Network Analysis of the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) and Maize Farmers in Osun State, Nigeria

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Abstract
This paper analyzed the network between the NACRDB and the maize farmers in Ilesa, Osun State, Nigeria. The network was assessed in terms of loan disbursement from the NACRDB and the profitability of the maize enterprise of the beneficiaries. Data were obtained from the bank and sixty randomly selected beneficiary maize farmers. These were analyzed using descriptive statistics and budgetary analysis to elicit the profitability of maize enterprise. The results indicated that the bank witnessed remarkable increase in the number of beneficiaries (728%), loan approval and disbursement (486%) between 2003 and 2004. However, loan per beneficiary dropped by 29% during the period. Loan approval and disbursement relative to loan application increased from 57% in 2003 to 90% in 2004, loan recovery rate was low (43% - 44%). An average beneficiary derived 59.2% of investment in maize production in 2004 as credit from NACRDB. The highest component of the average variable cost was land clearing (31.3%) while that of the average fixed cost was permanent labour/management (54.0%). Profitability of the maize enterprise, with a gross margin of ₦152, 201 and profit of ₦79, 912, suggests that loan recovery should be higher than what it is currently in the bank. The bank is therefore advised to improve on staffing and logistic supports for loan monitoring.

Key words: Network, Loan, Gross margin Mize.

INTRODUCTION

Agriculture is the mainstay of the Nigerian economy and it provides food and fiber, and influences the standard of living of many people in the country. A sectoral analysis showed that agricultural output, comprising crop production, livestock, forestry and fishery, accounted for 41.2 per cent of the gross domestic product (GDP) in 2005 (CBN, 2005). The sector also provides about 60% of the workforce, earns foreign exchange and provides raw materials for the industries (FARMD, 2001).

However, agriculture in Nigeria is characterized by small-holdings, low technological input, low farm income, and low capacity to satisfy the food and fiber needs of the nation. Livestock production is dominated by the nomadic herdsmen, while poultry is mostly of the scavenging type with patches of commercial units nationwide. The fishery and forestry sub sectors are also underdeveloped and characterized by exploitation of resources without plan for their renewal.

Various innovations and techniques available to improve farmers' productivity level require financial commitment. However, the average Nigerian farmer is poor (Oke, 2005) with low output, low income, low savings and consequently low capital investment. Hence, there is the need for provision of credit to transform agriculture to the commercial level where farmers can reap the benefits of economies of scale in farm production.

The Nigerian government has established various credit institutions over the years with the major aim of making credit available to farmers towards boosting agricultural productivity. They include the Nigerian Agricultural Cooperative Bank (NACB) in 1973, the Agricultural credit Guarantee Scheme in 1977, the rural banking scheme in 1977, the Peoples Bank of Nigeria (PBN) in 1988, the Community Banks and the Microfinance Banks which had their policy regulations inaugurated in December 2005. In October 2000, the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB), was formed following the successful merger of the former PBN, the defunct NACB and the risk assets of the Family Economic Advancement Programme (FEAP). The merger aims at making credit available to the farmers in order to meet self-sufficiency in food production.

Agricultural credit is essential to agricultural development as it removes financial constraints that may hinder adoption of new technological innovations. Opportunities for borrowing and lending may increase farm incomes and welfare (Upton, 1997). Miller (1977) stated that unless production credit is made available on suitable terms and in adequate amount, majority of the Nigerian small scale farmers will be seriously handicapped in adopting profitable technology. However, credit markets work imperfectly, even in developed market economies due to problems related to asymmetric information, adverse selection, moral hazards, credit

rationing, optimal debt instrument choice and initial wealth (Swinnen and Gow, 1999).

Foltz (2004) applied recent theory and methods on credit disequilibrium to investigate the links between credit access and agricultural profitability and investment in Tunisia. He premised his study on two hypotheses: profit-liquidity effect and investment demand effect. Profit liquidity effect states that access to credit allows farmers to optimize input usage for a given set of fixed assets in the short term. Credit rationed farmers will use inputs only up to their capital availability. In particular the amount of liquidity a rationed household has will influence the overall profit level. While the investment demand effect opined that farmers with credit access problems will invest less in capital assets and their land. Credit rationed farmers will not be able to smooth their expenses over time implying that they will not make long-term investments, especially those which entail sunk costs. The investigation of credit access and its effect suggests that the presence of credit market constraints does impinge significantly on farm profitability, but not on investment (Foltz, 2004).

NACRDB is the largest agricultural development finance institution in Nigeria. It is dedicated to agricultural financing both at micro and macro levels, as well as financing of small and medium scale enterprises. The bank is owned by the Federal Government with 60% of the share capital subscribed for by the Federal Ministry of Finance and the remaining 40% subscribed for by the Central Bank of Nigeria. The bank's broad mandate to network encompasses savings mobilization and the timely delivery of credit to meet the funding requirement of the teaming Nigerian population in the agricultural and non-agricultural sectors of the economy (NACRDB, 2000).

