (30) come together to form a VSLA association. Although there aren't any strict requirements for participation, people who lived and built trust among themselves come together to form a group. There are NGOs like CARE international who help the groups through agents of the NGO with limited or no government intervention. The box and record books are often provided by the NGO for the start of their activities.

There are weekly meetings where contributions are taken and those who wish to borrow from the savings are given loans. The amount to be contributed by each member in a group is agreed by the group base on their constitution. Each member of the VSLA has a Passbook in which a record is kept on how much they contribute each week. Savings are kept in a secure despite box which is held in the community. The box in most cases has two to three different padlocks, with different people keeping the key for each. One person is selected by the group to keep the deposit box, meaning different people need to come together to open the box. This ensures the security of the box because an individual is not able to take anything without prior notice of other members of the group.

2. MATERIALS AND METHODS

2.1 Study Area

Garu-Tempane forms part of the thirteen districts in the upper east region of Ghana. The district lies in the southeast of the Upper East region with an area of 1060.91 square/km on the latitude 11^{o} 38^{1}N and 11^{o} and longitude $0^{o}06^{1}$E and $0^{o}23^{1}$E. It shares boundaries with the Bawku municipality to the north, Bunkpurugu-Yunyoo to the south, Bawku West District to the west and the Republic of Togo to the east [12]. The district is part of the interior continental climate zone of the country with a dry and wet season as its characteristics. Temperature is usually modest by tropical standard (26^{o}-28^{o}c). The temperature could be as high as 38^{o}c in between March and May. There is rain which amounts to 800mm per annum. The vegetation of the district is the Sahel savannah type with grassland [12].

2.2 Sampling Procedure and Sample Size

The study was centered on rural households within the Garu and Tempane districts in the Upper East region of Ghana. Primary data was obtained from a survey of beneficiaries and non-beneficiaries of VSLAs in the districts. The socio-economic and demographic characteristics of the respondents contain both categorical and continuous variables. For instance, gender, marital status and education are categorical whereas age, household size, income are continuous. Though we didn't find empirical evidence as to the total number of people participating in the VSLA program in the study area, the total number of people in the districts were used to calculate the sample size with a 10% margin of error.

The Yamane [14] sample size formula was used to estimate the sample size (*n*). This is given by expression in Equation 1 below:

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

Where N is the total population of households in the district and α is the margin of error allowed for the estimate. The total households (N) in the Garu-Tempane District are 17,520 (Bukari et al, 2015) [15] and with 90% confidence level, hence 10 % margin error was used in the estimation as shown below:

$$n = \frac{17520}{1+17520(0.1)^2} = 99.43\ households$$

Based on this, 100 VSLA members were interviewed in the study area. Multistage sampling technique was employed in collecting the data. These involved purposive sampling and simple random sampling techniques. Firstly, purposive sampling was used to choose the study areas due to the high incidence of poverty in the area and their immense interest in village savings and loans activities [16]. A simple random sampling was used to select 5 communities (3 from Garu district and 2 from Tempane districts). So, one VSLA group was randomly chosen from each community for the study. Furthermore, 10 participants in VLSA from each group in each community and 10 non-participants in each community were all randomly chosen respectively, making a total sample size of 100 respondents. It is relevant knowing that the selection of respondents from the same community is based on the assumption that they are affected with similar, if not the same institutional and socio-cultural constraints [17].

The data collection took place in the month of June and July, 2020. With a structured questionnaire used as the research instrument. Information on socioeconomic characteristics, age, income level, household size, whether a respondent is a native or migrant among others were solicited.

2.3 Methods of Data Analysis

2.3.1 Analyzing the effect of VSLA participation on household income

The Heckman Treatment Effect Model was used to analyze the determinant of participation in VSLAs and its effect on annual income of a respondent. To allow for selection bias in the assessment of the effect of VSLAs on household income, the Heckman two-stage technique was adopted to analyze the data. Selection bias refers to the unobservable factors which may influence the outcome on income due to VSLA membership.

