The Position of Women in the Repayment of Agriculture Loans in Nigeria: An Analysis
C J Arene and G C Aneke

The study attempts to assess the credit system within the framework of the Supervised Agricultural Credit Scheme (SACS) in Enugu State of Nigeria. The emphasis is on repayment position and technical aid to female farmers. The results show that high repayment rate farmers had a larger loan size, larger farm size, higher gross income, shorter distance between home and source of loan, higher level of formal education, larger household size, and higher level of adoption of innovations than low repayment rate farmers. Detailed statistical analysis reveals that the number of farm visits is significantly related to the farmers' gross income while number of farmers supervised, length of service as supervisors, and level of formal training in agriculture account for less. Loan programmes for female farmers are of great importance for the development of agriculture. Their efficiency is, however, considerably determined by good quantitative and qualitative supervision and advisory service.

C / Arene is a lecturer in the Department of Agricultural Economics, University of Nigeria, Nsukka, Nigeria and G C Aneke is a lecturer in the Department of Economics, University of Science and Technology, Enugu, Nigeria.
consider any field under four hectares as unprofitable. This would mean she would have less time to spend on the family field, which would be unacceptable to her husband. Furthermore, lending institutions usually demand a financial guarantee for any loan and only farmers' organizations, of which women are rarely members, are able to supply such guarantees. It is in line with the above-mentioned problems that the Enugu State Ministry of Agriculture decided to establish the Supervised Agricultural Credit Scheme (SACS).

In a nutshell, the SACS in Enugu State of Nigeria was established in 1980. The scheme is primarily meant for small-scale farmers. The projects sponsored by the scheme include maize, rice, cassava, oilpalm, poultry, and a few vegetable and plantain projects. The scheme gives a maximum loan of N 10,000 and a minimum loan of £f 1,000 to farmers. Lending is gender-neutral, although a greater number of loan beneficiaries are males. Loan disbursement is followed with technical advice from the scheme's extension agents (or supervisors).

Different studies by Lawal (1994) and Nwafor (1994) have shown that women are more reliable and honest than men, and where they do have greater access to and control of resources, they are more likely to invest in the welfare of the family, with direct spin-offs for improved childcare and nutrition. In the light of these problems and observations, this study attempts to assess the credit delivery system of the SACS with emphasis on loan repayment performance of female farmer-borrowers and technical aid from the supervisors of the scheme. The role of the supervisors needs to be assessed since rationalization is required for the continuous programme of upgrading their technical competence.

Methodology
The study was conducted in Enugu State of Nigeria in 1994-95. The choice of the area was primarily based on its relatively poor loan repayment performance at the time of the study and, secondly, its accessibility.

Sampling and Data Collection
Sixty female farmer-borrowers of the scheme in the state were randomly sampled. The women were mixed crop farmers cultivating cassava, maize, and vegetables. Nineteen supervisors who supervised the farmers during the period of study were likewise sampled. The supervisors were all males.

Data were gathered through personal interviews using two sets of pre-tested questionnaires.

Method of Analysis
Tabular analysis was employed in examining the farmer and farm characteristics that may influence the farmers' repayment performance.

Logit analysis was used to position and predict bad debtors prior to loan disbursement (Box).

Box: Logit Analysis

By using the size of loan ($X_1$), farm size ($X_2$), gross income ($X_3$), distance between home and source of loan ($X_4$), level of formal education of farmers ($X_5$), household size ($X_6$), and adoption of innovations ($X_7$) against agricultural loan repayment rate ($Y_1$), the model classifies the women farmers into two mutually exclusive and exhaustive categories by means of probability distribution. The model can be represented explicitly by taking $Y_1$ as a probability, $P$, and making its logarithm to depend linearly on the independent variable: \[
\text{Logit} \, P = \log \left( \frac{P}{1-P} \right) = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7.
\]

That is \( \log \left( \frac{p}{1-p} \right) \), is called the odds ratio, the log odds or logit. The classification procedure is as follows: If \( \log \left( \frac{p}{1-p} \right) \) tends to zero, we classify the individual farmers as belonging to group I (bad debtors), and if \( \log \left( \frac{p}{1-p} \right) \) tends to one, we classify the individual farmers as belonging to group II (good debtors). The classification boundary will then be the locus of points where \( a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 = 0.5 \). The logit score, \( \log \left( \frac{p}{1-p} \right) \), is estimated by the use of Maximum Likelihood Estimate (MLE) procedure. The logit coefficients, b's, are estimated by solving simultaneous equations using matrix algebraic form.

