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## **Determinants of Participation of Women in Self-Help Groups (SHGs) and Credit Delivery from Formal and Informal Sources to BPL Households in Odisha**

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### **ABSTRACT**

The study examines the determinants of credit delivery from formal and informal sources to women households who belong to below poverty line (BPL) in Ganjam district of Odisha, apart from analysing determinants of participation of women in self-help groups (SHGs) to avail credit, and identifying the factors influencing loans borrowed by BPL households. The study showed that majority of the households received loans from formal sources for agricultural purposes. However, a lower proportion of SHG members availed insurance services due to their low income. The results of logistic estimates clearly showed that factors such as age, education, number of children of the respondents, status as head of the household, sources of income, caste, informal debt, distance of banks, migration, economic status of households, etc. played a crucial role in determining women's participation in SHGs to borrow credit. The households also borrowed loans from different informal sources. The reasons for borrowing from informal sources included lack of collateral, faster delivery of credit, easy access without any bank account. Further, the estimated odds ratios with respect to variables like age and marital status of the head of households, caste, location of bank and membership of SHGs also had significant effect on households to avail credit from informal sources. It is to be noted that aside from credit there are numerous other factors that determine the high economic status of households like number of adults living in the house, availability of employment, income of the head of the households, etc. Nevertheless, the credit is the basic lubricant that helps people to live with dignity. The micro finance organisations provide small credit through group approach, which not only helps the financially excluded people in rural areas but also create a ray of hope for better future. This may not be possible in the short period but in the long term, it would definitely help to fulfill their basic requirements in the sustainable manner. The availability of credit is the one end of the spectrum, the other end being extension of training to the clients, availability of raw material and easy access to local markets so as to sell their product at reasonable prices. These facilities will help the clients to get sufficient profit, which in turn would be helpful for the long run survival of their micro enterprisers. Micro finance is not a panacea for poverty reduction, which needs both complementary supply-side and demand-side factors. Supply-side factors such as good infrastructure, entrepreneurial skills, etc. are needed to make micro-enterprises more productive.

**Keywords:** Microfinance, Women self-help groups, Formal and informal sources of credit.

**JEL:** Q14, Q13, O16, O17

### **I**

### **INTRODUCTION**

There are generally two schools of researchers studying the effect of micro finance on clients, viz., empirical and theoretical. The theoretical literature has shown

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that different aspects of group formation such as self-selection, socio-economic cohesion among members within the group and peer monitoring, etc., help in overcoming several inherent problems, and group lending leads to a Pareto superior outcome compared to individual lending (Wydick, 1999; Ghattak, 1999; Morduch, 1999; Besely and Coate, 1995). It also helps in overcoming the problem of gender disparity, raise the social and economic empowerment and increase the bargaining power, gender empowerment of the members in individual and community level (Hoque and Itohara, 2009; Mayoux, 1999, 2000; Kabeer, 1998; Ngo and Wahhaj, 2008). The access to savings and credit can initiate or strengthen a series of interlinked and mutually reinforcing 'virtuous spirals' of empowerment by increasing incomes and assets and control over these incomes and assets (Mayoux, 2000). The empirical studies on the impact of micro credit through group approaches have been broadly of two types, viz., quantitative and qualitative. The quantitative schools have given importance to the effect of group formation, increase in income, saving, assets, food security and livelihood approach of the participants (Rajasekhar and Vyasulu, 1990; Basu and Srivastava, 2005; Puhazhendhi and Satyasai, 2001).

There are different factors that influence probability of women to join SHGs and receive micro credit. Anggraeni (2009) found that the increase in age, education, total income of the household and percentage of income derived from agricultural activities have significantly influenced probability of women participation in SHGs. Kumar (2009) reported the participation in SHGs is influenced by various household specific factors like educational level of women, husband's education, number of dependents, sources of income and presence of other formal institutions. Although many studies have attempted to assess the factors influencing credit delivery to households, not much research is seen to have addressed poverty status of households. The present study, therefore, examines the determinants of credit delivery from formal and informal sources to women households who belong to below poverty line (BPL) in Ganjam district of Odisha, aside from analysing the determinants of participation of women in SHGs to avail credit, and identifying the factors influencing loans borrowed by households belonging to BPL category.