The Heckman Two-Stage Model comprises first, the estimation of the participation process and second stage, which involves the outcome of the participation. According to Zaman [18], as in Equation 2, the participation stage equation of the Model is estimated as;

$$y_i^* = b_0 + b_i x_i + u_i \quad (2)$$

y_1^* is a latent variable representing the probability of a person i to participate in a VSLA, x_i represents factors that will influence the person to participate in a VSLA program. They include Education, occupation and access to loans, labour force, and sex of household head among others.

Using the maximum likelihood estimation formula, the likelihood of participation was obtained from the first stage of the Heckman Two-stage technique, this involves employing a probit regression to predict the possibility of participation. With this, a variable known as the Mills ratio is obtained as follows in Equation 3:

$$\lambda_i = \frac{\phi(\rho + \delta X_i)}{\varphi(\rho + \delta X_i)} \quad (3)$$

Where ϕ the density function of the standard normal density, φ is the cumulative distribution

function of a standard normal distribution and λ_i is the Mills Ratio term.

The second stage involves adding the Mills Ratio to the income equation as seen in the Equation 4 below.

$$I_i = b_0 + b_1 x_1 + b_2 y_1 + b_3 \lambda_i + \varepsilon \quad (4)$$

Where I_i is the annual income of respondents, X_i represents all the factors that will influence the income of the respondents, y_i is a dummy variable which is 1 for VSLA membership and 0 if otherwise, $\varepsilon =$ error term and λ_i is the Mills ratio.

2.3.2 Measurement of perception of members on the performance of VSLA

Members' perception of the VSLA program is important since it can help shape their operations to make it more viable. A Likert scale questions was used to determine the perception of members on the performance of VSLA groups. Diverse types of rating scales have been created to directly assess attitudes. Likert scale is a psychometric response measure typically used to obtain participant expectations or degree of agreement with a statement or series of statements in questionnaires. Likert scales are a non-comparative scaling tool, and in essence, they are one-dimensional (measure only one trait) [19]. Dr. Rensis Likert, a sociologist at the University of Michigan, developed the Likert Scale technique. The likert scale is commonly seen as a 5□point scale ranging from "Strongly Disagree" on one end to "Strongly Agree" on the other with "Neither Agree nor Disagree" in the middle; nevertheless, some practitioners support the use of 7-point and 9-point scales that provide more granularity [20].

The construction of the Likert scale is embedded in the research objective often if the research aim is to understand the opinions/perceptions of participants related to the single 'latent' variable or interest phenomenon [21]

But Joshi & Pal [19] noted that taking into account the reliability of the survey participants' responses, a 7-point scale may perform better than a 5-point scale, therefore, this study used a 7-point Likert scale to determine member's perception on the performance of VSLAs. This was stated as strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree.

2.3.3 Measurements of constraints of VSLA membership

Kendall's coefficient of concordance also known as Kendall's W was used to rank the constraints that members face in participation in the VSLAs. This model is a non-parametric statistic and a normalization of the Friedman test statistics, which can be used to determine the agreement between raters. Kendall's W ranges from 0 (no agreement) to 1 (complete agreement).

For instance, if a number of people were asked to rank a list of constraints, from the most important to the least important to them, Kendall's coefficient of concordance performs better in addressing that. If the result of the test statistic W is 1, then all respondents to the survey were unanimous and each respondent allocated the same order to the list of questions. If W is 0, then there is no overall pattern of agreement among the respondents and their answers can be assumed to be essentially random. Intermediate W values suggest a greater or lesser degree of unanimity among the different responses.

Suppose that object i is assigned the rank r_{ij} by judge number j, where there are *n* objects and *m* judges in total. Then in Equation 5, the total rank given to object i is:

$$R_i = \sum_{j=1}^{m} r_{ij} \quad (5)$$

and the mean value of these total ranks is in Equation 6

$$\bar{R} = \frac{1}{n}\sum_{i=1}^{n} R_i \quad (6)$$

The sum of squared deviations, *S*, is defined as indicated in Equation 7

$$S = \sum_{i=1}^{n} (R_i - \bar{R})^2 \quad (7)$$

And then Kendall's *W* is defined as;

$$W = \frac{2S}{m^2(n^3 - n)} \quad (8)$$

The Table 1 shows the explanatory variables and their hypothesized effects in the treatment and outcome models.

