

Impact of Micro-Credit on Selected Household Welfare Attributes: Evidence from Sri Lanka

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Abstract

Despite the increasing number of micro-credit institutions in Sri Lanka during the last few decades, their impact on improving welfare of households is unclear. This paper attempts to examine the impact of micro-credit on some selected household welfare attributes, i.e., household income, assets, expenditure, housing conditions and employment, based on a recent national-level household survey on microfinance in Sri Lanka. The results indicated that on overall, micro-credit has enabled the households to improve their income, assets, housing conditions, etc., however, the magnitude of impact varies across different income groups. Micro-credit has largely helped the middle and higher income quintiles to increase their level of income, assets and housing, while there is no significant impact on these attributes for the poorest quintile. For the poorest households the impact of micro-credit is mainly on their consumption level.

1. Introduction

Micro-credit has attracted a great deal of international attention in recent years, as an effective tool for reducing poverty and improving welfare of households. In recognition of the role of micro-credit, the United Nations General Assembly has designated the year 2005 as the International Year of Micro-credit. The Micro-credit Year seeks to raise public awareness of the importance of micro-credit, promote innovation and new partnerships to expand its outreach and support sustainable access to financial services by the poor.

In Sri Lanka, micro-credit sector has expanded significantly during the last couple of decades. Currently, there is a wide range of micro-credit providing institutions including co-operative societies, Non-governmental Organizations (NGOs), commercial banks (both state-owned and private) and development banks such as the Regional Development Banks (RDBs). In addition, the Government's *Samurdhi* Savings and Credit Scheme established in 1996 is presently one of the largest microfinance programmes in Sri Lanka, with over 32,000 village level societies and over 1000 bank branches operating island-wide.

Despite the increasing number of micro-credit institutions during the last two decades, their impact on enhancing welfare of households is somewhat ambiguous. Only few studies have been undertaken previously to assess how micro-credit has impacted on the living conditions of the households in Sri Lanka. These studies have also been largely confined to one or few micro-credit institutions or to limited geographical locations (Colombage, S.S., 2004; Shaw, J., 2004; Gunatialka R. and R.Salih, 1999; Gunatilaka *et al*, 1997; Hulme and Mosely 1996).

The objective of this paper is to analyse the impact of micro-credit on household welfare using some key attributes such as household income, assets, expenditure and employment. The data used in this paper have been obtained from a national level household survey on microfinance in Sri Lanka

designed and conducted by a team lead by the author in 2004. In the next section we will briefly discuss the design of the household survey used for this analysis. The section 3 analyses the micro-credit impact on the selected household attributes for the whole sample, while the section 4 looks at the impact of micro-credit for different income groups. The section 5 provides some concluding remarks.

2. Data and Survey Design

The analysis in this paper is based on a recently conducted national level household survey on microfinance in Sri Lanka. The survey covered 1500 households from 50 Grama Niladhari divisions (G.N. divisions) ²across 17 districts of Sri Lanka. ³ The G.N. Divisions were selected using a stratified random sampling method. ⁴

From each of the selected 50 G. N. divisions, a sample of 30 households was selected for conducting the survey. Approximately 80 percent of the sample was taken from the participants of MFIs while the remaining was selected from the non-participants. The latter group was used as the control group in the analysis. In each G.N. division, participants were selected randomly using the member lists of all the MFIs in the area. The non-members were selected randomly using a list of names (e.g. election name list) obtained from the Village Headman of the respective divisions.

The survey was conducted in two phases. In the first phase, a *Village Resource Profile (VRP)* was prepared for each of the 50 selected G.N. Divisions by obtaining various village level (division level) information including infrastructure facilities (transport, electricity, communication, etc) and various MFIs in the area. In the second phase, a *Household level survey* was conducted to collect various data

² Sri Lanka's administrative system from bottom: Village, Grama Niladhari division (G.N. division), district secretary division (D.S. division), district and province.

³ Northern and Eastern parts of Sri Lanka were excluded due to security reasons.

⁴ See Tilakaratna, G., U. Wickremasinghe and T.Kumara (2004), for further details on the survey design.

from the selected households such as households' income, expenditure, assets, economic activities and details of credit and savings activities.

