

Formal Credit Access by Rural Households: Empirical Evidences from Four Districts of Assam

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Abstract

This study tries to find out the influence of a number of socio-economic and demographic factors on the ability of rural households to borrow from formal banking institutions. The study is based on primary data collected through primary survey in four selected districts of Assam, namely, Kamrup, Nagaon, Barpeta and Dhubri. The sample consists of 400 households from 16 Gram Panchayats of the selected districts. The analysis of primary data shows that access to formal credit significantly differs across different socio-economic and demographic attributes. For example, the study found that male has greater access to formal credit than females, higher percentage of financially literate respondents has access to credit compared to the financially illiterate households. Econometric analysis using the logistic regression model shows that variables like gender, financial literacy, number of dependent family members have positive significant effect on access to formal credit. Variables like holding of bank accounts, age group (50 and above), occupation categories (self-employed and handicraft worker), and semi-medium land holdings have no statistically significant influence and, distance to bank branch and constraints etc., have significant negative impact on access to formal credit.

Introduction

The ability of rural households to engage in diversified income-earning activities enhances financial stability and flexibility against agricultural uncertainties. Lack of capital in the hands of the rural poor is a major hurdle in their path to convert potentialities into productivity (Levine & Kunt, 2007). Several studies across different countries have shown that timely access to formal credit is an effective tool for fighting against poverty. Studies conducted by the World Bank (2009) have revealed that access to credit can reduce damaging concentrations of economic power and help the poor catch up with the rest of the economy as it grows. Due to the instability of rural income and uncertainties associated with the agricultural sector, rural households are vulnerable to various types of risks and shocks (Kapoor & Ojha, 2006). By removing capital constraints on rural

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households, access to credit increases their risk-taking and risk-bearing abilities and alters their risk-coping strategies (BIRTHAL et al., 2021). In times of crop failure and other unforeseen events, such as price fluctuations and seasonal variations, access to credit helps rural agricultural households to stabilise income flow and reduce vulnerability (Coulibaly et al., 2015). In addition, credit helps in managing capital requirements necessary for modernisation and diversification of agriculture and thus results in increased income, reduced poverty, increased employment, and empowerment of women (Diagne & Zeller, 2001). For the rural households, there are three major sources of credit- formal credit sources like commercial banks, semi-formal sources like Micro Finance Institutions (MFIs) and informal sources like moneylender, landlords etc.

However, despite the significant expansion of the formal banking sector over the past few decades, a large section of rural households in developing countries are still unable to access formal credit. According to the World Bank (2021), only 23% of adults in developing countries had access to formal credit, compared to 56% of adults in developed countries. In India, as of 2020, approximately 44.8% of adults had access to credit from any source, but only 12.8% accessed credit from formal sources. Notably, 31% of adults in India borrowed from informal sources, primarily from friends and relatives (World Bank, 2021).

The All India Debt and Investment Survey³ (AIDIS, 2019), conducted by the NSSO in its 77th round of survey, reveals significant differences in the extent of credit access based on occupation, gender and social cast. The survey shows that only 35% of rural households in India have access to credit from either formal or informal sources. Among the cultivator households, 40.3% have access to credit, while just 28.2% of non-cultivator households have access to any source of credit. In the case of gender, 36.2% of male-headed households have access to credit from any source, compared to only 27.6% of female-headed households. In the case of social categories, 34.7% of Scheduled Caste households have access to credit from various sources, compared to only 24.7% of the Scheduled Tribe households. The households belonging to the OBC category have 38.3% borrowers, while the “Other” or general category of households has 34.7% borrowers from any source of credit. Apart from AIDIS (2019), other studies also reported that commercial banks and cooperatives follow discriminatory policies against SC and ST households in terms of credit access (Madheswari, 2020).

Inter-regional and inter-state inequality in formal credit access by rural households is another significant issue in the rural credit market in India. AIDIS (2019) data reveals that more than 35% of rural households in states like Andhra Pradesh, Karnataka, Punjab, and Rajasthan have access to credit from any source, while in states like Delhi, Meghalaya, and Nagaland, less than 10% of rural households have access. Contrary to this, states like Assam, West Bengal, and Uttar Pradesh have less than 30% of rural households with access to credit from any source. This indicates that the extent of access to credit is largely dependent on the level of development of the states in India.