Table 1. Explanatory variables and their hypothesize effects on the models

Variable	Definition and measurement	A priori expectation	
		Participation	Outcome
Education expenditure	Amount of money spent on education in Ghana cedis	+	
FBO membership	1 if participant belongs to an FBO, 0 otherwise		+
Educational level	Number of years spent in education	+/_	+
Labour	Number of man-days employed for the production activities		+/-
Farm size	Size of land cultivated or own (acres)	+	+
VSLA participation	1 if farmer I a participant of VSLA, 0 otherwise		+
Age	Age of a farmer in years	+	+/-
Gender	if male, 0 otherwise	-/+	+/-
Annual income	annual amount of money owned by a respondent in Ghana cedis	+	
Experience	Number of years spent in farming	+	+
Household size	Number of family members who live and eat from the same source		+
Cycles	Number of cycles completed		+
Marital status	Marital status of a respondent		+

Source: Field Survey, 2020

3. RESULTS AND DISCUSSION

3.1 Socio-Demographic Characteristics of Respondents

The result of the survey in Table 2 revealed that majority of the members were predominantly women (85%). This indicates that most members of the VSLA are females which confirms the basic principle of the VSLA model which advocates for women empowerment [22].

There was no respondent less than 16 years. This is because this age range is usually school going age and participants within that age range, if any at all might not have income to participate effectively since they are mostly taken care by their parents. A great number of the respondents were within the age range of 31-45 with 32 females and 7 males which constitutes 39% of the population. The respondents above 60 years were about 12% as at the time the data was collected. However, on average, a respondent was approximately 44 years old. This suggests that the model attracts people from the younger and economically productive age group who can work hard to ensure the sustainability of their associations. The findings further reveal that 53% of the respondents had no formal education, 18% had primary level of education, 26% high school level and 1% with a tertiary qualification. Based on the above results, majority of the respondents had no formal education, however, 47% of the respondents had some form of education to understand the activities and the benefits of joining the VSLAs.

On marital status, the findings indicate that 78% of the respondents were married, 16 % were widowed, and 2% were divorced while the remaining 4% were single. Marriage lead to an increase in household size and therefore enhance their capacity to venture into productive ventures in order to meet their extra financial requirements [2].

Household size was measured as the number of family members who live and eat from the same source. The results show that 35.33% of respondents live in households with about 6-10 members, while those with 1-5 member (s) follow next (16.67%). Those with 11-15, 15-20 and members above 20 persons are the least, with a percentage of 16.0%. The result also revealed that the average household size of the respondents is approximately 9 persons even though, this result is inconsistent with the average national household size of 4.5 [23]. This inconsistency could be due to the extended family systems in Northern Ghana where majority of people live and eat together with household sizes ranging from 7-10 in northern Ghana compared to other parts of Ghana.

Table 2. Socio-demographic characteristics of respondents

Characteristics	Males	Females	Total	Percentage (%)	Mean
Sex	15	85	100	100.00	-
Age (years)					
16-30	2	20	22	22.00	43.65
31-45	7	32	39	39.00	
46-60	3	24	27	27.00	
Above 60	3	9	12	12.00	
Education					
No Formal	8	45	53	53.00	
Primary	2	16	18	18.00	
JHS	4	9	13	13.00	
SHS	1	12	13	13.00	
Middle/Vocational	0	2	2	2.00	
Tertiary	0	1	1	1.00	
Marital Status					
Single	0	4	4	4.00	
Married	14	64	78	78.00	
Widowed	1	15	16	16.00	
Divorced	0	2	2	2.00	
Household Size					
1-5	-	-	32	16.67	9.33
6-10	-	-	47	35.33	
11-15	-	-	14	16.00	
16-20	-	-	2	16.00	
Above 20	-	-	5	16.00	

