

THE IMPACT OF COMMUNITY BASED SAVING AND LENDING GROUPS (SLG) INTERVENTION IN INCREASING HOUSEHOLD INCOME:EVIDENCE FROM ADAMA CITY, ETHIOPIA

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Abstract

Community-based Saving and Lending Group (SLG) interventions have been found to be a critical instrument in a bid to improve the livelihoods of poor and vulnerable people. The purpose of this study was to assess the contribution of SLG interventions in supporting household income, particularly assessing the impact on asset, social capital and the effect of income in ensuring household welfare. Descriptive and econometric analyses were done to see the impact on basic household economic variables that include change in income, income diversification, asset accumulation, change in assets and living standards. The PSM estimation findings provided statistically significant effect for the SLG intervention which yielded at least ETB 1368.074 income differences on average between beneficiaries and non-beneficiaries, all other things kept constant. The household's total income increase, social capital increase and developing self-confidence and overall income increase were considered as important factors that help households to create assets though its contribution to household welfare and meeting basic needs in the study area.

Keywords: SLG, household, income, assets, impact, livelihood, PSM

INTRODUCTION

Today, there are approximately 7 million saving group (SG) members in 300,000 groups across five continents. While SGs are most widely observed

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in Africa, there are also increasing numbers of groups in Asia and Latin America; and a handful of groups in North America and Europe. Their popularity has been recent; from 2009–2013 alone, the number of their members has grown from 1.5 to 7 million. This grouping has been taken up around the world as savings and borrowing strategy for the poor, often providing financial services to populations with little access to formal institutions. As SG practice has evolved, the groups are used as a platform to introduce additional development services, such as education or health, or to link to additional financial services, such as formal accounts or mobile money transfer (Allen, 2014).

Several studies indicated that in Ethiopia, there are a number of community-based indigenous savings and credit groups, which are also widely used by women. Critics often say that the poor are too poor to save; yet empirical data contradicts this point of view showing that everyone saves, including the poor. Though not always apparent, the poor save in many different forms, in kind and in cash, to meet their daily food consumption, education, and health care needs or to invest in small businesses. However, the poor frequently have more difficulties in accumulating capital than the better-off since they are more vulnerable to risks from bad weather or poor health, and have limited access to markets and safe saving facilities (FAO, 2002).

Group saving approaches have had notable successes when they are responsibly managed, and when the savings are felt as an asset by their members. Group savings also help build solidarity among members and provide a safety-net against exploitative money lending institutions. Ample evidence of this exists in the widespread use of informal and formal group saving approaches around the world: rotating savings and credit groups, savings clubs, village banks, credit unions, and so on. The fact that they

must be essentially self-managed, given the opportunity to generate group self-confidence, the first step towards sustainable poverty elimination (Pitamber 2003). As indicated by different researchers, participation in SLG program would result in improvements in the economic and social welfare of households, growth and/or diversification in income-generating activities; increase in financial assets, reduced household poverty, improved health and nutrition, improved access to education and increased empowerment (social, as well as economic) of household member, etc. Under each of these broader impacts, a number of specific studies were conducted by various researchers. A very limited and common type of findings are explored here and discussed in greater details throughout this research report.

RESEARCH METHODOLOGY

Description of the Study Area: Adama city is located in Oromia National Regional State, East Shewa Zone, at a distance of about 100 kilometers from Addis Ababa; found at 8°44' North Latitude and 39°04' East Longitude. Based on the 2007 Census conducted by the Central Statistics Agency of Ethiopia (CSA, 2007), this City has a total population of 220,212, an increase of 72.25% over the population recorded of 1994 Census. Of these 108,872 are men and 111,340 women. The City has a total of 60,174 households and 59,431 housing units with an average 3.66 persons per a household.

Adama was founded in 1924 and is one of the reform cities in the region and has a city administration consisting of 14 urban and four rural kebeles. The City has a masterplan which was prepared in 2004. The four largest ethnic groups reported to live in Adama were Oromo (39.02%), Amhara (34.53%), Gurage (11.98%) and Silte (5.02%); all other ethnic groups make up 9.45%

of the population. Amharic is spoken as a first language by 59.25%, Oromiffa spoken by 26.25% and Guragigna spoken by 6.28%; the remaining 8.22% of the population speak all other primary languages. The majority of the inhabitants were followers of Ethiopian Orthodox Christian Church, with 63.62% of the population reporting they observed this belief, while 24.7% of the populations were Muslims and 10.57% were Protestant (CSA, 2007).

