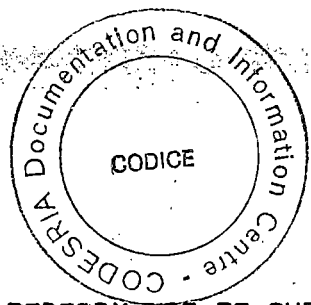Thesis By

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DEPARTEMENT Of AGRICULTURAL ECONOMICS UNIVERSITY OF NIGERIA . NSUKKA

EVALUATION OF THE PERFORMANCE OF SUPERVISED AGRICULTURAL CREDIT SCHEME OF ANAMBRA STATE NIGERIA

OCTOBER,1990

EVALUATION OF THE PERFORMANCE OF SUPERVISED

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NIGERIA

BY

ARENE, CHUKWUEMEKA JOHN
(PG/Ph.D/87/5385)

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A THESIS SUBMITTED TO THE DEPARTMENT OF

AGRICULTURAL ECONOMICS, UNIVERSITY OF

NIGERIA, NSUKKA IN FULFILMENT OF

THE REQUIREMENTS FOR THE DEGREE OF DOCTOR
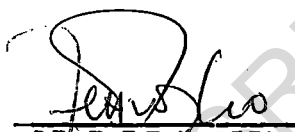
OF PHILOSOPHY (Ph.D) IN AGRICULTURAL ECONOMICS

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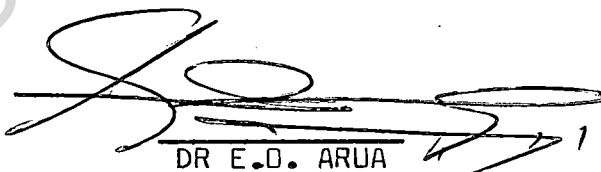University of Nigeria,
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CERTIFICATION

Arene, Chukwuemeka John, a postgraduate student
in the Department of Agricultural Economics and with the
Registration Number PG/Ph.D./87/5385 has satisfactorily
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Philosophy (Ph.D.) in Agricultural Economics. The
work embodied in this thesis is original and has not
been submitted in part or full for any other diploma
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DEDICATION

This work is dedicated to my mother,

Mrs Esther Udeka Arene, who has sacrificed

so much for my education.

ACKNOWLEDGEMENT

In such a project as this, where objective statistical analysis and subjective evaluation came into play, the advice of experts were of paramount importance. I am particularly indebted to my thesis supervisors, Dr. E.C. Nwagbo and Dr. B.C. Amadi respectively, and do hereby tender grateful thanks to them for their expert advice and directives throughout the study period which were invaluable.

I also wish to express my grateful thanks to the supervisory staff of Anambra State Supervised Agricultural Credit Scheme (SACS) through whom I reached the farmers. My special thanks go to Mr. Mojindu and Mr. Ugwu for their useful contributions, especially in the supply of secondary information.

I also wish to express my deep appreciation to Dr A.N. Chidebelu for his useful contribution during my first seminar and for lending me some of his statistical books which were invaluable towards the successful completion of this study; to Mr Okoye of the

ABSTRACT

This study evaluated the performance of the Supervised
Agricultural Credit Scheme of Anambra State of Nigeria with
emphasis on credit extension decisions.

The cluster sampling method of data collection was used and
it involved random sampling without replacement of a total population
of about 700 farmer-beneficiaries in the state. Three hundred
farmers, 60 from each of the clusters, were selected and interviewed.
The supervisors who supervised the farmers were likewise interviewed.
The instrument of data collection was an interview schedule.
Descriptive statistics, multiple regression, correlation, and
discriminant analyses techniques were employed to analyse the
data and achieve the objective.

The research findings showed that maize and poultry farmers
were not very consistent in the repayment of their loans. In terms
of supervision, efficiency seemed to be sacrificed due to small
supervisor/farmer ratio and some other related problems, although
the farmers had positive attitude towards supervision. The
results further revealed that in giving loans to maize farmers,
the scheme should focus attention on four major characteristics,
namely size of loan, age of farmers, number of years of farming
experience, and distance between home and source of loan; to
rice farmers, on income; and to poultry farmers, on age of
farmers, distance between home and source of loan, and level of
formal education of farmers.

