Journal of
Applied Sciences

Factors Influencing Participation and Credit Constraints of a Financial Self-Help Group in a Remote Rural Area: The Case of ROSCA and ASCRA in Kemang Village West Java

Lukytawati Anggraeni

Department of Agricultural and Resource Economics, The University of Tokyo,
1-1-1 Yayoi Bunkyo-Ku, Tokyo, 113-8657, Japan

Abstract: This study has investigated characteristics, participation and factors influencing probability of being credit constraint of two types of financial Self-Help Groups (SHG), ROSCA and ASCRA, in Indonesia. Both financial SHG can obtain more information that is only available inside a community to judge member creditworthiness. It is found that some households' individual characteristics and economic condition influence households' participation in ROSCA and ASCRA. In particular, being older, working as government employee and having higher education and steady income. Although, social sanction is a useful enforcement tools but it can cause internal credit constraint on socially active households. In ASCRA, households' health condition and having wedding celebration are good predictors of whether the committee will judge the applicant to be creditworthy. However, there is tendency misuse committee members' power by giving privileges to family and friends. It is also found that ROSCA reach poorer borrowers than ASCRA.

Key words: Characteristics, banana leaf, social participation, nepotism

INTRODUCTION

Despite the variety and coverage of microfinance in Indonesia, most of rural households had no access to saving and credit services from a semiformal or formal financial institution, even if they have a viable commercial enterprise (Charitonenko and Iswan, 2002). Poor access to credit correlates strongly with deficiency in income and lack of assets for collateral, generally land ownership (Pattern and Jay, 1991; Mizuno, 1996; Johnston and Jonathan, 2008). Most of them have to rely on informal sector, such as moneylenders, money keepers, financial arrangements tied to land, labor and traded goods, friends and relatives and financial self-help groups for financial intermediation. Third-party guarantees, tied contracts and threats to future access to credit are common devices in informal contracts (Adams and Fitchett, 1992; Holloh, 1996).

There is growing interest in the importance of financial Self-Help Groups (SHG) in developing countries since it sustain under social and geographic isolation and reported to have a very low default rate (Biggart, 2001). Bouman (1995) introduced two basic types of financial SHG with savings and lending as their primary function, those with rotating and those with nonrotating funds. The first type is widely known in the literature as ROSCA, for Rotating Savings and Credit Association. The second type is called as ASCRA, for Accumulating Savings and

Credit Association. Both types form an important part of all three main functions of self-help groups: security or insurance, financial and social.

ROSCAs have become a widespread phenomenon in rural and urban economics around the world (Ardener, 1964). A large number of Indonesia households, most particularly including women, have a strong tradition of participating in ROSCAs, widely known as arisan (Geertz, 1962; Varadhanarajan, 2004; Hospes, 1996; Kawagoe et al., 1992). In rural Java, nearly every village has an arisan group (Shigetomi, 2004). The number of arisans groups in Indonesia is estimated to be in the millions (Martowijoyo, 2007). Gertz (1962) believed arisan in rural areas has become more and more important as strictly economic institutions due to the intense need for a cash resource.

Van-den-Brink and Jean-Paul (1997) stated that ROSCA is an association of men and women who meet at regular intervals and distribute a lump sum of money to one of its member. Loan is automatically distributes by rotation among ROSCA members thus generates incentive problems. The prospect of participating in future cycles of the ROSCA and social sanctions by the other members of the group are tools to decrease opportunistic defection (Besley and Alec, 1996; Ardener, 1964). Enforcement is also possible through exclusion, allocation of ranks and membership fee (Anderson et al., 2008).

ASCRA is another endogenous financial SHG that has developed in rural Indonesia, which known as simpan

pinjam (Soemardjan, 1963; Shigetomi, 2004). ASCRAs resemble credit unions. The pooled savings are kept in custody and accumulated for a specified time, then redistributed to members. The common period is one year, so it can meet member demand for paying taxes, education, a religious ceremony, or social activities (Bouman, 1995). Loans from ASCRAs require a decision from a loan committee or the consent of members. However, most of study on ASCRA in Indonesia focused on loan-subsidized group by government or NGO rather than indigenous one (Seibel and Uben, 1992; Ismawan, 2000).

There is still limited information regarding a group's characteristics and credit constraint problems of financial SHG, especially in remote areas in Indonesia, although such information can result in a better understanding of a household's participation and development of financial SHG. The earlier literature of financial SHG in Indonesia subsequently addressed questions of efficiency and effect regarding ROSCA or ASCRA by ignoring factors that influence individuals to participate in the first place. By taking institutional characteristics into consideration, social-based information should be discussed, since both ROSCA and ASCRA belong to local level community associations.

The crucial assumption regarding financial SHG participant is that individuals are credit constraint by formal institutions (Besley *et al.*, 1993; Handa and Claremont, 1999). In contrast, Varadhanarajan (2004) found the opposite condition for Indonesia case. However, there is limited information of credit constraint by financial SHG although it able to gain and utilize information from community to decide member creditworthiness. Zeller (1994) found that similar with formal institutions, informal lender might consider wealth and leverage ratio as criteria for credit rationing. Schreiner and Geetha (1998) study found that being female and having borrowed from other informal lenders are good predictors of being creditworthy by ROSCA or ASCRA.

