Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.9, No.9, 2018

Analysis of Factors Influencing the Benefits of Microcredit in Farm Production: A Welfare Economic Perspective from Punjab Province of Pakistan

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Abstract
Microcredit seems to be the dire need of small farmers and believed to be an appropriate tool for facilitating small enterprises. This study examined the effects of farmers' certain internal and external factors on microcredit major benefits i.e. farm production and income. The study was confined to the four districts of Punjab Province of Pakistan. Data was randomly collected from 118 small farmers who had borrowed microcredit from different microfinance institutions (MFIs). Data analysis was performed in such a way that influence of specific variables under six categories of internal and external factors was estimated by employing logit model. Most influencing variable observed from each logit model was selected for overall multiple regression analysis. Findings from data analysis revealed that farmers' education and their saving habit were positively influencing farm production and income. Number of livestock animals and more off-farm income sources reduced the changes of credit money to be used on non-income generation activities. These results were significant at 1% significance level. Inter-cropping had positive relationship for crop productivity. Suitable weather conditions was taken as environmental factor and its influence was positive for microcredit benefits. Farmers' long distance from major agricultural market and strict repayment plan of MFIs were negative influencing microcredit benefits and were significant at 1% significance level. Multiple regression model overall 54.81% explained the impacts of six important variables on microcredit benefits. Econometric models also showed that many of the variables were inter-related and inter-dependent to each other and were affecting farm production and income on varying degree.
Keywords: microcredit benefit, farm production, impact assessment, inter-dependence, Punjab.

1. Introduction

Microcredit is considered as a developmental strategy which can facilitates poor people to become more resilient and better able to provide their families an improved living standard. Microcredit had proved to be a vital solution for poor farmers, who simply won't acquire loans from banks due to little or no assets (Norma and Jarita, 2010). The potential benefits of microcredit in improving the quality of life of poor people could be: accessibility to banks, encourage self-entrepreneurship and manage risks, better education of family households, improved health care, job creation, empower women and poverty reduction (Rahman et al., 2009; AlMamun and Mazumder, 2015). Microcredit provide access to funds for underprivileged people who have profitable business plans but they are lacking funds to start-up. These less privileged people acquire financial supports from informal money lenders which are often costly and unreliable. While most of the commercial banks presumed that underprivileged clients are unstable due to lack of financial security. Microfinance institutions (MFIs) dismissed such collateral requirements by providing loans at flexible terms and conditions. Micro-credit schemes often associated with a philosophy that even a small working capital might be enough to launch a small business that could help the benefactors to pull themselves and their families out of poverty. Household who run their business with the aid of microcredit are less likely to pull their children out of school. Microcredit also provides improved health care with more awareness for clean water and better sanitation. Flourishing business can help to create new job opportunities, which have a beneficial impact on local economy. Benefits of microcredit in terms of women empowering and poverty reduction are also major achievements. In the past, women were not able to participate in economic activities. However, microfinance institutions had provided sufficient financial services for women to start their business projects. Women economic participation and sustainability gave them more confidence to reduce their poverty, encourage their decision making ability and thereby establish gender equality (Miller, 2011; Osei et al., 2009; Shah et al., 2008).

In rural economy of Pakistan, credit remained an integral part of agricultural modernization and commercialization. Several credit programs have been introduced by the government of Pakistan through different institutional sources. Credit market for farming in Pakistan is comprised of the co-existence of formal,

semi-formal and informal money lenders. Formal sources include public and private commercial banks. Semi-formal credit sources contain rural support programs (RSPs), micro-finance institutions (MFIs), non-government organizations (NGOs) and farmer based cooperatives (FBOs). Informal money lenders referred to specialized stakeholders such commission agents, commodity hoarders and marketers that execute financial services to the poor farmers on high interest rate but flexible terms. State Bank of Pakistan (SBP) has allocated agricultural credit disbursement target of 600 billion Pakistani rupee (PKR) for the financial year of 2016-17 which was 20 percent higher than the last year target of 500 billion PKR (Economic Survey of Pakistan, 2016).