Sampling Design: To have equal and proportional chance of representation for all the 14 kebeles in Adama City, stratified random sampling method was used. The sample size of each stratum in this application was proportionally distributed to each kebele and to the population size of each SLG. There are closer to 1000 active SLG members in the study area. This means each SLG has a fair sample share, proportionate to the size of the number of members. Once the sample size and share of each kebele has been identified, the next step was to select sample respondent households from the list of treatment and control groups.

Both beneficiary and non-beneficiary households were targeted in this study. The sample size for both household categories was determined based on a 50% response distribution estimate (which gives the largest sample size), 10% margin of error, and 95% confidence level. This computation was carried out using a formula derived from Leslie (1965), a standard sample size determination formula for finite population presented below. The maximum sample size N for a given confidence level and precision is calculated as follows.

According to the formula, the sample size (n) is calculated as

$$n = \frac{N \cdot z^2 \cdot p(1-p)}{(N-1) \cdot d^2 + z^2 \cdot p(1-p)} \dots\dots\dots(i)$$

$$\approx \frac{z^2 \cdot p(1-p)}{d^2} \dots\dots\dots(ii)$$

As $N \rightarrow \infty$ Where; n = estimated sample size

z = value on standardized normal distribution curve corresponding to a level of significance. The level used is 95% and the corresponding z value is 1.96

P= is the estimated proportion or value of what the researcher is going to measure and to be testing-using the sample. Since the researcher wants to study the impact of SLG intervention in poor urban households, taking a reasonable guess in reference to the Ethiopian Household and Income Expenditure (HICE, 2010/11) survey data, the proportion of poor people (poverty head count index) in the country is estimated to be 29.6% (which is 30.4% in rural areas and 25.7 in urban areas). Hence this study focuses on urban areas, **P** for this study is taken as 25.7 (25%)

N = Population size.

d = Selected accepted error (level of precision). The margin of error assumed here is 10%.

$$\approx \frac{z^2 \cdot p(1-p)}{d^2} \dots\dots\dots \approx \frac{1.96^2 \cdot .25(1-.25)}{.1^2} \dots\dots\dots = 72$$

Using the above sample size determination formula, a sample size of 72 was determined for the household survey. In other words, a total of 144 beneficiary (treatment) and non-beneficiary (control group) households were covered by the survey in the study area.

Tools for Data Collection: Structured schedule method was employed to collect primary data from the households. And also, Focus Group Discussion (FGD) was carried out to further triangulate and substantiate the information obtained using questionnaires. FGD constituted the qualitative assessment part of data collection.

Method of Data Analysis: The primary data collected through interview schedule was analyzed using descriptive and econometric analysis through the use of Statistical Package for Social Science (SPSS) and STATA version 12.0 computer programs. Descriptive statistics such as mean, standard deviation, percentage, chi-square test and t-test were used for analyzing the data.

a) Econometric models:

i) Model specification (theoretical base): Propensity Score Matching (PSM) was employed, which is usually used to analyze the impact and effects of interventions, which already had no baseline data and analysis. According to Caliendo and Kopeinig (2005), the implementation of PSM involves five steps. These are: PSM estimation; choosing matching algorithm, checking for overlap (common support); matching quality (effect) estimation and sensitivity analysis.

ii. Procedures of propensity score matching estimation: The first step in PSM method is estimation of the propensity scores. To get this propensity scores any standard probability model can be used, for example, logit, probit or multi-nominal logit (Rajeev, *et al.*, 2007). As described by Rosenbaum and Rubin (1983), matching can be performed conditioning on $P(X)$ alone rather than on X , where $P(X) = \text{Prob}(D=1|X)$ is the probability of participating in the program conditional on X . If outcomes without the

intervention are independent of participation given X, then they are also independent of participation given P(X). This reduces a multidimensional matching problem to a single dimensional problem (ibid). A logit model is often used to estimate propensity scores using a composite of pre-intervention characteristics of the sampled households (Rosenbaum and Rubin, 1983) and matching was then performed using propensity scores of each observation. In estimating the logit model, the dependent variable is participation in SLG which takes the value of 1 if a household participated and 0, otherwise. The mathematical formulation of the logit model is as follows:

$$P_i = \frac{e^{z_i}}{1+e^{z_i}} \dots\dots\dots (2) \quad \text{Where, } p_i \text{ is the probability of participation.}$$

$$Z_i = a_0 + \sum_{i=1}^n a_i x_i + u_i \dots (3) \quad \text{Where, } i = 1, 2, 3 \dots n$$