3. Micro-credit Impact on Selected Household Welfare Attributes

In this section, we will look at the impact of micro-credit on selected household welfare attributes, i.e. household income, expenditure, assets, housing conditions and employment, using both quantitative and qualitative approaches.

i.) Income, Expenditure and Assets

An increase in income can help households in many ways: it can increase consumption possibilities of the household, allow to save for the future, reduce vulnerabilities arising from future income failures, give the children better educational opportunities, etc. Therefore, increase in income is one of the most desirable household welfare outcomes regardless of the current level of income. A slight improvement in income for the poor may not be much in absolute terms, but the marginal benefits may be much higher in comparison to their rich counterparts. Thus, many microfinance programs all over the world make attempts to raise the level of incomes of their participants. Sri Lanka's microfinance programs are no exception in that a significant part of the effort is geared towards achieving the objective of raising household incomes. Therefore, in analysing the impact of micro-credit, it is crucial to look at how it has impacted on household income.

Expenditure is another key variable in analyzing the effect of micro-credit on household welfare. A higher level of household expenditure is generally considered to be associated with higher consumption and better standard of living. A micro-credit scheme may exert a positive impact on household welfare through their effects on expenditure at all levels, but in general the marginal effect would be the highest among the lowest income groups.

Assets also play a multitude of roles among households, particularly in agrarian societies where incomes are closer to the subsistence level. The ways in which households use assets to smooth out consumption is a well documented process. In general, households purchase assets when their incomes are better and sell them during the lean periods. Therefore, assets also serve as a form of savings; however, the kind of assets that may be used by a household at any point in time depends on the severity of the income failure and the liquidity of the assets.

In order to see if there is any statistically significant relationship between micro-credit (loan amount) and household welfare attributes such as household income, expenditure⁵ and assets, the Pearson correlation coefficients were calculated for loan amount with each of these three variables. The results suggest that there is a significant positive correlation between micro-credit and each of the three variables, i.e. household income, expenditure and assets. (See Table 1).

Table I
Pearson's Correlations: Micro-Credit with Selected Household Attributes

| | Income | Expenditure | Assets |
|----------------------------|--------|-------------|--------|
| Pearson Correlation | .202** | .358** | .211** |
| Sig. (2-tailed) | .000 | .000 | .000 |

Note: ** Correlation is significant at the 0.01 level.

Source: Authors calculations based on the Microfinance Survey 2004, IPS.

Nevertheless, the above results do not measure the magnitudes of the impact of micro-credit on these variables. Nor had it taken into account the possible effects of variables that are not directly related to microfinance such as household or village characteristics on the household attributes. Therefore, an attempt was made to model the existing relationship among the key variables using econometric techniques. It is well known that such household econometric models suffer from endogeneity bias that arises from the fact that the major variables relating to household welfare such as income, expenditure and assets affect each other. For example, household income affects both the levels of

⁵ Household expenditure used for analysis throughout the study mainly consists of consumption expenditure.

expenditure and assets. On the other hand, the level of household assets is a key determinant of household income.

Given the endogeneity bias, assessing the impact of micro-credit on household outcomes would require the estimation of a simultaneous equation system. We postulate that household income (I) to be a function of the total amount of credit obtained (C), and a few other household characteristics, namely the occupation of the household head (HO), the education level of the household head (HE) and the number of income earners in the family (IE). This yields us the income equation,

$$I = i_0 + i_1C + i_2HO + i_3HE + i_4IE . \quad \text{-----(1)}$$

The level of expenditure is thought to be determined by the total credit amount obtained (C), household income (I), household assets (A), sex of the household head (HS), family size (FS) and the distance to consumer market (CM), which is given by

$$E = e_0 + e_1C + e_2I + e_3A + e_4CM + e_5HS + e_6FS \quad \text{----- (2)}$$

The level of assets is determined by the amount of credit (C), household income (I) and the sex of the household head (HS), which is given by

$$A = a_0 + a_1C + a_2I + a_3HS \quad \text{-----(3)}$$

These three equations result in a simultaneous equation system, where household income, expenditure and assets are determined endogenously. Note that the household income is determined by several exogenous variables. Income enters both expenditure and asset equations, while assets enters into the expenditure equation. This system of equation is estimated by using the Two-Stage Least Squares (2SLS) method for the entire sample as well as for each income quintile. (See Table II)