Source: Field Survey, 2020

3.2 Annual Income Distribution of Respondents

The results in Table 3 indicate that majority (82.0%) of the respondents had their annual income less than GH₵ 4000 while 18.0% had their income above GHC 4000. The findings further indicates that women make up the larger percentage (66%) of those who earn the least as compared to their male counterparts. This particular finding is not encouraging because in attaining the objective of SDG 5 of achieving gender equality at all levels women income will have to improve. The findings also showed that respondents had a minimum income of GH₵100.00 and the maximum GH₵12,000 which clearly shows that there is some level of income inequality among the participants. The results also indicated that, the average annual income of respondents is GH₵ 1719.7. This result is almost twice less than the findings of Ghana Living Standard Survey which reported the average income of rural dwellers in Ghana to be about GH₵ 3,302.83 [23]. This tells us that, though VSLA is playing a significant role in getting rural dwellers out of abject poverty, there is still the need to continue to research in their operations in order to upscale their financial performance.

Table 3. Annual distribution of respondents

Annual income (GH₵)	Male (%)	Female (%)	Total percentage (%)
< 2000	7.00	66.00	73.00
2001- 4000	4.00	5.00	9.00
4001 – 6000	1.00	6.00	7.00
6001-8000	1.00	8.00	9.00
8001-10000	1.00	0.00	1.00
Above 10000	1.00	0.00	1.00
Total	15.00	85.00	100.00
Mean=1719.7,	Max=12000,	Min = 100	

1 US dollar ($) = 5.79 Ghana Cedis (GH₵),

3.3 Results from the Heckman Treatment Effect Model

Results of the variables used in determining the effect of farmer participation in the VSLA program on income is shown in Table 4. The Lambda is negative and significant indicating that there is sample selective bias, and that unobserved factors that make participation is more likely to be associated with income of the participants. From the analysis, the Wald chi-square test at 15 degrees of freedom is 51.45 and an associated p-value of 0.0000. This indicates that the model gives a good fit for the data. Out of the eight variables in the probit selection equation, age, whether a respondent is a native or foreigner, household size, years spent in the community were found to be significant at 1% while the amount of labour hired was significant at 5% in determining the decision to participate in the VSLA program. Also, out of the seven variables used in the outcome equation, age, years in school, amount of labor, cycle's completed and VSLA participation were statistically significant determinants of income.

3.4 Determinant of Participation in the VSLA Groups

From Table 4 the variables in the probit selection equation, age, whether a respondent is a native of the community, household size, years spent in the community were found to be significant at 1% while the amount of labour employed is significant at 5%.

The age of a respondent is significant at 1% with a negative effect on participation in VSLA programs, ceteris paribus. This result does not meet a priori expectation because as people grow older and assume more responsibilities in a household, they tend to be mindful of expenditure, giving more attention to savings [24]. In addition, the result does not agree with similar studies that was conducted in other areas of Ghana. For instance, [25] found out in Awutu Seya West district of Ghana that both age and educational status were significant determinants of participation in VSLA program. Similarly, [2] had a similar results where age was a determinant of participation in most livelihood intervention programs in Ghana. The contradiction of this results to other researches could be as a result of the fact that most of the participants of the VSLA program in the study area are people in the active labor force as evident in the descriptive analysis of the socio-demographic features of the respondents. Also, holding all other variables constant, the result show that natives have higher propensity to participate in the VSLAs program than foreigners in the respective districts at 1% level of significance. This finding could be as a result of the fact that the natives might have built trust among themselves and for that matter willing to engage with one another in activities that can improve their welfare.

However, the amount of labour employed by a respondent in their farming activities is a significant determinant of participation in the VSLA program at 5% level of significance. This makes sense and agrees with a priori expectation because high demand for labour for other agricultural activities by rural dwellers will mean that they need to result to diversifying their sources of income in order to be able to meet their increased expenditure. Household size is another variable that met a priori expectation, the larger the household size of a respondent, the more likely that they may engage in activities that can help them improve their financial capability which VSLA seeks to help achieve. This result is in line with other studies which indicated that the motivation to join VSLA increases with household size at 1% significance level, ceteris paribus. The researchers did indicated that larger households may have a greater need for savings to meet future expenditures which may encourage them to become members of savings associations such as the VSLAs [26].

