Transaction Costs in Borrowing Agricultural Credit by Farm Households across Rural-Urban Interface of Bengaluru

M. S. Udaykumar[1*], K. B. Umesh[1] and P. S. Srikantha Murthy[1]

[1]*Department of Agricultural Economics, UAS, GKVK, Bengaluru, India.*

Authors' contributions

Article Information

Original Research Article

ABSTRACT

The study was undertaken in North of Bengaluru to analyze transaction cost involved in borrowing agricultural credit from formal and informal sources and to identify the factors influencing the borrowers' transaction cost across rural-urban interface. The data was collected from randomly selected 50 farmers each from rural, peri-urban and urban transacts. The results revealed that the transaction cost in availing credit was more in formal sources in all the three gradients compared to informal sources. Among the formal sources, the total transaction cost incurred by farmers was highest in commercial banks followed by Regional Rural Banks (RRBs) and Co-operative banks in all the three gradients. In rural gradient total transaction cost incurred by farmers was highest in commercial banks (Rs. 5395.26) followed by Co-operative banks (Rs. 3112.33) and RRBs (Rs. 1811.20) and it was lowest in case of informal sources of credit (Rs. 1140.27). Rent seeking cost was the major cost in transaction cost followed by cost of documents and opportunity cost of time spent in all the gradients. Results of multiple regression analysis revealed that education, number of visits, total land holding and amount borrowed were the major factors significantly influencing the

---

*Corresponding author: E-mail: msudaykumar94@gmail.com;

borrower's transaction cost. From the study it was evident that transaction cost was high in formal sources, and this needs special attention by the government and the institutions like Registration and Revenue authorities to curb rent seeking behavior of officials involved which contribute towards higher transaction cost. Collateral security norms are hindering the marginal and small farmers in obtaining credit from formal sources and hence, there is a need to redesign these norms especially for small and marginal farmers.

1. INTRODUCTION

Development of agricultural economy is very important in developing countries like India, as two third of its rural population either directly or indirectly depends on agriculture sector for their livelihood. Indian agriculture holds paramount position in growth and development of the Indian economy by providing employment to 43.21 per cent of the total population of the country [1], besides meeting the food and nutritional needs of 1.3 billion population. Backward and forward linkages in agriculture expressively contribute to employment generation, food production and demand creation [2]. Given the strong backward and forward linkages of agriculture with the overall Indian economy and its sheer scale, a strong growth in agriculture (at the rate of 4.0-5.0% per annum) has the potential to shoot the Indian economy to well past 10.0 per cent growth trajectory [3]. A stronger growth in agriculture would lead to higher income for farmers, generate more employment opportunities and sharply reduce poverty. Credit plays a vital role in enhancing both production and productivity in agriculture through promoting the use of modern technologies in farming and commercialization. The development of agriculture depends on the adoption of new technology which demands agriculture credit [4].

To improve agricultural credit flow, the credit target for 2016-2017 has been fixed at 9 lack crore against 8.5 lakh crore for 2015-2016 [5]. Between 1960 and 1980, credit programs at heavily subsidized interest rates were common in developing countries like India. Yet, from the review of in-depth examination of those programs, it was found that they were not effective enough and low interest rates coupled with credit availability did not provide sufficient opportunities for an individual's long lasting success [6,7]. The World Bank report on agricultural credit stated that the Transaction Costs (TCs) were unduly significant for many transactions involving credits in developing countries.

Transaction cost (TC) in the financial markets is the cost incurred over and above the interest cost. The efficiency of any financial market is measured through transaction costs in the financial intermediation and there is a negative relationship between transaction cost and efficiency of the performance. Transactions cost occur both on the lenders' side as well as on the borrowers' side. On lender side, transactions cost involves cost of information, loan administration, enforcement, etc., whereas, on borrower's side, transactions cost includes mainly charges imposed by lenders beyond interest rate such as application fees, services fees, photographs, documentation, etc. The most important transactions cost is borrower's opportunity cost of travel time and time spent in obtaining the loan. Borrowers' transaction cost is the most decisive one as it originates from the cash outlay and the opportunity cost of time spent in applying for, securing and repaying a loan. Among the different components of borrowers' transaction cost, borrower's travel time and time spent in obtaining the loan are the key factors [8]. There is a positive and direct relationship between the time taken by a lender to disburse loan and transaction cost. The transaction cost varies from borrower to borrower even if they are availing credit from the same agency as the borrowers come from different locations with different land holding size, experience in borrowing, quantum of the loan. Based on this, estimation of borrowers' transaction cost and determinants of transaction cost are crucial for the Government to formulate the policies for advancing the loan to farmers at a reasonable rate. The high transaction cost coupled with cost of delivery and risk loss provisions are major constraint for banks and other lending institutions including micro credit institutions. The small size of seasonal agricultural credit, wide geographical spread, poor transport and communication infrastructure results in higher transaction costs for rural banking. The regulated interest rate for agriculture lending further erodes the capacity of banks in particular to service their portfolios.