This study will concentrate on development financial SHGs in a remote upland village in West Java since most households living in geographically isolated areas have poorer access to formal financial institutions due to collateral requirements and high transaction costs. Most of rural households in West Java are excluded from formal credits market since only 14% of land has land title. The objectives of the study are: to determine factors to promote rural household participation in ROSCAs or ASCRAs and to determine factors influencing households probability to receive credit rationing from ROSCAs or ASCRAs.

MATERIALS AND METHODS

Research area: Research was conducted in Kemang Village, which is a mountainous area in the Eastern end of the valley of the Bojong Picung sub-district of Cianjur, West Java. It lies 25 km Southeast of the district capital. The village area is 2,529 ha and is divided into 22 hamlets (kampong). Access to Kemang Village is limited since public transportation only reaches the nearest village and then continues by motorcycle or walking. Other than this main road, there is only a footpath is connecting hamlets up to higher and hilly areas.

Kemang village represents the upland area that is surrounded by the National Forest Land (NFL). Of the total village area of 2,529 ha, 44% of it belongs to national forest land. The land that belongs to the people of Kemang consists of 87.8 ha rice fields or sawah (4%) and 878.6 ha dry land or pasir. Rice production is cultivated twice a year but mainly for self consumption. Meanwhile in the dry land area, most of the households are engaged in a huma-talun system (Mugniesyah and Mizuno, 2007), a typical agroforestry system in the Sundanese community in West Java in which people cultivate the land with a mixture of annual and perennial plants. The commercialization of dry land commodities contributes more cash income than paddy production (Tsujii, 2002). The cultivated commodities on dry land are Banana (*Musa* sp.), red rice (*Oryza sativa*), sugar palms (*Arrena pinnata*), cassava (*Manihot esculenta*), pepper (*Piper nigrum*), Sengon (*Albazia falcata*), maize (*Zea mays*), vegetables and fruits trees.

Increasing market demand for banana leaves for wrapping food in urban areas increased banana leaf production by 30% per year during 1998-2003. The topographical condition gave advantage to banana leaf quality since less wind creates fewer cuts on the banana leaves. Banana leaf production is accessible to all households. The middle and the landless households can cultivate the national forest land through temporary agreement with the state forestry corporation (informal rights) or even illegal cultivation (Inoue *et al.*, 2003). In addition, the patron-client relationship creates opportunities for them to work in the harvesting and transporting of banana leaves for the upper stratum households. The more remote the dry land is, the higher is the share obtained by the laborers (Mugniesyah and Kozuke, 2007).

Banana leaf production delivers regular cash income since it is harvested about eighteen times a year, using about a week each time. Farmers can choose to sell banana leaves either to hamlet or village traders by

considering the most convenient place, kinship relation, or patron-client relationship with traders. Despite the fact that the banana leaf marketing structure in the Kemang village is an oligopsony (Asmarantaka *et al.*, 2003) traders maintain a marketing network with farmers by giving gifts, supporting social activities and improving public facilities (roads and Islamic boarding school or pesantren).

Data and respondents: This study uses primary data collected from in-depth interviews of upland households in two adjacent hamlets, Beber and Cikupa. These two hamlets are in the central part of Kemang Village, where public services facilities such as a primary and secondary school, village office, etc. and economic activities are located. First, the household socioeconomic survey and interview of key informants related to ROSCA and ASCRA development were conducted in 2003 and 2005. Second, an intensive survey regarding households' savings and credit access from both formal and informal financial institutions was conducted in July-August 2006 and September-October 2007. The primary data on households' individual characteristics, landholding, assets, income, expenditure and households memberships in local institution were collected.

The households sample consists of 74 households or 44.8% of the total households in the two hamlets. The households were stratified into 4 strata based on two criteria: (1) ownership value of their rice field and (2) ownership value of their dry land. Stratum A has land value of more than 56 million, stratum B between 28-56 million, stratum C less than 28 million and stratum D is landless.

Households participation in financial self help group and credit constraints: A two stage analysis is needed to determine the factors influencing the development of the financial SHG in rural Indonesia: (1) identifying factors influencing rural household participation and (2) identifying factors influencing rural households faced credit constraint from financial self help group.

Model of participation in financial self help group: Households' participation on ROSCA and ASCRA shows demand for credit and access to an informal credit market. ROSCA participation means creditworthiness since every member received equal credit. However, participation to ASCRA not necessarily means credit access since their credit application will be decides by groups committee.

The logit model is used to estimate factors influencing households to participate in ROSCA or ASCRA. The dependent variables have binary values of 0 if not participate and 1 if participate. The following equation is used to estimate the probability of joining ASCRA or ROSCA:

$$\text{Prob (Participation)} = F (I, H, S, W, E) \qquad (1)$$

Where:

I	=	Vector of individual characteristics of households affecting participation to financial SHG (age (+), education (+), sick days (+), being a government employee (+), having non-steady income (+))
H	=	Vector of endowment in human capital (education (+), dependent (-))
S	=	Participation in social activity (S (+) measuring membership and position in local association)
W	=	Vector of household assets (rice field and dry land value)
E	=	Vector of household events that are expected to affect participation in financial SHG (costly social events such as marriage (+))

Household's characteristics, asset, type and income and social network in local associations are considered to influence participation of financial SHG. Type of income identified by share of agricultural income (exclude banana leaves income), brown sugar and labor may influence decision to participate. Households consider having non steady income if share of agricultural income is higher than 50% of total income.