## II

### DATA AND METHODOLOGY

The study was conducted in Ganjam district of Odisha in 2011 and the survey included information relating to ownership of asset, availability of food and housing characteristics with respect to new and old clients of micro finance institutions, and also these information for non-clients. In this study, 40 SHGs from two blocks of Ganjam district were covered. Multistage random sampling was adopted for the identification of old and new clients as well as non-clients of SHGs. In the first stage, the data relating to total clients of Women Self Help Groups (WSHGs) was collected. The members of the SHGs established 4 to 7 years ago were treated as old clients,

whereas members of SHGs associated within 1 to 4 years ago were considered as new clients. The non-clients were those who did not receive credit from these micro finance organisations. In the second stage, the old and new clients as well as non-clients of SHGs were selected randomly. In all, the study covered 300 micro finance clients with 127 new clients and 173 old clients. The numerical strength on non-clients was 100. The old and new clients were considered as extension group, whereas non-clients as control group. In order to measure the determinants of credit, especially with respect to formal and informal sources, logistic regression analysis was performed.

Based on the above analysis, the present research attempts to examine different individual/household factors likely influences on the probability of women to join SHGs and securing micro loans (Kumar, 2009; Anjugam and Ramasamy, 2007; Anggraeni, 2009). The factors studied encompass household demographics (such as age, education, employment, etc.), and socio-economic factors (economic status, amount of land, family size, etc.). The study applies logistic model for predicting the probability of women “*n*” choosing to join SHGs and get credit. It is assumed that a woman is faced with two alternatives, to participate in SHGs and take micro credit from the available provider or not (Gujrati, 2006). In essence, the logistic model predicts the logit of *Y* from *X*. The logit is the natural logarithm (*ln*) of odds of *Y*, and odds are ratios of probabilities ( $\pi$ ) of *Y* happening (i.e., a woman joining SHGs to get micro credit) to probabilities ( $1 - \pi$ ) of *Y* not happening (i.e., a woman who hasn't joined SHGs). The logistic regression model *Y* (likelihood to take micro credit) to multiple predictors (say  $X_1$  = age and  $X_2$  = education), has the form

$$\text{Logit } (Y) = \text{natural log (Odds)} = \ln \left( \frac{\pi}{1 - \pi} \right) = \alpha + \beta_1 X_1 + \beta_2 X_2 \quad \dots(1)$$

Taking the antilog of Equation 1 on both sides, one derives an equation to predict the probability of the occurrence of the outcome of interest as follows:

$$\pi = \text{Probability } (Y = \text{outcome of interest} \mid X_1 = x_1, X_2 = x_2) = \frac{e^{\alpha + \beta_1 x_1 + \beta_2 x_2}}{1 + e^{\alpha + \beta_1 x_1 + \beta_2 x_2}} \quad \dots(2)$$

where  $\pi$  is the probability of the outcome of interest or “event,” such as women's participation in SHGs for micro credit,  $\alpha$  is the *Y* intercept,  $\beta$  is the regression coefficient, and  $e=2.71828$  is the base of the system of natural logarithms. *X* can be categorical or continuous, but *Y* is always categorical. According to Equation 1, the relationship between logit (*Y*) and *X* is linear. Yet, according to Equation 2, the relationship between the probability of *Y* and *X* is nonlinear. For this reason, the natural log transformation of the odds in Equation 1 is necessary to make the

relationship between a categorical outcome variable and its predictor(s) linear (Madala, 1992).

### *Dependent Variable*

Dependent variable in the model is “1” if the woman has participated in SHGs and availed micro credit, Otherwise “0”.

### *Independent Variables*

Different individual characteristics viz., level of education, age, occupation, marital status, any child and access of media to the respondent are included to find out the determinants of participation in SHGs.

