The Determinants of access to Agricultural credit for small and Marginal Farmers' in Dharwad district, Karnataka, India

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Abstract

Access to credit generally refers to the possibility of individuals or an enterprise to access financial services from the formal sources or carrying capacity of loans from financial institutions. Accessibility is determined by the demand of clients with existing supply of credit from different banks. This study tries to find those factors which are responsible to access agricultural credit from banks by the small and marginal farmers. The age, gender, level of education, family size, landholdings, irrigation facilities, income level, marital status and occupation are considered as determinants of access to agricultural credit. Out of these variables landholdings, educational status, irrigation facilities, income level and gender are found to be the significant factors in determining the agricultural credit access of the small and marginal farmers from the banks. It was concluded that policies needs to be redirected on government-sponsored and guaranteed agricultural financing schemes that could favour the small and marginal farmers who are the major producers of food crops in India particularly in study area.

Keywords: Access, agricultural credit, small and marginal farmers, Dharwad district.

Introduction

Ensuring demand of agricultural credit for small and marginal farmers means ensuring food security of the country. Availability and access to adequate, timely and low cost credit from institutional sources has great importance especially to small and marginal farmers. Credit is an important instrument for improving the welfare of the poor directly through consumption smoothening that reduces their vulnerability to short-term income[1]. It also enhances productive capacity of the poor through financing investment in their human and physical capital. Agriculture credit is one of the pre-requisites for farmers to increase the agricultural output in the process of agricultural development of a country[2].

Along with other inputs, credit is essential for establishing sustainable and profitable farming systems. Most of the Indian farmers are small producers engaged in agricultural activities in areas of widely varying potential. Experience has shown that easy access to financial services at affordable cost positively affects the productivity, asset formation, income and food security of the rural poor. Many Micro Finance Institution loans are used for agricultural production, trading, processing and transport, resulting in an increase in the use of agricultural inputs and increased output of agricultural production[3]. Microcredit played a positive role in agricultural development, which considerably enhanced the crop production[4].

There are so many factors which inhibit especially small and marginal farmers from accessing agricultural credit and financial services timely and at required amount namely age of the household, gender, size of landholding and the role of agent are significantly affected accesses to credit[5]. Moreover, the low bargaining power, bureaucratic and procedural formalities required, asset based lending and policies of financial institutions and corruption prevailing in the agencies, all worked against small farmers[6]. The small size of holdings, the informal and oral nature of tenancy contracts, illiteracy, and low caste status were other inhibiting factors. The higher transaction costs with formal lending have led to an increase in effective rate of interest.

The Indian government, focused on extending rural financial services for smallholder subsistence farmers that are widespread in the rural landscape through Parastatal organizations initiated to achieve such an objective National Bank for Agriculture and Rural Development (NABARD). The National Bank of Agriculture and Rural Development (NABARD) has emerged as an apex refinancing institution for agricultural and rural credit in the country since July, 1982. It has taken over the refinancing functions from the Reserve Bank of India with respect of State Cooperative Banks and Regional Rural Banks[7]. Consequently access to credit by the small-scale farming sector is still a major challenge that confronts many smallholder farmers in India. This paper seeks to assess factors that have impact on credit access by small and marginal farmers in the Dharwad District of Karnataka State.

Material and Methods

Study area and data sources: The study was conducted in the Dharwad District that is situated at the northern part of Karnataka. The district is basically known with crop production of sorghum, maize, wheat, cotton, onions and rice. The district also grows mangoes, papaya and bananas as horticultural produce. Dharwad district mainly consists of five taluks, that is, Dharwad, Hubli, Kundgol, Navalgund and kalghatgi.

The study used both qualitative and quantitative approaches in data collection and analyses. A primary data were collected through well structured and pretested interview schedule that were administered to small and marginal farmers. Specific predictor variables that were included are age of household, family size, education status of household, gender, landholdings, income level, occupation of household and irrigation facilities. Cross-sectional-data were collected from 120 respondents from ten selected villages of the Dharwad district from two selected Taluks. From each selected village's six members both beneficiary and non-beneficiary were selected randomly from each farm groups (small and marginal). Thus, each Taluks will constitute sixty samples, and totally 120 sample respondents were selected from both Taluks.

Data Analysis: The data were captured into the SPSS spreadsheet and analyzed through the binary logistic regression modelling technique. The main objective of the analysis was to determine the factors influencing access of agricultural credit in the study area. The dependent variable is a dummy, which takes a value of zero or one depending on whether small and marginal farmer's access agricultural credit or not. However, the independent variables were both continuous and discrete.