Local associations included in the indicator are women's groups, Koran reading groups, water management groups, sports groups, youth groups, brown sugar farmers groups, forest farmers groups, groups for education, pension groups, teacher groups and village development groups. Social participation index estimate by this following equation:

Social participation index = Σ Household membership in local association×positions×meeting in the last three months $\qquad (2)$

Model of credit constraint: Credit constraint identifies directly from the households' surveys by asking whether households consider themselves to be credit constrained by using a carefully designed credit questionnaire (Zeller, 1994; Sawada *et al.*, 2006). To identify credit constrained households, first households were asked whether they have applied for credit in the last two years. Among those who apply for credit, households were identified as unconstrained if they received as much credit as they

requested. Meanwhile, households were considered external credit constrained if their loan application was rejected or they could not borrow sufficiently.

Second, for those who did not try to borrow, respondents were asked why they did not apply for financial SHG credit in order to further classify them. Households were identified as being unconstrained if the answer was no need for credit. Respondents were identified as being internal credit constrained if:

- They already had a large amount of debt
- They believe credit application will be refused
- They do not know anyone who could be a guarantor
- They do not know how to get credit or do not know any SHG
- They feel ashamed to ask for credit
- They are afraid to apply for credit

The logit probability model was used for both the external and internal credit constrained, since the dependent variable has a binary value. In the external credit constraint, the dependent variable has binary value of 0 if the household's credit application was not rationed or rejected or 1 if it was rationed/rejected. The following equation is used to estimate the probability of households receiving an external credit constraint:

$$\text{Prob (External credit constrained)} = F (I, H, S, W, E, R) \tag{3}$$

Meanwhile, the following equation is used to estimate the probability of households having internal credit constraint:

$$\text{Prob (Internal credit constrained)} = F (I, H, S, W, E, R) \tag{4}$$

Where:

I = Vector of individual characteristics of households affecting the committee financial SHG decision on the loan application (age (-), education (-), sick days (+), working as government employee (-), having non-steady income (+))

H = Vector of endowment in human capital (education (-), dependent (+)

S = Participation in social activities (-)

W = Vector of household assets (rice field and dry land value (-), total income (-))

E = Social event that required high expenditure (wedding celebration (-))

R = Vector of repayment ability variables (ratio of debt over last year's income (+))

RESULTS AND DISCUSSION

Kemang households' income and demand for mutual financial institutions: Table 1 shows the income structure of respondent households according to strata. Household's income calculation excludes irregular incomes such as gifts, remittances and government subsidies. The average households' total income grew 1.5% from 14.8 million IDR in 2006 to 15 million in 2007. All households in Kemang village regardless their landholding conducts pluriactivity. The non-agricultural activities have a significant contribution to total income, especially for the highest stratum (stratum A) and the landless (stratum D). Meanwhile, agricultural income still plays a major role in the middle (stratum B) and the low (stratum D) stratum households' total income.

Agricultural income is closely related with economic and employment opportunities in highland farming. Income from wet rice farming, agricultural labor, palm sugar, livestock and banana leaves production varies according by stratum. There is tendency that larger landholding implies to higher agricultural income. Rice farming, which produces twice a year, is mainly for self consumption. The highest stratum produces the most.

Table 1: Average total income by stratum in Kemang Village, 2006-2007

Source of income	Average total income (000 IDR)				
	Stratum				
	A	B	C	D	Total
Year 2006					
Agriculture	8,141	7,076	5,025	2,717	6,160
Rice	4,312	1,419	954	0	1,437
Banana leaf	2,676	4,085	2,642	1,607	3,327
Other commodities	264	87	6	208	86
Wood	820	183	93	213	230
Livestock	0	173	303	250	220
Palm sugar	69	1,127	569	270	621
Agricultural labor	0	2	459	170	239
Non-agriculture	19,474	4,561	4,595	4,605	8,633
Processing	2,688	39	689	405	754
Trade	7,598	675	1,305	1,755	3,276
Salary	7,143	3,226	1,551	2,363	2,865
Services	1,924	503	711	83	712
Others	121	118	338	0	1,026
Total	27,615	11,636	9,620	7,322	14,793
Year 2007					
Agriculture	10,450	8,188	6,427	4,402	7,144
Rice	4,768	2,090	990	78	1,709
Banana leaf	3,815	4,175	2,856	2,675	3,064
Other commodities	1,231	439	277	126	435
Wood	420	237	184	463	261
Livestock	0	139	91	668	327
Brown sugar	216	960	1,683	0	1,099
Agricultural labor	0	149	346	392	249
Non-agriculture	20,900	5,403	5,409	4,297	7,871
Processing	10	158	446	554	319
Trade	9,097	736	2,388	1,626	2,683
Salary	8,380	3,970	1,930	2,079	3,663
Services	2,194	477	427	0	914
Others	1,219	62	218	38	292
Total	31,350	13,591	11,836	8,698	15,015

Table 2: Households participation in ROSCA and ASCRA by stratum, 2006-2007

Stratum	ROSCA		ASCRA	
	2006	2007	2006	2007
A (n = 11)	4 (36)	1 (9)	9 (82)	9 (82)
B (n = 20)	8 (40)	14 (70)	11 (55)	11 (55)
C (n = 35)	16 (46)	20 (63)	18 (51)	21 (60)
D (n = 8)	3 (38)	2 (25)	2 (25)	2 (25)
Total	30 (41)	37 (50)	40 (54)	43 (58)

Number in parentheses is participation rate (%). ROSCA in kind is excluded due to low sustainability

Dry land delivers higher income than rice fields for all stratum households. The commercialization of banana leaves delivers regular cash income since it can be harvested 18 times per year. Another important source of income from dry land is palm sugar, especially for middle and low stratum households (B and C). Other commodities produced from dry land are peppers, red rice, peppers and fruits.