Maize is an important source of food for man and livestock in Nigeria. Since the ban on importation of cereals by the government in 1986, there has been an increasing demand for maize by households and agro-allied industries in the nation (Laraba, 2004). A big threat to world supply of maize is the production of bio-fuel (ethanol) from maize in some developed economies like the United States (World of Corn, 2007). Since the United States supplies 70 percent of world maize exports, maize-importing countries are worried about their supply (Agro-Terra,. 2006). Despite the good progress that has been made

in attaining the goal of food self sufficiency in West African sub-region, several researchable constraints to increase maize production and productivity need to be removed (Uriyo, 1995). Oni (1980) opined that farmers are not able to access the additional investment fund needed for higher productivity; hence they are not able to increase their profit. A support to boost local maize production through provision of credit as NACRBD is doing for some of its clients will go a long way in achieving food security for Nigeria.

The networking of NACRDB (the Ilesa branch was established in 2002) and the maize farmers commences with the prospective applicant's initial contact with the Ilesa office of Osun State Agricultural Development Programme (OSSA DEP) where he/she obtains a standard application form. The filled application form is returned for processing with the relevant documents for project identification and formulation by the bank and OSSADEP. The applicant will submit a feasibility report on the farm which will be reviewed in accordance to the standard of the bank. Officials of the bank and the corporation will then visit the project site for an on-the-spot assessment. The information obtained on the proposal of the enterprise is communicated to the head office where it is analyzed for viability depending on the size of loan. But proposals under the small holder scheme are processed and approved at the branch office.

Once the project has been approved, the applicant carries out some legal documentation at the legal department followed by a pre-take-off visitation to the project site again. The, implementation commences according to the approved programme of the project. The disbursement procedure makes it mandatory for the branch office officials to visit the project after each disbursement to ascertain that the previous disbursement was judiciously utilized. The officials submit a written report at the end of the visit. The interest rate structure is as approved in the guidelines of the Central Bank of Nigeria (CBN) for the bank. Maize farming, like other agricultural production, attracts 16.5% interest per annum. Two civil servants are presented as guarantors for the loan. There is no sex discrimination in the approval of loans.

The objective of this study is to assess the network of the NACRDB and the maize farmers in terms of loan disbursement and profitability respectively. The net-

work of the financial institutions and the small and medium scale enterprises is a needful one. It is needful to know what the growth in size of beneficiaries of NACRDB, its loan disbursement and approval over time are. There is also the need to determine the profitability of the farm enterprises of the beneficiaries which may serve as indicator of their loan repayment ability and hence retention in the NACRDB network.

RESEARCH METHODOLOGY

The study was conducted in Ijesa zone comprising of six local government areas in Osun State in the Southwestern Nigeria. The local government areas were Ilesa East, Ilesa West, Oriade, Obokun, Atakumosa East and Atakumosa West. The population of the area was 620,109 by the year 2006 (NBS, 2006). The study area lies within the rain forest zone with annual rainfall distribution of 1020 – 2030 mm and mean temperature of 85^0F. It is characterized by seasonal rainfall and related cropping season from March to September or early October to March. The area is suited for the production of permanent crops such as cocoa, oil palm and kolanut while the important arable crops produced are maize, yam, cassava and cocoyam.

Primary and secondary data were used. Primary data were obtained from a cross section of NACRDB clients in addition to secondary data obtained from the NACRDB Ilesa branch. The list of names and locations of maize farmers was obtained from the Osun State Agricultural Development Corporation (OSSADEP) at Ilesa. The corporation serves as the intermediary between the loan beneficiaries and NACRDB. A total of 297 beneficiaries obtained loan from the NACRDB out of which 158 were maize farmers. From the list, sixty of the beneficiary maize farmers were randomly selected (Table 1) for interview using structured questionnaire administered with the assistance of OSSADEP enumerators.

Two reasons informed the choice of maize farmers for this study. First, most loans disbursed by NACRDB are short term loans which are repaid in less than one year. Secondly, maize is the major farm crop planted by farmers in Ilesa. The life span of the crop makes it suited for short term loans. Information were sought on socioeconomic characteristics of the respondents, their borrowing procedures, the adequacy of loan obtained, the uses to which the

Table 1: Distribution of Respondent Maize Farmers

Local Government Area	No. of Respondents	Percentage (%)
Atakumosa East	10	16.7
Atakumosa West	14	23.4
Ilesa East	8	13.3
Ilesa West	9	15.0
Obokun	11	18.3
Oriade	8	13.3
Total	60	100.0

Source: Data analysis, 2005.

loans were put and the costs and returns on their maize enterprises.

