

# Impact of Microfinance on Household Welfare of Low-income Households in Sri Lanka

M B M Sarjoon  
Central Bank of Sri Lanka

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**Abstract:** Microfinance act as an alternate channel for granting credit and other financial assistance to economically active low-income segment of the population. Even though majority of the literature argue that microcredit has a strong positive relationship with household income and welfare, certain other scholars have a slightly different view. Moreover, previous studies have found that, certain household elements also influence the level of household income and welfare, in addition to microcredit. In Sri Lanka, there are large number microfinance providers offering microfinance to economically active low-income people. However, its impact on household income and welfare is not clearly seen as still 8.9% or 1.8 million of the total population are under poverty. Further, lack of a comprehensive regulatory framework for the sector led to several governance issues which may have a negative impact on household welfare. Therefore, this study is conducted to evaluate the impact of microcredit and certain demographic factors on household income and welfare of low-income households in Sri Lanka. Kalutara District is selected as the survey location. Multiple linear regression model is used for the study and parameters are estimated by Ordinary Least Square (OLS) method. The findings of econometrics analysis revealed that microcredit, household assets, educational status and age of the households have significantly affected the household income at 1% level. Whereas family size, gender and employment level of the households did not have significant impact on household income at 1% or 5% or 10% levels. The findings of the study are mostly consistent with empirical evidence.

**Keywords:** Microfinance, Microcredit, Household Income, Household Welfare, Low-income Households

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## I. Introduction

The concept of microfinance was introduced to the world in the eighteenth and nineteenth century. However, recognition for microfinance gained with the introduction of Grameen bank by the Noble prize winner Muhammad Yunus (Silva, 2012). Microfinance aims to offer financial assistance to economically underprivileged and financially ignored households (Bernard, 2015) by playing a dual role as social and financial intermediaries (Khavul, Chavez, & Bruton, 2013 and Ledgerwood, 1999). Studies conducted in many countries including Bangladesh, India, China and Sri Lanka have revealed that microfinance was used as a strategic instrument to mitigate poverty, enrich welfare for low-income households and to promote sustainable growth among low-income households in those countries (Bernard, 2015).

The official launch of microfinance in Sri Lanka commenced with the formation of Thrift and Credit Co-operative Societies in 1911 (Tilakaratna, Wickramasinghe & Kumara, 2005). However, people used to take small loans from family members and informal money lenders, until mid-90s (Silva, 2012). During late-90s, microfinance started to flourish in Sri Lanka subsequent to the success of microfinance in neighbouring countries like Bangladesh and India (Bernard, 2015). Samurdhi Poverty Alleviation programme and Poverty Alleviation Microfinance project (CGAP, 2006) are some of the large scale microfinance projects in the country. Moreover, commercial banks contribute to the commercialisation of microcredit in Sri Lanka by tapping the niche market. However, the growth of microfinance sector in Sri Lanka still hindered due to governance issues, non-availability of coherent regulatory and supervisory framework and suitable human and technological resources (Bernard, 2015). Further, in Sri Lanka bulk of the microfinance providers primarily deals with microcredits and micro-savings (Silva, 2012). Therefore, the scope of this study is limited to examine the influence of microcredit on household income and thus on household welfare.

Navajas, Schreiner, Meyer, Gonzalez-Vega & Rodriguez-Meza (2000); Panjaitan-Drioadisuryo & Cloud (1999) and Johnson & Rogaly (1997) have applied the poverty line income to define low-income household in measuring the impact of microfinance on household welfare. There are three categories of poverty lines used in Sri Lanka namely, food poverty line, lower poverty line and upper poverty line. For this study, upper poverty line which represents the low-income households has been selected as reference category. Lekobane & Seleka (2017) stated that most studies have used monetary dimensions such as income and expenditure on consumption to proxy household welfare because both the income and expenditure on

consumption indicate the ability of households to buy goods and service. This study uses household income as a proxy to household welfare.

The impact of microcredit on household income is a widely debated subject. Even though majority of the literature argues that microcredit has a strong positive relationship with income level of household, certain scholars like Chowdhury (2009); Coleman (1999); Mosley & Hulme (1998) and Berger (1989) carries a slightly different view on the effectiveness of microcredit on household income and welfare. Accordingly, the main objective of this study is to evaluate the impact of microcredit and other demographic factors on household income and welfare of low-income households in Sri Lanka.

The remaining part of this paper is structured as follows. A brief on relevant literatures both theories and empirical studies are given in section 2. The Section 3 presents sources, explanations and measurement framework of data. Research methodology and specifications are described in section 4. In section 5 the empirical results are discussed before concluding in section 6.