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Table 1.1:   Trends in the Structure of Output, 1960-1979

		Percentage of Total Output								
		1960	1966	1969	1973	1974	1975	1977	1978	1979
1.	Agriculture (L/S,* Agriculture, Forestry, Fishing)	62.94	54.97	48.87	27.60	23.90	23.50	19.20	19.80	17.98
2.	Mining and Quarrying	0.58	4.83	6.99	24.50	32.90	26.30	27.60	23.30	25.94
3.	Manufacturing and Crafts	4.79	6.90	8.04	5.00	3.90	5.00	5.40	6.40	6.65
4.	Electricity and Water	0.41	0.58	0.71	0.40	0.30	0.30	0.40	0.40	0.40
5.	Building and Construction	4.79	5.35	4.60	7.30	5.90	6.80	9.30	10.90	11.11
6.	Distribution	12.40	12.90	12.93	18.70	19.50	20.00	20.00	20.00	19.19
7.	Transport and Communication	4.89	4.49	3.99	3.80	2.90	3.30	5.00	5.20	5.22
8.	General Government	3.31	3.08	7.17	5.50	4.60	9.20	7.80	8.20	7.74
9.	Services (Education and Health)	5.77	6.90	6.69	7.10	6.10	5.60	5.30	5.80	6.69

*L/S = Livestock

Source:- Federal Office of Statistics, for 1960-79, Lagos.

Table 1.2. Index of Agricultural Production in Nigeria (1975 = 100)

Items	1981 (1)	1982 (2)	1983 (3)	1984 (4)	1985 (5)	1986 (6)	1987 (7)	(1) and (2)	(2) and (3)	(3) and (4)	(4) and (5)	(5) and (6)	(6) and (7)
								Percentage difference between					
1. Crops													
(a) Staples	71.60	73.80	63.50	81.50	88.90	98.60	93.30	3.07	-13.96	28.35	9.08	10.91	-5.36
(b) Other Crops	124.10	122.20	108.10	115.10	126.30	125.90	128.70	-45.87	-11.54	6.48	9.56	-0.32	2.22
2. LIVESTOCK	94.20	104.40	99.90	102.40	106.80	110.70	113.00	10.83	-4.31	2.50	4.30	3.65	2.08
3. FISHERY	104.30	107.30	109.90	73.60	51.80	60.70	84.30	2.88	0.56	-33.03	-29.62	17.18	38.88
4. FORESTRY	114.50	113.40	105.60	107.40	110.60	110.70	114.20	-0.96	-6.88	1.70	2.98	0.09	3.16
5. AGGREGATE INDEX	90.10	92.50	83.80	91.40	95.80	102.10	100.30	2.66	-9.41	-9.07	4.81	6.58	-1.76

Source: Federal Office of Statistics, Lagos.

Table 1.3.   Contribution of Agriculture to the Gross
Domestic Product (GDP), 1960 - 1979.

Year	Total GDP N'Million	Agriculture N'Million	Agriculture as Percentage of GDP
1960	2247.40	1414.60	62.90
1974	16462.60	3565.30	23.90
1975	19437.70	3439.60	23.50
1976	23826.60	3613.70	20.50
1977	26758.50	3777.70	19.20
1978	27370.20	3039.30	19.80
1979	31424.70	5656.80	18.00

Source: Central Planning Office, 1981, Lagos.

bill for food items (table 1.4). Because of the declining trend in the output and rising cost of food items, the states and federal governments embarked on a number of programmes designed to make the country self-sufficient in food production.

Some of the programmes embarked upon by the various governments to takle the food production problems are the Operation Feed the Nation (OFN), the National Accelerated Food Production Programme (NAFPP), and the Green Revolution Programme (GRP). The programmes, particularly the Green Revolution Programme, have included the provision of credit facilities as one of the measures for solving the agricultural problems. As a result, the agricultural sector recorded a marked increase in rate of growth in overall production in 1986 bringing about a remarkable decrease in food import bill (table 1.4). However, there are slight declines in some general agricultural activities in 1987 bringing about another increase in food import bill (table 1.4).

