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## DETERMINANTS OF PARTICIPATION IN AGRICULTURAL GROUP GUARANTEE LOANS: A CASE OF SMALLHOLDER FARMERS IN EASTERN UGANDA

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## ABSTRACT

This paper establishes that agricultural group guarantee loans (AGGLs) are indeed an innovative tool used by Microfinance Institutions (MFIs) to extend credit to resource-disadvantaged smallholder farmers regarded as not credit-worthy by traditional lenders. It disproves popular literature that one requires assets to access formal credit and that extremely poor farmers are segregated from borrowing citing a lack of collateral to pledge to both group members and to the lender. This paper indicates that efforts to get smallholder farmers out of destitution should be redirected to addressing other group credit aspects other than increasing participation. Multi-stage sampling obtained 161 agricultural loan borrowers of Promotion of Rural Initiative Development Enterprises (PRIDE) microfinance, a formal Tier III credit institution in Uganda. Both borrowers of the group (AGGLs) and Individual (Individual Loan borrowers, IL) loans were selected for comparison purposes. Semi-structured interviews and in-depth discussions with farmer groups (focus group discussions, FGDs) collected both quantitative and qualitative data for the study. Descriptive statistics analysis presented the socioeconomic characteristics of the borrowers while the binary logistic regression model determined the factors that influence participation in AGGLs. The findings indicated that IL borrowers were better off in socioeconomic aspects such as income than AGGL borrowers. The study results revealed that the probability of participating in AGGLs decreases with an increase in the number of asset ownership and an increase in household expenses, particularly education. This implies that AGGLs are socially perceived to be a “facility for the poor”, supporting the motives of MFIs. Agricultural group guarantee loans are associated with smaller loan amounts due to fear of default. These smaller amounts limit investment and consequent income improvement. This is the first paper to study participation in AGGLs offered by a formal credit institution in Uganda. Other group loans offered in Uganda do not target agriculture, those that do, are offered by savings and credit cooperative organizations (SACCOs) informally started by farmers.

**Key words:** Agricultural lending, Smallholder farmers, Collective action, Group participation, Uganda

## INTRODUCTION

Agricultural lending plays a substantial part in the livelihoods of smallholder farmers in rural areas where agriculture is the major economic activity. About 57% of the global population hinges on credit for different purposes ranging from household basic needs to rural development [1]. Farmers, particularly in Africa, use agricultural credit to purchase inputs such as seeds, fertilizers, hiring machines, and human labour, acquire or expand agricultural land, and market the produce. Access to agricultural credit among smallholder farmers facilitates the process of food production, livelihood derivation, and sustenance as well as rural socioeconomic development. Notwithstanding the importance of agricultural credit to farming, access remains a constraint for smallholder farmers, particularly in the poorest farming communities of Uganda.

Uganda's agricultural lending was generally informal and unorganized with smallholder farmers disguising loan purposes in non-agricultural business enterprises to obtain funding for agricultural activities. Farmers would only use financial institutions (FIs) classified as Tier IV (FIs not subject to Bank of Uganda regulation), such as savings and credit organizations (SACCOs) and informal money lenders, to access credit. Agricultural lending later took shape in 2009 with the introduction of the Agricultural Credit Facility (ACF) by the government of Uganda in partnership with participating financial institutions (PFIs), in Tiers I, II, and III (FIs subject to Bank of Uganda regulation) [2]. Since then, lending for agriculture has evolved, with microfinance institutions (MFIs) coming up with new methods for lending to resource-poor farmers, the most popular of which is group guarantee [3, 4].

Agricultural group guarantee loans (AGGLs) are given to farmers organized in groups, loan repayment is collectively guaranteed, and access to subsequent loans is contingent upon the timely repayment by all group members [5]. In contrast, individual loans (ILs) are taken out on an individual basis without any reference to a group. Access to the latter requires mandatory collateral (immovable and movable properties) to be pledged to the microfinance institution (MFI), and subsequent loans may be granted as top-ups even when the initial loan is still recurrent [5].