The technique has been used for this kind of a situation (field of social sciences) where prediction of the presence or absence of an outcome based on values of a set of predictor variables is needed. The coefficient of logistic regression can be used to estimate odds ratios for each of the independent variables in the model[8]. The term "logit" refers to the natural logarithm of the odds (log odds) which indicates the probability of falling into one of two categories on some variable of interest[9]. In the other way the model shows how a set of predictor (explanatory) variables (X's) are related to a dichotomous response variable $Y(\ln(Pi/1 - Pi))$. The dichotomous response variable $Y = 0$ or 1 with $Y = 1$ denotes the occurrence of the event of interest while $Y = 0$ denotes otherwise. The dummy variables, also known as indicators and bound variables, characterize dichotomous responses[10]. In this study, since only two options were available, namely "access to agricultural credit" or "no access to agricultural credit" a binary model was set up to define $Y = 1$ for situation where the farmer accessed agricultural credit and $Y = 0$ for situations where the farmer did not access agricultural credit from formal credit sources. Assuming that X is a vector of explanatory variables and *p* is the probability that $Y = 1$, two probabilistic relationships[9]. It can be considered as follows:

$$P(Y = 1) = \frac{\varepsilon^{\beta x}}{1+\varepsilon^{\beta x}} \tag{1}$$

$$P(Y = 0) = 1 - \frac{\varepsilon^{\beta x}}{1+\varepsilon^{\beta x}} \tag{2}$$

$$logit[\theta(x)] = log\frac{\theta(x)}{1-\theta(x)} = \beta 1 + \beta_2 X_1 + \beta_3 X_2 + - + \beta_k X_k \tag{3}$$

The foregoing operations were feasible within the SPSS package. In relation to equation-3 the analysis generated the odd ratios using the maximum likelihood procedure[11]. The logistic regression in this study can be specified as:

$$Y = \beta 1 + \beta_2 X_1 + \beta_3 X_2 + ----- + \beta_k X_k \tag{4}$$

Where: Y_{1i}= is a binary variable for the probability of access to credit or not, X_1 = are explanatory variables that affect the dependent variable household's access to credit. β_i = the unknown parameter that reflects the impact of the change in variable X on Y_i which will be estimated, ε_{1i} = is the error term, and i = 1, 2, 3,.., n, where i is the number of observations, Therefore specified a nested Logit model in the following form in table-1,

$$Yi = \beta 1 + \beta_2 X_1 + \beta_3 X_2 + \beta 4 X3 + \beta 5 X4 + \beta 6 X5 + \beta 7 X6 + \beta 8 X7 + \beta 9 X8 + \beta 10 X9 + \varepsilon$$

Table-1
Description of variables

Variable	Types variables	Variable description
Access to agricultural credit (Y_i)	Dummy	1= accessed agricultural credit, 0 = not accessed agricultural credit
Age of household(X_1)	Continues	Years of age
Education status (X_2)	Dummy	1= for an educated person, 0 = non-educated
Landholdings (X_3)	Continues	Total land size owned
Family size (X_4)	Continues	Number of family members
Irrigation facilities (X_5)	Dummy	1=irrigation facilities, 0=no irrigation facilities
Income level (X_6)	Continues	Amount of annual income
Marital status (X_7)	Dummy	1=Married , 0= unmarried
Occupation of households (X_8)	Dummy	1=farming only 0= both farming and others
Gender (X_9)	Dummy	1 = male, 0 = female

Results and Discussion

The correlation matrix of variables included in the analysis is presented in Table-1, which indicated that, the association between access to agricultural credit and other variables. Except age of farmers the rest of the variables associated with access to agricultural credit significantly. Education status, landholdings, irrigation facilities, income level and gender are associated with access to agricultural credit directly and significantly while family size and occupation of the respondents were associated indirectly and significantly with access to agricultural credit. The positive correlation between agricultural credit access and education status, landholdings, irrigation facilities, income level and gender implied that access to credit increased with increases in these variables. On the contrary family size and occupation implied that access to credit decreases with an increase of variable.

In table-3, education level of the respondents was found the important variables in accessing agricultural credit and it affected access to agricultural credit significantly and being positively with coefficient of 1.047. As education level increases the chance of borrowing of agricultural credit increase

by coefficient of 4.084. This might be attributed to the contribution of education on the understanding of the banks procedures, filling essential documents and cordial communication with bank staff. From this it could be inferred that keeping other thing constant more educated respondents accessed agricultural credit more than less educated respondents. This result in line with other study whereby it was indicated that literacy status can increase the probability of being a borrower by a factor of 20[12].