ω

Table 1.4:   The Nigerian Food Import Bill for 1981 - 87

| | | 1981 (1) | 1982 (2) | 1983 (3) | 1984 (4) | 1985 (5) | 1986 (6) | 1987 (7) | % change between | | | | | |
									(1) and (2)	(2) and (3)	(3) and (4)	(4) and (4)	(5) and (6)	(6) and (7)
1.	Food and Life Animals	1477.90	2048.20	2115.90	1052.10	686.10	534.40	1573.70	38.59	3.31	50.28	-34.79	-22.11	194.48
2.	Beverages and Tobacco	9.70	12.60	17.10	7.00	6.30	13.00	38.60	29.90	35.71	-59.06	-10.00	106.35	196.92
3.	Animal and Vegetable Oils and fats	106.90	123.10	150.80	84.90	79.80	119.10	65.20	15.15	22.50	43.70	-6.01	49.25	45.26
4.	Total for Food	1594.50	2183.90	2283.80	1144.00	772.20	666.50	1677.50	36.96	4.57	-49.91	-32.50	-43.69	151.69
5.	Total for all Imports	9723.00	12565.50	12919.60	7178.30	7932.90	5469.70	17861.70	29.23	2.82	-44.44	10.51	-31.05	226.56
6.	% of the Total Imports	16.40	17.38	17.68	15.94	9.73	12.19	9.39	5.98	1.73	-9.84	-38.96	25.28	-22.97

Source: Compiled from the Exchange Control Department of Central Bank of Nigeria and Federal Office of Statistics, Lagos.

One of the primary causes of low food production in Nigeria is insufficient credit to develop agriculture. Agricultural credit is one of the programme packages designed to be part of the institutional infrastructures necessary for the development of agriculture (Federal Ministry of Agriculture and Natural Resources, 1974). The agricultural credit policies in the third and fourth national development plans are to make short and medium-term capital available to farmers so as to give them access to more productive inputs.

The need to give farmers access to credit, especially on short- and medium-term basis, led to the establishment of the Nigerian Agricultural and Co-operative Bank (NACB) Limited in 1973. The NACB alone is not equipped to service loans directly to the millions of small-scale farmers, who account for over 90 per cent of agricultural production in the country. Loans to this category of farmers are, therefore, disbursed through the on-lending schemes of various state ministries of agriculture. Less than 20 per cent of the total loans disbursed by the NACB during the third national development plan period (1975 - 1980) has gone to the

on-lending scheme for small-scale farmers, and over 80
per cent of the loans have gone to corporate, large-scale
agricultural enterprises and producers with adequate
collaterals (Oyaide, 1979). The Federal Government of
Nigeria, therefore, instituted the Agricultural Credit
Guarantee Scheme Fund (ACGSF) in 1978 in order to induce
commercial banks operating in the country to offer credit
to farmers. Under the scheme, government, through the
Central Bank, guarantees 75 per cent of all loans made to
agriculture by the commercial banks. Despite this guarantee,
the commercial banks have not succeeded in simplifying the
amount of paper work and redtape that prospective borrowers
have to go through to secure loans. The result is that
hardly any smallholder farmer is benefiting from the scheme
and loans have gone principally for agricultural marketing
and small scale processing.

It is in line with the above mentioned problems that
the Anambra State Ministry of Agriculture decided to
establish the Supervised Agricultural Credit Scheme (SACS).
A breakdown of the total amount of loan issued to Anambra
State farmers and the refund situation from 1980 to 1987
indicated that the refund situation among the farmers is poor
(Table 1.5).

Table 1.5:   Total Amount of Loan Issued to Anambra State
Farmers and the Refund Situation from 1980 to 1987.

Zone	Year	Number of Farmers	Amount Loaned (₦)	Amount Repaid (₦)	Balance (₦)
Abakaliki	1980	26	86,509.25	66,850.00	19,659.25
	1981	132	499,501.25	156,638.90	342,862.35
	1982	176	475,078.86	69,115.52	405,963.34
	1983	None	None	None	None
	1984	269	272,500.00	194,408.73	77,091.27
	1985	405	270,900.00	244,897.14	26,002.86
	1986	153	162,600.00	111,050.00	50,550.00
	1987	220	288,800.00	252,800.00	36,000.00
Awka	1980	18	46,537.69	27,645.63	18,892.06
	1981	65	235,699.85	68,496.39	167,203.46
	1982	73	366,034.72	20,969.25	345,065.47
	1983	None	None	None	None
	1984	139	139,000.00	100,456.56	78,091.27
	1985	233	178,700.00	140,891.44	37,808.56
	1986	122	120,600.00	99,800.00	20,800.00
	1987	137	172,400.00	169,200.00	3,200.00

Table 1.5 (contd.)