³ AIDIS, 2019 is the latest available data source on rural credit in India.

In the context of the rural credit market of Assam, the AIDIS (2019) data highlights that rural households of the state had limited access to credit from any source, and the extent of credit access differs considerably between males and females, between agricultural and non-agricultural households, and among SC, ST, OBC, and “Other” categories of rural households.

In Assam, AIDIS (2019) data reveals that 24.75% of all rural households’ accessed credit from institutional sources, while 17.1% of them accessed credit from non-institutional sources. In the case of the occupational groups, 21.2% of cultivator households’ accessed institutional credit, 10.3% borrowed from non-institutional sources, and 8.8% borrowed from both institutional and non-institutional sources. On the other hand 13.5% of the non-cultivator households borrowed from institutional sources, 10.0% from non-institutional sources, and 4.7% borrowed from both institutional and non-institutional sources. Thus, compared to the cultivator households, non-cultivator households had lower access to formal credit. In rural economies, the weaker segment of the non-cultivator households mainly comprised landless agricultural labourers, daily wage earners, small businessmen, rural artisans, etc. Therefore, as revealed by AIDIS (2019) data, these households have faced larger barriers to accessing formal credit in India and Assam.

The issues of barriers to accessing formal credit and the dependence on informal credit among rural households have become increasingly significant to governments, policymakers, and researchers worldwide in recent times. Several studies have identified various constraints that hinder poor individuals from obtaining institutional credit (World Bank, 2009; Beck et al., 2006; Sing, 2021). Furthermore, empirical evidences confirmed that these credit constraints have a considerable negative impact on the income and overall welfare of low-income households (Boucher et al., 2009; Zeller, 2000). In India also, several studies have been conducted on several issues related to banking sector development, credit supply, agricultural credit, etc. (Kumar et al., 2013; Pradhan, 2013).

In case of Assam, surveys conducted by NSSO surveys (2012, 2019) shows that rural households have limited participation in the credit market and minimum access to credit from formal banking institutions. A major portion of rural households are still dependent on informal sources to meet their credit requirements. However, there have been limited efforts to explore the underlying causes of the participation of a fewer number of rural households in the credit market and limited access to formal credit. In the specific context of Assam, studies investigating whether rural households are excluded from credit access by formal financial institutions or lack demand for formal bank credit seems to be limited. This study aims to fill these gaps by identifying the factors that determine access to formal credit for rural households in Assam.

Objectives of the Study

The primary objective of this study is to identify the key barriers faced by rural households in accessing formal bank credit. The specific objectives are:

1. To analyse the extent of borrowing from formal banking institutions across different socio-demographic attributes such as age, gender, and education.
2. To empirically identify the factors influencing rural households' access to formal bank credit.

Data Sources and Methodology

This study is based on a Primary survey conducted across four districts in Assam, namely, Kamrup, Nagaon, Barpeta and Dhubri. The study area is selected using the CRISIL-Inclusix financial inclusion index which categorises the districts of Assam as highly inclusive, average inclusive and low inclusive on the basis of availability of banking infrastructure, deposit mobilization and credit disbursement.

To select the sample, multistage sampling technique is used. At the first stage, 2 Community Development Blocks from each district are selected. In the second stage, 2 Gram Panchayats from each CD Block is selected. At the last stage, 50 households from each Gram Panchayats are selected. Thus a total of 400 households across 16 Gram Panchayats in Kamrup (high inclusion), Barpeta (average), Nagaon (below average), and Dhubri (low inclusion) are selected in the sample.

To study the differences in formal credit access, descriptive statistics are used and to analyse the association between the formal credit access and socio-economic and institutional factors, Chi-Square test of independence is used.