$a_0 = \text{intercept}$

$a_i = \text{regression coefficients to be estimated}$

$u_i = \text{a disturbance term, and}$

$X_i = \text{pre-intervention characteristics.}$

The probability that a household belongs to non-participant is:

$$1 = P_i = \frac{1}{1+e^{z_i}} \dots\dots\dots (iii)$$

According to matching theory (Rosenbaum and Robin, 1983; Jalan and Ravallion, 2005), the logit model via which the propensity score is generated should include predictor variables that influence the selection procedure or participation in the program and the outcome of income.

Several factors guide selection of predictor variables. In this study, explanatory variables of the logit model were identified using findings of previous empirical studies on community-based microfinance interventions. Many explanatory variables were included to minimize the problem of unobservable characteristics in evaluation of the impact of the program (*see explanatory variables description under section ‘C’ below*).

iii).Matching Estimators: After estimation of the propensity scores, seeking an appropriate matching estimator is the major task of a program evaluator. In theory, there are different matching estimators. The most commonly applied matching estimators are: **Nearest Neighbor Matching (NN), Caliper Matching and Kernel Matching.**

b) Testing the Matching Quality: Using predicted probabilities of participation in the program (i.e. propensity score) match pairs are constructed using alternative methods of matching estimators. The impact estimation is the difference between simple mean of outcome variables of income for participant and non-participant households. In our case, C is the Mean impact of the intervention. The mean impact of the SLG program on household income is given by:-

$$C = \sum_{j=1}^P (Y_{ij1} - \sum_{i=1}^{NP} Y_{ijo} /$$

p..... (iv)

Where, Y_{ij1} is the post intervention outcome variable of household j (monthly income in Birr).

Y_{ijo} is the outcome variable of the non-participant matched to the j participant household; P is the total number of participants and NP is the total number of non-participants. Additionally, household total monthly

income value expressed in Birr was used to measure the change brought by the program on the beneficiary households.

iv). Examining Treatment Effect on the Treated

This is a question of identifying factors that bring heterogeneity impact on the treatment of the treated. In other words, it would be important to further analyze data to answer the question “why impacts of the program vary, if any, among the SLG participant households?” The idea is that the effect of the program varies among households due to beneficiaries own and other characteristics. The effect of the treatment on the treated was explained by using a standard multiple linear regression model, which is specified as follows:

$$Y_i = \beta_0 + \beta_i x_i + u_i \dots\dots\dots (v)$$

Where, Y_i is magnitude of the impact of the program on beneficiaries expressed in disposable income and total monthly income; β_0 is the regression intercept; β_i is a vector of regression coefficients to be estimated; x_i is pre intervention independent variables; and u_i is an error term. According to Ahmed and Ninno (2001), it is important to consider targeting criteria to improve the benefit from SLG interventions. The design feature of SLG programs should be economically vulnerable to poor households within the study areas. In view of this, targeting efficiency is crucial to assess the impact of SLG program. It is, therefore, inferred that for every intervention it is necessary to know clearly how the intervention will contribute to household income and also under which conditions they have to be implemented.

b) Definition and Hypothesis of Variables

Based on theoretical base and objectives of the study, the following dependent and independent variables are defined and hypothesized.

i) Dependent Variables: Decision to join saving and lending groups (DTJ) is dummy and has dichotomous nature representing households' decision to join. Therefore, it was represented in the model as $Y_1=1$ for the household that has decided to join SLG and $Y_1=0$ for household that does not want. *The following are categorized as independent variables of this section:* Age of a household head (AGE), Education of household head (EDU), Income per capita (HHI), Access to loan (LOAN), Distance of SLG center from the household (DIST) and Family size (FZ):

ii) Definition of Outcome variables/Household Income (HHI): In this case Income is the second dependent variable for this study approach; hence it is associated to the PSM estimation procedure. The main outcome variables included in this study are economic and social network variables; such as income, assets, social capital, education, quality of housing and health.

RESULTS AND DISCUSSIONS

Results of the descriptive analysis are presented in the form of mean, standard deviation, percentages, T-Test and chi-square test. This is followed by the discussion of the econometric model results. Propensity Score Matching (PSM) method was employed to estimate the impact of SLG program on household welfare through increase in disposable income, asset increase, change in social status and increase on confidence of the household.