Borrowers of AGGLs possess distinct characteristics from the rest of the microfinance borrowers. They are people with comparable socioeconomic characteristics, they frequently reside in the same areas, they engage in roughly comparable economic activities, the majority own agricultural enterprises and a

sizable portion of them are women. In point of fact, the sole objective of some MFIs in Uganda such as the Foundation for International Community Assistance (FINCA) is lending to women. Focus is put on women for two reasons. First, lending to women is believed to benefit the whole family, society and ultimately the nation. Consequently, this leads to improved livelihoods, fostering economic development and alleviation of poverty as spelt out in Uganda's Poverty Eradication Action Plan [6]. The second reason is that women have been perceived around the world to be better at loan repayment than men [7]. Management of the enterprises of AGGL borrowers is simple with no formal administration, and it is assumed that borrowers are capable of running these enterprises and determining their need for credit. As a result, they rarely receive training or technical assistance from MFIs regarding enterprise selection, agronomy, postharvest handling and marketing [5].

Due to the importance of agriculture to the economy of Uganda, and the undeniable need for credit in agricultural operations, credit access to all categories of farmers is emphasized by the government and other stakeholders. More than half (70%) of the population in Uganda is employed in agriculture, making agriculture the largest employer of the economy. In the fiscal year 2021–2022, agriculture contributed 24.1% of Gross Domestic Product (GDP) and 33% of export earnings [8].

Much as the economy is literally dependent on agriculture, national financing to the sector is still small. Over the years, Uganda's budgetary allocation to agriculture has been significantly small. For the two financial years (2021/2022 and 2022/2023), agriculture was allocated 3.7% and 3.0%, 44.78 and 48.13 trillion Ugandan shillings, respectively [9]. This is way below the 2003 Maputo declaration and the Comprehensive Africa Agriculture Development Program (CAADP)'s target of 10% [10]. Moreover, with 75% of Uganda's unbanked rural population [11], and other priority areas in the agricultural sector, very little funds are left to facilitate rural financing. The Uganda ACF which provides access to credit to rural farmers only targets a small section, especially those that are able to service facilities from 10 million Ugandan shillings and above [2]. This leaves out the majority of the farmers in the low-income earning categories who can neither afford big instalments nor meet the many requirements of accessing the ACF from the PFIs.

Furthermore, formal financial institutions (FFIs) shun lending to agriculture because of the numerous risks involved. As a result, FFIs agricultural loans account for only around 6% of total loans [12]. Worse still, most FFIs have not developed suitable lending instruments to lend to farmers along the various



agriculture value chains. Consequently, there is low agricultural productivity growth, which was reported at 4.3% by 2021, below the CAADP's target of 6% [13, 10], food insecurity, low-income levels and deprivation among the AGGL member households. Additionally, pertinent areas of smallholder farmers' well-being are also lagging behind including: education (progress and completion), health, access to electricity, clean water and housing.

To avert this situation, there is a need to address credit access challenges among smallholder farmers, with the ultimate objective of reaching the poorest of the poor farming households. The AGGL program has been used as one of the remedies to achieve this, however, the factors considered while recruiting smallholder farmers to the AGGL groups are not known. Scholars of microfinance in Uganda have focused on AGGLs offered by Tier IV FIs and their impact on the livelihoods of smallholder farmers. However, they have not addressed the dynamics of participation in AGGLs offered by more formal Tier I, II and III FIs, like PRIDE microfinance. To close this gap, this study aimed at assessing the factors that influence participation in AGGLs, so as to determine the appropriateness of AGGL program in extending agricultural credit to Uganda's resource-poor smallholder farmers.

### Theoretical consideration

This study adopted a theory of collective action that occurs when a group of people work together to achieve a common objective. The first-generation scholars of collective action theories like Mancur Olson in 1965 [14], contend that any group of people trying to offer a public good faces challenges in doing so effectively. This is because of the group action problem of "free riding" (a situation where one benefits from a resource without spending effort on it). However, second generation scholars like Ostrom [15] present scenarios of successful collective action initiatives, refuting this notion.

Successive philosophers such as Gilbert, Bratman, Searle and Willis [16, 17] contended that collective action rests on interpersonal commitment, what Gilbert specifically called "joint commitment". Gilbert explains that joint commitment is not a matter of setting personal commitments independently, as is the case when individuals make a personal decision to do something. Rather, it is a single commitment to which each participant makes a contribution. Joint commitments can be created less explicitly and through processes that are more extended in time. One merit of a joint commitment account for collective action is that it explains the fact that those who set out to do an activity together, understand that

each of them is positioned to demand corrective action of the other if he or she acts in ways that negatively affect the completion of the joint activity [16].