For empirical study of the impact of the socio-economic and institutional factors on formal credit access, Logistic regression model is used. The dependent variable included in the model is access to credit which is a binary variable ($Y=1$, if household has access to credit and $Y=0$, otherwise). In the study, a household is considered as having access to formal credit if he or she successfully borrowed from the formal institution at the prevailing interest rate. A number of predictors consisting of households' socio-economic and demographic characteristics and institution related factors are included in the model. These are age, education, gender, number of dependent family members, occupation, distance to the nearest bank branch, constraints in the form of collateral and others faced in the application for formal loan, agricultural landholdings, business experiences and ownership of household assets, availability of interest free loan and financial literacy. Appropriate regression diagnostic tests are conducted for ensuring robustness of the analysis.

Review of Literatures

In different parts of the World, especially in the developing countries, several research works have been conducted to study the significance and impact of access to credit. A review of some of these literatures can provide valuable insights in finding out the relevant factors influencing access to credit. Until recently, the issue of access to credit has often been neglected due to significant data gaps and little attention has been paid to the various practical and policy barriers that hinder poor people's access to financial

services in developing countries (Beck et al., 2009). According to Diagne & Zeller (2001), a household has access to a particular source of credit if it can borrow from that source, although it may choose not to borrow for a variety of reasons. Thus, access to formal credit depends on a number of supply-side as well as demand side factors. On the supply side, literatures identified the following barriers to access to credit:

Financial Service Availability: Credit access depends on the presence of banking services, suitable financial products, affordability, and ease of transaction (Diagne & Zeller, 2001).

Institutional Challenges: Issues like rural income instability, lack of collateral, small loan sizes, and high operational costs deter financial institutions from serving rural populations (Baiyegunhi, 2008).

Distance & Cost: High transportation costs and remote locations reduce access to formal financial services (Dallimore et al., 2013).

On the demand side, the following factors are identified by literatures as major determinants of formal credit access-

Household Characteristics: Credit access is influenced by factors such as wealth, assets, debt-service capacity, borrower reputation, and business relationships (Zeller, 1994; Morduch, 1999).

Socio-Demographic Attributes: Age, gender, education, land ownership, and occupation play a role in determining loan eligibility (Kumar et al., 2017).

Loan Terms & Interest Rates: Higher wealth increases access to larger loans with better terms (Binswanger & Khandekar, 1993), while low demand for formal sector credit due to high transaction costs and other reasons, push rural borrowers towards informal credit sources (Kochar, 1997).

Differences in the Proportion of Households having Access to Formal Credit Based on Socio-Demographic Attributes

The analysis of data collected through primary surveys revealed that the proportion of households having access to formal credit differs widely across different socio-economic and demographic attributes. The detailed components of each attribute along with the proportion of households having access to formal credit and the association between the dependent variable, access to credit, and the predictors socio-economic characteristics included in the model are summarised in Table: 1. The association between the dependent variable and various predictors has been examined by using the chi-square test of independence.

Table 1: Relationship between Credit Accessibility and Socio-Economic and Demographic Factors

Variable	Category	No. of HH	Proportion of HH with Access to formal Credit	Proportion of HH without Access to formal Credit	Calculated χ^2	p-Value
Gender	Male	227	61.14	38.86	59.2040 (d.f.=1)	0.000
	Female	173	33.92	66.08		
Financial Literacy	Fin. Literate	263	66.02	37.07	62.3398 (d.f.=1)	0.000
	Fin. illiterate	137	19.15	75.18		
Bank account	holder	301	56.19	43.81	28.0389 (d.f.=1)	0.000
	Non-holder	99	29.70	70.30		
Possession of Agricultural Land	no holder	136	23.53	76.47	57.0718 (d.f.=3)	0.000
	Marginal holder	202	64.85	35.15		
	Small holder	54	55.56	44.44		
	Semi –Medium holder	8	62.50	37.50		
Distance from home to the nearest bank branch	Less than equal to 5 km	221	60.25	39.75	12.8674 (d.f.=1)	0.000
	More than 5 km	179	33.54	66.46		
No. of dependent family members	Less than / equal to 3	146	39.29	60.71	48.7664 (d.f.=1)	0.003
	More than 3	254	55.00	45.00		
Age	1(20-29) years	151	23.17	76.97	131.26 (d.f.=2)	0.000
	2(30-49) years	172	79.06	42.94		
	3(50 & above)	77	18.18	32.05		
Occupation	1(Farm)	136	41.18	58.82	122.1019 (d.f.=5)	0.000
	2(Wage)	105	6.67	91.43		
	3(Service)	41	85.37	14.63		
	4(Business)	62	80.65	19.35		
	5(Self Employed)	33	63.64	36.36		
	6. Handicraft	23	60.87	39.13		
Education Years of Schooling)	Primary(less than 4 years)	163	24.00	76.00	51.4850 (d.f.=2)	0.000
	2(Class 5 to 12)	182	63.08	36.92		
	3(graduate and above)	55	70.91	29.09		
Business Experience	0 to less than 5 years	192	36.87	63.13	11.4630	0.000
	More than 5 years	208	53.84	46.16		