Benefits of microcredit in farm production can be evaluated from different aspects. For example, microcredit might increase farm productivity by enabling poor farmers to purchase necessary inputs. It could help the famers to assist in agricultural value addition activities (Frank and Agnes, 2013). Microcredit could also be used for certain other purposes relating to income and welfare improvement activities such as: improving quality of housing, household assets, agricultural land and savings. Provision of cheap and easy credit is a prime demand of farming community in Pakistan to alter subsistence agriculture into commercial farming. However, farmers are facing many challenges in perspective of internal and external constraints which limit their accessibility to avail microcredit in timely fashion (Asim et al., 2015).

Benefits of microcredit in farming can be affected directly and indirectly by different internal and external factors. Internal factors are specifically related to the farmers' socio-economic circumstances. External factors are related to environmental settings that are beyond the direct control of farmers. Socio-economic or internal factors might include social factors such as education level, tradition and saving habit of people, while economic factors might include the number of employed persons in a family, off-farm income sources, and number of livestock animal. Social and economic factors create fungibility issues and repayment problems. Usage of microcredit in non-income generating activities e.g. expenses on wedding, children education and buying motorcycle etc. Such kind of expenses could lower the chance to gain real benefits of microcredit. The external factors might include agricultural production technologies, environmental factors, physical and institutional factors. Agricultural production technologies involve the application of latest cultivation, improved irrigation, crop rotation and inter cropping methods etc. These agricultural practices increase farm production, recover soil fertility and reduces cost of production (Bhatta, 2014). Environmental factors comprise of climatic, weather conditions, and level of rainfall. Physical and institutional factors are also potential determinants to foster significant effects on the benefits of microcredit. Physical and institutional factors might comprise of farm- to-market road, distance from district market, access to information and extension services, and monitoring framework of credit institutions related to farming activities. Both internal and external factors could play a greater role on the accomplishment of microcredit benefits. Following diagram indicate a conceptual framework showing the nature of relationship existed between the benefits of microcredit and factors influencing them.

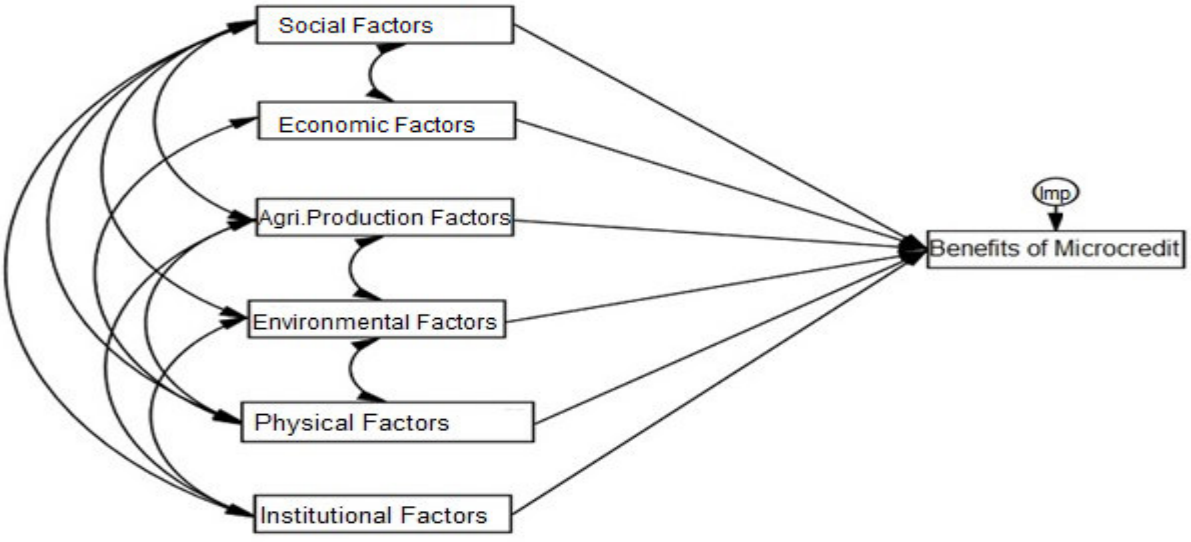

Fig. 1 Conceptual framework regarding factors affecting microcredit benefits

This study was an endeavour to find empirical evidences regarding the probable impacts of farmers' internal and external factors on microcredit benefits in farm productivity. Primary benefits of microcredit assumed in this study were the farm production and farmers' income. In view of that, farm production and income differentials between microcredit borrowers and non-borrowers was estimated. Attention was also given to examine the factors that might influence the optimal usage of microcredit in agriculture farming. As the optimal usage of microcredit decide the attainment of primary benefits of microcredit i.e. farm production and

income.