Groups (formal, informal or group guarantee) also adopt the concept of joint commitment to access agricultural credit. Group action is viewed as a platform for meeting individual needs and an outlet for individual interests. People join, work and remain in groups for various reasons such as security, status, self-esteem, affiliation, power and goal achievement [18]. The AGGL members reduce the insecurity of shouldering the borrowing conditions alone, feel stronger together, have reduced self-doubts and are more resilient to threats such as forceful bank recoveries and chattel liquidation in case of untimely repayments. Their major goal is to improve member livelihoods through a joint commitment to group access and loan repayment. Groups provide recognition to the members, feelings of self-worth and increased capacity for fulfilling social needs. They pool talents, knowledge, skills and power to achieve particular goals and improve performance, cooperation and satisfaction.

That aside, collective action initiatives have been successfully observed in post-disaster responses such as evacuation, providing public goods, repairing public utilities, and improving resource access to victims [19]. This is because the interests and incentives of victims are aligned and consistent with those of disaster recovery institutions, similar to the proposition of second-generation scholar, Ostrom [15]. For example, following the earthquakes in Haiti in 2010, people established watch communities to prevent theft [20], the Hurricane Katrina's devastation of New Orleans in 2005 collectively brought together residents to use a local church as a focal point for providing housing and provision of club goods [21]. Blomsma [22] reported a successful collective action (in the form of a framework, collective action framework) approach in designing and effectively implementing waste and resource management frameworks in circular economies. Blomsma's report is founded on the idea that sustainable waste and resource management can only be accomplished if it becomes everyone's responsibility.

This does not, however, eliminate the dilemmas in collective action efforts as put forward by Olson [14], and the likelihood that some collective action initiatives will fail. Taking the establishment of a new market or market infrastructure in a community as an example, collective action theory assumes shared capacity (in terms of resources) and goals among the actors, which is not always the case [23]. Different actors may have different opinions, expectations and participation levels in the new market, and if these are not carefully assessed, collective action is bound to fail. An example comes from a study on the co-management of fisheries

in Kenya, where the sequence of early occurrences, such as conflict, mistrust, and cultural differences, hampered group action and the sustainable use of fisheries' resources [24].

The aforementioned examples of collective action, whether successful or unsuccessful, show that collective action can be used to acquire credit, especially by communities that view the AGGLs as their only option. Since this is a shared objective by the government of Uganda and MFIs, it is envisaged that if the group participants are appropriately selected, AGGL program should be successful. Thus, the purpose of this study is to determine the factors underpinning participation in AGGLs so as to foster the success of collective action.

## MATERIALS AND METHODS

### Study area

The study was conducted in Iganga district, Busoga sub region, in Eastern Uganda. This sub region was selected because of its rankings; as the second poorest sub region in Uganda from 2003 to 2013, and as the poorest by Uganda Bureau of Statistics latest report of 2019/2020 [25]. Busoga is characterised by having the lowest income levels in comparison to other regions, accounting for 14% of the country's 22% poverty. Agricultural output level is very low and this is attributed to sugar cane growing in the area. Farmers lease their land for a maximum of 8 years to sugarcane growing companies leaving them with very small land to carry out growing of food crops. As a result, food insecurity is very high, and around 73.3% of rice which is considered a food security crop in the sub region is instead sold for income [25].

Iganga district was selected primarily because of its concentration of MFIs, including PRIDE microfinance, which lends to farmers organized in groups. According to estimations from the 2014 National Population and Housing Census, it has a sizable total population of 504,197, a population density of 495/km<sup>2</sup>, and an annual population growth rate of 2.9%.

### Research design

The study adopted a cross-sectional research design which involves looking at and collecting data from people who differ in one key characteristic at one specific point in time. These people may be similar in other characteristics but different in key factors of interest such as age, income levels, or geographic location [26]. This research design was adopted because data were collected from a population of smallholder farmers with differing socioeconomic characteristics at a given time.