In terms of non-agricultural income, households from high and low strata conduct different types of off-farm activities. Some households from upper strata (A and B) generate income by working as government employees (teachers or pensions), banana leaf traders, or providing rice milling service. Meanwhile, the lower strata (C and D) generate income from trading (timber trading, grocery stores), industrial labor and motorcycle taxi services (ojek).

Growing economics activities after a boom of banana leaf production increase demand for saving and credit services. The geographically isolated location of Kemang village constitutes a natural barrier to access formal financial institutions. This situation encourages Kemang households to utilize their networking and develop financial SHG. Table 2 shows an interesting pattern of household participation in informal credit markets. There is a tendency for higher stratum households to have higher participation in ASCRAs. In contrast, the middle and the low stratum households have a tendency to participate in ROSCAs. However, the landless have little access to both ROSCAs and ASCRAs, since participation is possible only if they have surplus income. Especially for ROSCA, participation requires a regular cash income flow.

Household Access to ROSCA in Kemang Village: The development of ROSCA or arisan in Kemang Village is highly influenced by upland farming activities. Unlike the characteristics of ROSCA described in the earlier, the ROSCA in Kemang Village shifted into a prominent economic association. As banana leaf and brown sugar production required intensive labor work, most ROSCA groups conduct no regular meeting. All groups apply a fix

order of lots or called kocok mati in the local language. The order of lots was made by member negotiation rather than a bidding auction under a manager's leadership. However, it is opens to change in case one of the members experiences a sudden misfortune such as illness or death.

The managers, who are largely managers by profession, have an important role in ROSCA. They are in charge of screening potential members, collecting and distributing the fund. They are also responsible for smoothing out problems and compensating for any loan default. In return, they have the benefit of receiving the first lot and commission. This potential benefit has increased competition among managers by offering different size, duration, or commission rule. In the Beber hamlet, almost all groups have a fixed rule on commission (one or half lot payment). However, all groups in Cikupa agree to give commission based on each member's willingness to pay. In both hamlets, there is no case of managers give loans to needy members by charging interest.

There is a relationship between membership and frequency. Short frequency ROSCA has more group members. Weekly ROSCA has a bigger membership than that of the monthly ROSCA (20-80 people compared to 12-21 people). Further characteristics among ROSCA groups in Kemang village are shown in Table 3.

Unlike earlier study, which highlighted a social function for meeting especially among women, only a small number of groups formed based on similarity of gender, kinship and occupation. ROSCA members are mostly close acquaintances and know each other through daily interaction, especially through religious activity in the mosque. It is not only popular among women since most ROSCA groups consist of mixed gender members. The exclusive women's groups are based on residential propinquity or common association (Koran reciting group, health group). Meanwhile men exclusively groups are based on occupation similarity (taxi driver service (ojek)).

Table 4 shows the different functions of ROSCA by. Weekly ROSCA is mostly used for smoothing consumption as a security against fluctuation of expenditure, especially for celebrating the end of Ramadan (lebaran), facing health problems, paying education fees and others. Meanwhile, monthly ROSCA has the potential to contend capital scarcity problems, since it provide credit for productive activity. It provides capital for agricultural production and land mortgage.

ASCRAs in Kemang Village: ASCRAs were first developed by a few elementary school teachers in Kemang to provide credit and saving services. Although,

Table 3: Characteristics of ROSCA groups in Kemang Village, 2006-2007

Variables	Groups														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Frequency															
Weekly	○	○	○	○	○	○	○	○							
2 weekly									○						
Monthly										○	○	○	○	○	○
Value of lot 000 IDR)	3.5	3	5	10	10	10	20	20	20	50	50	100	100	100	100
No. of member	20	39	80	25	40	40	32	53	24	12	20	12	14	14	21
Total value (000 IDR)	70	117	400	250	400	400	640	1060	480	600	1000	1200	1400	1400	2100
Level															
Neighborhood	○	○	○	○	○										
Hamlet/Kampong						○	○	○		○	○	○	○	○	○
Village									○						
Kinship	○						○								
Gender	Mix	Mix	M	F	F	Mix	Mix	Mix	M	F	F	Mix	Mix	Mix	Mix
Occupation		○					○		○		○		○		

Group 1-7 are weekly ROSCA. Group 8 is a bi-weekly ROSCA. Group 9-15 are monthly ROSCA

Table 4: ROSCA function by frequency and stratum, 2007

	Weekly ROSCA		Monthly ROSCA	
Functions	No. of HH	Percentage	No. of HH	Percentage
Consumption	11	48	3	19
Production	6	26	5	31
Mortgage	2	9	4	25
Others	4	17	4	25
Total	23	100	16	100

Table 5: Function of ASCRA credit in Kemang Village, 2007

Functions	No. of households	Percentage
Consumption	10	32.3
Production	12	38.7
Investment	4	12.9
Mortgage	3	9.7
Others	2	6.4
Total	31	100.0

at the group had homogenous members, it developed into heterogeneous group after membership become open to the Kemang community. There are two ASCRA groups currently active in Kemang Village. The first group was started in 1983 and is named Silih Asih, which means to take care of each others. The second group, Simpay Wargi, means bond of family and was started in 1986. The membership is basically spread through kinship, friendship and working relationships. Both ASCRAs groups have large memberships of more than 100.