2. Material and Methods

2.1 Data Source

To assess the factors that might affect the benefits of microcredit, qualitative research approach was used to evaluate the opinions, insights and impressions of farmers who borrowed microcredit for farm production. Sampling frame was comprised of 118 small farmers who borrowed microcredit. Study area encompassed of four districts (Vehari, Lodhran, Bahawalpur and Rahimyar Khan) geographically located in Punjab Province of Pakistan. These districts are famous for agricultural production. The data was collected through survey questionnaire. The structured questionnaire contained both the open-ended and closed-ended questions. The questions were simple and easy to comprehend for farmers. Microcredit borrowers' attitude and opinions were recorded precisely and used in data analysis.

2.2 Model Selection

Statistical approach to get inferences regarding the influence of factors on microcredit benefits was based on regression analysis. Logit and multiple regression models were used to check the relationship between dependent variable (benefit of microcredit) and basic variables included in each specific category of internal and external factors. From the results of logit regression analysis, significant variables were selected to run a multiple regression model that collectively verified the strength of internal and external factors impacts on microcredit benefits. The dependent variable was dummy variable which assumed a value of one or zero depending on respondents' opinion. Most of the explanatory variables used during analysis were of qualitative response and were dichotomous. Benefit of microcredit was a dependent variable which took two values, one if borrower was of opinion that the inquired factor influenced and zero otherwise. For the estimation of such type of relationship, Logit model is of widely used qualitative response model. Assume the existence of latent variable:

$$y_i^* = \beta x_i + \varepsilon_i$$

$$y_i = \begin{cases} 1 \; if \; y_i^* > 0 \\ 0 \; if \; y_i^* \leq 0 \end{cases}$$

Where,

Yi denoted the proportion of microcredit benefit effected by factors, β represented the coefficients of change in dependent variable due to change in independent variables, and Xi were the variables included in model. Ɛi showed the error term that was normally distributed. Hence logistic model could be econometrically specified as:

$$P_i = F(Z_i) = F\left(\alpha + \sum \beta_i X_i\right) = \frac{1}{1 + e^{-zi}}$$

Pi demonstrated the probability that microcredit benefit would influence or not influence given the Xi. While βi were parameters to be estimated for each independent variables. Logistic model in terms of odds and log of odds could be written as following:

$$\left(\frac{P_i}{1 - P_i}\right) = \left(\frac{1 + e^{Zi}}{1 + e^{-Zi}}\right) = e^{Zi}$$

Or,

$$\left(\frac{P_i}{1 - P_i}\right) = \left(\frac{1 + e^{Zi}}{1 + e^{-Zi}}\right) = e^{(\alpha + \Sigma B_i X_i)}$$

Logit model became following, if disturbance term (μi) was taken into account,

$$Z_i = \alpha + \sum_{i=1}^{m} \beta_i X_i + \mu_i$$

Multiple regression analysis was conducted to test the effects of social, economic, farm production technologies, environmental, physical and institutional factors on microcredit benefits.

$$BM = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where,

BM = Benefits of Microcredit (dependent variable)

X1=Social Factors, X2= Economic Factors, X3= Farm Production Technologies,

X4= Environmental Factors, X5= Physical Factors, X6= Institutional Factors (independent variables)

β0= Intercept, βi= Coefficients of the Variables, Ɛ= error term.