Table II : Determinants of Selected Household Welfare Attributes (2SLS Model)

| Regression | | Intercept | C | I | HO | HE | IE | A | CM | HS | FS | R ² | Adj. R ² |
|------------------------|-------------|------------|---------|---------|--------|-----------|-----------|---------|---------|----------|----------|----------------|---------------------|
| Total Sample | Income | -1189.27 | 0.023** | -- | 545.33 | 1170.17** | 3201.23** | -- | -- | -- | -- | 0.164 | 0.162 |
| | Expenditure | 1840.79 | 0.003 | 0.002 | -- | -- | -- | 0.053** | -188.12 | 444.53 | 463.75** | -0.732 | -0.739 |
| | Asset | -9748.07 | 0.020** | 6.199** | -- | -- | -- | -- | -- | 102.15 | -- | 0.146 | 0.144 |
| First Quintile | Income | 1809.18** | 9.56E-4 | -- | 145.06 | -42.69 | 539.985** | -- | -- | -- | -- | 0.082 | 0.070 |
| | Expenditure | 1993.39* | 0.023* | -0.25** | -- | -- | -- | 0.036 | -268.79 | -91.37 | 658.03 | -0.079 | -0.102 |
| | Asset | 9201.73 | 0.051 | 0.822 | -- | -- | -- | -- | -- | 9895.25 | -- | -0.004 | -0.005 |
| Second Quintile | Income | 3984.48** | 0.013** | -- | 31.23 | -108.49 | 709.506** | -- | -- | -- | -- | 0.121 | 0.108 |
| | Expenditure | 1727.69 | 0.069 | -7.333 | -- | -- | -- | -0.033 | -400.57 | 2320.36 | 8302.40 | -3.384 | -3.476 |
| | Asset | 4853.23 | 0.567** | 0.601 | -- | -- | -- | -- | -- | 8030.94 | -- | 0.090 | 0.080 |
| Third Quintile | Income | 4455.46** | 0.010** | -- | 143.83 | 136.05 | 890.14** | -- | -- | -- | -- | 0.129 | 0.117 |
| | Expenditure | 2443.72* | -0.001 | -2.629 | -- | -- | -- | 0.042* | -172.29 | 852.73 | 4498.80 | -0.901 | -0.940 |
| | Asset | -13355.88 | 0.476** | 5.501** | -- | -- | -- | -- | -- | 19.015 | -- | 0.128 | 0.119 |
| Fourth Quintile | Income | 5159.24** | 0.009** | -- | 33.70 | 501.25 | 1621.32** | -- | -- | -- | -- | 0.263 | 0.252 |
| | Expenditure | 2892.13 | -0.032 | 2.323 | -- | -- | -- | 0.106 | -200.21 | 2058.92 | -5650.31 | -4.251 | -4.360 |
| | Asset | -9301.73 | 0.360** | 6.806** | -- | -- | -- | -- | -- | -16221.3 | -- | 0.169 | 0.160 |
| Fifth Quintile | Income | 11654.25** | 0.008 | -- | 27.68 | 273.69 | 2945.47** | -- | -- | -- | -- | 0.054 | 0.041 |
| | Expenditure | -1734.05 | 0.006 | 0.874 | -- | -- | -- | 0.031 | -179.11 | -83.55 | -2215.32 | -4.128 | -4.235 |
| | Asset | 13497.21 | 0.138 | 4.583* | -- | -- | -- | -- | -- | 5896.67 | - | 0.071 | 0.062 |

Note: ** Significant at $\alpha = 0.01$ level.

* Significant at $\alpha = 0.05$ level.

Source: Authors calculations based on the Microfinance Survey 2004, IPS

As can be seen from the model, for the whole sample, the loan amount has a significantly positive impact on both income and assets. The results imply that improved access to credit could lead to positive impact on household income, probably through productive investment in income generating activities. The results also imply that households can improve their level of assets through increase in level of credit.

However, a significant impact of micro-credit on household (consumption) expenditure could not be observed for the entire sample. The peer monitoring mechanisms observed in many of the microfinance programs may have contributed for the households to control their expenditure voluntarily and channel as much credit to productive purpose. Further, it was observed during the survey that microfinance institutions had implemented monitoring mechanisms to control the use of credit and direct the borrowers to channel the funds for optimum use.