Respondents background characteristics: The majority (99%) of beneficiary and non-beneficiary respondents, who had participated in the survey were women and also were heads of their households. Occupation was the only indicator that had shown significant difference between beneficiary and non-beneficiary categories; otherwise there were no differences in most other demographic characteristics such as sex, age, family size, marital status and education level.

Table 1: Mean Age of Respondents (N=144)

| Respondents' category: | Mean | N | Std. Deviation |
|-------------------------------|-------------|----------|-----------------------|
| Non-beneficiary | 38.21 | 71 | 10.992 |
| Beneficiary | 40.01 | 73 | 8.750 |
| Total | 39.13 | 144 | 9.926 |

Source: Own survey, February, 2016

As presented in Table 1 above, out of 144 total surveyed households, 40.01 is recorded as mean age for beneficiaries while 38.21 is recorded as mean age for non-beneficiaries. As can be seen from the result, there was no as such significant difference observed in the mean age of both beneficiaries and non-beneficiaries category.

Table 2: Percentage distribution of respondents by SLG membership (N=144)

| Description | | Respondents' category: | | Total |
|--------------------|------------|-------------------------------|--------------------|--------------|
| | | Non-beneficiary | Beneficiary | |
| Yes | Count | 6 | 72 | 78 |
| | % of Total | 4.2% | 50.0% | 54.2% |
| No | Count | 65 | 1 | 66 |
| | % of Total | 45.1% | 0.7% | 45.8% |
| Total | Count | 71 | 73 | 144 |
| | % of Total | 49.3% | 50.7% | 100.0% |

Source: Own survey, February, 2016

As presented in the Table 2 above, when compared beneficiaries with non-beneficiaries category, 50% of the respondents were reported to have involved in self-help Savings and Lending Groups (CSSG) and all of them were categorized as SLG beneficiaries. Similarly, nearly 45% of the respondents who were categorized as non-beneficiaries were not members of any kind of saving and loan groups in the community, while 4.5 % of the non-beneficiaries were members of some kind of group saving and loan associations in their villages. This indicates that, the beneficiaries have better access, privilege, opportunities and experience to acquire the benefit and advantage of SLG financial and social network services compared to that of the non-beneficiaries.

Table 3: Reasons given by respondents for Joining SLG (N=72)

| Description | Respondents Category | | | Total |
|--|----------------------|-----------------|-------------|-------|
| | | Non-beneficiary | Beneficiary | |
| Means of saving | Count | | 69 | 69 |
| % of Total | | | 96% | 96% |
| Social support(network) | Count | 0 | 65 | 65 |
| % of Total | | 0.0% | 90% | 90% |
| Access other services (health, Education, food support etc.) | | 0 | 45 | 45 |
| % of Total | | | 62% | 62% |
| Skills training | Count | 0 | 32 | 32 |
| % of Total | | 0.0% | 44% | 44% |
| access information/support for business | Count | 0 | 50 | 50 |
| % of Total | | 0.0% | 69% | 69% |
| Means of accessing loan fund | Count | 0 | 66 | 66 |
| % of Total | | 0.0% | 91% | 91% |
| % of Total | 72 | | 100% | 100% |

Source: Own survey, February, 2016

The beneficiary respondents were asked to respond to the main reason for joining SLG intervention and services. As shown in Table 3 above, large

proportions of beneficiaries responded that their main reason to join SLG was to access financial services, mainly saving services. Similarly, the next large proportions of beneficiary respondents' main reason for joining SLG was to access loan fund from their group. About 65 (90%) of beneficiary respondents also said, the main reason to join SLG was to increase their social bond or networks with other friends and fellows who have similar socioeconomic background in the community and live in the same locality. The other reasons mentioned by beneficiaries were listed as to access other services like education, health services (62%), to get skill development services (44%); and to access information for business development accounted for (69%).