## **II. Literature Review**

Bernard (2015) stated that microfinance act as an intermediary to offer financial assistance to people who have been economically and financially neglected by conventional banks. The main objective of microfinance is to focus on micro-lending. According to Bernard (2015), low-income households obtain microcredit not only for business investments but, also to meet a range of cash needs on health, education, and other household emergencies that they may encounter during day to day life. As stated by Ledgerwood (1999), micro-loans are generally in small tickets and granted against social security rather than against financial securities. Moreover, microcredits are priced at high interest rates as such loans are comparatively risky loans (Ledgerwood, 1999). However, financial and social gains enjoyed by deprived households by obtaining microcredit easily counter balance the high borrowing cost (Chiyah & Forchu, 2010). Researches carried out in many countries including India, Bangladesh, China and Sri Lanka has shown that microcredit has been used as a strategic instrument to mitigate poverty and to promote sustainable growth among low-income households in those countries (Bernard, 2015).

The world bank study in 1996 found that globally microfinance providers operate as rural banks, cooperatives, credit unions, NGOs and banks (Silva, 2012). Their clientele are micro-enterprises and self-employed households (Ledgerwood, 1999). They employ several microcredit and microfinance models to offer financial and non-financial assistance to low-income clienteles. Kiiru & Machakos (2007) stated that the prominent feature of all microcredit models is that it targets the poor and enforce collective recovery of such loans based on joint liability lending to groups of borrowers. The Grameen Bank is the well-known microcredit model (Silva, 2012). The other micro-lending models are integrated lending model, group of group lending model village banking model and individual lending model (Khan & Rahaman, 2007 and Ledgerwood, 1999). The non-financial model includes poverty alleviation model, women empowerment model and financial sustainability model (Khan & Rahaman, 2007; Morduch, 2000 and Wahid, 1994). Lending models mainly concentrate on granting microcredit to underprivileged segments in the society. Other microfinance models, in addition to financial assistance, provide enterprise development and social welfare assistance.

In general, the literatures do not provide concrete evidence on the impact of microcredit on household income and welfare. Therefore, this research tries to fill the gap in the literatures through an impact assessment.

### **2.1 Microfinance activities in Sri Lanka**

Microfinance has been practiced in Asia, Latin America and number of European countries since very early days and evolved out of experiments (Bernard, 2015). Similarly, origin of microfinance in Sri Lanka dated back to eighteenth century. However, official launch of microfinance in Sri Lanka commenced with the formation of Thrift and Credit Co-operative Societies in 1911 (Tilakaratna et al., 2005). Another important step taken by the Government in early days to promote microfinance was the establishment of Co-operative Rural Bank in 1964 (Gant, De Silva, Atapattu & Durrant, 2002). The interest on microfinance began to increase in Sri Lanka in late 90s, with public, private and non-government entities started to introduce formal microfinance to economically active low-income people in the country.

According to Thibbotuwawa et al. (2012) Samurdhi Poverty Alleviation Project implemented by the Government in 1995, is still one of the biggest ongoing microcredit and welfare project in this country. By 2012, around 51% of the total population have been benefitted from this microcredit project (Thibbotuwawa et al., 2012). Another key microcredit project implemented to enhance household income in Sri Lanka is the Poverty Alleviation Microfinance Project (JICA, 2017). The project was funded by Japan International Cooperation Agency (JICA) and micro-loans were granted for income generating activities of low-income households. JICA has provided Rs. 3.2 bn worth microcredit to 59,215 households throughout 2009 to 2014 (JICA, 2017). On top of these large microcredit projects, several other government and non-government microcredit institutions are operating in Sri Lanka (CGAP, 2006). Most of the microfinance institutions in Sri Lanka do not provide

diversified microfinance products but, primarily aims on providing microcredit and micro-savings products (Silva, 2012).

Moreover, commercial banks contribute to commercialisation of microcredit in Sri Lanka by tapping the niche market. On the other hand, Central Bank of Sri Lanka work with the Government and many non-Government donor agencies in the capacity of 'executing agency' for many microcredit and rural credit schemes (Thibbotuwawa et al., 2012). However, the growth of microfinance sector in Sri Lanka is still hindered due to governance issues, non-availability of coherent regulatory and supervisory framework and lack of suitable human and technological resources (Bernard, 2015).

## **2.2 Household welfare of low-income households**

As stated by Thibbotuwawa et al. (2012) the minimum amount of income required to meet the lowest level of household welfare is defined as the ceiling for low-income households. Thibbotuwawa et al. (2012) stated that household welfare could be explained in terms of household income, living standard, housing condition, health condition, education level and level of human rights. Tilakaratna et al. (2005) studied the household welfare of low-income household in terms of (i) economic dimensions, (ii) vulnerability to risk and loss of income and (iii) social status and stated that microcredit directly or indirectly affect the above dimensions positively.