This study is intended to provide an overview of the transaction costs incurred by farmers in availing credit from formal and informal sources. A comprehensive survey was carried out to compute the transaction costs borne by the borrower at each step of the credit flow from different sources. The data includes the cost of documentation, travel cost to check if the credit is ready or not, cost involved in credit disbursement, cost involved in preparation for the visits from the bank, and the cost involved in repayment. Utilizing additional household data, the factors influencing individual rural household transaction costs were examined. In this backdrop, the present study was carried out with the following objectives:

1. To assess the transaction cost involved in availing credit across rural urban interface of Bengaluru;
2. To identify the factors influencing the borrowers' transaction cost while borrowing credit from the institutional source.

2. METHODOLOGY

Bengaluru city lies in the southeast of Karnataka in the heart of the Mysore Plateau at an altitude of 920 m above the mean sea level (3,020 ft.). It is positioned at 12.97°N, 77.56°E and covers an area of 1741 km². Major part of Bengaluru is covered by Bengaluru Urban district and the surrounding rural areas are a part of the Bengaluru Rural district. Bengaluru is one of the fastest growing cities in South Asia and urbanization of rural landscape in its vicinity is taking place at an unparalleled pace. Hence, the study was carried out in rural-urban interface of north of Bangalore in Karnataka during 2017. North transect was further divided into three layers namely rural, interface (peri-urban) and urban gradients. The distinction of the gradients into rural, interface (peri-urban) and urban gradients was made based on the survey stratification index [9] developed by considering percentage of built-up gradient and its linear distance from the city centre. The building of the state legislature, Vidhana Soudha was used as the reference point to measure the distance. Up to about 20 to 25 km away from the city centre building density was strongly correlated to distance (the closer to the city, the higher the percentage of built-up gradient). Beyond that, however, the two parameters were negatively correlated. The present study focuses on assessing transaction cost and factors influencing borrowers transaction cost across

rural urban interface of north of Bengaluru. The villages were selected randomly across all the three gradients. The purposive stratified random sampling method was adopted for the selection of borrower farmer households. The sample frame consists of 150 farmers representing 50 each from rural, interface (peri-urban) and urban gradients, respectively. The sample farmers were selected based on random sampling technique. Farmers were interviewed using pretested well-structured schedule by personal interview method during 2017. Data pertaining to both short term and term loans, transaction cost involved in availing credit etc., were collected from the sample respondents across rural-urban interface of north of Bengaluru. In case of long-term loans, the farmers who borrowed loan from the year 2013 were considered.

2.1 Transaction Cost Approach

Several authors explored the importance of transaction cost in credit delivery system. According to Ladman [10], the transaction cost consists of non-interest expenses incurred by both lenders and borrowers in obtaining, implementing and repaying loans. To obtain a loan, the borrowers not only consider the agreed conditions of the loan, but also go through the procedures that are required by the lenders credit delivery system. As defined by Ladman [10], the costs associated with the steps which the borrower undertakes to complete the lender's requirements results in borrower transaction cost. When the procedure becomes complex, the credit delivery system becomes intricate to the borrower. Under these conditions, borrower may have to spend a high cost to complete the steps of the loan procedure. The costs associated with these steps result in borrower transaction costs.

Transaction costs include all the costs other than the interest rate costs that are incurred by borrowers in obtaining the credit. Therefore, in this study, the Total Transaction Cost (TTC) of obtaining credit is defined to include the following:

$$TTC = TC + OC + DC + RC + IC + AC + RS$$

TTC = Total Transaction Cost
TC = Travelling and refreshment cost
OC = Opportunity cost of time spent
DC = Document cost
RC = Registration cost
IC = Search/Information Cost
AC = Account opening cost
RS = Rent seeking

2.2 Multiple Regression Analysis

To analyze the factors influencing the transaction cost of the farm households across three transacts of North of Bengaluru, multiple linear regression analysis was used, considering total transaction cost as dependent variable.