Among the other variables that have a significantly positive impact on income include the occupation and education level of the household head and the number of income earners. On assets, similar impact can be observed from the level of income and the sex of the household head.

ii.) Housing Conditions

Housing quality is another important indicator of household wellbeing. Micro-credit enables households to improve housing quality and obtain access to electricity and other amenities. To test if a significant relationship between credit amount and improvement in housing conditions exists, the Spearman Rank correlation test was carried out. The level of housing improvement (during the last two years) was categorized into five levels: (a) much decreased, (b) decreased, (c) no change, (d) increased or (e) much increased. The results for the entire sample showed a significantly positive

correlation between the level of housing improvement and the total amount of credit obtained from micro-credit institutions.⁶

iii.) Employment

Employment generation is one of the major objectives of any micro-credit program. Such programs are expected to contribute to the generation of employment in a number of ways: self employment, finance for starting up new businesses or to improve the existing businesses and secondary effects through financing relatively large projects. To assess the impact on employment opportunities that micro-credit may have created, we directly asked the micro-credit clients whether and how micro-credit has impacted on their employment. 19 percent of the clients indicated that their employment opportunities were improved as a result of their participation in micro-credit programs. Moreover, it was found that about 36 per cent of the total amount of credit disbursed by micro-credit institutions has been given to start up new businesses. As far as the type of businesses are concerned, about 20 percent of clients have started small shops, 18 percent have used for activities related to animal husbandry, 16 percent for cultivation and about 10 percent for hand looms or knitting businesses.

In order to complement the quantitative findings, we use a qualitative approach to analyse the impact of micro-credit on some selected household variables. In other words, the clients of micro-credit programs were directly asked what the impact of micro-credit was on their levels of income, assets, housing conditions, etc. The perceptions of the micro-credit clients on the impact are shown in the Table III.

It is interesting to find that over 44 per cent of micro-credit clients believed that micro-credit has helped them to increase their level of household income. Further, 38.3 per cent believed that micro-

⁶ The Spearman's Rho value 0.0998 significant at 0.01 level.

credit has enabled them to improve their housing conditions. On the contrary, relatively smaller proportion of clients indicated that micro-credit had improved their asset level. Overall, 42.3 percent felt an improvement in their living standard as a result of micro- credit.

Table III
Impact of Micro-credit: Perceptions of the Clients

| Attribute | What Extent (%) | | |
|----------------------------|-----------------|-----------|-----------|
| | Decreased | No change | Increased |
| Income | 2.2 | 53.6 | 44.2 |
| Assets | 0.4 | 86.3 | 13.3 |
| Housing condition | 0.5 | 61.2 | 38.3 |
| Water, sanitary facilities | 0.1 | 87.3 | 12.6 |
| Electricity | 0.0 | 88.3 | 11.7 |
| Standard of living | 1.5 | 56.2 | 42.3 |

Note: *Sample size of micro-credit clients is 1286
Source: Microfinance Survey 2004, IPS

4. Impact of Micro-Credit for Difference Income Groups

Micro-credit impact is not the same for households of all the income categories. Moreover, level of micro-credit obtained by households also differs across different income groups. Thus, it is vital to see the extent of micro-credit obtained by different income groups and how its impact differs across different income groups. For this purpose Households were allocated to quintiles (five equal groups) based on the per capita household monthly income.

The Figure 1a shows the household mean monthly income against the average monthly credit amount obtained by households from different income quintiles. This shows that the higher households in income groups on average have obtained higher amount of credit from micro-credit programs. One may erroneously conclude that even the micro-credit schemes favour the relatively rich households. However, once the percentage share of credit in relation to their monthly income takes into consideration, a totally different picture emerges, which shows clearly that in relation to the mean income levels of the poorer household, they have obtained much higher amount of credit than the

richer households. (Figure Ib) The amount of credit as a percentage of mean monthly income is 20.5 percent for the poorest quintile, while it is 12.5 percent for the richest quintile. This indicates that for the poorer groups, the amount of credit obtained from micro-credit institutions, though small in absolute terms, is much larger in relation to their income levels.