Biyase & Zwane (2018) stated that scholars use monetary dimension and non-monetary dimension to analyse household welfare. Monetary dimensions such as income and expenditure on consumption measure household welfare easily, because both indicate the ability of households to buy goods and service. Most of the low-income household do not have adequate level of income to live a kind of life that others value. an improvement in income level allows people to spend more on consumption, save and accumulate assets for future, compensate against any temporary loss in current income and spend more to upgrade housing conditions. Further, marginal benefits from a small increase in income for a low-income household is considerably bigger than marginal benefits for a household with high income level (Tilakaratna et al., 2005). Therefore, income level play in important role in deciding the level of household welfare of low-income households (Tilakaratna et al., 2005).

Many scholars like Akerele and Adewuyi (2011); Adams (2006); Datt and Jolliffe (2005); Quartey and Blankson (2004); Mukherjee and Benson (2003) and Kabubuo-Mariara (2002) have used the monetary dimension such as income and expenditure on consumption to analyse household welfare. Therefore, this study also proxy income level to household welfare and measures the impact of microcredit and certain other household elements on income level and household welfare of low-income households.

## **2.3 Impact of microcredit on income level (household welfare) of low-income households**

Kiiru & Machakos (2007) stated that household labour productivity is vital to improve household income and welfare. Nevertheless, labour productivity of low-income household is limited as a result of inadequate liquidity or inadequate credit (Kiiru & Machakos, 2007). Tilakaratna et al. (2005) mentioned that absence of credit is the major barrier to increase income, consumption and production of low-income households. Availability of credit enables the low-income segment to overcome liquidity constrains (Heidhues, 1995), to improve household income and welfare. However, formal financial sector is hesitant to attend to financial needs of low-income households due to perceived high risk, high transaction cost, non-availability of securities and lack of credit worthiness (Richard, 2004). As mentioned by Bakhtiari (2006), microfinance is thriving globally with the main objective of providing liquidity to improve the income level and household welfare of participants.

Large amount of studies has been steered to evaluate the impact of microcredit and microfinance on income level and household welfare of low-income households. Impact studies on the Grameen model by Hossain (1988), studies in Zambia by Copestake et al. (2001), sophisticated econometric study conducted by Pitt & Khandker (1998) in Bangaldesh, impact study conducted by GTZ in Sri Lanka, impact studies on micro business in Kenya by Mokogi (2003) are some of the examples. All these studies revealed a positive correlation between microcredit and household welfare of low income household as microcredit empowers low-income households to meet their household expenditure on consumption needs, earn higher income, accumulate physical and financial assets, start micro-businesses and self-employment and to upgrade the housing condition (Bakhtiari, 2006).

As mentioned by Chowdhury (2009), microcredit enables the low-income household to commence self-employed businesses and microenterprises. Being employed gives them self-esteem, significant boost to dignity, self-respect and improve the creditworthiness of such borrowers (Chowdhury, 2009). Thus, Chowdhury (2009) argues that even though benefits through self-esteem, dignity and self-respect cannot be gauged in monetary values and largely remain unacknowledged, these factors together with profits from self-employed businesses will help to increase the level of household welfare.

On the other hand, Berger (1989) claims that microcredit has a tendency to protect the income instead of increasing the income. Studies conducted in seven countries by Mosley & Hulme (1998) revealed that the level of household income increases at a decreasing rate when income level of people are increased. Tilakaratna et al. (2005) and Coleman (1999) claim that microcredit mostly helped middle and upper income households to increase their income and build assets. However, deprived households had utilised such loans only to meet consumption needs. Chowdhury (2009) argues that microcredit may not increase the income level of low-income households but, enable them to manage short-run cash flows and expenditure on consumptions and finally defaulted such micro-loans. Gurses (2009) mentioned that microcredit alone cannot minimise poverty level because, poverty reduction depends on several other aspects. As argued by Salia (2014), the impact of microfinance on household welfare is widely disputed despite microfinance is flourishing rapidly, worldwide.

However, Robinson (1998) pointed out that microcredit has evolved as a winning tactic to economically empower the underprivileged households. Richard (2004) stated that microcredit has a positive influence on income generation, building up assets, women empowerment, expenditure on health and housing condition. Therefore, microcredit result in improved household welfare. Moreover, microfinance in addition to financial empowerment, helps low-income households to socially empower by building up social network, social recognition and status in the society (Tilakaratna et al., 2005). Despite having different arguments on this topic, large number of experimental results proved that microcredit exert a strong positive influence on household income and welfare (Aigbokhan, 2011). Therefore, this study evaluates the impact of microcredit on income level of low-income household in order to find out the contributions of microcredit in improving household income and welfare of low-income households.