2.2.1 Grouping variable

Grouping variable is the set of dummy variables that defines the farm household in rural, peri-urban and urban gradients.

2.2.2 Predictor variable

Predictor variables are a set of independent variables which help to discriminate the groups.

The empirical model specified is as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8D_1 + b_9D_2 + e$$

Y: Transaction cost (Rs.)
X_1: Age (Years)
X_2: Education (Years of schooling)
X_3: Number of visits
X_4: Total landholdings (acres)
X_5: Amount borrowed (Rs.)
X_6: Distance from bank (Km)
X_7: Interest rate (%)
D_1: Dummy variable as "1 0" for peri-urban farm households
D_2: Dummy variable as "0 1" for urban farm households
And dummy "0 0" for rural farm households
e: Error term
$b_1, b_2,... b_7$ are the regression co-efficient for the variables $X_1, X_2,… X_7$ respectively.
b_8 and b_9 are the regression coefficients for dummy variables D_1 and D_2, respectively.

3. RESULTS AND DISCUSSION

3.1 Transaction Cost Involved in Borrowing Credit in Rural Gradient

To assess the transaction cost involved in borrowing credit in rural gradients (Table 1), the different sources of transaction cost were identified for formal and informal sources of credit viz, opportunity cost of time spent, transportation and refreshment cost, cost of documents, registration cost, information search cost etc. The total transaction cost incurred by farmers was highest in commercial banks (Rs. 5395.26) followed by Co-operative banks (Rs. 3112.33) and RRBs (Rs. 1811.20). It was low in case of informal sources of credit amounting to

Rs. 1140.27, because of zero cost incurred on account opening, maintenance of document and registration cost. The transaction cost is more in formal since the formal sources demanded more number of documents. To furnish necessary documents, getting no dues from other institutions, to know trustworthiness of farmer by institution to grant loan, tracking farmers credit worthiness etc., made farmer-borrower to visit around nine times to commercial bank, four times to cooperative bank and five times to RRB as against two times to informal sources in rural gradient. Among different types of transaction costs, rent seeking was the highest in both formal and informal sources of credit, which accounted for 31.58 per cent in commercial banks, 36.15 per cent in co-operative banks, 35.34 per cent in RRBs and 70.65 per cent in informal sources of credit followed by cost of documents. It is also important to note that there was no amount spent for document in case of informal sources of credit. Other costs like information/search cost, opportunity cost, transportation costs were significant and have smaller extent of contribution to the total transaction cost. Among the informal sources, farmers borrowed more from local money lenders. Local money lenders who knew the farmer borrower from many years lent money to farmers on time with less number of visits. In transaction cost, rent seeking cost was the major cost followed by cost of documents in all the gradient. Results of Arjinder [11] aptly supports the findings of this study. The transaction cost involved in borrowing loan of 100 was more in RRBs (Rs. 30.18) followed by cooperatives (Rs. 7.07), commercial banks (Rs. 5.80) and informal sources (Rs. 0.96).

3.2 Transaction Cost Involved in Borrowing Credit in Peri-Urban Gradient

Transaction cost involved in borrowing credit in peri-urban gradient is presented in Table 3. It is evident from the table that the number of times borrower visited the banks to avail the loan was nine, four, six and three for the commercial banks, co-operative bank, RRB and informal sources, respectively. The transaction cost was highest in formal sources compared to informal sources. Among formal sources, the transaction cost was highest in commercial banks (Rs. 5,079.32) followed by RRB (Rs. 4,732) and co-operative banks (Rs. 3213.25). Rent seeking cost formed the significant proportion of the transaction costs followed by cost of documents

and opportunity cost of time spent. The rent seeking cost was highest in informal sources (69.75%) followed by cooperative banks (53.68%), RRB (53.04%) and commercial banks (37.75%). The documents cost was highest in commercial banks followed by RRB and co-operative banks which constituted 32.59, 25.15 and 20.03 per cent, respectively. The transaction cost involved in borrowing loan of Rs. 100 was more in RRBs (Rs. 12.45) followed by cooperatives (Rs. 11.90), commercial banks (Rs. 3.34) and informal sources (Rs. 1.62).