## Sample selection and size

The study's focus was on PRIDE microfinance's smallholder farmer borrowers who had running loans in the AGGL and IL categories. The sub-counties of Nakalama and Namung'alwe were purposively selected because of their peri-urban population while Nawandala and Buyanga (present day in Bugweri District) were purposively selected due to their rural nature and rural farmer dominance. The peri-urban and rural sub-counties were selected in order to acquire a representative sample of 161 borrowers. Information regarding the number of groups per the selected sub-counties was obtained from the Iganga branch of PRIDE microfinance. The AGGL and IL borrowers from each sub-county were selected and the sample size was calculated using the Anderson *et al.* [27] formula below:

$$n = \frac{c^2 N p (1-p)}{(A^2 N) + (c^2 p [1-p])} \dots\dots\dots I$$

Whereby; n is the sample size required, N is the whole target population in question, p is the average proportion of records expected to meet the various criteria (0.86 was an estimate for this study depending on the sample size), A is the margin of error deemed to be acceptable (calculated as a proportion) for example: for 5% error, A = 0.05, and c is a mathematical constant defined by the confidence interval chosen. To be 95% sure of the results, the constant c = 1.96 was adopted for estimating n in this study.

$$n = \frac{1.96^2 * 1190 * 0.86 (1-0.86)}{(0.05^2 * 1190) + (1.96^2 * 0.86 [1-0.86])} \dots\dots\dots II$$

$$n = 161$$

## Sampling Techniques and Procedure

A multi stage sampling technique was employed; purposive sampling (maximum variation sampling based on two categories: rural and peri-urban) was used to select 4 sub-counties, 2 from rural and 2 from peri-urban settings. Thereafter, a total number of AGGL groups in the 4 selected sub-counties was obtained from the PRIDE microfinance branch office. Four AGGL groups were randomly selected per sub-county to achieve a total of 16 groups. Then, simple random sampling was used to select 5 members per group to achieve a total of 80 AGGL respondents. Simple random sampling was further used to select 20 IL borrowers per sub-county to acquire a total of 80 IL respondents. Overall, a sample size of 161 respondents was interviewed. Purposive sampling was later used to select 3 key informants and 2 groups with whom FGDs were conducted, to provide additional information.



## Data collection

The study used data from two sources. First and most importantly was primary data from the respondents. Secondary data was also used, involving review of PRIDE microfinance's lending policies and procedures. Quantitative and qualitative methods were used sequentially in data collection and analysis. Qualitative data supplemented data collected by quantitative methods. Semi-structured interviews using questionnaires were used to obtain the quantitative data while in-depth interviewing was used to obtain qualitative data from key informants. Focus group discussions (FGDs) obtained deeper insights about the operation of AGGL system. Ethical Considerations

The research and ethics committee of Uganda Christian University authorized the study protocols, and there were no risks associated with participation. Since the data contained information on a credit institution, the highest level of respondent rights protection and data confidentiality was upheld while in the field. The Iganga branch of PRIDE Microfinance granted permission and authorization for the usage of customer credit data. Respondents were informed about the reason and purpose of the research and verbal informed consent was given by those who agreed to take part.

## Data validity and reliability

The validity of the data was ensured by using validated data collection tools. To check on content validity, the opinions of experts in the field of microfinance and the branch credit staff were sought. For most questions in the research tool, there were multiple possible answers to ensure that the responses provided effectively answered the study questions. The tool was pre-tested in a pilot study conducted in a different district (Jinja) in the Busoga sub-region to guarantee data reliability.

## DATA ANALYSIS

Descriptive statistics presented the socioeconomic status of the two borrower categories while binary logistic regression analyzed determinants of participation in AGGLs. The binary logistic regression was appropriate for this study because the outcome variable was dichotomous and the explanatory variables took any type. The logistic regression applied the maximum likelihood estimation after transforming the outcome into a logit variable. The procedure that calculated the logistic coefficient compared the probability of an event occurring with the probability of it not occurring.

Let  $P_i$  be the probability of participation in AGGLs and  $X$  be a vector of explanatory variables. The likelihood of participation in AGGLs is specified as

$$P_i = f(X, \varepsilon) \dots \dots \dots \text{III}$$

where  $\varepsilon$  is an error term with logistic distribution.  
The conceptual model is given as

$$\ln \left[ \frac{P_i}{1 - P_i} \right] = \beta_0 + \sum_{j=1}^n \beta_j X_{ji} + \varepsilon \dots \dots \dots \text{IV}$$

where  $P_i = \text{prob}(y=1)$  is the conditional probability for participating in AGGLs;  
 $(1-P_i) = \text{prob}(y=0)$  is the conditional probability for not participating;  $X_{ji}$ s are the set of explanatory variables;  $\beta_0$  and  $\beta_j$  are the coefficients that were estimated, and  $\varepsilon$  is the error term.