#### **2.4 Other factors affecting the income level of low-income households**

In addition to microcredit, there are some other rigorously studied elements that determine the level of household income and hence household welfare. Such factors include gender, age, marital status, education attainment and occupation of the head of the household; size of family in terms of dependency ratio and number of income earning people in the family; and assets held by the household (Biyase & Zwane, 2018; Akerele & Adewuyi, 2011; Adams, 2006 and Datt & Jolliffe, 2005).

Accordingly, this research model has factored size of the family, household assets, educational qualification, age, gender and employment of the household to analyse the impact of such variable on household income and household welfare, in addition to the impact of microcredit.

### **III. Material And Methods**

The research is conducted as a survey based on a structured questionnaire. The questionnaire was developed by taking inputs from similar research questionnaires developed by Wang (2013); Mbugua (2010); Khan & Rahaman (2007); Kiiru & Machakos (2007) and author's own inputs. The questionnaire was designed to gather data under five headings namely demographic data, socio-economic data, household assets, household expenditures and quality of housing conditions. A wrap up discussion was held at the time of collecting the questionnaires to fill incomplete or missing information. The time horizon is cross-sectional as the study takes place at a single point in time (Saunders et al., 2009).

Kalutara District has been selected for this study mainly because the District has larger distribution of microcredit within the Western Province and consist of 7,214 low-income families (Household Income and Expenditure Survey, 2016). Based on poverty headcount index, Kalutara District has been deemed as the backward district in the Western Province. District wise poverty details in the Western Province are presented in Table 01 below.

Table 01: District-wise poverty details, Western Province

District	Poverty Headcount Index	No. of Low-income Household
Colombo	0.9	3,611
Gampaha	2.0	7,875
Kalutara	2.9	7,214

Source: Household Income and Expenditure Survey (2016)

Simple Random Sampling Technique is used to select the sample size. The sample size covered a sample of 100 low-income households in Kalutara District. Random sample of 10 households are picked from 10 Divisional Secretary's Divisions of the District in order make up a sample size of 100 low-income households. 4 remote Divisional Secretary's Divisions were ignored due to the inconvenience in travelling to those villages as travel restriction were in place on account of COVID-19 pandemic. Head of the Household is the unit of analysis.

### 3.1 Econometric Model and Specifications

Determinants of Household welfare of low-income households are examined by multiple linear regression model and parameters are estimated by Ordinary Least Square (OLS) method. Scholars like Akerele & Adewuyi (2011); Adams (2006); Datt & Jolliffe (2005); Mukherjee & Benson (2003); Kabubo-Mariara (2002) and Glewwe (1991) have used OLS model to estimate the determinants of household welfare as measured by income level of households.

Accordingly, the study postulate that household income (I) is a function of total amount of microcredit (MC) and few other household characteristics such as size of the family (FS), assets held by the household (A), education level of the household (E), Age of the household (AG), Gender of the household (G) and Occupation of the household (O).

This derived the following OLS model:

$$I = \beta_0 + \beta_1MC + \beta_2FS + \beta_3A + \beta_4E + \beta_5AG + \beta_6G + \beta_7O + \varepsilon$$

The multiple linear regression model is chosen because, it permits to explicitly control other factors that could simultaneously affect the independent variable and therefore it is easy to adjust independent variables (Wang, 2013). The regression model is used to match general functional form relationships. The best estimation is ensured by testing endogeneity, multicollinearity and autocorrelation.

OLS model produces inconsistent results if endogeneity bias exists. Therefore, the model is tested for endogeneity bias to ensure that the results produced by OLS model are consistent. However, it is difficult to resolve endogeneity problem statistically (Ullah et al., 2018).

Naes & Martens (1985) mentioned that, if high level of Multicollinearity ( $VIF \geq 10$ ) exists, the OLS regression tend to reject theoretically perfect variables from the regression model considering them as non-significant variables. This results in OLS regression model producing volatile outcomes due to high level of standard error in the estimated coefficients (Field, 2013). Therefore, the value of Multicollinearity of this model is tested to ensure best estimation.

The OLS estimator ( $\beta$ ) become biased and inconsistent, if the disturbances in the model are autocorrelated (Maeshiro, 1999). Further, Maeshiro (1999) concluded that the impact of negatively autocorrelated disturbances is much higher than the impact of positively autocorrelated disturbances. Therefore, the model is tested to find out whether the disturbances are positively or negatively autocorrelated with OLS estimator ( $\beta$ ).