Table 4: Percentage distribution of respondents categorized by distance from SLG center (N=72)

| Description | | Respondents' Category: | | Total | |
|---------------------------------------|-------------------|------------------------|-------------|---------------|-------------|
| | | Non-beneficiary | Beneficiary | | |
| Reside in kebele where SLG is located | Count | 0 | 72 | 72 | |
| | % of Total | 0 | 100% | 100% | |
| Not reside near SLG is located | Count | 0 | 0 | | |
| | % of Total | 0 | 0.0% | 0.0% | |
| Total | Count | 0 | 72 | 72 | |
| | % of Total | 0% | 100% | 100.0% | |
| Frequency of group meeting | Weekly | Count | 0 | 36 | 36 |
| | % of Total | | 0 | 50% | 50% |
| | Fortnightly | Count | 0 | 36 | 36 |
| | % of Total | | 0 | 50% | 50% |
| | Monthly | Count | 0 | 0 | 0 |
| | % of Total | | 0 | 0.0% | 0.0% |
| | Total | 72 | 0 | 100% | 100% |

Source: Own survey, February, 2016

As can be seen from Table 4 above, 100% of beneficiary categories were reported to reside in the same village or 'kebele' where SLG centers are located. Members were asked to explain the time it will take them to reach

the center of SLG from home for meetings and access services. The majority of them indicated that, on average, it would take them 5-10 minutes to walk to the centers. This means that SLG members are enjoying SLG participation, thus distance is not a constraint. As we noticed from the result above, closeness of SLG centers to beneficiaries' homes and villages greatly helped them to fully participate, strengthen their ties, cohesion, and meet with group members frequently and regularly to attain their intended group objectives.

With regard to frequency of attendance in a group meeting, 50% of beneficiary respondents reported that they attend group meetings on weekly basis. At the same time, they collect agreed amount of weekly savings, loan transactions and other group functions which are done in a regular fashion as agreed by and expected of all members. Similarly, 50% of respondents reported to attend their group meetings every fortnightly or bi-monthly and contributing their agreed saving amount which is also in a regular basis, while no respondent was reported to attend group meeting on monthly basis or beyond. From this result, we can infer that attending most frequently in a group meeting leads to increased group solidarity, mutual support and trust; increased cohesiveness and strengthened group management skills.

Table 5: percentage distribution of respondents received CSSG training (N=72)

| Description | | Respondents' Category: | | Total | |
|---|----------------------------|------------------------|-------------|------------|-----------|
| | | Non-beneficiary | Beneficiary | | |
| Yes | Count | 5 | 71 | 76 | |
| | % of Total | 6.5% | 92.2% | 98.7% | |
| No | Count | 1 | 0 | 1 | |
| | % of Total | 1.3% | 0.0% | 1.3% | |
| Total | Count | 6 | 71 | 77 | |
| | % of Total | 7.8% | 92.2% | 100.0% | |
| benefits of SLG training(multiple answer) | Developed saving habits | Count | 10 | 65 | 75 |
| | % of Total | | 14% | 93% | 100% |
| | Increased own saving funds | Count | 5 | 61 | 66 |
| | % of Total | | 7% | 80% | 100% |
| | Increased social bonds | Count | 3 | 67 | 70 |
| | % of Total | | 4% | 96% | 100 |
| | Able to access loan fund | Count | 2 | 62 | 68 |
| | % of Total | | 9% | 91% | 100 |
| | % of Total | 72 | 5.5(8%) | 63.5 (92%) | 69 (100%) |

Source: Own survey, February, 2016

As shown in the Table 5 above, the majority (92%) of respondents have received training in community saving and self-help groups (CSSG) through the support provided by SLG promoters. In this particular service, when beneficiaries were compared to non-beneficiaries, the majority of these training participants were members of SLG. In addition, in a multiple answer options presented, (93%) and (80%) of respondents stated that such training has enabled them to develop saving habits and increase own saving funds, respectively. Other benefits mentioned by beneficiaries were increased social bond (96%), and access to loan funds and related social network services.

In a follow up survey, the majority had received additional business training; thus, over 90% of the beneficiaries had indicated that it helped them to understand the local market opportunities for their product/service, while others had stated that it helped them to realize the importance of Microenterprise (ME) operation skills, as well as source and allocation of initial capital. It had also enabled them to analyze profit and loss, and how to start and manage a business.