Zone	Year	Number of Farmers	Amount Loaned (₦)	Amount Repaid (₦)	Balance (₦)
Enugu	1980	22	74,142.79	46,960.66	27,182.13
	1981	98	436,162.26	119,868.67	316,293.59
	1982	66	294,112.84	15,705.74	278,407.10
	1983	None	None	None	None
	1984	159	157,000.00	114,910.74	42,089.26
	1985	314	256,300.00	189,870.87	66,429.13
	1986	190	211,700.00	111,150.00	100,550.00
	1987	208	240,800.00	207,000.00	33,800.00
Nsukka	1980	36	100,823.70	42,265.48	58,558.22
	1981	29	86,208.85	30,411.49	55,797.36
	1982	94	238,267.48	14,394.09	223,873.39
	1983	None	None	None	None
	1984	45	43,800.00	32,521.91	11,278.09
	1985	207	144,700.00	125,169.65	19,530.35
	1986	140	132,400.00	108,700.00	23,700.00
	1987	146	168,200.00	133,000.00	35,200.00

Table 1.5 (Contd.)

Zone	Year	Number of Farmers	Amount Loaned (₦)	Amount Repaid (₦)	Balance (₦)
Onitsha	1980	11	32,820.30	20,393.70	12,426.60
	1981	42	202,498.70	73,071.49	129,427.21
	1982	48	144,433.74	8,755.64	135,678.10
	1983	None	None	None	None
	1984	21	19,500.00	15,176.89	4,323.11
	1985	146	172,100.00	88,283.91	83,816.09
	1986	99	94,600.00	89,300.00	5,300.00
	1987	125	144,000.00	88,000.00	56,200.00

Source: The Supervised Agricultural Credit Scheme,
Enugu, 1988.

Also, a breakdown of the physical achievements of the Supervised Agricultural Credit Scheme Loan Operations upto 1987 indicated that the achievements are below the expected targets (Table 1.6).

Table 1.6: Physical Achievements of the Supervised
            Agricultural Credit Scheme Loan Operations
            upto 1987.

Zone	Project	Target	Achievement	Expected Yield
Abakaliki	Maize	111 ha	90 ha	63 tonnes
	Rice	541 ha	478.5 ha	2153.35 tonnes
	Cassava	111 ha	90 ha	1350 tonnes
	Poultry	8,800 layers	7,800 layers	139,750 dozens of eggs
Awka	Maize	70 ha	61 ha	42.7 tonnes
	Rice	17 ha	17 ha	76.5 tonnes
	Cassava	70 ha	61 ha	915 tonnes
	Poultry	35600 layers		

Table 1.6 (Contd.)

Zone	Project	Target	Achievement	Expected Yield
Enugu	Maize	83.60 ha	52.60 ha	36.82 tonnes
	Rice	12 ha	12 ha	54 tonnes
	Cassava	83.60 ha	52.60 ha	789 tonnes
	Vegetables	1 ha	1 ha	-
	Oil Palm	123.40 ha	123.40 ha	-
	Poultry	40,000 layers	36,000 layers	652,166 dozens of eggs
Nsukka	Maize	90 ha	84.94 ha	95.59 tonnes
	Rice	103 ha	86.75 ha	390.40 tonnes
	Cassava	90 ha	84.84 ha	1274 tonnes
	Plantain	8 ha	1 ha	-
	Oil Palm	10 ha	10 ha	-
	Poultry	15,700 layers	8,000 layers	89,583 dozens of eggs
Onitsha	Maize	44 ha	31 ha	21.77 tonnes
	Rice	2 ha	2 ha	9 tonnes
	Cassava	44 ha	31 ha	405 tonnes
	Poultry	20,000 layers	12,850 layers	230,229 dozens of eggs

Table 1.6 (Contd.)

Zone	Project	Target	Achievement	Expected Yield
	Maize	398.60 ha	319.54 ha	259.88 tonnes
	Rice	675 ha	596.25 ha	2683.15 tonnes
	Cassava	398.60 ha	319.54	4793 tonnes
Total	Vegetables	1 ha	1 ha	-
	Plantain	8 ha	1 ha	-
	Oil Palm	133.40 ha	133.40	-
	Poultry	111,100 layers	95,250 layers	1,659,978 dozens of eggs for table and 92,650 birds disposed as expired layers

Source: Supervised Agricultural Credit Scheme, Enugu,

1988.