2.3 Definition and Selection of Variables

Table 1 Description of variables

Variables	Descriptions	Type	Values
Dependent Variable			
BM	Benefits of Microcredit	binary response	1= microcredit benefits is affected by Xi, 0= otherwise
Independent variables regarding specific internal and external factors			
Social Factors X1			
EDU	Education of Farmers	dummy	1= affect microcredit benefit, 0=otherwise
SH	Saving Habit	dummy	1= affect microcredit benefit, 0= otherwise
NIGA	Non-Income Generating Activities	dummy	1= yes, 0=otherwise
Economic Factors X2			
OFSIC	Off-Farm Sources of Income	dummy	1= affect microcredit benefit, 0= otherwise
NEMP	Number of Employed Persons in Family	continuous	1,2,3…. number of persons working in family
NLA	Number of livestock animals hold by Farmers	continuous	1,2,3 number of animals he/she holds
Farm Production Technologies X3			
CR	Crop Rotation	dummy	1= improved the farm production, 0= otherwise
ICR	Inter-Cropping	dummy	1= increased farm production, 0 otherwise
Environmental Factors X4			
RF	Rainfall	dummy	1= optimal rainfall affect BM, 0= otherwise
SWC	Suitable Weather conditions	dummy	1= suitable weather affect BM, 0 otherwise
Physical Factors X5			
Road	Farm to Market Road	dummy	1= yes affect BM, 0= otherwise
DDM	Distance from District Market	continuous	kilometers
Institutional Factors X6			
SRP	Strict Repayment Plan	dummy	1=yes affect BM, 0= otherwise
CMFW	Credit Monitoring Framework by MFIs	dummy	1= yes affect BM, 0=otherwise
ESMI	Extension Services and Market Information	dummy	1=yes affect BM, 0= otherwise

3. Results and Discussion

3.1 Impact of social factors

Table 2 showed the results regarding the influence of social factors on microcredit benefits in agriculture sector (i.e. farm production and farmers' income). Results revealed that education was positive and it significantly (p-value 0.001) affected the benefits of microcredit. This could be suggested that education was a critical factor and farmers with good education were able to efficiently utilized microcredit for their farming activities to attain maximum benefits of microcredit. Education provided appropriate skills and information for the optimal use of microcredit that led to enhance the performance of microcredit. Lack of education may led to inappropriate utilization of microcredit that would reduce its benefits. Results in Table 2, indicated that saving habit (SH) of the farmers was positive and significant (t-value 2.201) in relation to the benefits of microcredit. This suggested that, the farmers that had saving habit become sustainable and more capable to effectively manage their expenses. This result also stressed the importance of saving habit among farmers for timely and accurately application of microcredit in agriculture. Findings revealed that the variable of microcredit usage on non-income generating activates (NIGA) such as; paying fee of school going children, doing expenses on wedding or buying household items or motorcycle from credit money. This variable was negative and significant at 1 % level of significance. It implied that usage of microcredit on non-income generating activities would decline the benefits of microcredit. It might be due to the reason that children school expenses were unavoidable and if family was deficient of funds then credit money could be shifted from farming to household expenses, which actually diminished the microcredit benefits. Such expenses incurred on non-income generating activities would create the fungibility

issues. Hence credit money used interchangeable would negatively impact the real outcomes of credit purpose.

Table 2 Results of social factors affecting microcredit benefits

Variables	Coefficients	Std. Error	t-Statistics	Prob.
Edu	0.338	0.0624	5.416	0.001***
SH	0.107	0.0486	2.201	0.02**
NIGA	-0.266	0.075	-3.546	0.000***

*Source: Field data results, 2017. Note ***, **, *, Significance at 1%, 5% & 10% respectively*

3.2 Impact of economic factor

Results demonstrated in Table 3 showed that off-farm income sources (OFSIC) were positive and this variable significantly (t-value 3.462) influenced the benefits of microcredit. This implied that availability of more off-farm income sources could improve proper and efficient utilization of microcredit in farm production that would lead to increase the crops yield and income. Number of employed persons (NEMP) in a family was continuous and its coefficients demonstrated that this variable had positive relationship for microcredit benefit, although not statistically significant, as could be seen in Table 3. Further the results depicted that number of livestock animals (NLA) reared by microcredit borrowers was positive and it was significantly (t-value 2.552) influencing the benefits of microcredit. This suggested that as the number of livestock animals increased, the performance of microcredit in agriculture would also increase. This might be contributed by joint ability aspect of livestock animals in household expenses, which reduced the risk of credit money to be used towards family expenses. As per field observation, it was noted that whenever farmers need to meet sudden or immediate expenses, they sold out their heifers or unproductive animals. The presences of livestock animals, therefore, reduced the chances of fungibility issues for microcredit and its benefits would be more secured.