ASCRA is similar to a credit union. The fund accumulates over time, allowing members to take short- and long-term loans. Both groups are charged a high loan interest of 36% per year. The credit terms can be extended under negotiation with the committee. The savings and credits transactions make fund grow fast and deliver good rewards to the saver. The profit is distributed in an annual meeting: committee (15%), bookkeeping (10%) and distributed profit for member (75%). ASCRA has a social function since the profit distribution allows members to celebrate Ied (lebaran) and Independence Day (August 17).

Members usually apply for loans in the annual meeting. They can borrow more money than their savings, which potentially causes liquidity problems to the groups. There is no written contract and collateral requirement for a credit transaction, even for large and long-terms credits. However, loans from ASCRA are not automatic since they require approval from a board of loans committee. This

system may cause inequality credit access among members since the committees give priority to their inner circle committees (relatives and teachers).

Table 5 shows the function of ASCRA credit to member applicants. ASCRA is able to deliver credit for productive activities. It can provide larger loans under long-term contracts so that members are able to mortgage and even buy dry land. However, credit is also important for consumption purposes since, a third of credits were utilized for celebrating wedding ceremonies and paying medical expenses.

Both groups have imperfect information problems in fund management. Members have limited information about committee decision on loan distribution and safekeeping. As the group grows bigger, the committee decides to deposit part of the fund in a local semiformal bank to reduce safekeeping risks. Few members reported receiving credit constraint. There is tendency of misuse of power by the committee member by giving loan privileges to teachers and close relatives. Both groups are having serious liquidity problem because loan default and loan term extension. As a result, committees have to reject or only partially approved credit applications. In addition, members unable to withdraw their savings in under short notice. Both credit rationing and withdrawal problems thus deteriorated member trust of the committee, especially by those who received credit constrained. Table 6 shows the decreasing number of membership in both groups over the last four years.

Table 6: Development of membership, savings, credit and distributed profit of ASCRA in Kemang Village, 2000-2007

| | First group (Silih Asih) | | | | Second group (Wana Wukti) | | | |
| | People | Million IDR | | | People | Million IDR | | |
Years	Members	Savings	Credit	Profit	Members	Savings	Credit	Profit
2000	na	na	na	na	51.0	13.5	na	3.5
2001	na	na	na	na	77.0	29.1	na	6.2
2002	na	na	na	na	101.0	53.3	40.7	14.3
2003	na	na	na	na	100.0	74.7	58.0	19.6
2004	171.0	57.7	57.1	19.09	143.0	85.7	79.8	28.4
2005	174.0	52.5	52.3	16.44	136.0	92.1	74.3	19.7
2006	140.0	53.4	43.6	11.63	138.0	87.2	69.7	20.9
2007	129.0	51.4	46.8	6.10	117.0	80.8	78.1	20.3
Growth (%)	-8.5	-3.7	-5.9	-30.50	15.1	35.5	15.8	37.5

Field survey (2005-2007)

Participation in financial self help groups and credit constraint problems: Households' participation in borrowing depends on their access to financial SHG and demand for credit. A further explanation will divide households experienced in ROSCA and ASCRA. The first section will describe factors influencing households to participate in any financial groups. The second section will describe factors influencing credit constraint of Kemang households. There are two types of credit constraint, external and internal. Households are identified as external credit rationing if they receive a rejection or partial ration loan from ASCRA or ROSCA (supply side). Households were questioned about how much they asked to borrow and whether it was from financial groups approved or rationed by their lender. Meanwhile, internal credit rationing occurs when households decide not to apply for credit, since they perceive no chance for receiving any credit, so they find it not even worth trying.

Participation in ROSCA and credit constraint

Participation in ROSCA: ROSCA mainly functions as an economics institution, providing credits for consumption and production activities. Here, we try to determine the factors influencing households to participate in this institution.

Table 7 shows factors influencing households to participate in ROSCA. First, the age of the household head has a significant influence on their probability of participating in ROSCA. Households with older household heads are more likely to join ROSCA since they presumably have more control on household resources. This relationship is declining, however, with higher age. The average head of household's age who participates in ROSCA is 47 years. Second, households with higher household head education have a higher probability of participating in ROSCA. They might have better knowledge to anticipate fluctuation of income and expenditure in agricultural economies. Third, total income has indifferent influence on households' participation in

Table 7: Factors influencing households participation in ROSCA

Variables	B	SE	Wald	df	Sig.	Exp. (B)
Age	0.257	0.151	2.895	1	0.089*	1.294
Age 2	-0.003	0.001	3.878	1	0.049**	0.997
Education	0.212	0.119	3.175	1	0.075*	1.236
Dependent	0.050	0.136	0.137	1	0.711	1.052
Sick day	-0.001	0.003	0.126	1	0.722	0.999
D_gov employee	0.617	0.699	0.781	1	0.377	1.854
Total income	0.000	0.000	3.106	1	0.078*	1.000
D_wedding	0.053	0.568	0.009	1	0.925	1.055
Participation_index	0.000	0.001	0.315	1	0.574	1.000
D_non-steady income	-0.775	0.450	2.972	1	0.085*	0.461
Rice land value	0.000	0.000	0.079	1	0.779	1.000
Dry land value	0.000	0.000	0.231	1	0.630	1.000