Possession of Other Household Assets	Yes	277	60.28	39.72	71.4176	0.000
	No	123	14.63	85.36		
Constraints	No	253	76.67	23.32	33.2640	0.000
	Yes	147	2.72	97.27		
Availability of Interest Free Loan	No	253	74.60	25.40	18.6786	0.001
	yes	147	25.40	74.60		

Source: Own calculation.

The analysis of primary data collected through survey in Kamrup, Nagaon, Dhubri and Barpeta districts of Assam have shown the following key findings-

In the case of the attribute Gender, Male-headed households have higher access to credit (61.14%) than female-headed households (33.92%). With regard to the possession of Bank Account, it has been found that households with bank accounts have higher access to credit (56.19%) than those without (29.70%).

The analysis shows that, access to formal credit is positively correlated with Landholding Size: Larger landholdings are associated with higher access to credit. While only 23.53% of Households with no land have access to formal credit, 64.85% of the households with marginal size of land holdings and 55.56% with small size of land holdings have access to formal credit. Highest 62.50% of the semi-medium land holders have access to formal credit.

In the case of the geographical distance from home to the nearest bank branches, it has been found that, Closer proximity to banks increases access to credit. Similarly, it has been found that Households with more dependent members have higher access to credit. Data shows that, Middle-aged respondents (30-49 years) have higher access to credit compared to the younger age group and older age group respondents. In respect of the influence of the occupation of access to formal credit, analysis of data reveals that service and business owners have higher access to credit compared to the wage earners, farmers and handicraft workers. It has been found that, respondents having education level of graduation or above have greater access to formal credit compared to the primary education holders. Similarly, it has been found that more experienced business owners have higher access to formal credit in the study area. It has been found households owning other assets have higher access to credit (60.28%). Data reveals that, households who faced constraints like lack of collateral, difficult paper works etc., have lower access to formal credit (2.72%). Moreover, it is also found that, households without access to interest-free loans have higher access to formal credit. Thus, analysis of primary data reveals that access to formal credit differs significantly across different socio-economic and demographic characteristics of the households in the study area.

The association between access to formal credit and various socio-economic factors has been tested by using the Chi-square test of independence. The findings of the test, summarised in Table 1, reveals that a significantly high value of $\chi^2 (1, N=400) = 59.2040$

indicates that there is a strong association between access to credit and the gender of the households.

In the case of possession of a bank account, it has been found it has significantly high value of $\chi^2 (1, N=400) = 28$ and hence has a strong association with access to formal credit. Landholding size as a predictor has a close association with the dependent variable, access to credit. The Chi-square test of independence shows that landholding size has a significant value of $\chi^2 (3, N=400) = 57.0718$.

Distance from home to the nearest bank branch is another important predictor included in the study. The Chi-squared test of independence shows that access to credit and distance to a bank branch from home are closely associated. A significant value $\chi^2 (1, N=400) = 12.5674$ is an indication of an association between access to credit and distance to a bank branch.

In the case of dependency ratios, the chi-square value is $\chi^2 (1, N=400) = 48.7664$, which indicates a significant association with access to credit. It has also been found that there is a significant association between the age of the respondents and access to credit, as indicated by the calculated value of $\chi^2 (2, N=400) = 131.26$ with a p-value of 0.000.