The estimated coefficients ( $\beta_0$  and  $\beta_j$ ) are measures of the changes in the ratio of the probabilities, termed as the odds ratio. The empirical model specifying participation in AGGLs is stated in equation 3. Thus, the logistic prediction equation for this study was modelled where  $Y$  is the logit for the dependent variable (Participation in AGGLs) =  $P_i Y$ ; (1 = AGGL borrowers, 0 = IL borrowers). The logistic prediction equation for this study was:

$$Y = \ln(\text{odds}(\text{events})) = \ln \left( \frac{\text{prob}(\text{event})}{\text{prob}(\text{nonevent})} \right) = \ln \left( \frac{\text{prob}(\text{event})}{(1 - \text{prob}(\text{event}))} \right)$$

This is the same as equation IV

$$\ln \left[ \frac{P_i}{1 - P_i} \right] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_n X_n + \varepsilon \dots \dots \text{V}$$

The expectations from the measurements of the variables used in the study are presented in Table 1.

Age of the respondents is expected to have a negative or positive influence on participation in AGGLs as older people are equated to having finances and assets. Therefore, they have their own collateral and can borrow individually compared to the youth who usually do not have collateral and thus join the group to be able to borrow.

Household size is expected to have a positive influence on participation in AGGLs as bigger households are deemed to have higher household expenditure and low asset capacity yet they require finances thus AGGLs is their only chance for borrowing.

Value of assets is expected to have a negative influence on participation in AGGLs as respondents with high valued assets seemingly have the collateral to present for loans thus borrow individually.

Educational expenses may have either a negative or positive influence on participation in AGGL as high educational expenses are believed to leave borrowers without adequate asset collateral for pledging individually in microfinance for loans and thus they may desire to borrow through groups. However, the groups can still select against households with high education expenses associating them with loan default.

Gender (1=Male 0=Female) is expected to have a negative influence on participation in AGGLs as male borrowers often deem group borrowing as one for vulnerable categories of people such as women and, therefore, they tend to avoid AGGLs. Women on the other hand find AGGLs as the predominant option for accessing credit due to their limited rights on traditional collateral such as land.

Distance to main town in km is expected to have a negative influence on participation in AGGLs as individuals located far in villages are discouraged from joining AGGLs since it seems difficult for credit officers and the group leaders to coordinate them.

Total household income in Uganda shillings (Ugx) is expected to have a negative influence on participation in AGGLs as higher-income households may not desire more income acquisition through group loans.

Number of livestock owned may have a negative or positive influence on participation in AGGLs as big numbers of livestock may easily be turned into cash income and thus no need for group borrowing. On the other hand, livestock can also be pledged as chattels to the group and increases the possibility that group members accept to guarantee another member for the loan.

Land size in acres is expected to have a negative influence on participation in AGGLs as people with many acres of land are regarded to have sufficient collateral for obtaining individual loans, thus no need for joining the group.

Prior group involvement is expected to have a positive influence on participation in AGGLs as group members serve as social capital and members have ease in joining other groups with purposes of borrowing as opposed to people who have not participated in groups.

## RESULTS AND DISCUSSION

### Descriptive statistics

Table 2 presents a comparison between AGGL borrowers and the IL borrowers that participated in the study. On average, IL borrowers had significantly bigger household sizes (8.88) than the AGGL borrowers (7.76). This implies that IL borrowers have the financial capacity to sustain bigger households than AGGL borrowers. Nevertheless, mean household sizes of both AGGL and IL borrowers were bigger than the average national household size of 5 persons, conforming to the findings of Mwavu *et al.* [28]. Table 2 also indicates that IL borrowing households' mean incomes from crop farming, agricultural trade, formal and informal employment were significantly higher ( $p < .06$ ,  $p < .05$ ,  $p < .001$  and  $p < .01$ , respectively) than those of AGGL borrowers. This could be attributed to differences in the level of financial investment in these activities, with IL borrowers investing more finances than AGGL borrowers. This is possible as lenders may believe that households with higher incomes are more likely to be able to repay their debts.

The mean distances to main town and tarmac road were significant ( $p < .03$ ,  $p < .01$ , respectively) across the two borrower categories with AGGL borrowers nearer to both main towns and tarmac roads than IL borrowers, agreeing with the findings of Regesa *et al.* [29] that most microfinance borrowers are located nearer main towns. It is possible that the location of AGGL borrowers nearer to main towns is due to the need for frequent collective loan recovery meetings within the groups. Contrary, the IL borrowers lived far away from the tarmac road, and this is possible because IL borrowers possess large pieces of land for large-scale agriculture (large sugar cane and rice plantations) which are located far from access points like tarmac roads and towns. This however, seems disadvantageous as it increases transport costs to market centres and reduces farm gate prices [30].