Household income (I) is used to proxy household welfare of low-income households. The total income of the household represents total monthly income of all income earning family members and from all income sources.

For this study, microcredit (MC) include the total amount of microcredit loans obtained by the respondent and his/her family members during the last two years and measured in Sri Lanka Rupees, to the nearest thousands.

Family size (FS) include both income earning members and non-income earning dependent members in the family and assessed under 4 categories. (1). 1-2 members, (2). 3-4 members, (3). 5-6 members and (4). Over 6 members. In addition, separate data was collected on the number of income earning members in the family to further analyse the impact of family size on household income.

Household assets (A) represents the self-reported total values of financial assets, physical assets and live stocks held by the family of the respondent. This was further analysed based on ownership of assets by purchase or inheritance.

Under educational variable (E), the highest level of educational qualification achieved by any household member is factored. Education level of the household is measured under 5 groups according to the education system in the country. (1). Below CGE(O/L), (2). GCE(O/L), (3). GCE(A/L), (4). Certificate/Diploma, (5). Degree.

Age of the household (AG) is factored under four categories. (1). 25 - 35, (2). 36 - 45, (3). 46 - 55, (4). Over 55.

Gender variable (G) is also factored in the study and categorised in to two. (1). Male, (2). Female. However, gender relations in a society depends on number of other social and cultural aspects.

The study has factored the primary and secondary Occupation of the household (O) under four categories. (1). Employment, (2). Business, (3). Self-employed, (4). Unemployed. Further, the variable is analysed based on the occupation status of the spouse of the household under same category.

## IV. Result And Discussions

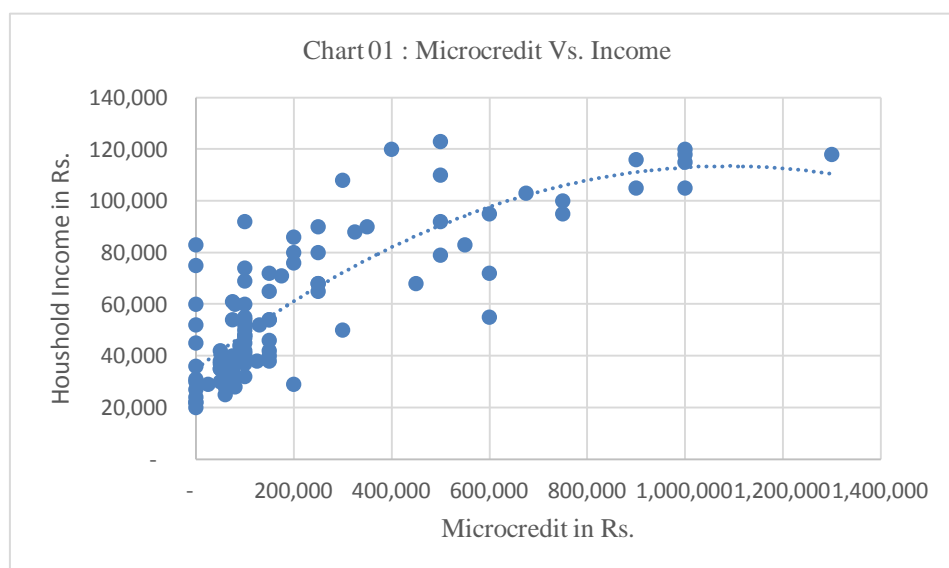
### 4.1 Summary Statistics

Descriptive statistics of the variables are presented in Table 02 below. The survey found that all households in the sample have obtained some amount of loans during the last two years either from a

microcredit institution or from other sources of borrowings. However, the mean microcredit loan size of Rs. 286,650 is much higher than the average of loan size of Rs. 106,258 obtained from other informal sources. Mokogi (2003) stated that the larger the amount of credit the higher the prospect for growth for low-income households. The average monthly income for households who have obtained microcredit recorded at Rs. 61,988. While, the average monthly income for households who have obtained loans from informal sources reported at Rs. 40,538. Accordingly, it appears that the households who have borrowed from microcredit institutions are better-off. Moreover, the average monthly income for households who have obtained microcredit was higher than the mean and median values for income which stood at Rs. 59,200 and Rs. 52,000 respectively.