Similarly, the occupations of the respondents have a strong association with access to formal credit. Likewise, for educational attainments of the respondents, the Chi-square value $\chi^2 (2, N=400) = 51.4850$ with a P-value of 0.000 indicates that there is a close association between the level of education and access to credit in this model. Moreover, as indicated by the Chi-square test of association, business experience and access to credit are strongly related. The significant $\chi^2 (1, N=400) = 11.4630$ is the indication of a close association between the two. An important predictor included in the study is the ownership of other household assets, "like inhabitable lands, two-wheelers, four-wheelers, etc. Ownership of other assets and access to credit are closely related, as the calculated Chi-square value is 71.41.

It has been found that, different types of constraints, like lack of collateral, difficulties in documentation, rejection of previous loan applications, etc., are closely associated with access to formal credit.

The availability of interest-free loans from friends and relatives or other sources is another predictor included in the study. The test of independence shows that the interest-free loan has a significant chi-square value of 18.6786, which indicates that it has a close association with the dependent variable, access to credit. Thus, from the analysis of primary data, it has been found that all the variables used as predictors in this study have a strong association with the dependent variable access to credit. The extent and dimension of the impact of the predictor on the dependent variables can be made clear from the result of the logistic regression model used in this study. The subsequent sections present the outcome of the regression analysis of the data collected through the primary survey.

Determinants of access to Formal Credit by Rural Households-Results of the Logistic Regression

To empirically verify the potential influence of the selected household-level socio-economic and demographic factors on access to credit, a logistic regression model is used in this study. The dependent variable is the access to formal credit and is a binary variable such that $Y=1$ if the household has access to formal credit and $Y=0$ otherwise. Households that had successfully been able to borrow from formal financial institutions are considered as having access to formal credit, and households whose loan applications were rejected or not applied for formal credit are considered as not having access to credit. A total of 12 variables are included in the model. Out of these, gender, age, education, occupation, number of dependent family members and financial literacy are exclusively demand-side factors. On the other hand, possession of agricultural land, distance to a bank branch, possession of a bank account, and possession of other assets are the factors that influence both the borrower and the lender. However, complete separation of the demand side factors and supply side factors is very difficult. Hence, all the variables are combined in the same model without classifying them as demand-side and supply-side factors. All the explanatory variables are categorical, and the first category of each variable is taken as the reference category. The model is tested for goodness of fit by using the log-likelihood ratio test and Pearson's chi-square goodness of fit test. The LR test involves comparing a model with all the predictors (full model) to a model with only the intercept (null model). The LR test for this model shows a Chi2 value of 351.72 with a p-value of 0.000. A substantially high value of Chi2 with a significant p-value suggests that the model is well-fitted to the data. The LR test indicates that the inclusion of additional predictors enhances the explanatory power of the model. Again, Pearson's Chi2 test for goodness of fit also suggests that the logistic regression model used in this study fits the data well. The result of the Person's Chi2 test for the model of this study shows that for a total of 400 observations, the number of covariate patterns is 387, and the degrees of freedom are 365. The Chi2 value is 297.20, and $p = 0.9961$. Since the p-value of 0.9961 is reasonably higher than the prescribed threshold of 0.05, we have failed to reject the null hypothesis that there is no significant difference between the observed and the expected frequencies. Thus there is strong evidence that the model's predictions are consistent with the observed data and the model is a good fit for the data. Further, the pseudo-R² value of the model is 0.6431. It indicates that 64.31 percent of variations in the dependent variable access to formal credit are explained by the predictor. The result of the logistic regression is presented in Table 2. Table 2 reflects the influence of the various demand related and supply related factors on the dependent variable access to formal credit. The Table 2 contains odds ratios which reflect the likelihood of accessing formal credit, coefficients which indicates the extent and direction of the influence of the predictor and the significance level. Values of odds ratios greater than one indicate positive association and values less than one indicates negative association. Positive coefficients suggest an increase in the log-odds of accessing credit, while negative coefficients suggest a decrease in the log-odds of accessing credit. Again, p-values which are below 0.05 indicate statistical significance at 5% level of significance.