Availability of irrigation facilities around the field of the respondents affected access to agricultural credit positively and significantly. Respondents with irrigation facilities have better opportunity to access agricultural credit services than with no irrigation facilities. The wald statistics corresponding to the variable level of irrigation of respondents show that it is significant at 10% level. The odds in favor of access to agricultural credit use increases by a factor of 3.903 for households, which had irrigation facilities than those who had not irrigation facilities. In table-3, it shows that the existence of positive and significant relationship between irrigation availability and access to agricultural credit.

Table-2
Contingency coefficients of association of included variables

Variables	Yi	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Yi	1									
X_1	-.017	1								
X_2	.231**	-.003	1							
X_3	.456***	.078	-.018	1						
X_4	-.219**	-.054	-.032	-.304***	1					
X_5	.485***	-.190**	.067	.381***	-.103	1				
X_6	.581***	-.046	.104	.374***	-.140	.337***	1			
X_7	.249***	.110	.207**	.234**	.086	.158	.185**	1		
X_8	-.566***	.125	-.151	-.263***	.119	-.343***	-.400***	.126	1	
X_9	.271***	-.081	.192**	.015	-.201**	.035	.118	.065	-.204**	1

Source: Computed from the field survey data (2013), *** and ** represent level of significant at 1 % and 5 % respectively. Description- Yi=Access to agricultural credit X1= Age household, X_2= Education status, X_3 = Landholdings, X_4= Family size, X5 = Irrigation facilities, X_6= Income level, X_7= Marital status, X_8 = Occupation and X_9=Gender

Table-3
Estimate logit regression model of access to agricultural credit

Variables	Estimated coefficient	Odds ratio	Wald statistics	Significance level
Age	-.065	.937	.027	.869
Education Level	1.407	4.084	3.140*	.076
Landholdings	1.217	3.378	3.186*	.074
Family Size	-.458	.632	.609	.435
Irrigation facilities	1.362	3.903	3.276*	.070
Income level	1.131	3.099	6.280**	.012
Marital Status	39.247	1.108E17	.000	.998
Occupation	-20.626	.000	.000	.997
Gender	1.348	3.848	2.861*	.091
Constant	-27.472	.000	.000	.998

Source: Computed from the field survey data, 2013, ** and * represent level of significant at 5% and 10% respectively.

This indicates that the probability of access to agricultural credit increase with availability of irrigation facilities. Farmers having with irrigation facilities got selected by credit institution with expectation of the timely repayment and less risk of loss due rainfall fluctuation. Another reason may be farmers' were having irrigation facilities able to produce throughout the year and for that they needs continues financial flow for labor wage, input purchase and other requirements to their farm operation.

It was also apparent from the results that large landholdings would increase access to agricultural credit use. The study result revealed that rural households with large cultivated land size more likely access agricultural credit than those households with less land size. The odds in favor of access to agricultural credit use increases by a factor of 3.378 for households, which had larger cultivated landholdings than those who had lesser landholdings. That is, the larger the cultivated land size, the farmers utilize more farm inputs such as the labor (higher additional labor), fertilizer and others that demand additional capital that might be obtained through agricultural credit. The result agrees with other study which indicated that total cultivated land holding (TOCULASI) would increase access to formal credit use[13].

Income level of the respondents is another factor, which is significantly related to the dependent variable and that it is significant at 5% probability level as indicated in Table-3. The odds in favour of access to agricultural credit use increase by a factor of 6.280 for respondents, which had higher income than those who had lesser income level. The probability for the farmers to access agricultural credit will increase with increase of the income or the existing of financial status of the farmers determines the probability to obtain agricultural credit from credit institution. This is due to lenders expectation that, farmers were having higher income level not use agricultural credit for consumption purpose rather the use for investment or production and expansion of the business as the result higher income farmers were selected to access agricultural credit prior to other less income farmers. From this it can be conclude that the probability of the farmers to access agricultural credit is high for the farmers having higher income farmers than less income farmers. This study in line with the other study *which indicated that income of the farmers affected access to credit positively and significantly[14]*.

In table-3, gender and access to agricultural credit have significant and positive relationship indicating that probability of man to access agricultural credit is higher than that of woman. The odds in favor of access to agricultural credit use increases by a factor of 3.848 for man as compare to woman. This may be high dominance of man in agricultural field in most developing countries.

Conclusion

This paper examined the different factors determining small and marginal farmer's access to agricultural credit. The survey data from two taluks of Dharwad district has been used to identify and analyze these factors. Depending on access ratios or proportion of agricultural credit received by the group, the results show that smallest landholders have less opportunity for access to agricultural credit in the study area.

The study finds that accessibility of agricultural credit for small and marginal farmers are driven by five variables namely land size, education level, irrigation facilities, income level and gender. It is evident that education level, gender, land size, irrigation facilities and income level of the farmers are significantly determined access to agricultural credit at least at the 10 per cent level of significance.

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