3.3 Transaction Cost Involved in Borrowing Credit in Urban Gradient

The results (Table 4) revealed that the transaction cost in urban gradient was more in formal sources of credit compared to informal sources. Among formal sources, transaction cost was highest in commercial banks followed by co-operatives and Regional Rural Banks with Rs. 5,028.29, Rs. 3,876.93 and Rs. 3,326, respectively. It can be observed that, rent seeking cost had highest contribution to the total cost of transaction cost in case of formal source of credit (which accounts to 39.44% in case of commercial bank, 40.77% in co-operative banks and 33.07% in RRBs) followed by cost of documents, opportunity cost of time spent and transportation and refreshment costs. The average transaction cost in borrowing loan of Rs. 100 was more in formal sources (Rs.17.50, Rs. 2.74 and Rs. 1.86 in RRBs, Commercial banks and co-operative banks, respectively) compared to informal sources (Rs. 1.39).

Table 1. Transaction cost involved in borrowing credit in rural gradient

Particulars	Commercial banks	Co-operative banks	RRB	Informal sources
Average amount borrowed (Rs.)	93,000	44,000	6,000	11,9000
Number of visits	9	4	3	2
Opportunity cost of time spent (Rs.)	1200 (22.24)	675 (21.69)	300 (16.56)	187.5 (16.44)
Transportation and refreshment cost (Rs.)	467.24 (8.66)	450 (14.46)	160 (8.83)	122.22 (10.72)
Cost of account opening (cost of photos, address proof duplication etc.)	54.48 (1.01)	50.83 (1.63)	68.2 (3.77)	0 (0.00)
Cost of document * (Rs.)	1,655.17 (31.26)	654.17 (21.02)	540 (29.81)	0 (0.00)
Registration costs (Rs.)	189.65 (3.52)	108.33 (3.48)	68 (3.75)	0 (0.00)
Information search costs (Rs.)	56.3 (1.04)	49 (1.57)	350 (1.93)	25 (2.19)
Rent seeking (Rs.)	1672.41 (31.58)	1125 (36.15)	640 (35.34)	805.56 (70.65)
Total Transaction cost (Rs.)	5395.26 (100)	3112.33 (100)	1811.2 (100)	1140.27 (100)
Transaction cost per Rs. 100 loan amount	5.80	7.07	30.18	0.96

Note: 1. Figures in parentheses represents percentage to total transaction cost; 2. List of documents and associated costs included under cost of documents are presented in Table 2*

Table 2. List of documents produced to avail loan from the banks

Sl. No.	Name of document	Cost (Rs.)
1	Pahani	200
2	Mutation register	15
3	Registration paper	00
4	Encumbrance certificate	175
5	Check bandi	00
6	Record of Rights, Tenacy and Crops (RTC)	00
7	Vamshavruksha	200
8	Sale deed/Market deed	0.5 per cent of loan amount

Table 3. Transaction cost involved in borrowing credit in peri-urban gradient

Particulars	Commercial banks	Co-operative banks	RRB	Informal sources
Average amount borrowed (Rs.)	1,52,000	27,000	38,000	91,000
Number of visits	9	4	6	3
Opportunity cost of time spent (Rs.)	950 (18.70)	450 (14.00)	675 (14.26)	250 (16.97)
Transportation and refreshment cost (Rs.)	286.32 (5.64)	206.25 (6.42)	192 (4.06)	142.78 (9.69)
Cost of account opening (cost of photos, address proof duplication etc.) (Rs.)	87.63 (1.73)	56.25 (1.75)	70 (1.48)	0 (0.00)
Cost of document * (Rs.)	1,655.26 (32.59)	643.75 (20.03)	1190 (25.15)	0 (0.00)
Registration costs (Rs.)	165 (3.25)	102 (3.17)	70 (1.48)	0 (0.00)
Information search costs (Rs.)	43 (0.85)	30 (0.93)	25 (0.53)	53 (3.60)
Rent seeking (Rs.)	1,892.11 (37.75)	1,725 (53.68)	2,510 (53.04)	1,027.78 (69.75)
Total Transaction cost (Rs.)	5,079.32 (100.00)	3,213.25 (100.00)	4,732 (100.00)	1,473.55 (100.00)
Transaction cost per Rs. 100 loan amount	3.34	11.90	12.45	1.62

*Note: 1. Figures in parentheses represents percentage to total transaction cost; * List of documents and associated costs included under cost of documents are presented in Table 2*