Table 2: Results of Logistic Regression on Determinants of Access to Formal Credit by Households

Variables		Odds ratios	Coefficients.	Significance
Access to formal Credit(Y-Dependent Variable)				
Gender		2.384143	.8688397**	0.032
Financial Literacy		5.83084	1.763161***	0.000
Bank Account		2.07633	.7306021	0.140
Distance to bank branch		.4329707	-.8370853**	0.043
No. of dependent (More than 3)		5.084907	1.626277***	0.000
Age	Age group (30-50)	12.20406	2.501769***	0.000
	Age group (50 and above)	2.372683	0.8640214	0.154
Education	Secondary (6 to Class 12)	2.07813	.7314683*	0.100
	Graduate and above	16.12565	2.780411***	0.000
Occupation	Wage labour	.1797506	-1.716185***	0.007
	Service	19.34006	2.962178***	0.000
	Business	5.541454	1.712257***	0.004
	Self-employed	2.605058	.9574548	0.169
	Handicraft	2.354357	.8562678	0.228
Household Assets (Consumer durables)		9.211793	2.220484***	0.000
Constraint in loan application		.4424582	-.8154092**	0.038
Interest free loan		.4121562	-.8863529**	0.042
Agricultural land	Marginal	2.336988	.8488631*	0.063
	Small	5.837124	1.764238***	0.003
	Semi-medium	.9047234	-.1001261	0.904
Business Experience		2.535193	.9302699***	0.018
Dependent variable: Access to formal credit (1 = Access to credit; 0 = otherwise). Note: first category is the reference category. Categories are mentioned in Table 3.6 Pseudo R2=0.6431 *, **, *** indicates 10%, 5% and 1% level of significance Pseudo R2=, LR Chi2 (21) = 355.18 and p=0.000, N=400				

Source: own calculation based on Primary data.

From the logistic regression analysis presented in Table 2, it has been found that, gender (male), financial literacy, number of dependent family member (more than 3), age group (30-49), higher education (Graduate and above), service and business occupations, possession of household assets, small agricultural land holdings, and business experience have positive significant impact on access to formal credit.

From Table 2 it has been found that, the impact of gender on access to credit is statistically significant at 5% level of significance. And hence the null hypothesis that

males and females have equal likelihood for access to formal credit is rejected and we accept the alternative hypothesis that male have greater likelihood, compared to female of having access to formal credit.

As expected, it has been found that the odds of having access to formal credit are 2.38 times higher for males compared to females. It indicates that being male have 2.38 times more likely to have access to formal credit than females.

Financial literacy has been found statistically significant at 1% indicating that financially literate households have a greater likelihood of having access to formal credit, compared to the illiterate households. The positive coefficient reflects that log odds of financially literate respondents increase by 1.76 times compared to financially illiterate individuals, keeping all other effects constant.

It has been found from Table 2 that, the variable number of dependent family members in a household has strong statistical significance in influencing access to formal credit at 1% level of significance. The Table 2 shows that, having more than three dependents increases the odds of having access to formal credit by 5.08 times.

Middle-aged respondents have significantly greater probabilities of access to formal credit than the younger population or the old aged populations. Age group (30-49) is found to have a strong positive significant impact on access to formal credit with a coefficient value of 2.50 and odds ratio 12.20.

Concerning education as a predictor, Table 2 reveals that attainment of the level of education up to graduation or above has strong statistical significance in determining access to formal credit compared to primary and secondary education levels. The influence of higher education (graduate and above) is significant at the 1% level. Hence we reject the null hypothesis that education does not have a significant effect on access to formal credit. A similar finding is also reported by other studies (Lazaro & Alexis, 2021).

Among the occupational categories, it has been found that being in service as an occupation has 19.34 times higher odds of having access to formal credit compared to those in farming. Similarly, it is also found that the odds of having access to formal credit are 5.54 times higher for those in business occupations (p -value = 0.000). Thus, occupation is statistically significant in influencing access to credit at the 1% level.