Table 02: Descriptive statistics								
	AGE	ASSETS	EDU	GEN	INC	MC	OCU	SIZE
Mean	2.340000	429750.0	3.000000	1.270000	59200.00	228650.0	2.090000	2.260000
Median	2.000000	250000.0	3.000000	1.000000	52000.00	100000.0	2.000000	2.000000
Maximum	4.000000	3000000.	5.000000	2.000000	123000.0	1300000.	4.000000	4.000000
Minimum	1.000000	0.000000	1.000000	1.000000	20000.00	0.000000	1.000000	1.000000
Std. Dev.	1.036895	510082.9	1.340888	0.446196	28292.13	281088.1	0.975405	0.927906
Skewness	0.159368	2.200931	-0.075795	1.036131	0.711871	1.836811	0.278908	0.225611
Kurtosis	1.862715	9.310514	1.963136	2.073567	2.379333	5.687096	1.862510	2.181494
Jarque-Bera	5.812541	246.6624	4.575278	21.46894	10.05111	86.31660	6.687682	3.639804
Probability	0.054679	0.000000	0.101506	0.000022	0.006568	0.000000	0.035301	0.162042
Sum	234.0000	42975000	300.0000	127.0000	5920000.	22865000	209.0000	226.0000
Sum Sq. Dev.	106.4400	2.58E+13	178.0000	19.71000	7.92E+10	7.82E+12	94.19000	85.24000
Observations	100	100	100	100	100	100	100	100

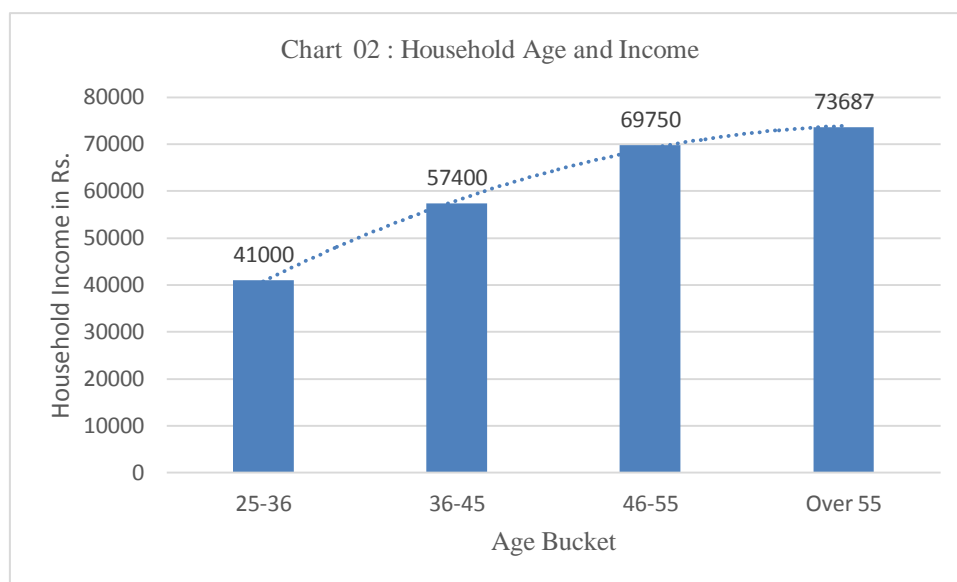
As shown in Chart 01 Below, the survey results revealed that there is a strong positive relationship between microcredit and income level of low-income households. However, the trend line shows that income level of households increases at a decreasing rate when the amount of microcredit is increased. Mosley & Hulme (1998) mentioned that the results of studies conducted in seven countries indicated that household income increased at a diminishing rate when the amount of microcredits are increased.



Gender distribution of sample indicates that 73% of the households are headed by males while the balance 27% of the households are headed by females. Even though microcredits are generally granted to female beneficiaries (Khan & Rahaman, 2007), the survey results provided an opposite finding. This may be due to the

social norms and gender discrimination prevailing in rural areas of the country as women empowerment highly depends on many social and cultural dynamics (Tilakaratna et al., 2005).

The mean value for age stood at 2.34, while median value stood at 2.0. Both represent the age group of 36 to 55 years. The average monthly income of households in the age group 25-35, 36-45, 46-55 and over 55 was recorded as Rs. 41,000, Rs. 57,400, Rs. 69,750 and Rs. 73,687, respectively. Therefore, with the increase in age, households were able to earn more income due to more work experience (Gounder, 2013; Cheema & Sial, 2012 and Datt & Jolliffe, 2005). However, as depicted in Chart 02 Below, the rate of increase in income tends to decline with the households getting older (Litchfield & McGregor, 2008).



The size of the family is also analysed to see its impact on household income and welfare. Lekobane & Seleka (2017); Akerele & Adewuyi (2011) and Litchfield & McGregor (2008) stated that having high number of income earning family members exert positive result on the income level of the family while higher dependency level may negatively affect household welfare. The results revealed that families with 5-6 members had monthly average income of Rs. 78,000 which is higher than the average monthly income of families with 3-4 members (Rs. 59,500) and families with 1-2 members (Rs. 40,435). This is because families with 5-6 members had grown up children, who are income earners, compared to other families.