Figure I a: Mean Credit and Income by Quintiles

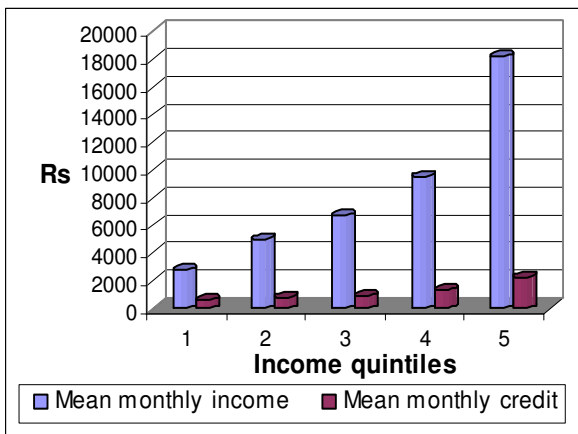
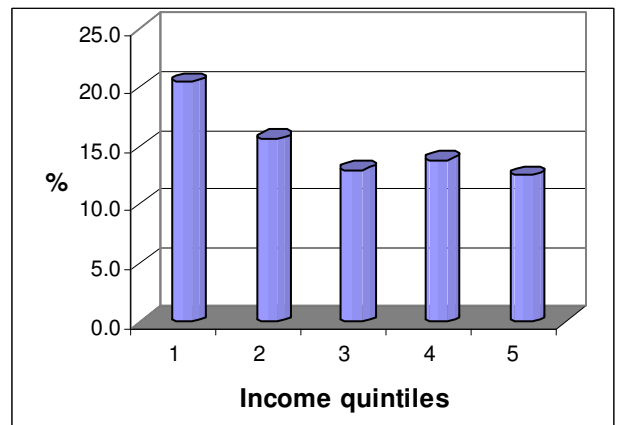


Figure I b: Mean Credit as a % of Income



Source: Microfinance survey 2004, IPS

1) Impact on Income, Expenditure and Assets

In order to see whether there is a statistically significant association between micro-credit and variables such as income, assets and expenditure for different income groups, the correlation coefficients were calculated for different quintiles. The results showed a significantly positive correlation between credit and income among the middle income quintiles (2nd, 3rd and 4th quintiles), while there was no significant correlation for the poorest and the richest quintiles. Similar results were observed for household assets. In regard to household expenditure, Pearson's correlation coefficients were found to be significantly positive for all the quintiles. (See table IV)

Table IV
Pearson's Correlations: Micro-credit with Selected Household Attributes

| Attribute | | Lowest 20 % | Second 20 % | Third 20 % | Fourth 20 % | Highest 20 % |
|-------------|------------------------|----------------|----------------|---------------|----------------|-----------------|
| Income | Pearson Correlation | .031 | .185** | .166** | .190** | .082 |
| | Sig. (2-tailed) | .596 | .001 | .004 | .001 | .158 |
| Expenditure | Pearson Correlation | .189** | .320** | .352** | .352** | .303** |
| | Sig. (2-tailed) | .001 | .000 | .000 | .000 | .000 |
| Assets | Pearson Correlation | .023 | .293** | .300** | .313** | .100 |
| | Sig. (2-tailed) | .697 | .000 | .000 | .000 | .086 |

Note: ** Correlation is significant at the 0.01 level.

Source: Author's calculations based on the Microfinance Survey 2004, IPS

The 2SLS model explained in the section 3 was estimated for each of the five income quintiles, and tested for the possibility for structural shift among different income quintiles by using the Chow test, a standard method used for identifying structural shifts in regression models. The Chow test on each regression model confirmed that there is in fact a structural change among different income quintiles⁷. Therefore, we need to treat each quintile as having its own specific characteristics with respect to behaviour towards micro-credit.

As shown in the Table II, the poorest income group (quintile 1) in the sample seems to have a different pattern of response to credit compared to all the other income groups. The most striking feature of the results pertaining to the poorest income group is that the loan amount has a significantly positive impact on the level of (consumption) expenditure. At the same time, there seems to be no significant impact of credit on both income and assets. For the middle three income quintiles (2nd, 3rd and 4th quintiles), loan amount makes a significant positive impact on income and assets but not on expenditure. These results confirm the assertion that the poorest may be using loans

⁷ The calculated F values for income, expenditure and assets equations are 159, -105 and 15 respectively. In all the models F values are greater than the table values, rejecting the null hypothesis that there is no structural change. (This is significant at $\alpha = 0.01$ level)

for purposes of smoothing out consumption while a majority of the relatively better off households makes use of credit for income generating purposes or buying assets. The difference between the poorest and the relatively better off groups is that the latter use credit to first increase their assets base or capacity to generate income, while the poorest groups may be using them directly. This however does not suggest that credit provided to the poor is not useful. The efficacy of credit of course is related to the intended purpose. Once we define household vulnerability as one dimension of poverty, credit programs that may have increased household expenditure in the face of vulnerability resulting from income failure can also be considered to have made a positive impact.

ii. Impact on Housing conditions

The Spearman rank correlation test was conducted to see the relationship between micro-credit and housing conditions for different income quintiles. A significantly positive relationship between the improvement of housing conditions and the amount of credit was observed for the 3rd, 4th and 5th quintiles,⁸ while for the first two quintiles, no significant correlation between these two variables could be observed. This indicates that micro-credit has enabled the relatively rich groups to improve their housing conditions.