The data collected were analyzed using descriptive statistics and budgetary analysis. The cost components are divided into: fixed costs and variable costs. Fixed cost comprised of cost of hoes, cutlasses, boots, land rent, farmhouse, interest on loan and permanent labour/management. Variable costs were incurred on seeds, fertilizers, land preparation, weeding, herbicides, harvesting and marketing. The sum of these two costs gives the total cost i.e. TC = FC + VC, where TC is the Total cost, FC is the fixed cost and VC is variable cost. The revenue is the value of all products marketed. The total revenue is given as TR = PQ, where P is the price of maize and Q is the quantity of maize sold. The analysis bothers on calculating the gross margin which involves deducting the total variable costs (TVC) from the TR and profit or the net revenue (JI) which is the TR less the TC.

Useful life of two years was assumed for hoes, cutlasses and boots while ten years was assumed for farmhouse and a scrap value of zero for each item. The straight line method was used in calculating depreciation. Dt = (P – L)/N, where Dt = Depreciation in year t, P = Cost of the asset or the initial capital, L = Scrap or salvage value of the asset and N = Economic life (years) of the asset.

RESULTS AND DISCUSSION

Network of NACRDB and Maize Farmers in Ilesa

The NACRDB Ilesa branch established in 2002 recorded 138 male and 75 female beneficiaries and disbursed loan amounting to ₦22,883,000.00 as at 2004. Loan disbursement performance of the bank is outstanding because the initial disbursement in 2003 was ₦3,335,000.00 which went up with

an increment of 486% to ₦19, 548,000.00 in 2004 (Table 2). However, loan per beneficiary dropped by 29% from ₦104, 218.75 to ₦73,766.04. This implies that NACRBD lowered its quantum of loan per farmer in order to improve on outreach among them.

Table 2: Distribution of Loan Disbursement

Year	No. of beneficiaries	Amount benefited (₦'000)	Amount of loan per beneficiary (₦)
2003	32	3, 335	104, 218.75
2004	265	19, 548	73, 766.04
Total	297	22, 883	77, 047.14

Source: Data analysis, 2005.

Similarly, the number of loan beneficiaries rose with a remarkable increment of 728% from 32 in 2003 to 265 in 2004. Loan application commenced in 2002 but no approval was made that year (Table 3). The amount of loan applied for in 2003 was ₦5, 893,000.00 of which 57% was approved. Similarly, ₦21,720,000 .00 was applied for in 2004 with approval rate of 90%. Loan approval increased in 2004 over that of 2003.

The same amount approved was disbursed to beneficiaries in both periods. The loan recovery rates were 43% in 2003 and 44% in 2004. These were virtually the same and too low compared to the rate of about 90% attained by microfinance non-governmental organizations in the region (Oke, 2005).

Table 3: Loan Application, Approval, Disbursement and Repayment ('000) (2002 – 2004)

s/n	Loan status	2002	2003	2004
1	Amount applied for (₦)	4, 370	5, 893	21, 720
2	Amount approved (₦)	-	3, 335	19, 548
3	Amount disbursed (₦)	-	3, 335	19, 548
4	Amount recovered (₦)	-	1, 429.62	8, 503.38

Source: Data analysis, 2005.

The cost and returns analysis was aimed at eliciting the ability of beneficiaries to repay their loans (Tables 4, 5 and 6). The largest component of the variable costs (31.5%) was cost incurred on land preparation (Table 4). The maize farmers spent between ₦1,600 and ₦75,000 on land clearing. This is followed by costs on hired implements (18.4%) which averaged ₦9,656 while seeds accounted for the least. This stemmed from the fact that some farmers obtained seeds from previous harvest or buy seeds from the open market. The total costs of variable inputs amounted to ₦52, 321 and formed 42% of the total cost per beneficiary.

Table 4: Variable Cost of Input Used per Farmer in the 2004 Maize Cropping Season

Input	Minimum amount (₦)	Maximum amount (₦)	Average Amount (₦) (%)
Seeds	200	2800	1, 245 (2.4)
Seed treatment	500	5, 400	1, 867 (3.6)
Hired implements	3, 000	28, 500	9, 656 (18.4)
Land clearing	1, 600	75, 000	16, 470 (31.5)
Manual weeding	400	24, 000	4, 312 (8.2)
Herbicides	400	24, 000	8, 197 (15.7)
Harvesting	2, 500	22, 500	3, 127 (6.0)
Others	1, 600	54, 000	7, 447 (14.2)
Total	200	75, 000	52, 321 (100.0)

Source: Data analysis, 2005.