### *Determinants of Informal Credit*

Our research applied the logistic model to examine about different factors that determines credit from the informal sources to the BPL households in rural areas of India. We assume that for an individual  $K_{it}^*$  represents the critical decision point of taking informal credit or not and thus summarise this information, as:

Individual  $i$  takes informal credit if  $K_{it} > K_{it}^*$  and  $K_{it}^* = 1$

Individual  $i$  does not take informal credit if  $K_{it} \leq K_{it}^*$  and therefore  $K_{it}^* = 0$

The logistic model assumes that the error term is a cumulatively distributed random variable so that the probability that  $K_{it}$  is less than (or equal to)  $K_{it}^*$  can be computed from the cumulative normal probability function. The estimated model is then stated thus:

$$K_{it}^* = \alpha_0 + \alpha_1 HHAGE_{it} + \alpha_2 HHEDN_{it} + \alpha_3 HHEAD_{it} + \alpha_4 BANKDIST_{it} + \dots + \alpha_n$$
....(3)

where  $K_{it}^*$  Representing “1” if a household has borrowed credit from informal sources otherwise “0”. The rest of the explanatory variables are household factors, which is largely responsible for loan from informal sources to the BPL households.

### *Empirical Findings*

The findings of this study revolve around analysing the formal financial services available to the households, determinants of women’s participation in SHGs to access

micro credit, access to informal loans, and factors influencing informal credit to the households.

### *Basic Formal Financial Services*

The access to financial services from formal sources (i.e. banks, SHGs, Post-office, co-operatives, etc.) to the households is analysed in Table 1. All the members were seen to borrow loans from banks through SHGs. The proportion of households receiving loans from commercial banks was nearly 90 per cent. It was further observed that 46 per cent of total respondent households borrowed loans in the range of Rs.5,000-15,000, whereas 38 per cent of them borrowed loans in the range of Rs.3,000-5000. Majority of non-members borrowed higher amount of loan as against members of SHGs. Though half of the beneficiaries used the loan for agricultural purposes, it was also observed that 23 per cent of total respondents received loans for non-farm activities, and 26 per cent of them received loans for social purposes.

TABLE 1. DESCRIPTIVE STATISTICS OF FINANCIAL SERVICES TO HOUSEHOLDS

Particulars (1)	Member N <sub>1</sub> =300 (2)	Per cent to N <sub>1</sub> (3)	Non-member N <sub>2</sub> =100 (4)	Per cent to N <sub>2</sub> (5)	All respondents N <sub>3</sub> = 400 (N <sub>1</sub> + N <sub>2</sub> ) (6)	Per cent to N <sub>3</sub> (7)
Any formal debt						
Yes	300	100	61	61.0	361	90.2
No	0	0	39	39.0	39	9.8
Sources of debt*						
SHGs	42	13.5	1	1.6	42	11.5
Banks	270	86.5	60	98.4	330	88.5
Amount of debt					t = 7.09*	
Rs 3000-5000	123	41.0	14	23.0	137	38
Rs 5001-15000	146	48.7	20	32.8	166	46
Rs 15001-30000	31	10.3	27	44.3	58	16
Purpose of debt*						
Agriculture	211	56	35	35.0	246	51
Non-farm activities	100	27	10	10.0	110	23
Other (health, education, marriage)	66	17	62	62.0	128	26
Any saving account					$\chi^2 = 334.890^*$	
Yes	300	100	91	91.0	383	95.8
No			9	9.0	17	4.3
Any insurance					$\chi^2 = 25.00^*$	
Yes	87	29.0	63	63.0	150	37.5
No	213	71.0	37	37.0	250	62.5

\*Multiple responses based on response of cases, \* and \*\* denote <0.05 and <0.10, level of significance.

Both members and non-member households showed significant differences in possessing a savings account as a “chi square test” was significant. Out of the total respondents surveyed, cent per cent of members owned a saving account, whereas

this proportion stood at 91 per cent for non-members. As for availability of insurance facilities, 63 per cent of non-members and 29 per cent of members availed this facility. The study conducted by Singh and Singh (2008) also found a lower proportion of SHG members availing insurance services due to their low income.

## III

## DETERMINANTS OF WOMEN'S PARTICIPATION IN SHGS

Provision of credit through SHGs meets the short term financial needs and helps to improve the standard of living of members in a sustainable approach. The new members have agreed that credit through SHGs decreases need for loan from informal sources with an exorbitant interest rate. Similarly, old members are of the view that group credit helps them to perform different agricultural activities (viz., purchase of seed, fertilisers, etc.) in right time. As a result, more women in rural area came forward to participate in SHGs. The factors influencing women to join SHGs to avail credit are given in Table 2. Dependent variable is whether respondents have

TABLE 2. FACTORS INFLUENCING WOMEN'S PARTICIPATION IN SHGS: ODDS RATIO (EXP. B)