The study also inquired about the educational status of the respondents because, educational status of the households influences their lifestyle and the way they manage businesses (Khan & Rahaman, 2007). The mean and median values for education stood at 3.0, representing the education attainment up to GCE(A/L). The average monthly income of households with educational qualification above the mean qualification reported as Rs. 69,514. While the average monthly income for households with mean and below mean educational qualifications reported as Rs. 53,464. Therefore, it appears that attaining higher educational qualifications would enable households to earn high level of income.

Further, the average microcredit obtained by households with educational qualification above the mean level was Rs. 296,857 while, average microcredit obtained by households with below mean educational qualification was Rs. 191,923. This indicates that attaining higher educational qualifications enables households to access more and more microcredits.

#### 4.2 Correlation Analysis

Outcome of the above descriptive analysis were further analysed with econometrics model estimations. The outcome of the estimated household welfare model is exhibited in Table 03 Below.

Accordingly, the estimated coefficient for the determinant variables of the household welfare model is represented as follows:

$$I = \beta_0 + \beta_1MC + \beta_2FS + \beta_3A + \beta_4E + \beta_5AG + \beta_6G + \beta_7O + \epsilon$$

$$E = 9165.91 + 0.03MC + 1305.65FS + 0.02A + 6646.02E + 5693.97AG - 1209.92G - 103.03O$$

As shown in Table 03 below, explanatory variables such as microcredit, age of the households, assets accumulated by the households and education status of the households are statistically significant at 1% with

expected positive signs. While explanatory variables such as family size, gender and occupation of the households are not significance at 1% or 5% or 10% levels with the predicted signs.

Table 03 : Econometrics estimations				
Dependent Variable: INC				
Method: Least Squares				
Date: 08/08/20 Time: 10:09				
Sample: 1 100				
Included observations: 100				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9165.910	6440.711	1.423121	0.1581
MC	0.030042	0.009060	3.316029	0.0013
AGE (AG)	5693.973	1719.197	3.311996	0.0013
ASSETS (A)	0.020254	0.005073	3.992718	0.0001
EDU (E)	6646.018	1065.332	6.238446	0.0000
GEN (G)	-1209.923	3185.822	-0.379784	0.7050
OCU (O)	-103.0344	1450.887	-0.071015	0.9435
SIZE (FS)	1305.649	1826.722	0.714750	0.4766
R-squared	0.810163	Mean dependent var		59200.00
Adjusted R-squared	0.795719	S.D. dependent var		28292.13
S.E. of regression	12787.32	Akaike info criterion		21.82691
Sum squared resid	1.50E+10	Schwarz criterion		22.03533
Log likelihood	-1083.346	Hannan-Quinn criter.		21.91126
F-statistic	56.08950	Durbin-Watson stat		1.671055
Prob(F-statistic)	0.000000			

In order to check the fitness of the estimated model, the coefficient of the R-squared and adjusted R-squared were estimated. The coefficient value of R-squared at 0.81 (81%) and the coefficient value of adjusted R-squared at 0.80 (80%) indicates that 81% or 80% of the variation in the output variables are explained by the input variables. Therefore, it assumed that the model has a better predictability and is better fitted for the study.

In order to check the robustness on the estimated equation, endogeneity, autocorrelation and multicollinearity of the estimated equation was tested. The endogeneity test was conducted using prob(F-statistic). A less than 0.01 Prob(F-statistic) indicates that all determinant variables in the model collectively exert substantial influence on household welfare as proxy by household income, at 1% significance level. As presented in Table 04 below, the VIF values of the estimated coefficients are between 1 and 5. Therefore, it is assumed that there is no significant level of Multicollinearity in the model. Autocorrelation of the variables in the equation was estimated by using Durbin-Watson statistic. A value between 1.7 and 2.4 indicates that disturbance in the model are not autocorrelated (Maeshiro, 1999).

Table 04 : Variance inflation factors (VIF)			
Variance Inflation Factors			
Date: 08/13/20 Time: 22:45			
Sample: 1 100			
Included observations: 100			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	41482756	25.36929	NA
MC	8.21E-05	6.550472	3.926252
AGE	2955637.	11.82142	1.923963
ASSETS	2.57E-05	6.960160	4.053691
EDU	1134933.	7.482207	1.235466



GEN	10149463	11.23472	1.223406
OCU	2105074.	6.836010	1.212587
SIZE	3336913.	12.16275	1.739519

#### **4.3 Econometrics estimation of determinant variables of household welfare**

Variables factors in the model is analysed based on the model estimation to ensure that the findings are scientifically in line with empirical evidences and the descriptive analysis made above.