A qualitative approach was also used to analyse the impact of micro-credit on selected household attributes for each income quintile. The perceptions of the micro-credit clients by quintile are given in Table V below. The figures show that the proportion of the clients/households who experienced a positive impact of micro-credit on various household outcomes like income and assets vary across income quintiles. It is interesting to note that relatively higher proportion of households in higher quintiles (compared to lower quintiles) has experienced improvement in household variables income, assets, employment and housing conditions, as a result of micro-credit. For instance, 38.8 per cent of households in the first (poorest) quintile had indicated an increase in household income, while this

⁸ The Spearman's Rho values for the third, fourth and fifth quintiles are 0.1366, 0.1342, 0.1340 respectively and significant at 0.05 level.

percentage is about 58.8 for the fifth (richest) quintile. Moreover, about six times as many clients in the fifth quintile indicated an improvement in asset level (owing to micro-credit) compared to that of the first quintile.

Table V
Impact of Micro-credit: Perceptions of the Clients by Quintile

| | Extent | First quintile % | Second quintile % | Third quintile % | Fourth quintile % | Fifth quintile % |
|-------------------|-----------|------------------|-------------------|------------------|-------------------|------------------|
| Income | Decreased | 1.2 | 3.0 | 2.9 | 1.7 | 2.0 |
| | No impact | 60.0 | 58.0 | 50.6 | 57.5 | 40.2 |
| | Increased | 38.8 | 39.0 | 46.5 | 40.8 | 57.8 |
| Assets | Decreased | 0.00 | 0.5 | 0.5 | 0.6 | 0.00 |
| | No impact | 95.7 | 90.3 | 90.5 | 81.8 | 72.6 |
| | Increased | 4.3 | 8.2 | 9.0 | 17.6 | 27.4 |
| Housing | Decreased | 0.00 | 0.00 | 0.4 | 0.5 | 1.1 |
| | No impact | 70.9 | 62.0 | 62.3 | 59.3 | 50.9 |
| | Increased | 29.1 | 38.0 | 37.3 | 40.2 | 48.0 |
| Employment | Decreased | 0.6 | 1.5 | 1.5 | 1.0 | 0.6 |
| | No impact | 87.9 | 87.2 | 76.7 | 79.6 | 68.3 |
| | Increased | 11.5 | 11.3 | 21.8 | 19.4 | 31.1 |

Note: *Sample size of micro-credit clients is 1286
Source: Microfinance Survey 2004, IPS

5. Conclusions

The main objective of this paper was to examine the impact of micro-credit on some selected household welfare attributes, i.e., household income, assets, expenditure, housing conditions and employment. In this regard both a quantitative and a qualitative approach based on a recently conducted national-level household survey on microfinance in Sri Lanka were utilised.

The results indicated that micro-credit has enabled the households to improve their income, assets and housing conditions. Furthermore, it was found that micro-credit has supported various employment generating activities among the clients. However, many businesses that have started

under micro-credit programs are either micro-enterprises or small-scale self employment activities that use little or no technology and skills.

The paper further looked at how micro-credit has impacted on households of different income groups. The findings revealed that the impact of micro-credit on income, assets and housing conditions is largely on households in middle quintiles (second, third and fourth quintiles) who are able to channel more resources (out of a given loan amount) for investment and who could afford to take risks involved in investment. For the poorest households, the impact of micro-credit is mainly on their (consumption) expenditure level. The demand for credit by the poorest groups is largely for emergency credit to support consumption and reduce vulnerability to various risks, etc. However, most of the existing micro-credit programs have not adequately addressed the issue of servicing the demands for financial services emanating from the poorest groups; micro-enterprise promotion has rather been their overwhelming concern. Thus, it is of great importance to take into account the differences among the micro-credit clients in different income groups and their needs in designing more effective financial instruments.

Furthermore, it is important to recognize that credit alone is not sufficient to improve the living conditions of the households. Some of the critical questions that the many clients of micro-credit programs particularly those from poorer groups, face are lack of skills and training, limited access to markets and technology. As a result, even when these households have access to credit and start up new ventures or micro-enterprises, the sustainability of these businesses become an issue of concern. Therefore, it is important that micro-credit institutions facilitate or involve directly in providing various 'credit plus' services that include skill development/training, marketing facilities and business development services to their clients to help them to sustain their economic activities supported by micro-credit schemes.

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