N = 148; Chi-square = 41.1; Percentage correctly predicted = 66.9; ***Significant at $\alpha = 1\%$, **Significant at $\alpha = 5\%$, *Significant at $\alpha = 10\%$

ROSCA. The middle stratum household has same opportunity to participate in ROSCA regardless of their total income value since they can select groups with suitable frequency, management fee, or lot value. The highest stratum households might believe ROSCA does not deliver suitable financial intermediation for them. Meanwhile, the lowest stratum might be reluctant to participate due to a low surplus and irregular income. Fourth, households with non-steady income, proxied by a higher percentage income derived from agricultural activities excluding banana leaf income, has a lower probability of participating in ROSCA. ROSCA participation required regular cash income since each member contributes equal and regular payment. Households having non-steady income are less likely to participate in ROSCA to avoid loan default.

Credit constraint in ROSCA participation: In ROSCA, external credit rationing is not taken into consideration. There is no case of households being rejected to join ROSCA. Managers have a tendency to invite members based on trust and collective obligation. However, managers are able to conduct partially credit rationing by rationing the number of lots in future ROSCA circles, though this rarely happens. Among non participants, we questioned internal reasons not to borrow/join ROSCA.

Table 8: Factors influencing household of being internally credit constraint from ROSCA

Variables	B	SE	Wald	df	Sig.	Exp. (B)
Age	-0.300	0.147	4.160	1	0.041**	0.741
Age 2	0.003	0.001	4.786	1	0.029**	1.003
Education	0.000	0.125	0.000	1	0.997	1.000
Dependent	-0.055	0.149	0.135	1	0.713	0.947
Sick day	-0.001	0.003	0.119	1	0.730	0.999
Total income	0.000	0.000	0.892	1	0.345	1.000
D_non-steady income	0.455	0.452	1.012	1	0.314	1.575
Participation_index	0.002	0.001	4.102	1	0.043**	1.002
D_wedding	0.381	0.620	0.377	1	0.539	1.463
D_gov_employee	-2.184	0.881	6.147	1	0.013**	0.113
Rice field_value	0.000	0.000	5.171	1	0.023**	1.000
Dry land_value	0.000	0.000	0.004	1	0.947	1.000
Constant	7.052	3.841	3.371	1	0.066	1154.658

N = 148; Chi-square = 40.2; Percentage correctly predicted = 73.6; ***Significant at α = 1%; **Significant at α = 5%; *Significant at α = 10%

Table 9: Factors influencing household's participation in ASCRA

Variables	B	SE	Wald	df	Sig.	Exp. (B)
Age	-0.091	0.131	0.480	1	0.489	0.913
Age 2	0.001	0.001	0.533	1	0.465	1.001
Dependent	0.060	0.130	0.214	1	0.643	1.062
Education	0.029	0.106	0.075	1	0.784	1.029
Sick day	0.004	0.004	1.210	1	0.271	1.004
Participation_index	0.001	0.001	2.106	1	0.147	1.001
Total income	0.000	0.000	0.056	1	0.814	1.000
D_Non-steady income	-0.681	0.435	2.454	1	0.117	0.506
Rice field value	0.000	0.000	0.063	1	0.802	1.000
Dry land value	0.000	0.000	0.016	1	0.900	1.000
D_gov_employee	2.056	0.840	5.986	1	0.014**	7.816
D_wedding	0.299	0.561	0.283	1	0.595	1.348
D_burial	0.979	0.734	1.781	1	0.182	2.663
Constant	1.585	3.472	0.208	1	0.648	4.878

N = 148; Chi-square = 27.5; Percentage correctly predicted = 64.4; ***Significant at α = 1%; **Significant at α = 5%; *Significant at α =10%; Chi-square = 27.5

Households can be identified as credit constrained if their answers are (1) we already have enough debt and (2) we are afraid we cannot make a regular contribution.

Table 8 shows factors determine households of being credit internal constrained from ROSCA. There are three factors significant influencing households' probabilities of being credit constraint. First, older households head has lower probability of being internal credit-constrained. Older households head presumably have better control over household's resources. However the relationships increase with higher age. Second, of households head work as government employee are less likely of being credit constrained by ROSCA. They earned relatively steady cash income from salary so able to fulfill regular money contribution. Third, in contrast with present hypothesis, social participation has positive influence with credit constrained. Households that participate in many social activities in the community are more likely to be internal credit constrained. They were reluctant to participate in ROSCA since it becomes a strictly economic institution but utilizes social sanctions for default enforcement. Households living in a close tied community have incentives to keep their social reputation and responsibility in the community. Fourth, rice field value has indifferent influence on a household's probability of being credit constrained. Rice fields deliver no cash income since rice production mainly for self consumption.

Credit access and credit rationing from ASCRA

Participation in ASCRA: As stated before, there are two developing ASCRA groups in Kemang Village. Table 9 shows factors influencing a household's decision to participate in ASCRA. There is only one variables significantly influence households to join ASCRA. Households with the household head working as government employee have a higher probability of participate in ASCRA. Historically, a teacher has higher access to join ASCRA, since it first developed among teachers to increase their family welfare. Membership has increased through kinship relations by recruiting the inner circles families of teachers. ASCRA committees, which belong to the highest stratum households, also utilize patron client relationships to recruit members from the lower stratum households. Nowadays ASCRA groups develop have large and heterogeneous memberships.