Possession of "other household's assets," like inhabitable lands, two-wheelers, and four-wheelers, has been found to have a strong positive significant impact on access to formal credit.

Among the size of landholding categories, marginal landholding has a positive significant impact on formal credit access at the 10% level of significance. The small landholding categories have a much higher odds ratio of 5.84, indicating a much higher

likelihood of accessing formal credit. However, semi-medium landholdings have a negative coefficient of -0.1001261, indicating a reduced likelihood of accessing formal credit.

Respondents with more than 5 years of business experience have a 2.53 times greater likelihood of access to formal credit compared to the respondents with less than 5 years of business experience.

Additionally, from Table 2, several predictors are found to have a significant negative influence on access to formal credit. The variables distance to the bank branch (more than 5 km), constraints in the loan application, and availability of interest-free loans have statistically significant negative influences on access to formal credit. Distance to the bank branch is significant at the 5% level of significance with a negative coefficient value of (-0.84). It indicates that individuals living farther away from bank branches are less likely to have access to formal credit. The value of the odds ratio reflects that for every unit increase in distance to the bank branch, the odds of having access to formal credit decrease by 0.43 times.

Occupational category wage labour has a significant negative impact on formal credit access. Wage labour has a p-value of 0.007 and a negative coefficient of -1.72. An odds ratio of 0.18, which is less than 1, indicates that wage labour has reduced odds of access to formal credit compared to the reference category of occupation farmer.

The impact of the predictor constraints has been found significant at the 5% level. A negative coefficient value (-0.82) and an odds ratio of 0.44 indicate that the odds of having access to formal credit are 0.44 times lower for those who face constraints in loan applications compared to those without constraints, and the log odds of having access to formal credit decrease by 0.82 units for individuals who face constraints in loan applications. Similarly, the influence of the variable availability of interest-free loans has been found significant at the 5% level. A negative coefficient and odd ratio of less than 1 indicate that the odds of having access to formal credit are 0.41 times lower for those who receive interest-free loans.

From Table 2, it has been found that variables like holding a bank account, age group (50 and above), occupation category (Self-Employed and Handicraft Worker), and semi-medium land holdings have no statistically significant influence on access to formal credit.

The constant value in logistic regression is the predicted log-odds of the dependent variable when all the predictors are equal to zero. In this model, the constant has an extremely low odds ratio of .0002396. It indicates that in the absence of all the attributes reflected by the predictors, the chance of getting formal credit is extremely low. In other words, without financial literacy, education, agricultural land, other assets, etc., the chance of an individual getting formal credit is very low. A large and negative value of the coefficient of the constant (-8.34) means an individual has reduced chances of access

to formal credit in the absence of all the predictors. A p-value of 0.000 of the constant is highly significant and indicates that the constant term is significantly different from zero and plays an important role in predicting the likelihood of accessing formal credit in the absence of the predictors.

Conclusion

From the above analysis, it has been found that the extent of access differs significantly based on different attributes of the households. In the case of gender, male respondents have greater access to formal credit compared to females. Similarly, financially literate respondents have greater access compared to financially illiterate households, and households residing at a closer distance from a bank branch have relatively higher access than those living more in a distant place from banks. Similarly, families having more dependent members, service and business categories of education, small-size landholdings, and respondents with more business experience have greater access to formal credit compared to the other categories of the respective variables. The regression analysis has shown that several variables have a significant and positive influence on access to formal credit. These include gender (male), financial literacy, number of dependent family members (more than 3), age group (30-49), higher education (graduate and above), service and business occupations, possession of household assets, small agricultural land holdings, and business experience. Additionally, variables like distance to bank branches, wage-earning category of occupation, and constraints in loan applications have a significant negative impact on formal credit access. On the other hand, holding bank accounts, age group (50 and above), occupation categories (self-employed and handicraft worker), and semi-medium land holdings have no statistically significant influence on access to formal credit.