Independent variables <sup>1</sup>	Estimated coefficients	Standard error	Wald statistics	Odds ratio <sup>2</sup>
(1)	(2)	(3)	(4)	(5)
Respondent age in years (21-30) R				
31-40	-.035	.598	.003	0.966
41-50	2.264	.773	8.582	9.622*
51-70	.912	.948	.926	2.490
Respondent education (illiterate) R				
Primary or more	-1.797	.611	8.645	0.166*
No. of children R				
Any child	-.908	.540	2.828	0.403*
Male headed house R				
Female headed house	1.556	1.03	2.269	4.739*
Sources of income (agriculture) R				
Non-agriculture	-2.101	.525	15.984	0.122*
Caste of households (SCs/STs) R				
OBCs and others	-2.743	.706	15.096	0.064*
No informal debt R				
Any informal debt	-2.744	.639	18.463	0.064*
Bank distance (<1km) R				
More than 1 km	1.169	.615	3.609	3.219*
No. of migrated members R				
Any migration in households	-1.093	.531	4.239	0.335*
High economic status R				
Low economic status	1.793	.625	8.223	6.005*
Constant	3.170	1.654	3.673	23.802
Log likelihood -72.093, Cox & Snell R Square .534, Nagelkerke R Square .791, LR statistic 301.68*, Degree of Freedom =17, Pseudo R2=.67, Total observations= 400				

Notes: <sup>1</sup>Dependent variable = 1 if household has borrowed credit through SHGs and 0= Otherwise. R= Reference category. To avoid a multicollinearity problem, a dummy variable is dropped in each group. <sup>2</sup>Odds Ratio= Value more than 1 are more likely and less than 1 are less likely influences on dependent variable. \*, \*\* represent the 5 and 10 per cent significance level respectively.

participated in SHG (Member) or not participated in SHG (Non-Member) programmes. Different individual and socio economic variables of households were used to know about the factors determining the likelihood of women to join SHGs and thus borrow credit. Table 2 measures the logistic coefficients in terms of odds ratio. The odds ratio more than 1 predicts more likelihood and less than 1 predicts less likelihood of women to participate in SHGs.

The results show that the odds ratio of variables like age, education, number of children of the respondents (individual variables), and head of the household, sources of income, caste, informal debt, distance of banks, migration, economic status of households (household variables) are significant and related to women's participation in SHGs to borrow credit.

#### *Age and Education of Respondents*

With the increase in age, women are more likely to join SHGs to avail credit. The women in the age group of 41-50 years are 9.62 times more likely to join SHGs to get credit as compared to the reference category (21-30 years). The probability of women's participation in SHGs increases in the age bracket of 41-50 years due to more autonomy and less control by other members of households. Another possible explanation could be, as the woman's age increases, she becomes more self-confident or self-dependent, which in turn gives her the confidence to participate in SHG programmes for credit. On the other hand, women with primary or more education are less likely (OR=0.166 times,  $p<0.05$ ) to join SHGs as compared to the illiterate category. The increase in education helps to increase the knowledge of women regarding alternative credit sources. It also induces the women to earn money through self employment without depending upon credit from SHGs.

#### *Number of Children and Head of Household*

Women being the head of the household and the number of children are important determinants of participation in group credit programmes in India. The presence of any child (less than 5 years) makes it 0.403 times less likely to join SHGs as against the reference category (no child). An increase in the number of children might lead the women to spend more time in household activities which discourages their interest in association with SHGs. Further, women headed households are noticed to be 4.739 times more likely to join SHGs. The absence of alternate sources of credit without collateral may be the predominant factor compelling the women headed household to borrow credit from SHGs and fulfill economic requirements.

#### *Sources of Income and Caste*

The socio-economic characteristics also influence women's participation in SHGs programmes. For example, households dependent on agriculture as their source of

livelihood were availing credit through SHGs for different agricultural operations (i.e., tilling, ploughing, sowing, harvesting, threshing, winnowing, purchasing fertilisers, etc.). The result of odds ratio shows that households deriving income from non-agricultural sources were less in favour of joining SHGs as compared to households dependent on agriculture. The permanent earning opportunity from non agricultural sector throughout the year could be a possible reason that helps the households to depend less upon micro credit. Further, compared to women belonging to lower caste (SC/STs), women who belonged to the upper caste (OBCs/Others) were noticed to be less likely to join SHG programmes. Women belonging to upper caste have less interest to join SHGs due to their better economic position. Another possible explanation is that the small amount of credit through SHGs would not fulfill the financial requirements of households belonging to the upper caste.