Finally, the results showed that years spent in the community, has a positive effect on the participation in VSLAs. This makes sense because, the longer a person stays in a community, the more he or she become a customized and familiar with developmental opportunities in the community in order to get involved [27].

3.5 The Effect of VSLA Participation on Household Income

The key objective of this study was to evaluate the effect of VSLA participation on household income. The results in Table 4 showed that not only was the participation in VSLAs significant, participants of the program had an annual income of about GH₵ 2016.60 more than the non-participants, retaining its anticipated positive sign affirming the prior expectation that VSLA membership would improve the income of its beneficiaries. This conforms with the findings of [25] who found that, VSLA participation contributes immensely to the household income

of rural participants of Kyabakara, Uganda and thereby reducing poverty in the study area. This shows how relevant VSLAs are to rural folks and should be given greater attention and coverage since it's a source of livelihood improvement. Participants of the VSLA program did better in terms of annual income than their counterparts who didn't participate, *ceteris paribus*. This result justify the priori expectation that participation in VSLA program have a positive impact on their welfare. This finding is consistent with [17] who asserted that participation in VSLA had an influence on the off-farm income of the survey respondents. Another important component of VSLA membership is due to the fact that it paves way for members to gain knowledge and build their financial capabilities. They also learn to purchase shares and earn dividends giving them confidence to participate in the informal financial system.

The age of the respondent was also one of the relevant variables with a 5% significant value and a positive coefficient of GH₵ 45.497. This implies that keeping all other factors constant, older respondents who are participants of the VSLA program have an income of about GH₵ 45.5 more than the younger respondents. This results could also be as a result of the fact that older people in most communities in Africa are always believed to be the bread winners of their family's and must seek to improve their financial performance to be able to cater for the family. The years a respondent spends in school is also significant at 5% with a positive coefficient of GH₵ 0.517, *ceteris paribus*. This implies that when years spent in school increases by 1 year, household income increases by GH₵ 0.517. This meets prior expectations and agrees with [25] that education increases the earning capacity of individuals and also enlightens people to participate in interventions that can help improve their income levels. Also, as one's level of education increases, they obtain skills that allow them to work and earn more income. This outcome is also consistent with the findings of [26] that, VSLA participants would need some level of education to understand its management, bookkeeping and the organization's guidelines. Active labour force also had a significant effect on income at 10% significance level. This means that holding all other variables constant, households who are able to afford enough labour for farming and other livelihood engagements are better in terms of income than their colleagues who are labour constraint. Though excess labour can set in the law of diminishing returns, it is always important to get enough labour to enhance framing and related activities.

The number of cycles completed by a VSLA member had a positive of about GH₵ 59.159 on household annual income and it is significant at 1%, *ceteris paribus*. This means that if the number of times a member completes the VSLA cycle increases by 1, household income will increase by GH₵ 59.59. This result meets expectation because the more the cycle's one completes, the higher the income they get from the VSLA since the amount received is dependent on the savings available. This result agrees with the findings of [4] who reported a VSLAs increase farmers' incomes. [24] also found that VSLAs also play an important role in enhancing rural household welfare by raising household income, promoting the accumulation of household assets, reducing school dropouts among other benefits.

3.5.1 Perception of members on VSLA performance

From the survey, as shown in Table 5, 88% of the respondents that are participant agree that VSLA groups performs well in improving household income. This result closely agrees with the findings of [25] that 100% of the respondents agree that VSLA participation is helpful in improving the income levels of respondents. While 4.29% of them neither agreed nor disagreed and 7.14% of them disagreed that VSLAs are helpful in improving their incomes. This was confirmed with a mean score of 4.40 that the majority of the respondents agree that the groups are helpful. This results is very much encouraging because it may be easier to address challenges to improve their performance since majority of them already sees the benefits of belonging to a VSLA association.