Table 3 Results of economic factors affecting microcredit benefits

Variables	Coefficients	Std. Error	t-Statistics	Prob.
OFSIC	0.561	0.162	3.462	0.000***
NEMP	0.119	0.186	2.201	0.221
NLA	0.656	0.257	2.552	0.001***

*Source: Field data results, 2017. Note ***, **, *, Significance at 1%, 5% & 10% respectively*

3.3 Impact of farm production technologies

The variable of farm production technologies was comprised of chemical and biological practices that were applied to get higher crops yield. These technologies included chemical fertilizers, improved seed, water saving irrigation techniques and soil quality enhancing methods. Adoption of very expensive technologies restricted the small farmers to implement the latest technologies. In order to enhance farm production and land productivity, poor farmers used some biological technologies such as; crop rotation and inter-cropping. Crop rotation is practice of recurrent succession of different crops on a given piece of farm land. Crop rotation also helped to ensure the required soil fertility and control plant diseases. Continuous growing of same crop from a given plot of land causes soil nutrient imbalance, which declined land productivity. In Punjab Province, cotton-wheat rotation was practicing for many years and many plant specific pests and diseases had been established.

Crop rotation (CR) was positively influencing microcredit benefits, as could be seen from values in Table 4. This implied that crop rotations could maintain soil quality and it reduced the expenses of chemical fertilizer and pesticides. Saving of credit resources by less utilizing of fertilizers and pesticides could lower the overall cost of production. Furthermore, crop rotation also support to increase crops yield. Inter-cropping (ICR) was another farm production technology that was used by farmers to enhance farm yield by incorporating of some leguminous crops such as lentil; chickpea, mustard etc. Inter-cropping contributed to sustainable and high yield of focused crops by using soil nutrients that could not be used by a single crop. Inter-cropping proved to be a determinant variable at the 5% significance level. Coefficient showed that the farmers that were applying crop rotation would get 0.406 units more in term of farm production. However, farmers seek a support from extension department for the selection of crop varieties that could be used for inter-cropping. Hence, overall results of agricultural production technologies affect the productivity and income of farmers; which were the key benefits of microcredit in this study. Application of capital saving farm production technologies indirectly facilitated microcredit benefits.

Table 4 Results of agriculture production technologies affecting microcredit benefits

Variables	Coefficients	Std. Error	t-statistics	Prob.
CR	0.561	0.282	1.989	0.101
ICR	0.406	0.186	2.182	0.041**

*Source: Field data results, 2017. Note ***, **, *, Significance at 1%, 5% & 10% respectively*

3.4 Impact of environmental factors

Environmental factors such as rainfall, flood, and suitable weather conditions influence the farm production and ultimately the farmers' income. Findings in Table 5 showed the analysis of YES and NO responses that were collected from microcredit borrowers. Results exposed that rainfall (RF) had positive influence for farm production. It might assist in saving some money from irrigation expenses and this spare money could be used to purchase some other important inputs that could help to get better crop yield. Opinion of farmers' regarding the impact of weather conditions on crop production was processed and it was found that suitable weather condition (SWC) was positive and significantly (t-value 2.514) influencing the farm production. This variable was found to be significant at 5 % level of significance. Its coefficient indicate that if suitable weather conditions persistent during crop sowing and harvesting time, benefits of microcredit (farm production and income) would increase by 0.342 units as compared to bad weather, could be seen from Table 5.

Table 5 Results of environmental factors affecting microcredit benefits

Variables	Coefficients	Std. Error	t-Statistics	Prob.
RF	0.084	0.057	1.473	0.245
SWC	0.342	0.136	2.514	0.031**

*Source: Field data results, 2017. Note ***, **, *, Significance at 1%, 5% & 10% respectively*

3.5 Impact of communication factors

Farm-to-market road infrastructure and distance of village from district agricultural market were evaluated under physical factors. Table 6 revealed that farm to market road was positive and significant at 5% level of significance. This suggested that benefits of microcredit was dependent variable for the means of communications like road and transportation etc. Coefficient of road presence showed that microcredit benefits would be positively influenced. Farm to market road allowed farmers and farm goods to move faster and easier. These results, further evidenced that microcredit benefits were negatively and significantly (p-value 0.000) influencing by distance factor (Table 6). Large distance between village and district market (DDM) negatively influenced the performance of farmers. It implied that farmers that were living in villages near to district markets could easily approach agricultural markets for buying and selling of farm inputs and outputs respectively. This factor indirectly affected the benefits of microcredit, as farm production could be sold out at better prices and farm income would be more stable as compare to distant villages.