Table 4. Transaction cost involved in borrowing credit in urban gradient

Particulars	Commercial banks	Co-operative banks	RRB	Informal sources
Average amount borrowed (Rs.)	1,83,000	2,08,000	19,000	82,000
Number of visits	8	6	6	2
opportunity cost of time spent (Rs.)	900 (17.90)	600 (15.48)	750 (22.55)	187.5 (16.44)
Transportation and refreshment cost (Rs.)	295 (5.87)	265.16 (6.84)	176 (5.29)	122.22 (10.72)
Cost of account opening (cost of photos, address proof duplication etc.) (Rs.)	92 (1.83)	71.68 (1.85)	70 (2.10)	0 (0.00)
Cost of document * (Rs.)	1513.34 (30.10)	1216.13 (31.37)	1190 (35.78)	0 (0.00)
Registration costs (Rs.)	189.66 (3.70)	108.33 (2.79)	40 (1.20)	0 (0.00)
Information search costs (Rs.)	55 (1.09)	35 (0.90)	22 (0.66)	21.9 (1.92)
Rent seeking (Rs.)	1983.3 (39.44)	1580.65 (40.77)	1100 (33.07)	805.56 (70.65)
Total Transaction costs (Rs.)	5028.29 (100.00)	3876.93 (100.00)	3326 (100.00)	1140.28 (100.00)
Transaction cost per Rs. 100 loan amount	2.74	1.86	17.50	1.39

*Note: 1. Figures in parentheses represents percentage to total transaction cost; 2. * List of documents and associated costs included under cost of documents are presented in Table 2*

It was observed from the study (Tables 1, 3 and 4) that the transaction cost was more in commercial banks compared to co-operatives in all the three gradient. The lower transaction cost in cooperatives can be attributed to the location of Co-operative banks right in the villages [12]. In case of commercial banks, the transaction cost was less in urban gradient followed by peri-urban and rural gradients. This is due to the fact that the bank branches will be available at nearest distance in urban and peri urban gradients compared to rural gradients which will reduce the cost of transportation and opportunity cost of time spent [13,14].

Among the formal sources the transaction cost per unit (Rs.100) loan amount was more in Regional Rural Banks (RRBs) followed by co-operatives and commercial banks. This is due to the fact that farmers borrowed lower amount from the RRBs. It was observed from the study that the transaction cost decreases with the increase in the loan amount. The results of Hosseini and Khaledi [13] aptly supports the findings of the study. The transaction cost was more in formal sources in all the three gradient compared to informal sources because of the cost of documents, cost of account opening and added registration costs which were zero in case of informal sources. There was no significant difference in transaction costs across the gradient.

3.4 Factors Influencing the Borrowers' Transaction Cost

Multiple linear regression analysis was carried out to find out the factors influencing the borrowers' transaction cost and the results are presented in Table 5. The 'F' value of the regression was 15.37 and was significant at one per cent indicating good fit of the model. The co-efficient of multiple determination (R^2) was 0.59 indicating that the variables included in the regression model explained about 59 per cent of the variation in transaction cost. The threshold transaction cost was Rs. 4976 per farm which is the contribution of other factors which are not included in the regression analysis.

The regression coefficient for education, number of visits, total land holding and amount borrowed were statistically significant. Regression coefficient for number of visits was 853.43 and is statistically significant at one per cent. As the number of visits increases by one unit, the transaction cost increases by Rs. 853.43. If the total land holding increases by one unit, the transaction cost increases by Rs. 620.69. Regression coefficient for amount borrowed was 0.0014 and is statistically significant at ten per cent. As amount borrowed increases by one unit, the transaction cost increases by Rs. 0.0014. Distance was not statistically significant as decentralization of banks to small towns and suburban gradients reduced transaction cost.

Table 5. Factors influencing the borrowers' transaction cost in the study gradient (multiple regression analysis)

(Explained variable: Transaction cost: Rs/farm)

Sl. No.	Explanatory variables	Parameters	Coefficients	t value
1	Intercept*	a	4976	1.58
2	Age (years)	b_1	1.40^{NS}	0.03
3	Education (Number of years schooling)	b_2	228.43**	2.08
4	Number of visits	b_3	853.43***	4.96
5	Total land holding (Acre)	b_4	620.69***	6.70
6	Amount borrowed (Rs.)	b_5	0.0014*	1.83
7	Distance from bank (Km)	b_6	152.14	0.47
8	Interest rate (%)	b_7	12.68^{NS}	0.22
9	D_1(Peri-urban)	b_8	125.56^{NS}	0.09
10	D_2 (Urban)	b_9	5959.35***	4.11
11	Co-efficient of multiple determination (R^2)	0.59		
12	Adjusted Co-efficient of multiple determination ($\overline{R}^2$)	0.56		
13	F value	15.37***		