3.5.2 Challenges of VSLAs in the district

The result in Table 6 shows the ranking of challenges VSLAs members face in their operations. The null hypothesis that rural folks, most especially the participants are not in agreement with the ranking of the challenges they face in participating in VSLAs is rejected in favour of the alternate at a 1% level of significance. Therefore, it can be established that there is a 50.2% level of agreement among respondents in the ranking of the challenges they face in participating in VSLAs. The results show that inadequate funds to contribute is the major

challenge they face in participating in the VSLA with a mean rank of 1.33. Most of the rural folks do not earn high incomes that will allow them to spend and still put some money aside as contributions to the VSLAs. CARE International, [22] recognizes that it remains a challenge to meet the most severely poor and vulnerable, as some people cannot afford to contribute to the program, even though it only requires a few Ghana Cedis per week. Also, the second most important challenge that the groups face has to do with the absenteeism of members in participating in weekly meetings. Some of the members give out their weekly contributions to other members to save on their behalf. This does not contribute positively to the transparency in the groups as some members may not be available to witness when savings and loans are being made. The third most important challenge of the groups identified by members in their participation is ineffective monitoring of groups by governmental and non-governmental agencies responsible for monitoring and facilitating the activities of the groups.

Table 4. Result of heckman sample treatment effect model

Variable	Coefficient	Std. Error	P-values
Selection equation (VSLA participation)			
Age	-0.662***	0.2031	0.003
Marital status	0.253	0.9571	0.260
Religion	0.317	0.3331	0.340
Native	1.838***	0.4774	0.000
Labour	0.433**	0.2032	0.033
Household size	0.077***	0.0292	0.008
Years spent in community	0.065***	0.0204	0.001
Occupation	-0.443	0.6794	0.514
Cons	0.263	0.7362	0.721
Outcome equation (Income)			
Age	45.497**	17.8773	0.011
Years in school	0.517**	0.2241	0.021
Active labour force	149.067*	173.8012	0.133
Spending on education	-260.965	48.4029	0.443
Occupation	-1668.831	1410.826	0.514
Cycles completed	59.159***	509.1539	0.003
VSLA Participant	2016.60**	917.505	0.028
Constant	-38.079	1042.222	0.971
Rho	-0.069		
Sigma	2304.576		
Lambda	-158.755	640.305	
Model diagnostics			
Wald chi-square (15) =51.45, p> chi2=0.0000, N=100			

*NB: ***, ** and * denotes 1%, 5% and 10% significant levels respectively. 1 US dollar ($) = 5.79 Ghana Cedis (GH¢), Source: field survey, 2020*

Table 5. The perception of members on the performance of VSLA groups

Variable	Category	Frequency	percentage
Perception of members on VSLA performance in improving household income.	Disagree	1.00	1.43
	Somewhat disagree	4.00	5.71
	Neutral	3.00	4.29
	Agree	20.00	28.57
	Strongly Agree	42.00	60.00

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Level of agreement	70	4.40	0.923	0.110

Source: Field Survey, 2020

Table 6. Kendell's coefficient of concordance results of challenges VSLAs

Descriptive Statistics							
	Number	Mean	Std. Deviation	Minimum	Maximum	Mean rank	rank
Political Discrimination	100	4.29	1.559	1	6	4.29	4
Inadequate Fund to Contribute	100	1.33	.604	1	4	1.33	1
Lack of Transparency	100	4.48	1.227	1	6	4.51	5
Instability of Logistics	100	4.70	1.322	1	6	4.71	6
Infective Monitoring	100	3.65	1.184	1	6	3.66	3
Absenteeism of Members	100	2.52	1.168	1	6	2.52	2
Test statistics							
N		100					
Kendall's W[a]		0.502					
Chi-square		251.048					
DF		5					
Asymp.sig.		0.000					

Source: Field Survey, 2020

4. CONCLUSION AND POLICY RECOMMENDATIONS

The study examined the effect of VSLAs on household income in Garu and Temapane districts of the Upper East regions of Ghana. Heckman Treatment model was used to analyze the effect of participation on income and the factors that influences individuals to participate. The study revealed that, VSLA membership has a constructive influence on household income. There were several factors that influenced respondents to join VSLAs, among which are; age, household size, years in community, amount of labour employed by household. The majority (68%) of the participants in the VSLAs agree that participating in VLSAs is helpful. The major challenges faced by the groups are the inadequate funds of some rural inhabitants to contribute weekly, absenteeism of some members in weekly meetings and ineffective monitoring of the groups by the organizations responsible for monitoring and facilitation.