Credit constraint in ASCRA: In this study, among 76 credit applications, 54 households were identified as non credit constrained and 22 households were identified as externally credit constrained (16 partially granted, 6 get rejected). Internal credit rationing was identified among non-borrower households that decided not to apply for credit since they felt no chance of receiving credit. In non-borrowing households, 12 households were identified as unconstrained and 60 households were identified as internal credit constrained.

Table 10 shows the factors influencing the probability of receiving external and internal credit constraint from ASCRA. There are three factors significantly influencing households' probability of being externally credit-constrained. First, households with a poor health condition, proxied by high number of sick days, are more likely to be perceived as externally credit constrained by ASCRA. Although, some households first, decide to join ASCRA for insurance during poor health, unfortunately their loan applications get rejected. The committee might consider them risky borrower since households have to pay high medical costs under income fluctuation. Second, households who celebrated a wedding have a lower probability of receiving credit constraint. Wedding celebrations are only held by well-off family member show economic power and maintaining the family reputation. The ASCRA manager may approve loan applications since wedding celebrations potentially generate income from family and quests. Third,

Table 10: Determinants of being externally and internally credit-constrained by the ASCRA group (logit estimate)

Variables	External credit-constrained		Internal credit-constrained	
	B	Exp. (B)	B	Exp. (B)
Age	0.246	1.279	0.167	1.182
Age2	-0.003	0.997	-0.001	0.999
Dependent	-0.095	0.909	0.168	1.183
Education	-0.143	0.867	0.203	1.224
Sick days	0.012	1.012**	-0.002	0.998
Participation_index	0.001	1.001	0.000	1.000
Total income	0.000	1.000	0.000	1.000***
D_Non-steady Income	-0.819	0.441	0.891	2.438
Rice field value	0.000	1.000	0.000	1.000
Dry land value	0.000	1.000	0.000	1.000*
D_gov employee	-20.253	0.000	-1.181	0.307
D_wedding	-3.589	0.028*	1.346	3.842
Savings	0.000	1.000*	0.000	1.000***
Credit_income ratio	1.945	6.991	-10.644	0.000***
Constant	-6.322	0.002	-4.844	0.008

For external credit-constrained: N = 148, Chi-square = 32.4, Percentage correct = 89.2, For internal credit-constrained: N = 148, Chi-square = 114.1, Percentage correct = 87.8. ***Significant at α = 1%, **Significant at α = 5%, *Significant at α = 10%

households saving accounts have indifferent influence on households' probability of being credit constrained. This result supports the issue of misuse of funds by powerful committee members. There is a tendency that family and members with strong connections to the committee have privilege to borrow much more money than their savings account under long term contracts. On the other hand, among big savers, widows and households with poor health may receive credit rationing.

Meanwhile, internal credit rationing was influence only by the ratio of debt over last year's income as a proxy of repayment ability. Households with a higher ratio have a higher probability of hesitance in applying for credit from ASCRA. Households might feel reluctant to apply for credit unless it generates income since they are charged a high interest rate. In addition, they perceive no chance of receiving any credit before returning all debt, so they might feel it is not even worth trying. Savings accounts and total income have indifferent influence on the probability of receiving any credit constraint. Households have the same opportunity of being credit constrained regardless of their savings. Meanwhile, total income may not be useful as a factor to consider a household internally credit constrained. Regardless of their total income, households might have the same probability of not applying for credit.

CONCLUSIONS

A financial SHG in a geographically isolated area can replace a limited coverage of government agencies to provide financial services for rural households with low

income and lack of collateral. Both ROSCA and ASCRA strictly perform an economic function and are highly influenced by upland farming activities. As informal institutions, financial SHG can obtain more information that is only available inside a community to judge member creditworthiness. However, a household's decision to participate in a financial SHG influences by the characteristic of the group itself.

ROSCA is built among close acquaintances with different kinship, gender and occupational background. Banana leaf production played an important role in ROSCA's development. Despite the fact that ROSCA participation required equal and regular fund contribution, it is possible for middle and lower strata to participate in ROSCA after they have a steady income from commercialization of banana leaves. Households socially active in the community may conduct internal credit rationing by reluctant to participate in ROSCA to maintain their social reputation, since ROSCA only perform economics functions by utilizing social sanctions as enforcement tools.

ASCRA members mostly come from the highest and middle stratum households that work as government employees since it historically developed among teachers. It creates a misuse of power among committee members by giving privileges to close family and friends. In contrast with formal institutions, committees are able to obtain member health condition and information regarding wedding celebrations as a proxy for economic and social power information to decide on loan applications. Members with low repayment ability may encounter internal credit constraints.

REFERENCES

Adams, D.W. and D.A. Fitchett, 1992. Informal Finance in Low-Income Countries. Westview Press, Boulder, ISBN: 0-8133-1504-2.

Anderson, S., J.M. Balland and K.O. Moene, 2008. Enforcement in informal saving groups. J. Dev. Econ. 10.1016 jdeveco. 2008.09.003

Ardener, S., 1964. The comparative study of rotating credit associations. J. R. Anthropol. Inst. Great Britain Ireland, 94: 201-229.

Asmarantaka, R.W., S. Hartoyo, S. Sugiah, M. Mugniesyah and K. Mizuno, 2003. Analysis of rice farming production and agricultural product marketing (A case study in an Upland Village, West Java). Proceedings of 2nd Seminar for JSPS-DGHE Core University Program in Applied Biosciences, Toward Harmonization Between Development and Environment Conservation in Biological Production, Feb. 15-16, The University of Tokyo, pp: 289-304.