## Determinants of participation in AGGLs

The logistic regression results in Table 3 indicate that the log likelihood ratio test statistic is significant at 1%. This means that at least one of the variables in the model has a coefficient that is different from zero. The goodness of fit of the logit model was good, with a pseudo  $R^2$  value of 0.666, indicating that the logit model used has integrity and is appropriate. Of the ten variables used in the model, five variables were significant. These include education expenses, gender, total income, land size, and involvement in a group.

The coefficient of prior group involvement was significant ( $p < .001$ ) and positively influenced the likelihood to participate in AGGLs. This is in agreement with a priori expectations, and the findings of Srivastava and Samanta [31]. This may be an indication that belonging to a group (social, economic, political, peer or religious) makes it easier for members to join the AGGL program. In regard to this, FGD participants pointed out that:

*"Our group is not new. We were already in a village saving and credit scheme (VSCS) group before the PRIDE microfinance teachers told us about AGGLs. We transitioned into a group guarantee in order to get the loan."* (FGD participants, 2019)

From this, it is deduced that members knew each other prior to forming the AGGL group, and therefore they relied on prior knowledge and solidarity to select reliable participants. This inference agrees with Berger [32], who reported that among low-income farmers, the strongest collateral they can pledge to MFIs to access credit is group solidarity.

Total household income had a significant ( $p < .05$ ) negative influence on participation in AGGLs, contrary to the findings of Mutamuliza [33], who focused on participation in general microfinance markets in Rwanda. The findings of this study implied that as a household's total income increases, participation in AGGLs decreases, allowing smallholder farmers to more easily acquire finance through individual borrowing. According to previous studies in Uganda and Ghana [34,35], microfinance group borrowing increases household incomes, showing that increased income is a benefit rather than a factor in group participation. Additionally, it is likely that households with higher incomes will require bigger loan amounts that are not provided by the AGGL program. This shows that the AGGL program does indeed target the low income smallholder farmers and data from one of the FGD supported this statement by reporting that:

*“the loan money is too small to cover one enterprise activity; such as rice growing from input purchase to marketing. The highest amount a member has ever received is 800,000 UGX” (FGD participants, 2019)*

A negatively significant relationship ( $p < .04$ ) was observed between educational expenses and participation in AGGLs. Individuals from households with higher education expenses were selected against while forming groups in anticipation that the loan money would be channeled into paying school fees. Similar findings were reported in India [36] and western Uganda [37], where group guaranteed loans were used for contingencies including school fees payment. This, in turn, results in loan default and subsequent group liability for the defaulted loan.

With regard to gender, results indicated a significant ( $p < .04$ ) inverse relationship between participation in AGGLs and the borrower being male. Females were more likely to participate in AGGLs than men, in agreement with the findings of Armendáriz [38] and Hansen *et al.* [39]. This could be attributed to the issue of collateral, whereby the land tenure system in most African countries including Uganda, limits women's ownership of resources such as land yet it is the most acceptable form of collateral in most MFIs. Because of this, women are left with the chattel options to access loans. Chattel items include goats, cows and household items such as beds, sideboards, and chairs. These are instead presented to group members as security to earn the guarantorship on the “bench” prior to the loan application. A bench is composed of 4 to 6 members (out of the many 20-30 members of a group) that must guarantee each other.

The coefficient of land size (in acres) was significant ( $p < .005$ ) and negatively influenced participation, in that, an extra acre of land owned by individuals reduced their likelihood to participate in AGGLs. This indicates that smallholder farmers with smaller pieces of land are more likely to participate in AGGL, contrasting the finding of Agbeko *et al.* [40], that resource-disadvantaged farmers are excluded from participating in AGGL programs. This may be explained by the notion that smallholder farmers with more acres of land engage in large-scale production, which calls for greater financial investment that is inaccessible through the AGGL program. Also smallholder farmers with more land have more collateral, enabling them to get individual loans.