Based on the findings, the following conclusions are derived;

- Decision of rural folks to join VSLAs is mainly influenced by the years a respondent spends in the community, the number of active labour force in a household of a respondent and the belongingness of a respondent to the community.
- Rural folks who are members of VSLAs have a greater chance of increasing their incomes relative to non-members.
- Greater percentage (88%) of the beneficiaries are of the view that, the VSLAs are helpful in improving their household income.
- However, inadequate funds of some rural inhabitants to contribute weekly, absenteeism of some members in weekly meetings and ineffective monitoring of the groups by the organizations responsible for monitoring and facilitation are the major challenges faced by the groups.

Based on conclusions of this study, the following recommendations are made:

- Rural folks should consider joining VSLAs since it serves as a platform that provides members with a substantial amount of money that can help them get out of abject poverty.
- Also, as VSLAs have positive effect on household income, broadening the scope of the program by linking individual group members to formal microfinance institutions or credit unions would be of much good to members. Given that VSLAs rely on limited savings ability of members to provide loans, members' loan demand can outpace supply, it is therefore imperative for government and non-governmental bodies to connect VSLA participants with microfinance institutions in order to expand their access to financial

resources. This connection would have the effect of double fold. On the one side, participants would have access to micro-credits to grow their small businesses and create a giant step out of poverty, on the other hand, in addition to the VSLA, the participants will get an extra convenient spot in microfinance institutions to save more money in small amounts.

- Finally, absenteeism and lateness in meetings was identified as one of the major problems facing the VSLAs, therefore we recommend that appropriate measures be put in place such as stricter penalties against members who attend meetings late or excuse themselves from meetings without prior notice.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. United nations-sustainable development goal 1. Goal 1: End poverty in all its forms everywhere*;* 2015. Available:https://www.un.org/sustainabledevelopment/poverty/
2. Lambongang M, Ansah IGK, Donkoh SA. Participation and yield effect of Ghana's planting for food and jobs program in Bunkpurugu-Yunyoo District. Ghana Journal of Agricultural Economics and Agribusiness. 2019;2(1).
3. Isaac IM, Remmy MN. Impact of Village Saving and Loan Associations (VSLAs) in Rubengera sector – Rwanda. Journal of Agricultural Economics and Rural Development. 2017;2(1):011-021.
4. Ngegba MP. Impact of Village Saving And Loan Association (VSLA) On farm productivity in lower banta chiefdom, Southern. International Research Journal of Social Science and Humanities. 2016; 1(1):29-32.
5. Nnama-Okechukwu CU, Okoye UO, Obikeguna C, Onalu CE, Agha AA, Eneh J, Ogbu AI, Erhunwunse EA, Nwanze AA, OKUNSANYA T. An impact study of the Village Savings and Loan Association (VSLA) in Nigeria. African Population Studies. 2019;33.
6. CHRISTEN RP, ROSENBERG R. The rush to regulate: Legal frameworks for microfinance. Occasional Paper, 4; 2000.
7. Mohammed AS, Boateng-kwakye S. Village savings and loans associations and livelihood of people in rural communities in the Bole district of Ghana: A case of village savings and loans associations supported by jaksally youth group. International Journal of Development Research. 2018; 4(1):118-126.
8. Boateng GO, Boateng AA, Bampoe HS. Microfinance and poverty reduction in Ghana: Evidence from policy beneficiaries. Review of Business and Finance Studies. 2015;6(1):99-108.
9. UNDP 2018. Northern Ghana Human Development Report.
10. Alerigesane AA. A comparative study of the credit with education (CWE) and the village savings and loans (VSLA) methodologies of microfinance services on rural livelihoods.Masters Thesis, University of Ghana, Legon; 2012. Available:http://ugspace.ug.edu.gh/handle/123456789/5480?show=full
11. Kesanta J, Andre B. Impact of women empowered through community savings groups on the wellbeing of their families: A study from Mgubwe, Tanzania. Interdiciplinary Journal of Best Practices in Global Development. 2015;1(1):1-14.
12. GSS - Ghana Statistical Service. 2010 Population and Housing Census Report. Igarss. 2014;1:1–5. Available:https://doi.org/10.1007/s13398-014-0173-7.2
13. Amaning K, Paul SM. The impact of savings groups on female agency: Insights from village savings and loans associations in Northern Ghana. Asian Journal of Agriculture and Rural Development. 2019;9(2):133-146.
14. Yamane T. Elementary sampling theory. 1967.
15. Bukari M, Hajara IPN, Oloruntoba A. School feeding program in Ghana: Factors affecting academic performance among public primary school pupils in Garu-Tempane District. International Journal of Innovation and Applied Studies. 2015; 10(2):632.
16. Cooke E, Hague S, McKay A. The Ghana poverty and inequality report: Using the 6th