Besley, T., C. Stephen and L. Glen, 1993. The economics of rotating savings and credit associations. Am. Econ. Rev., 83: 792-810.

Besley, T. and L. Alec, 1996. The role of informal finance in household capital accumulation: Evidence from Taiwan. Econ. J., 106: 35-39.

Biggart, N.W., 2001. Banking on each other: The situational logic of rotating saving and credit associations. Adv. Qualitative Organiza. Res., 3: 129-153.

Bouman, F.J.A, 1995. Rotating and accumulation savings and credit associations: A development perspective. World Dev., 23: 371-384.

Charitonenko, S. and A. Iswan, 2002. Commercialization of Microfinance: Indonesia. Asian Development Bank, ISBN: 9715614191.

Geertz, C., 1962. The rotating credit association: A middle rung in development. Econ. Dev. Cult. Change, 10: 241-263.

Handa, S. and K. Claremont, 1999. The economics of rotating savings and credit associations: Evidence from the Jamaican partner. J. Dev. Econ., 60: 173-194.

Holloh, D., 1996. Financial system development and local financial institutions in Indonesia: Introduction and selected bibliography. Financial system development and local financial institutions in Indonesia: Introduction and selected bibliography.

Hospes, O., 1996. Women's Differential Use of ROSCAs in Indonesia in Money-Go- Rounds: The Importance of ROSCAs for Women (Cross Cultural Perspectives on Women). Berg Publishers, UK., ISBN-10: 1859731708, pp: 127-148.

Inoue, M., T. Yuuki, S. Siti and M. Mugniesyah, 2003. Hillside forest land as a safety net for local people in a Mountain Village in West Java: An examination of differences in the significance of national and private lands. J. For. Res., 8: 95-101.

Ismawan, B., 2000. Micro-finance, Poverty and social capital: A case study on the impact of economic intervention. Proceedings of the Asian Regional Conference on the Potential and Limitation of Economic Initiatives in Grassroots: Development-Current Issues and Asian Experiences, Nov. 27-30, BRAC Center for Development Management, Rajendrapur, Bangladesh.

Johnston, D. and M. Jonathan, 2008. The unbanked: Evidence from Indonesia. The World Bank Econ. Rev., 22: 517-537.

Kawagoe, T., O. Kunio and B. Al-Sri, 1992. Collective actions and rural organizations in a peasant economy in Indonesia. Dev. Econ., 30: 215-235.

Martowijoyo, S., 2007. Indonesia microfinance at the crossroads: Caught between popular and populist policies. The Essays on Regulation and Supervision, No. 23, The Microfinance Regulation and Supervision Research Center.

Mizuno, K., 1996. Rural industrialization in Indonesia: A case study of community-based weaving industry in West Java. Dev. Econ., 34: 114-119.

Mugniesyah, S.S.M. and M. Kozuke, 2007. Access to land in Sundanese community: A case study of upland peasant households in Kemang Village, West Java, Indonesia. Southeast Asian Studies, 14: 519-544.

Pattern, R. and R. Jay, 1991. Progress with Profit: The Development of Rural Banking in Indonesia. International Center for Economic Growth, San Francisco.

Sawada, Y., K. Kensuke, F. Nobuhiko, I. Seiro and K. Takashi, 2006. On the mother and child labor nexus under credit constraints: Finding from rural India. Dev. Econ., 4: 465-499.

Schreiner, M. and N. Geetha, 1998. Predicting creditworthiness with publically observable characteristics: Evidence from ASCRAs and RoSCAs in the Gambia. Savings Dev., 22: 399-414.

Seibel, H.P. and P. Uben, 1992. Linking Formal and Informal Finance: An Indonesian Example. In: Informal Finance in Low Income Countries, Adams, D.W. and A.A. Fitchett (Eds.). West View Press, Boulder, ISBN: 0-8133-1504-2.

Shigetomi, S., 2004. Institutionalization of people's self-organizing actions for rural development: Comparative analysis of micro-finance organizations in rural Thailand, Philippines and Indonesia. Report of Asian Productivity Organization Seminar in Role of Rural Communities and Institution in Integrated Rural Development Held in Islamic Republic of Iran, June 15-20, 2002 (ICD-SE-3-01), pp: 97-119. http://www. apo-tokyo.org/projreps_acd/04_ICD-SE-3.

Soemardjan, S., 1963. The Dynamic of Community Development in Rural Central and West Java: A Comparative Report. Cornell University Press, Ithaca.

Tsujii, H., 2002. An econometric analysis of agricultural sustainability in a Mountainous Village of West Java: Use of the multinomial logit model to soil fertility perception. Natl. Resour. Econ. Rev., 8: 1-20.

Van-den-Brink, R. and C. Jean-Paul, 1997. The microeconomics of an indigenous African institution: The rotating saving and credit associations. Econ. Dev. Cult. Change, 45: 745-772.

Varadhanarajan, S., 2004. Explaining participation in rotating saving and credit associations (ROSCA): Evidence from Indonesia. Department of Economics, Cornel University (Mimeo). http://www. microfinancegateway.org/files/23451_file_Arisan_ May.pdf.

Zeller, M., 1994. Determinant of credit rationing: A study of informal lenders and formal credit groups in Madagaskar. World Dev., 22: 1895-1907.