#### *Informal Credit and Bank Distance*

The likelihood of women's participation in SHGs is also significantly influenced by the availability of credit from other sources. The results show that SHG members were less likely to borrow loan from informal money lenders. An increase in the distance of commercial bank from the village leads to higher chance of women joining SHGs. The result shows that the households living more than 1 km away from commercial banks were 3.219 times more likely to join SHGs than the households living below 1 km from the bank. The lack of credit supply from formal financial institutions or absence of banks forces the households to borrow credit through SHGs.

#### *Migration and Economic Status*

The remittance of migrants helps to fulfill the economic requirements of households, resulting in low demand for credit from SHGs. The presence of migrated members in the house results in the women 0.335 times less likely to join SHGs as compared to non-migrant households. Compared to the HES category, those women who belonged to the LES group were 5.26 times more likely to join SHGs. Lack of confidence in terms of repayment of loan, use of credit for income generating purposes and higher illiteracy among LES category increase the probability of women's participation in SHGs.

#### *Access to Informal Loans*

The mismatch between demand for loans from formal financial institutions and lack of fulfillment of demand forces the poorest households to borrow from informal sources at an exorbitant interest rate (Basu and Srivastava, 2005). The information relating to access to informal loans by the sampled households is provided in Table 3.

TABLE 3. LOANS FROM INFORMAL SOURCES TO HOUSEHOLDS

Particulars (1)	Member N <sub>1</sub> =300 (2)	Per cent to N <sub>1</sub> (3)	Non- member N <sub>2</sub> =100 (4)	Per cent to N <sub>2</sub> (5)	All respondents N <sub>3</sub> (N <sub>1</sub> + N <sub>2</sub> ) = 400 (6)	Per cent to N <sub>3</sub> (7)
Any informal loan					$\chi^2 = 26.010^*$	
Yes	178	59.3	73	73.0	251	62.8
No	122	40.7	27	27.0	149	37.3
Amount of loan (in Rs.)					$t = -2.79$	
1000-17000	79	44.4	47	64.4	126	50.1
18000-70000	99	55.6	26	35.6	125	49.8
Sources of loan*						
Neighbours	100	39.8	22	27.5	122	36.9
Friends/ relatives	62	24.7	54	67.5	116	35.0
Money lender	63	25.1	3	3.8	66	19.9
Other	26	10.4	1	1.3	27	8.2
Reason of borrow*						
No collateral	133	37.9	29	24.6	162	34.5
Get faster	68	19.4	60	50.8	128	27.3
Easier to get loan	59	16.8	18	15.3	77	16.4
Others (less expensive, no bank account)	91	25.9	11	9.3	102	21.7
Purposes of loan*						
Agriculture	61	21.5	30	25.4	91	22.6
Emergencies	28	9.9	31	26.3	59	14.7
Health	43	15.1	15	12.7	58	14.4
Marriage	70	24.6	19	16.1	89	22.1
Home repairs/repay old debt	40	14.1	8	6.8	48	11.9
Other	42	14.8	15	12.7	57	14.2

\*Multiple responses based on response of cases, \* and \*\* represent < 0.05, < 0.10 level of significance.

In general, majority of the households borrowed loans from different informal sources. Half of the households borrowed informal loans ranging from Rs.1000 to Rs.17000 and the rest in the range of Rs.18000 to Rs.70000. The major sources of informal loans were neighbours, friends/relatives, and to some extent money lenders. The reasons for borrowing from informal sources included lack of collateral, faster delivery of credit, easy access without any bank account. The other reasons for obtaining informal loans were traced in meeting financial requirements for agricultural activities, emergencies and fulfillment of other social needs, viz., repair of house, health, marriage, etc.

#### IV

#### FACTORS INFLUENCING INFORMAL CREDIT

In spite of various facilities to supply formal credit, factors like an ineffective government intervention, procedural rigidities, refusal by banks, identity requirements, onerous terms and conditions etc., are the reasons to borrow from informal sources. The estimated odds ratios with respect to six variables like age and

marital status of the head of households, caste of the households, distance of the bank and membership of SHGs showed a significant effect to the availability of credit from informal sources (Table 4).