## CONCLUSION

The AGGL program is a beneficial tool used by formal FIs to reach the resource-poor smallholder farmers in Uganda's rural and peri-urban communities. The



AGGL program draws its principles from the theories of the second generation of collective action scholars, who maintain that collective action initiatives are successful when participants' incentives and interests are in line with those of their institutions. The factors influencing smallholder farmers' participation in Uganda's AGGLs were assessed, and descriptive analysis and binary logistic regression were used for analysis.

The descriptive analysis results show that smallholder farmers utilizing group lending have big household sizes compared to the national average. These farmers derive their incomes from crop farming, agricultural trade, formal, and informal employment. However, in all types of income sources, smallholder farmers borrowing individually were earning more than those borrowing through the AGGL program. Smallholder farmers borrowing individually lived further away from towns and tarmac roads than the AGGL borrowers. The factors that significantly influence participation in AGGLs were prior group involvement, total household income, education expenses, gender and land size.

Based on the study results, it can be inferred that participation in AGGLs is not dependent on the possession of livelihood resources such as land, income and livestock. Ownership of such resources, instead, encourages smallholder farmers to access loans through individual borrowing, leaving AGGLs for the resource-constrained smallholder farmers as is the intention of MFIs. Through AGGLs, farmers increase their incomes and accumulate resources that later enable them to borrow individually. Therefore, financial institutions need to direct their efforts towards strengthening the existing smallholder farmer borrowing groups, encouraging the formation of new ones, and equipping them with farming knowledge through training, as this proves to be a good way of expanding financial inclusion to the resource poor. In so doing, the focus should be put on increasing men's participation since they are household pillars and major decision-makers concerning household wellbeing.

In addition, the government should increase budgetary allocation to agriculture and through MFIs extend such funds to poor farmers in adequate amounts that would finance investments that can fetch reasonable returns. Further investigation is required in the area of utilization of AGGLs to have their impact more felt in agriculture.

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**Table 1: The expectations from the measurements of the variables used in determining participation in AGGLs**

Variable	Variable of description	Measurement	Expected sign
X <sub>1</sub>	Age of the respondent in years	Continuous	-/+
X <sub>2</sub>	Household size	Continuous	+
X <sub>3</sub>	Value of assets	Continuous	-
X <sub>4</sub>	Education expenses in UGX	Continuous	-/+
X <sub>5</sub>	Gender (1=Male 0=Female)	Dummy	-
X <sub>6</sub>	Distance to main town in km	Continuous	-
X <sub>7</sub>	Total income in UGX	Continuous	-
X <sub>8</sub>	Number of livestock owned	Continuous	-/+
X <sub>9</sub>	Land size in acres	Continuous	-
X <sub>10</sub>	Prior group involvement (1=Yes 0=No)	Dummy	+

**Table 2: Borrower socio economic characteristics**

Variable	Group guaranteed loan borrowers	Individual loan borrowers	P value
Age	42.11	43.22	0.96
Education (number of years in school)	7.12	7.88	0.75
Household size	7.76	8.88	0.01
Crop farming income	1,409,141.03	3,398,048.78	0.06
Livestock income	545,833.33	617,647.06	0.53
Agriculture trade income	776,923.08	2,376,666.67	0.05
Formal employment income	400,000.00	825,000.00	0.001
Informal employment income	206,363.64	1,041,321.43	0.01
Distance to main town (km)	3.48	3.66	0.03
Distance to tarmac road(km)	6.82	7.32	0.01



**Table 3: Determinants of participation in AGGLs**

Variable	Coefficient	Standard Error	P Value
Age of the respondent	0.0695717	0.0441253	0.115
Household size	-0.1485866	0.1243690	0.232
Value of assets	0.0000003	0.0000004	0.474
Education expenses in UGX	-0.0000005**	0.0000002	0.042
Gender (1=Male 0=Female)	-2.0145480**	1.0144600	0.047
Distance to main town in km	0.0017628	0.1625461	0.991
Total income in UGX	-0.0000002**	0.0000001	0.038
Number of livestock owned	-0.0114499	0.0263383	0.664
Land size in acres	-0.4243085***	0.1502583	0.005
Prior group involvement			
(1=Yes 0=No)	7.0996250***	1.4629430	0.001
_cons	-3.1224320	2.2110600	0.158
Number of observations = 159			
Prob > chi2	= 0.000		
Pseudo R <sup>2</sup>	= 0.666		

\*\*\* p < 0.01, \*\* p < 0.05 and \* p < 0.10

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