The model estimated that microcredit has a positive impact on household income and it is significance at 1% level. The model estimated that when microcredit is increased by Rs. 1, the household income increases by Rs. 0.3. Therefore, the outcome of the estimation is in line with the findings of scholars such as Chowdhury (2009); Bakhtiari (2006); Tilakaratna et al. (2005); Mokogi (2003); Copestake et al. (2001); Pitt & Khandker (1998) and Hossain (1988).

The estimation produced by the model indicates that the family size is insignificant to improve household income as the coefficient is not significant at 1% or 5% or 10% levels. However, the higher the family size, it has resulted in an increase of household income by Rs. 1,305.65. Higher number of income earning members in the family is positively related to the income level and household welfare (Lekobane & Seleka, 2017; Akerele & Adewuyi, 2011; Litchfield & McGregor, 2008).

As estimated by the model, accumulation of assets has a positive impact on household income and is significant at 1% level. When household assets are increase by Rs. 1, the household income is increased by Rs. 0.02. Accumulated assets yield a multitude output on household income (Blundell & Preston, 1995).

Education attainment of the household indicated a positive impact on household income and is significant at 1% level. The model estimated that when the level of education is improved by an education bracket under consideration, the household income increases by Rs. 6,646.02. This finding was in line with Gounder (2013); Akerele & Adewuyi (2011); Litchfield & McGregor (2008); Quartey & Blankson (2004) and Mukherjee & Benson (2003).

Estimation by the Model indicates that age of the household has a positive impact on household income. Age is significant at 1% level and when the age is increased by an age bracket, the household income increases by Rs. 5,693.97. This finding was consistence with the findings of Gounder (2013); Cheema & Sial (2012) and Datt & Jolliffe (2005).

According to the estimation provided by the model, gender of the household is not significant at 1% or 5% or 10% levels. This may be due the non-monetary contributions made by women in the household to improve income and welfare (Litchfield & McGregor, 2008).

The model estimated that the employment status of the household is not significant at 1% or 5% or 10% Levels. However, the results indicated that higher employment status of the household induced the household income to increase by Rs. 103.03

## **V. Conclusion**

Globally microfinance has started to flourish as an alternate means of granting credit and other financial assistance to economically active low-income segment of the population who are financially ignored by conventional institutions (Bernard, 2015). Many governments and international institutions have considered microfinance as an effective policy tool to economically empower the underprivileged to come out of the poverty line income and to enrich their household welfare. Even though microfinance institutions offer financial intermediation and social intermediation Ledgerwood (1999), many of the microfinance institutions mainly focus on microcredit.

During late-90s microfinance started to flourish in Sri Lanka, subsequent to the success of microfinance in neighbouring countries (Bernard, 2015). Currently, there are large number of public, private and non-government entities offering formal microfinance to economically active low-income people in the country. However, bulk of them primarily offer microcredit. Regardless of the long existence of microcredit institutions in Sri Lanka, the real impact of microcredit on household income and welfare is still indistinct. Further, the growth of microfinance sector in Sri Lanka is hindered due to governance issues, lack of competent human and technological resources and non-availability of coherent regulatory and supervisory framework. So far only few studies have been conducted in Sri Lanka to examine the impact of microcredit on household income and welfare.

Assessing the impact of microcredit on household income is a widely debated area. Even though majority of the literature argues that microcredit has a strong positive relationship with income level and household welfare, certain other scholars put forward slightly different arguments. Moreover, many previous studies have found that, in addition to microcredit, there are some other rigorously studied elements that determine the level of household income and welfare (Biyase & Zwane, 2018). Therefore, this study is

conducted to evaluate the impact of microcredit and certain other demographic factors on household income and welfare in Sri Lanka.

The Ordinary Least Square multiple linear regression model was used to examine the impact of microcredit and selected demographic factors on household income and welfare of low-income households in Sri Lanka. A descriptive analysis also incorporated in the study.

The findings of the study revealed that microcredit has a positive impact on household income and it is significance at 1% level. The model estimated that when microcredit is increased by Rs. 1, the household income increases by Rs. 0.3. Therefore, it could be concluded that, microcredit has enabled low-income household in the survey District to improve their income. However, the degree of impact differs across the sample. Further, household assets, educational status and age of the household have significantly affected the household income at 1% level. On the other hand, size of the family, gender and employment level of the household did not have significant impact on household income at 1% or 5% or 10% levels. The findings of the study are mostly consistent with empirical evidences. However, the outcome on microcredit outreach to women is not in line with the results of certain previous studies.

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