Table 6: Distribution of respondents views on continuity of membership in SLG (N=72)

| Responses | | Respondents' Category: | | Total |
|-----------|------------|------------------------|-------------|--------|
| | | Non-beneficiary | Beneficiary | |
| Yes | Count | 4 | 71 | 75 |
| | % of Total | 5.3% | 93.4% | 98.7% |
| No | Count | 1 | 0 | 1 |
| | % of Total | 6.6% | 93.4% | 100.0% |
| Total | Count | 5 | 71 | 76 |
| | % of Total | 6.6% | 93.4% | 100.0% |

Source: Own survey, February, 2016

During the survey, beneficiary respondents were asked whether their membership in SLG will continue or not in case SLG promoting and supporting organizations interrupt their technical and follow-up services. As can be seen from the Table 6 above, vast majority (98%) of the beneficiary respondents had stated that their membership and contribution will continue even after the program support ends. In a follow up question, they were asked for the reason to continue their membership in SLG. In response, the majority, over 90%, had indicated that being member in SLG has helped them in many ways. As such, their saving habit has increased and improved. It helped them to start new businesses and expand the existing ones, thereby increasing income and enabling them to access finance for

their businesses accompanied by increased business assets. It has also enabled them to meet their household basic needs, such as, food, clothing, shelter, education and health.

Table 7: Distribution of respondents by loan accessibility (N=144)

| Loan Accessible | | Respondents' Category: | | Total |
|-----------------|------------|------------------------|-------------|--------|
| | | Non-beneficiary | Beneficiary | |
| Yes | Count | 12 | 63 | 75 |
| | % of Total | 8.3% | 43.8% | 52.1% |
| No | Count | 59 | 10 | 69 |
| | % of Total | 41.0% | 6.9% | 47.9% |
| Total | Count | 71 | 73 | 144 |
| | % of Total | 49.3% | 50.7% | 100.0% |

Source: Own survey, February, 2016

Regarding accessibility to loan, more than half of them 74 (51%) have obtained loan. The loan range was from 1,200 Birr to 16,000 Birr (Table 7). Thus, beneficiaries of SLG intervention are said to be in a better position in accessing bigger size loans, and had developed experiences to borrow money from their group. The difference between beneficiaries and non-beneficiaries in accessing loan and the amount of money borrowed were very significant. By implication, community-based microfinance services, such as access to loan through saving and credit group have direct impact on variables, such as income diversification, asset accumulation, education expenditures, food expenditures, and livelihood coping strategies.

Table 8: Members view on status change after joining SLG (N=67)

| Status | | Respondents' Category: | | X ² - TEST |
|-----------------|------------|------------------------|-------------|-----------------------|
| | | Non-beneficiary | Beneficiary | |
| Improved | Count | 16 | 66 | .003 |
| | % of Total | 18.2% | 75.0% | |
| Stayed the same | Count | 5 | 1 | |
| | % of Total | 5.7% | 1.1% | |
| Total | Count | 21 | 67 | |
| | % of Total | 23.9% | 76.1% | |

Source: Own survey, February, 2016

One core objective of establishing SLG was to attain social capital presumed to create understanding and trust among group members which lead to a greater social cohesion and support. As the name indicates, other than the economic benefits, participation in SLGs has had the experience of mutual support, develop trust, confidence and emotional attachment to help each other. Functioning as solidarity group in SLGs, enabled women or beneficiary groups to develop the status of self-esteem, aspiration and motivation to build self-confidence and social capital to create sustainable personal and community development endeavors. As Table 8 above shows, about 75 % of the beneficiaries who participated in the survey had indicated that subsequent trainings provided by the SLG intervention increased their social bondage, increased social status and increased their acceptance by the community. On the contrary, with regard to non-beneficiaries, only 18% of them had their status in the community improved, but for 6% of respondents, their social status remained the same. Furthermore, this result was tested using a chi-square test (X²-test) and the test result shows that there was significant difference (P=.003) between beneficiaries and non-beneficiaries with regard to increasing social status and building self-

confidence within the household, as well as with the aspect of group management and discharging community responsibility (see Table 8 above).

Table 9: Mean monthly total disposable income of respondents (N=144)

| Group | Obs. | Mean | Standard Error. | Std. Dev | [95% conf. | Interval | T-test |
|-----------------|------|----------|-----------------|----------------------------------|------------|----------|--------|
| Beneficiary | 73 | 3515.114 | 450.3585 | 3847.865 | 2617.34 | 4412.887 | .0000 |
| Non-beneficiary | 71 | 1087.009 | 150.5349 | 1268.43 | 786.8661 | 1387.331 | |
| Combined | 144 | 2317.967 | 259.8907 | 3118.688 1804.423 2831.691 | | | |
| Diff | | 2428.015 | 480.2206 | | 1478.71 | 3377.321 | |

Source: Own survey, February, 2016

The mean total monthly disposable income for the beneficiary category is about ETB 3,515, while the mean of total disposable income for the non-beneficiaries was ETB 1,087, a difference of ETB 2,428.967 (Table 9). It is believed that the increase in mean total disposable income for the beneficiary household is realized as a result of access to larger size loans, which in turn encouraged beneficiaries to engage in, expand and diversify their micro-business activities.