*Note: *** Significant at 1 per cent level of significance, ** Significant at 5 per cent level of significance, * Significant at 10 per cent level of significance and NS- Non-significant*

To find the transaction cost across urban, peri-urban and rural farm households, two dummy variables were used viz., D_1 for per-urban farmers, D_2 for urban farmers. The intercept indicates the threshold transaction cost in rural gradient, which was Rs. 4976 per farm. Due to urbanization, the threshold transaction cost per farm is shifted by Rs. 5959.35 as given by the coefficient of the dummy variable (D_2 was significant at one per cent) used for farmers in the urban gradients. Hence, the threshold transaction cost per farm in urban gradient was Rs. 4976 + Rs. 5959.35 = 10935.35 per farm. In peri-urban gradients, threshold transaction cost per farm is shifted by 125.26 per farm indicating that the threshold loan amount repaid per farm in peri-urban gradient was Rs. 5101.26. The results clearly indicated that, transaction cost was more in urban farmers followed by peri-urban and rural farmers.

4. CONCLUSION

The average transaction costs varied significantly across formal and informal institutions. The transaction cost also varied with the loan amount. From the outcome of the study and analysis it can be concluded that the average transaction costs per loan amount is positively affected by the loan size and distance from the borrower's household to the lending institution. The analysis of the transaction costs infers that, the cost of credit was much higher for the borrowers who generally borrowed smaller amount of credits and vice versa. Results showed that the average transaction cost in borrowing credit was more in formal sources compared to informal sources across all the gradient and it is becoming a burden to the farmers and therefore, loan procedure should be simplified by reducing documentation. This will increase the accessibility of credit from formal sources and also helps in reducing farmers approaching informal sources. There is a need to have special attention by government institutions like Registration authority and Revenue authority to curb transaction costs influenced by rent seeking behavior of officials involved. Collateral security norms are hindering the marginal and small farmers in obtaining credit from formal sources and hence there is a need to redesign these norms especially for small and marginal farmers.

CONSENT

ACKNOWLEDGEMENTS

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Anonymous. The linkages between migration, agriculture, food security and rural development. Technical report, FAO; 2019.
2. Anonymous. The urban transition: Implications for global food security. The DuPont Advisory Committee on Agricultural Innovation and Productivity for the 21st Century. 2016;1-17.
3. Ranade A, Patil NB, Prashant B, Nitin A. Transaction cost of lending in rural finance. Institute for Financial Management and Research Centre for Micro Finance Working Paper Series; 2006.
4. Aroutselvam C, Zeaudeen P. Agricultural credit- A study in Villianur block, Pondicherry gradient. Financing Agric. 2000;32(3):17-18.
5. Anonymous, Economic Survey 2016-2017. Ministry of Finance, Government of India; 2016.
6. Mittendorf HJ. Promotion of viable rural financial systems for agriculture development. Quart J. Int. Agric. 1986;26: 6-27.

7. Khalilly MAB, Meyer RL. The political economy of rural loan recovery: evidence from Bangladesh. Savings Dev. 1993;17: 23-38.

8. Hosseini S, Khaledi M. Transaction cost of providing agricultural credit in Iran (case study: Rice producers in Mazandaran province). Agril. Sci. and Tech. 2005;19(1): 81-89.

9. Ellen MH, Monish J, Nils N, Thomas M. Construction and use of a simple index of urbanization in the rural–urban interface of Bangalore, India. Sustainability. 2017;1-21.

10. Ladman JR. Loan transactions costs: Credit rationing, and market structure: The case of Bolivia. in: Adams. Undermining Rural Development with Cheap Credit. West-view Special Studies in Social, Political and Economic Development, Bolivia; 1988.

11. Arjinder Kaur. Growth, structure and cost of agriculture credit: A study of Punjab. Ph.D. Thesis (Unpub.), Punjabi University, Patiala, Punjab; 2010.

12. Sukhpal Singh, Manjeet Kaur, Kingra HS. Inadequacies of institutional agricultural credit system in Punjab state. Agril. Econ. Res. Rev. 2009;22:309-318.

13. Houseini SS, Khaledi M, Ghorbani M, Brewin DG. An analysis of transaction costs of obtaining credits in rural Iran. J. Agril. Sci. and Tech. 2012;14(2):243-256.

14. Igwe KC, Egbuson OM. Determinants of transaction costs for borrowers among farmers in Ikwuano local government gradient, Abia State, Nigeria. American J. Rural Dev. 2013;1(5):116-120.