Ghana living standards survey. University of Sussex; 2016.
17. Bannor RK, Oppong-Kyeremeh H, Derkyi M, Adombila AY, Amrago EC. Village savings and loans association participation and impact on off-farm income among rural women. Journal of Enterprising Communities: People and Places in the Global Economy; 2020.
18. Zaman H. Assessing the poverty and vulnerability impact of micro-credit in Bangladesh: A case study of BRAC. Policy Research Working Papers; 2000.
Available:https://doi.org/10.1596/1813-9450-2145
19. Joshi A, Pal DK. Likert Scale : Explored and Explained Likert Scale : Explored and Explained. British Journal of Applied Science and Technology. 2015;7(4):396-403.
Available:https://doi.org/10.9734/BJAST/2015/14975
20. Harpe SE. How to analyze Likert and other rating scale data. Currents in Pharmacy Teaching and Learning. 2015;7(6):836-850.
Available:https://doi.org/10.1016/j.cptl.2015.08.001
21. Boone HN, Boone DA. Analyzing Likert data. The Journal of Extension. 2012;50: 1-5.
Available:https://joe.org/joe/2012april/tt2.php
22. CARE International. Participatory Monitoring, Evaluation, Reflection and Learning for Community-based Adaptation (PMERL) Manual: A revised Manual for Local Practitioners. Care; 2012.
Available:https://insights.careinternational.org.uk/media/k2/attachments/CARE_PMERL_revised_manual.pdf
23. GSS - Ghana Statistical Service. Ghana Living Standards Survey (GLSS7): Poverty trends in Ghana; 2005-2017. In Ghana Statistical Service; 2018.
Available:https://www2.statsghana.gov.gh/nada/index.php/catalog/97/study-description
24. Murundi Pierre P, Habumuremyi D, Habamenshi V, Mvunabo G. Village savings and loan associations and social economic development of poor households in Rwanda. A case of murundi sector (2015-2019). International Journal of CHUR Research Academy. 2020;2: 0–69.
25. Alesane A, Yussif K, Anang BT. Cogent economics & finance determinants of village savings and loans association membership and savings amounts in Awutu Senya West District of Ghana determinants of village savings and loans association membership and savings amounts in Awutu Senya West. Cogent Economics & Finance. 2020;7(1).
Available:https://doi.org/10.1080/23322039.2019.1707004
26. Ksoll C, Bie H, Helth J, Dahl O. Impact of Village Savings and Loan Associations : Evidence from a cluster randomized trial. Journal of Development Economics. 2016; 120:70–85.
Available:https://doi.org/10.1016/j.jdeveco.2015.12.003
27. Schola BK. A case study of a village Saving and Loan Association and its relation to poverty reduction among rural households in Kyabakara, Uganda. Masters Thesis, University of Agder, Normay. Department of Global Development and Planning; 2015.
Available:https://uia.brage.unit.no/uia-xmlui/handle/11250/2380031

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/64767