Consequently, beneficiaries demonstrated both the will and capacity to save by managing their business expenditures, managing household consumptions and thereby continuously boosting their sources of income. The increased revenue resulting from investing their saving on expansion and diversification of micro-businesses has also helped in meeting their families' basic needs and in servicing their loans. Engagements in micro-business activities were hypothesized to have positive impact on household income, income diversification and increase in household assets.

The difference between mean total monthly disposable income of beneficiaries and non-beneficiaries was tested using a T-test value ($P=.0000$) which shows that there is high significant difference between the two groups.

Table 10: Members view on changes in the overall income during the last 3 years (N=144)

| Overall income | | Respondents' category: | | Total | X ² - TEST |
|-------------------|------------|------------------------|-------------|--------|-----------------------|
| | | Non-beneficiary | Beneficiary | | |
| Decreased | Count | 5 | 0 | 5 | .000 |
| | % of Total | 3.5% | 0.0% | 3.5% | |
| stayed the same | Count | 51 | 14 | 65 | |
| | % of Total | 35.4% | 9.7% | 45.1% | |
| Increased | Count | 12 | 55 | 67 | |
| | % of Total | 8.3% | 38.2% | 46.5% | |
| increased greatly | Count | 0 | 3 | 3 | |
| | % of Total | 0.0% | 2.1% | 2.1% | |
| Don't know | Count | 3 | 1 | 4 | |
| | % of Total | 2.1% | 0.7% | 2.8% | |
| Total | Count | 71 | 73 | 144 | |
| | % of Total | 49.3% | 50.7% | 100.0% | |

Source: Own survey, February, 2016

Participation in SLG has increased engagement and investment in micro-business that has also led beneficiary households to significant increase in amount and regularity of household income. Close to 40% of the beneficiary households had indicated that they were able to earn more income after involvement in SLG (Table 10). Furthermore, this result was attested using chi-square test (χ^2 -test), which showed that there is highly significant ($P=.000$) difference between beneficiaries and non-beneficiaries in overall total disposable income during the last 3 years. Furthermore, participation in SLG intervention has changed their income upward in a positive trend for

the household which in return helped beneficiaries to improve the livelihood and welfare of their families. Such changes include meeting expenses on education, health, basic needs, and improving quality of housing as well.

Table 11: Members participation in improvement of housing (N=138)

| Member's house improved | | Respondents' Category: | | Total | X ² - TEST |
|-------------------------|------------|------------------------|-------------|--------|-----------------------|
| | | Non-beneficiary | Beneficiary | | |
| Yes | Count | 0 | 33 | 33 | |
| | % of Total | 0.0% | 23.9% | 23.9% | |
| No | Count | 65 | 39 | 104 | .000 |
| | % of Total | 47.1% | 28.3% | 75.4% | |
| Total | Count | 66 | 72 | 138 | |
| | % of Total | 47.8% | 52.2% | 100.0% | |

Source: Own survey, February, 2016

Beneficiaries, compared to non-beneficiaries as a group in improvement of their residences, those participants in SLG have shown positive progress. They repaired their houses, expanded their living rooms, and built additional rooms in the compound for rent to generate additional income (Table 11).

Empirical findings

The PSM method was employed in estimating the impact of participation in SLG intervention. The impacts are calculated using alternative estimators to ensure robustness. As indicated in Table 12 below, 3 out of the 6 impact results, the matching estimators show participation in SLG intervention has a positive and statistically significant effect on increasing income and welfare of households.