References

- Beck, T., Demirgüç-Kunt, A., Laeven, L., & Maksimovic, V. (2006). The Determinants of Financing Obstacles. *Journal of International Money and Finance*, Vol 25, No 6, pp.932–952.
- Birthal, P. S., Hazrana, J., & Negi, D. S. (2021). Effectiveness of Farmers' Risk Management Strategies in Smallholder Agriculture: Evidence from India. *Climatic Change*, 169(3), 30
- Boucher, S. R., Guirking, C., & Trivelli, C. (2009). Direct Elicitation of Credit Constraints: Conceptual and Practical Issues with an Application to Peruvian Agriculture. *Economic Development and Cultural Change*, Vol. 57, No 4, pp.609–640.
- Coulbaly, J. Y., Gbetibouo, G. A., Kundhlande, G., Sileshi, G. W., & Beedy, T. L. (2015). Responding to Crop Failure: Understanding Farmers' Coping Strategies in Southern Malawi. *Sustainability*, Vol. 7, No. 2, pp.1620–1636.
- Diagne, A., & Zeller, M. (2001). *Access to Credit and Its Impact on Welfare in Malawi. Research Report 116, International Food Policy Research Institute.*
- Kapoor, S., & Ojha, R. K. (2006). Vulnerability in Rural Areas: Potential Demand for Micro Insurance. *International Journal of Rural Management*, Vol 2, No 1, pp. 67–83.
- Levine, R., & Demirgüç-Kunt, A. (2007). The Impact of Financial Development on Economic Growth: A Review of the Evidence, *Journal of Economic Literature*, Vol. 45, No. 2, pp. 181–217.

National Sample Survey Organization (2019), *All India Debt & Investment Survey*. Government of India, Ministry of Statistics and Programme Implementation

Singh, A. (2021). Exploring Demand-Side Barriers to Credit Uptake and Financial Inclusion. *International Journal of Social Economics*, 48(6), 898–913.

World Bank. (2009), *Financial Access 2009: Measuring Access to Financial Services*, Washington DC

World Bank. (2021), *Global Findex Database 2021: Financial Inclusion, Digital Payments, and the COVID-19 Pandemic*. Available at: <https://www.worldbank.org/globalfindex>

Zeller, M., & Sharma, M. (2002). Access To and Demand for Financial Services by the Rural Poor: A Multi-country Synthesis. *Baltimore, John Hopkins University Press/International Food Policy Research Institute (IFPRI)*.

Zeller, M., Diagne, A., & Sharma, M. (2000). Empirical Measurements of Households' Access to Credit and Credit Constraints in Developing Countries: Methodological Issues and Evidence (No. 90). *Food Consumption and Nutrition Division, International Food Policy Research Institute*

Pradhan, N. C. (2013). *Persistence of Informal Credit in Rural India: Evidence from 'All-India Debt and Investment Survey and Beyond*, RBI Working Paper Series No. 5, Department of Economic and Policy Research, Reserve Bank of India.

Baiyegunhi, L. J. S., Fraser, G. C. G., & Darroch, M. A. G. (2010), Credit constraints and household welfare in the Eastern Cape Province, South Africa, *African Journal of Agricultural Research*, Vol. 5, No. 16, pp. 2243-2252.

Madheswaran, S. (2020), *whether caste impedes access to formal agricultural credit in India? Evidence from NSSO unit level data (No. 478)*, Institute for Social and Economic Change, Bangalore.

Dallimore, A. (2013), *Banking On the Poor: Savings, Poverty, and Access to Financial Services in Rural South Africa* (Doctoral Dissertation, London School of Economics and Political Science).

Kumar, A. (2017), Dynamics of Access to Rural Credit in India: Patterns, Determinants, and Implications. In *Changing Contours of Indian Agriculture: Investment, Income and Non-Farm Employment*, pp. 29–50.

Binswanger, H. P., & Khandker, S. R. (1995), the Impact of Formal Finance on the Rural Economy of India. *The Journal of Development Studies*, Vol.32, No. 2, pp. 234–262.

Kochar, A. (1997). An Empirical Investigation of Rationing Constraints in Rural Credit Markets in India. *Journal of Development Economics*, Vol. 53, No. 2, pp. 339–371.