Regression analysis was used to determine the relationship and effect of selected supervisory characteristics on the income of the farmers they supervised. The model relates income ($Y$) as a function of number of farmers supervised ($X_1$), length of service as supervisors ($X_2$), level of formal training in agriculture ($X_3$), and the number of farm visits ($X_4$). The model is represented explicitly as
\[
Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \epsilon
\]

Results and Discussions
Tabular Analysis

The farmer-borrowers were dichotomized into low and high repayment groups. Low repayment farmers were those with 0 to 50 per cent repayment rate while high repayment farmers were those with 51 to 100...
per cent repayment rate. The results of the tabular analysis are shown in Table 1.

The table shows that the farmers have positive attitude towards loan repayment. For example, high repayment farmer group had larger loan size, larger farm size, higher income, were closer to loan source, more educated, had larger household, and adopted more agricultural innovations than low repayment farmer group.

Logit Analysis

The management of the Supervised Agricultural Credit Scheme in the study area shows clear preference for customers with proven ability to repay previous loans. When new applicants were to be considered for loans in any year, choice was made from the long list of customers whose approved applications had been pending before the board. This bias, therefore, restricts potential beneficiaries to old customers whose repayment records are readily available for consideration.

Under the present constraint of financial inadequacy to maintain existing level of credit activities, the current loan restrictions may be justifiable. However, when the scheme’s finances improve and credit expansion becomes necessary, new applicants will necessarily be given equal consideration as old customers. It is, therefore, desirable to develop a logit function capable of identifying bad debtor farmers with high degree of accuracy. This is the main objective of the study. Three years of the farmers' records were used to develop the function.

The set of socio-economic characteristics involved in the study are: size of the loan ($X_1$), farm size ($X_2$), gross income ($X_3$), distance between home and source of loan ($X_4$), level of formal education of farmers ($X_5$), household size ($X_6$), and adoption of innovations ($X_7$). Those whose repayment rates ranged from 0 to 50 per cent were assigned zero (bad debtors) while those whose repayment rates ranged from 51 to 100 per cent were assigned one (good debtors). Accordingly, 13 farmers were found to be bad debtors while the remaining 47 farmers were found to be good debtors. The estimated function for the farmers using logit probability method is stated in Table 2.

Loan repayment rate is positively influenced by the size of loan, farm size, income, level of formal education.

### Table 1: Characteristics of Repayment Groups

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Repayment Group</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Size of Loan (in Naira)*</td>
<td>1,264.89</td>
<td>3,032.20</td>
</tr>
<tr>
<td>Farm Size (in Hectares)</td>
<td>1.04</td>
<td>1.09</td>
</tr>
<tr>
<td>Gross Income (in Naira)**</td>
<td>3,082.19</td>
<td>4,476.28</td>
</tr>
<tr>
<td>Distance Between Home and Source of Loan (in Kilometre)</td>
<td>33.15</td>
<td>16.78</td>
</tr>
<tr>
<td>Level of Formal Education of Farmers (in Years)</td>
<td>5.29</td>
<td>7.16</td>
</tr>
<tr>
<td>Household Size (No. of Dependents)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Adoption of Innovations (Adoption Index)*** (Low - 0 to 3; High - 4 to 6)</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

@ Low: 0 to 50 per cent repayment; High: 51 to 100 per cent repayment. *

= 22 Naira (N 22) = 1 US Dollar ($1).

** Gross income was defined as the difference between aggregate Total Revenue (TR) and aggregate Total Variable Cost (TVC). Fixed costs (FC) were not included as the farmer did not operate with fixed inputs-characteristics of smallholder farmers in Nigeria.

*** Adoption of innovations was defined as the number of improved agricultural production technologies adopted by the farmers. Recommended improved technologies available to the farmers include fertilizer application, pesticide application, minimum tillage, seeds/planting materials, irrigation practice, and appropriate planting distance. A farmer is assigned six if she adopts all the innovations and zero if she does not adopt any. The adoption score is expressed in indices.

Source: Calculations from Field Survey Data, 1994-95.
education of farmers, household size, and adoption of innovations, but negatively influenced by the distance between home and source of loan. The negative influence of distance between home and source of loan on repayment rate implies that farmers staying far from the source of loan are less able and willing to pay back their loans. Household size and adoption of innovations are not significantly related to loan repayment rate.

**Supervisory Characteristics as Related to Farmers' Income**

Major supervisory characteristics (X's) were regressed with the farmers' gross income (Y) as the dependent variable. The independent variables were X₁ (number of farmers supervised), X₂ (length of service as supervisors), X₃ (level of formal training in agriculture), and X₄ (number of farm visits).

The resultant model is shown in Table 3. It shows that the combined effects of number of farmers supervised (X₁), length of service as supervisors (X₂), level of formal training in agriculture (X₃), and number of farm visits (X₄) explained 23.26 per cent of the variation in the farmers' gross income. This was significant at 1 per cent using the F-statistic. The test of significance, which is the t-test of the coefficients, showed that the number of farm visits by the supervisors was significant at 10 per cent level, and directly related to the farmers' gross income level. This implies that the supervised farmers' gross income increases as the supervisors' visit becomes more frequent. The frequent farm visits by the supervisors could bolster the farmers' confidence in the acceptance of new technology since the supervisors could help them solve their technical problems.