Table 6 Results of physical factors affecting microcredit benefits

Variables	Coefficients	Std. Error	t-statistics	Prob.
Road	0.335	0.127	2.633	0.022**
DDM	-0.462	0.109	-4.238	0.000***

*Source: Field data results, 2017. Note ***, **, *, Significance at 1%, 5% & 10% respectively*

3.6 Impact of institutional factor

Institutional factors were those variables that considered to be provided by the government departments and certain other institutional management. The institutions like agriculture department, microfinance banks, agriculture market information system. These institutions offered various facilities in form of extension, market information, and microcredit repayment plan. Values in Table 7, described that a strict repayment plan (SRP) of microcredit was negative and significant at 1% significance level. The estimated coefficient (β= 0.445) showed that if microcredit banks imposed a strict repayment schedule, its benefits would be reduced by a factor of 0.445, as per opinions of farmers. This might be due to the competition between capital flows among farmers, either they spent money to grow next crops or to repay that money to the banks. Farmers' were of opinion that if microcredit repayment plan should be relaxed, maximum benefits could be realized. Appropriate and pressure free repayment plan offered by banks, could help in the efficient utilization of credit in agriculture. Outcomes of data analysis regarding credit monitoring framework (CMFW) implemented by microfinance institution showed a positive and significant impact on attaining higher benefits of microcredit. This variable was significant at 10% level and it implied that effective monitoring system ensured the proper utilization of credit towards agriculture farming. The estimated coefficient showed that one unit increase in monitoring framework by microfinance institution would lead to increase the microcredit benefits by a factor of 0.235, as could be seen from Table 7. Monitoring framework could motivate the farmers to use credit for productive purposes. Therefore the chances of fungibility issues could be reduced and credit real outcomes would be realized. Extension service mostly provided by agriculture department encouraged the farmers to enhance their farm productivity. Result of logit model in Table 7, indicated that extension service was positive and significant (p-value 0.061) for microcredit benefits. Extension agents should delivered the latest research information to farmers that could help to improve farm production and ultimately income level. Access to market information system was used as proxy variable for microcredit benefits. Table 7 showed that extension services and market information (ESMI) were positive

and significant at 5% level of significance. This suggested that access to market information system had enabled microcredit borrowers to take rational decisions. This variable could develop the opportunistic behaviors among farmers who borrowed microcredit. By utilizing better information about credit and agriculture market, farmers could adopt technology, access inputs and also could properly market their farm produce at better prices.

Table 7 Results of institutional factors affecting microcredit benefits

Variables	Coefficients	Std. Error	t-Statistics	Prob.
SRP	-0.445	0.167	-2.664	0.002***
CMFW	0.235	0.107	2.196	0.061*
ESMI	0.122	0.049	2.489	0.024**

*Source: Field data results, 2017. Note ***, **, *, Significance at 1%, 5% & 10% respectively*

3.7 Multiple regression model results regarding the factors influencing microcredit benefits

To estimate the impact of various factors influencing the benefits of microcredit, multiple regression model was employed. Education (EDU) was used a proxy variable for social factors (X1), number of livestock animals (NLA) was used from economic factors (X2), inter-cropping (ICR) was taken from farm production technologies (X3), suitable weather condition (SWC) was used for environmental factors (X4), distance of village from district market (DDM) was taken from physical factors (X5), and strict repayment plan (SRP) was taken from institutional factors (X6). The selection of these variables was based on their performance or significance level as observed in logistic regression. Collective impacts of all these factors influencing microcredit benefits have been presented in Table 8. Multiple regression model had expressed a strong positive relationship between six independent variables for microcredit benefits i.e. farm production and income. Specifically education revealed a positive and significant impact on benefits of microcredit at the 5% significance level. The estimated coefficient (β=0.189) for education variable implied that one unit improvement in social factors would lead to a corresponding 0.189 increased in microcredit benefits (t-value 2.661). Data analysis showed a positive and significant impact of economic factors (X2) for microcredit benefits. The variable of number of livestock animals reared by farmers was taken from economic factors and its coefficient (β= 0.485) was significant at 1% significance level (t-value 4.449). This implied that if farmers increased one livestock animals in their herd size, microcredit benefits would increase by a corresponding 0.485 units. Results indicated that inter-cropping had a positive relationship for crop yield and it was significant (t-value 3.078). This suggested that a unit increase in farm production technologies (β= 0.234) would lead to rise the benefits of microcredit by 0.234 factor. In addition to this, the outcomes in Table 8 showed that suitable weather conditions was also positively affecting farm production and it indirectly influenced the microcredit utilization. For example, if during crop sowing there was enough rainfall, then money expenses on irrigation would be declined and credit money could be used to some other important farm inputs i.e. fertilizer etc. The estimated coefficient of environmental factor (SWC) implied that good weather condition would lead to increase microcredit benefit by a factor of 0.278 and this variable was significant at 1 % (t-value 5.245)