Table 12: Treatment effect estimation on-Income (N=144)

| | | | |
|--------------------------------------|------------------------|-------|-----|
| Treatment-effects estimation | Number of observations | = | 144 |
| Estimator: propensity-score matching | Matches: requested | = | 1 |
| Outcome model: matching | min | = | 1 |
| Treatment model: logit | | max = | 1 |

| Income | Coefficient. | AI Robust Std. Err. | Z | p> z | [95% Conf. | Interval] |
|--|--------------|---------------------|-------|-------|------------|-----------|
| ATE Membership (non-beneficiary vs. beneficiary) | --1368.074 | 587.4158 | -2.33 | 0.020 | -2519.387 | -216.7599 |

Source: Own survey, February, 2016

The estimation result presented in Table 12 above provides a supportive evidence for the effect of the SLG intervention in increasing beneficiary households’ income. In order to attain the stated objective of measuring the impact of SLG on household income, the estimation result provides statistically significant (P=.020) effect for the SLG intervention, which of course, is applicable to the beneficiary households. After controlling for pre-intervention differences in demographic, location, training and other characteristics of SLG beneficiaries and non-SLG beneficiaries, it was found that, using Average Treatment Effect (ATE); the SLG intervention has brought a difference of Birr 1,368.074 income over non-participants. By implication, PSM estimator model indicates that by applying other SLG intervention in a similar area, the program may yield or result at least Birr 1,368.074 income differences between beneficiaries and non-beneficiaries.

Table 13: Treatment effect estimation-on increased degree of confidence (N=131)

| | |
|--------------------------------------|------------------------------|
| Treatment-effects estimation | Number of observations = 131 |
| Estimator: propensity-score matching | Matches: requested = 1 |
| Outcome model : matching | min = 1 |
| Treatment model:logit | max = 2 |

| Status change/degree of confidence | Coefficient. | AI Robust Std. Err. | Z | p> z | [95% Conf. Interval] |
|---|--------------|---------------------|------|-------|----------------------|
| ATE Members (non-beneficiary vs. beneficiary) | .0916031 | .0287299 | 3.19 | 0.001 | .0352935 .1479127 |

Source: Own survey, February, 2016

As expected, ATE and ($p=.001$) result, as shown in the Table 13 above, involvement in SLG has significant impact in changing the social status, developing confidence and self-esteem behaviors. The involvement further motivates beneficiaries to strengthen participation, access to financial and social services from the group that ultimately helped them to increase their overall income and assets. This implies that households who are believed to be aware about the importance of SLG intervention had a high chance of joining the SLG. The participation subsequently facilitated access for financial and social services that enabled them to engage in micro-business initiatives. The engagement, in turn, generates income for households in a bid to improve their livelihood and welfare.

Table 14: Treatment effect estimation on increase of overall income (N=144)

| | | | |
|--------------------------------------|------------------------|---|-----|
| Treatment-effects estimation | Number of observations | = | 144 |
| Estimator: propensity-score matching | Matches: requested | = | 1 |
| Outcome model : matching | min | = | 1 |
| Treatment model:logit | max | = | 1 |

| Trends in overall income | Coefficient. | AI Robust Std. Err. | Z | $p > z $ | [95% Conf. | Interval] |
|---|--------------|---------------------|-------|-----------|------------|-----------|
| ATE Members (non-beneficiary vs. beneficiary) | -.944444 | .3018287 | -3.13 | 0.002 | -1.536018 | -.352871 |

Source: Own survey, February, 2016

The other important impact indicator which showed positive result was the trend in increasing the overall household income during the last 3 years since majority of the beneficiary households involved in SLG intervention. As expected, participation in SLG and engagement in different micro-business activities enabled them to record a positive significant outcome in the ATE ($p=.002$), which showed consistent rise and increasing of overall income. This implies that households who were believed to be hard-working with motives and dedications to come out of poverty have had a high chance of benefiting from the services of SLG intervention and the other extended supports obtained from solidarity group. This result showed consistency with other literatures and the hypothesis of this study as well.

Conclusion

The impact analysis of SLG intervention has indicated positive results on basic household economic conditions, such as, changes in income, in assets and living standards; improvement in health and education, and self-employment creation at household level. Similarly, empowerment of women in the family, increased social capital and self-confidence and impact on household economic as well as social improvement were observed. With regard to financial access, beneficiaries of SLG intervention had better access to bigger size loan and had gained experience to borrow money from their groups. The findings also revealed that there has been a significant increase in the household's disposable income and overall income during the last 3 years. Similarly, the intervention has significantly increased beneficiaries' engagement in micro-enterprise which was positively correlated with the increase in disposable income. Given the fact that the vast majority of the beneficiaries were women, the intervention enabled them to gain skills and knowledge that increased their confidence to involved in micro-enterprises and to generate additional disposable incomes.

In conclusion, it is important to state that organizations and government stakeholders who are concerned with SLG promotion and development as a means to household poverty reduction, should take into consideration the results of this study for better promotion of community based microfinance in general and CSSG in particular.

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