Table 5: Fixed Cost of Input Used per Farmer in the 2004 Maize Cropping Season

Item	Minimum amount (₦)	Maximum amount (₦)	Average Amount (₦)(%)
Depreciation on hoe	300	1, 800	885 (1.2)
Depreciation on cutlass	300	3, 000	1, 131.67 (1.6)
Depreciation on boots	400	6, 000	1338.33 (1.8)
Depreciation on farmhouse	2, 000	50, 000	8, 580.00 (11.9)
Land rent	1, 000	40, 000	9, 150.00 (12.7)
Interest on loan	1, 800	65, 000	12, 171.40 (16.8)
Permanent labour/ management	24, 000	120, 000	39,032.60 (54.0)
Total	300	120, 000	72, 289.00 (100.0)

Source: Data analysis, 2005.

Table 6: Costs and Returns per Beneficiary Maize Farmer for the 2004 Planting Season

s/n	Item	Value (₦)
1	Total variable costs (42% of 16)	52, 321
2	Seed treatment	1, 867
3	Hired implements	9. 656
4	Land clearing	16, 470
5	Manual weeding	4, 312
6	Herbicides	8, 197
7	Harvesting	3, 127
8	Others	7, 447
9	Total fixed cost (58% of 16)	72, 289
10	Depreciation on hoe	885
11	Depreciation on cutlass	1, 131.67
12	Depreciation on boots	1, 338.33
13	Depreciation on farmhouse	8, 580.00
14	Land rent	9, 150.00
15	Interest on loan	12, 171.40
16	Total costs	124, 610
17	Total revenue	204, 522
18	Gross margin (17 – 1)	152, 201
19	Net revenue, JI (17– 16)	79, 912

Source: Data analysis, 2005.

The least components of the average fixed costs (AFC) were depreciations on hoe (1.2%), cutlass (1.6%) and boots (1.8%). An average maize farmer in the area spent 11.9%, 12.7% and 16.8% of his fixed costs on depreciation on farmhouse, land rent and interest payment respectively. The chunk of the AFC is the cost of permanent labour/management which ranged between ₦24,000 and ₦120,000 and averaged ₦39,032.60. This is so because some farmers did not hire permanent labour while those that did had maximum of two. The total fixed cost per beneficiary was ₦72,89 or 58% of the total cost (₦124,610).

Loan per beneficiary of ₦73, 766.04 calculated for 2004 in Table 2 is 59.2% of the total costs. This implies that, of the ₦124, 610 invested by the average NACRDB beneficiary in maize production in the study area in 2004, 59.2% was sourced from the bank.

Revenue generated from the sale of green and dry shelled maize ranged between ₦50,020 and ₦585,002, and averaged ₦204,

522 per respondent. The gross margin per respondent ranged between ₦22,680 and ₦492,850 and averaged ₦152,201.

The profit or the net revenue of ₦79,912 per beneficiary is considered adequate for enhanced loan repayment capacity given that the average beneficiary made this much profit after meeting all costs. Therefore, the low loan repayment rate of 43-44% NACRDB for recorded by 2003-2004 could not be justified when compared with this finding on their gross margin and profit. This revelation is a reflection of the imperfect information problems associated with agricultural loans (Swinnen and Gow, 1999) where beneficiaries hide under asymmetric information to default.

However, the farmers expressed poor loan supervision; untimely disbursement of loan and short loan duration as part of problems militating against loan repayment. The NACRDB on its part is faced with inadequate staff strength and mobility for loan monitoring.

SUMMARY AND CONCLUSION

This paper assessed the network of NACRDB on loan delivery to maize farmers in Ilesa. Data were obtained from the bank and sixty randomly selected beneficiary maize farmers in the area. The budgetary analysis was carried out to determine the profitability of maize enterprise.

The results showed that the bank (NACRDB) witnessed a remarkable increase in the number of beneficiaries (728%) and loan approval and disbursement (486%) between 2003 and 2004. Loan approval and disbursement relative to loan application also improved during the period. However amount of loan granted per beneficiary dropped by 29% during the period.

Loan per beneficiary was ₦73,766.04 and formed 59.2% of total investment in maize production by beneficiaries. But loan recovery rate of 43% and 44% for 2003 and 2004, respectively was low. The budgetary analysis revealed that maize enterprise was profitable in the study area with a gross margin of ₦152, 201 and profit of ₦79, 912 realized. These results corroborate the study of Foltz (2004) that credit access enhances profitability of agricultural enterprise. However, the rate of loan repayment which could enhance and sustain the network was low.

For there to be an efficient and sustainable network, the NACRDB must ensure timely disbursement of loans and timely supervision in order to safeguard repayment. Given the complaint of

low frequency of visitation of farmers by loan officers, it is recommended that the level of loan recovery rate by NACRDB can be improved in the area by increasing the staff strength and logistics for loan monitoring which, however, may lead to high interest rate and increased transaction cost.

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