Table 8 Multiple regression results of factors affecting microcredit benefits

Variables	**Coefficients**	**Std. Error**	**t-Statistics**	**Prob.**
C	5.8	0.287	20.209	0.000***
EDU (X1)	0.189	0.071	2.661	0.004**
NLA (X2)	0.485	0.109	4.449	0.000***
ICR (X3)	0.234	0.076	3.078	0.003***
SWC (X4)	0.278	0.053	5.245	0.000***
DDM (X5)	-0.314	0.103	-3.048	0.002**
SRP(X6)	-0.147	0.039	-3.469	0.001***
R-Squared	0.5674	D-W stat	1.775	
Adj. R-squared	0.5481	AIC	7.326	
F-statistic	11.661	SIC	7.502	
Prob (F-statistics)	0.00025	No. of obs.	128	

*Source: Field data results, 2017 *, **, ***, Significance at 10%, 5% & 1% respectively.*

Distance of village from district market (DDM) had a negative and significant influence on microcredit benefits at 5% significance level. This result indicated that farmers who lived in far-away villages from district markets got less farm income than farmers living near to the market. Estimated coefficient (β= -0.314) conveyed that one kilometer increased in distance from major markets would decline the microcredit benefits by a factor of 0.314, as could be seen from Table 8. Microcredit benefits were higher when distance was shorter, which implied that remote farmers were less benefited as compared to farmers that were settled around the district market. The possible reason could be that farmers who lived near urban areas could frequently visit the market. They might also have good information and contacts with traders and could take better returns of their crops and

livestock. Furthermore, the strict repayment plan (SRP) imposed by microcredit institutions showed a negative and significant (t-value -3.469) impact on microcredit benefit at 1% significance level. The estimated regression coefficient (β= -0.147) for SRP variable implied that strictness in repayment schedule would lead to a corresponding 0.147 units decline in farm production and therefore farmers' income.

Finally, the value of adj-R2 =0.5481 or the coefficient of determination shown in Table 8 showed that only about 54.81% of the microcredit benefits could be collectively explained by social factors (X1), economic factors (X2), farm production technologies (X3), environmental factors (X4), physical factors (X5), and the institutional factors (X6). Many of variables of these factors were inter-related and inter-dependent to each other. This suggested that the existence of one factor could influence the impact of other factor positively or negatively. For example, bad weather conditions during crop cultivation are linked with the decrease of farm production and the effects of microcredit on production process would be diminished. Similarly, if the farmers are not well trained and informed about farm production technologies, it can affect the yield of crop and ultimately farm income. Also, the problem of strict microcredit repayment schedule could affect the capital shortage at the time of next crop growing season. Likewise, many of these factors have similar interrelated effects upon each other.

4. Conclusions

Analysis of factors influencing the benefits of microcredit presented in this study was of descriptive nature. The findings were derived from the opinions, perceptions, and attitude of farmers who had borrowed microcredit from different institutions. The collected information was processed by employing econometric models. Benefits of microcredit (i.e. farm production and income) was taken as dependent variable. Model results showed that education level, saving habits of farmers, off-farm income sources, presence of livestock animals, inter-cropping practices, suitable weather conditions, farm to market road, access to information/extension services, credit monitoring framework by microfinance institutions etc. were the variables which showed positive and significant influence on microcredit benefits. Conversely, the variables such as usage of microcredit on non-income generating activities, large distance of farmers from district market and strict repayment plan of credit institutions etc. showed a negative and significant influence for microcredit benefits. The interdependence of most of the variables would lead to influence microcredit benefits on varying degree. If these variables were positively interrelated, this relationship might lead to attain more benefits and if they were negatively interrelated it might affect the microcredit benefits adversely.

Acknowledgement

Authors are grateful to Punjab Agriculture Department and Pakistan Microfinance Network for their support during field visits and providing needed research materials.

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