**Problems in Administration of Credit**

The supervisors listed the following problems in the administration of credit to farmers:

- Socio-cultural constraints.
- Lack of female supervisory field staff.
- Diversion of loan to other uses by the farmers.
- Insistence on excluding input supply functions from the supervisors' roles.
• Negative attitude of the farmers towards government-owned credit agencies.

Common problems reported by the farmers include:

• Negative attitude of the supervisory officials towards their farming potential.
• Bad weather conditions.
• Pests and diseases.
• Low price of farm products especially during harvesting period.
• High cost of farm inputs.
• Irregularity and low frequency of farm visits by the supervisory staff.

Conclusions and Recommendations for Policy

The major conclusions which are derived from this study are as follows:

• Loan repayment rate is directly related to size of loan, farm size, gross income, level of formal education of farmers, household size, and adoption of innovations.
• Loan repayment rate is inversely related to distance between home and source of loan.
• Significant determinants of loan repayment are size of loan, farm size, gross income, distance between home and source of loan, and level of formal education of farmers.
• Farmers' gross income is directly related to length of service as supervisors, level of formal training in agriculture, and number of farm visits.
• Farmers' gross income is inversely related to number of farmers supervised.
• A significant determinant of gross income is number of farm visits by supervisors.
• High repayment farmers have relatively positive attitude towards credit.

Farmers encountered many problems in trying to repay their loans while the supervisors of the scheme also had problems in the discharge of their duties. Considering the immense benefits that can be derived from a well-administered credit system, some recommendations are as follows:

• Efforts should be made to increase the level of income of these farmers through improved production and marketing system for their products. This can be done by giving loans to farmer groups and encouraging them to extend their group activities to purchases of farm inputs, production and marketing of members' farm products.

• If the scheme must continue to provide loans to farmers on individual basis, an alternative way out of the problem is for the operators to employ qualified and experienced female supervisors and send them specifically to the farmers for technical assistance. This may instil more confidence on the farmers and their husbands. If it becomes difficult to recruit this category of supervisory staff, the scheme should concentrate on lending to unmarried women, divorcees, widows, and women with polygamous marriages. It is believed that these groups of women are more culturally independent and can take individual decisions that will influence their homes. Supervisory staff (both men and women) can easily get to them without fear of molestation.

• The administration of the scheme should be decentralized so that the farmers do not need to travel to the headquarters to obtain loans. This implies increasing the number of offices of the scheme to reach every Local Government Area of the state. Enugu State has three agricultural zones, namely, Abakaliki, Enugu, and Nsukka. The administrative headquarters of the scheme is in Enugu zone where the state capital is situated. This accounts for most of the farmer-respondents coming from Enugu agricultural zone. The decentralization of the credit scheme is likely to improve the farmers' repayment performance. It is to be expected that farmers staying far away from the source of loan are less able and less willing to repay.

1 Farmer groups have more power to bargain for lower input prices and higher prices for their products. This strategy will be doubly beneficial and a more effective way of credit recovery since it will make for easier access to loan on the part of the farmers and a high recovery rate for the scheme. For example, instead of applying for loans separately, the farmers can form groups, decide how much each individual needs, and submit an application for the group. The scheme can thus process one application for N 80,000 instead of processing 40 applications for say, N4,000 each and follow it up through the group leader. In addition, credit recovery is easier through groups since peer pressure mounted by the groups on defaulting members can make them comply provided the scheme makes it a condition not to make any new loans to a group until all its members have repaid their old loans. At present, the scheme gives loans to farmers on individual basis. However, there is no unquestionable virtue about group loans because groups can also “collude” to jointly default. Nweke and Obi (1982) pointed out that small-holder credit problems resulting from low cash value of their farming activities cannot be resolved by lending through cooperatives (groups) alone.
Since the number of farm visits by the supervisors is a significant determinant of the farmers' income, the supervisors should be given incentives to encourage them to give their best to the farmers. The scheme should also include training programmes for supervisors on specific subject areas in agriculture and provision of facilities to increase frequency of farm visits by the supervisors.

Finally, since the productivity of female farmers is low (Arene and Kalu, 1993), the Nigerian Government should formulate means of raising their productivity. These include not only access to land and gender (female)-oriented agricultural technologies, but also access to credit. According to Arene and Omorogie (1991), the strategy for agricultural development should consider the economic significance of raising the productivity of the female labour force and ensuring their equitable participation in the daily process of agricultural transformation. The specific needs of women should be treated with priority and programmes for achieving the above-mentioned objectives should not be seen merely as "women power," "women emancipation," or "women liberation programmes. They are aimed at utilizing women to solve a major national problem—the Nigerian food question.

References