TABLE 4. DETERMINANTS OF INFORMAL CREDIT: ODDS RATIO (EXP B)

Independent variables <sup>1</sup> (1)	Estimated coefficients (2)	Standard error (3)	Wald statistics (4)	Odds ratio <sup>2</sup> (5)
Age of household head in years (30-40) R				
41-50	-.078	.330	.055	0.925
51-70	.511	.370	1.907	1.668*
Marital status of house head (Unmarried) R				
Married	.904	.418	4.671	2.470*
Caste of households (SCs/STs) R				
OBCs and others	.797	.310	6.591	2.219*
Bank distance (<3 km) R				
More than 3 km	1.792	.398	20.255	6.003*
Non member R				
New Member of SHGs (< 4 years)	-2.354	.464	25.745	0.095*
Old member (> 4 years)	-.875	.464	3.556	0.417*
Number of working member (1 to 3) R				
Number of working member (3 to 6)	.600	.329	3.331	1.823**
Constant	-.337	.589	.327	0.714
Log likelihood -203.025, Cox & Snell R Square .260, Nagelkerke R Square .355, LR statistic 120.63*, Degree of Freedom =17, Pseudo R2= .23, Total observations= 400				

Notes: <sup>1</sup>Dependent variable = 1 if household has any informal debt and 0= otherwise. R= Reference category. To avoid a multicollinearity problem, a dummy variable is dropped in each group. <sup>2</sup>Odds Ratio= Value more than 1 are more likely and less than 1 are less likely influences dependent variable. \* and \*\* represent 10 and 5 per cent significance level respectively.

There has been significant relation between age of the head of household and borrowings from informal sources. The head of the households in the age group of 51-70 years are noted to be 1.66 times more likely to avail loans from informal sources as against the reference category. Since earning capacity reduces with rise in age, this induces to borrow money from informal sources and fulfill socio economic requirements of the family members. The results of logistic estimates further revealed that married women had greater likelihood to avail loans from informal sources as against unmarried women.

As compared to SC/ST category, the households belonging to upper caste had greater probability to borrow from informal sources. Although, the upper caste group had collateral to get formal loan, easier and quicker loan facilities attracted them to borrow from informal sources. The distance of commercial bank from the village was positively related to borrow loan from informal sources. The households living more than 3 km away from the bank had 6 times higher probability to borrow from informal sources as against households living less than 3 km from bank. The high borrowing cost due to distant location of bank was the reason to borrow from informal sources. There was also a positive effect between the number of working members in the households and credit from informal sources. The households with

more working members had greater likelihood to borrow from informal sources. The results of logistic estimates also showed that the presence of old members in the house made them less likely to borrow from informal sources. The provision of adequate credit through SHGs helps in reducing informal loan and frees the poor households from the clutches of moneylenders (Ray, 2008).

## V

### CONCLUSION

The results of logistic estimates clearly showed that factors such as age, education, number of children of the respondents, status as head of the household, sources of income, caste, informal debt, distance of banks, migration, economic status of households, etc. played crucial role in determining women's participation in SHGs to borrow credit. Further, the estimated odds ratios with respect to variables like age and marital status of the head of households, caste of the households, distance of bank and membership of SHGs also had significant effect on households to avail credit from informal sources.

There is no doubt that aside from credit there are numerous other factors that determine the high economic status of households like number of adults living in the house, availability of employment, income of the head of the households, etc. Nevertheless, the credit is the basic lubricant that helps people to live with dignity. The micro finance organisations provide small credit through group approach, which not only helps the financially excluded people in rural area but also create a new ray of hope for better future. This may not be possible in the short period but in the long term, it would definitely help to fulfill their basic requirements in a sustainable manner. The availability of credit is the one end of the spectrum, the other end being extension of training to the clients, availability of raw material and easy access to local markets so as to sell their product at reasonable prices. These facilities will help the clients to get sufficient profit, which in turn would be helpful for the long run survival of their micro enterprisers. Micro finance is not a panacea for poverty reduction, which needs both complementary supply-side and demand-side factors. Supply-side factors such as good infrastructure, entrepreneurial skills, etc. are needed to make micro-enterprises more productive.

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