1.1 PROBLEM STATEMENT

Since credit is identified as an important input for developing Nigerian agriculture, how then is this input made available to the smallholder farmers so that it can be utilized profitably? The credit institutions provide an important source of credit to farmers. The banks and the various credit agencies have failed to administer credit profitably to a sizeable proportion of rural farmers. Even the Agricultural Credit Guarantee Scheme Fund has also failed despite huge sum of money made available for the scheme. The informal credit institutions, though they are accessible to the farmers, are known to be usurious.

It is not just enough to provide loans to farmers. Sometimes the purpose for which the credit is taken, the way it is applied, and the condition under which it is given determine whether it is beneficial to the farmer or not. Belshaw (1959) identified two types of credit situations namely: static and dynamic credit situations. In the static situation, a farmer uses credit to produce but is

not left with a net increase or positive change in his
production capacity.   In the dynamic credit situation the
farmer's capacity to produce and maintain his level of
consumption is positively changed.   The problem here is
on how to deal with the former (static credit situation)
in administering loans to farmers.

A lot of investigations done in farmers' use of
credit in their farming activities have revealed that farmers
divert loans to non-agricultural areas.   To avoid loan
diversion, default, and to be able to identify who is a
real farmer, supervised agricultural credit scheme has been
widely advocated.   The Anambra State Supervised Agricultural
Credit Scheme became functional in 1980.   In terms of
repayment, the farmer-borrowers were not very consistent
in the repayment of their loans.   In terms of supervision,
efficiency seemed to be sacrificed due to small supervisor/
farmer ratio and some other related problems.   Therefore,
the two issues affecting the scheme are low repayment rate
and poor supervision.

In the light of these problems, this study attempts
to evaluate the scheme's system of credit administration
with emphasis on repayment rate. Possible factors affecting
poor repayment performance need to be identified and
analysed. Likewise, the role of supervisors in the scheme
needs to be evaluated since rationalisation is required
for the continuous programme of upgrading their supervisory
competence.

1.2. OBJECTIVES OF THE STUDY

The broad objective of this study is to evaluate
the performance of Anambra State Supervised Agricultural
Credit Scheme, and derive implications for credit extension
decisions.

The specific objectives are:

1. To identify and to describe the problems faced by
   farmers in trying to borrow from the scheme.

2. To identify and to describe the problems faced by the
   scheme in trying to lend to the farmers.

3. To identify factors that influence loan repayment among the farmers.

4. To determine the relationship between selected supervisory characteristics and the farmers' income.

5. To develop a scoring index for determining credit worthiness of the farmers, and

6. To make policy recommendations based on the result of the study.

1.3. HYPOTHESES

Based on the above specific objectives, the following null hypotheses are formulated:

1. Loan repayment does not depend on size of loan

2. Loan repayment does not depend on farm size

3. Loan repayment does not depend on the farmers' income

4. Loan repayment does not depend on the farmers age

5. Loan repayment does not depend on number of years of farming experiance

6. Loan repayment does not depend on the distance between the farmers' home and source of loan

7. Loan repayment does notdepend on level of formal

    education of the farmers.

8. Loan repayment does not depend on household size of

    the farmers

9. Loan repayment does not depend on adoption of

    innovations by the farmers

10. Loan repayment does not depend on credit needs of

    the farmers.

1.4.   JUSTIFICATION FOR THE STUDY

This study can be justified by a number of reasons.
It has been well established that credit availability is one
of the factors that increase small farmer agricultural
productivity. Both private and public agency effort to
extend credit to small farmers have not been very
successful. This study will examine the problems that
are faced by both the lender (The Supervised Agricultural
Credit Scheme) and their small farmer client. The results
would enable the lenders to better understand their

problems and the problems of their clients so as to better
modify their approach.

The results would enable the lenders to evaluate
applications for credit so as to extend credit to those
who could make judicious use of credit and so be in a
position to repay the credit received.

CHAPTER II

2.   THE ANAMBRA STATE SUPERVISED AGRICULTURAL
       CREDIT SCHEME (S.A.C.S.)

2.1 Background:-

The Fund for Supervised Agricultural Credit Scheme
in Anambra State was established by the Edict No. 13 of
12th April, 1978. With the advent of the civilian
administration in October, 1979, the Edict was repealed
by Law No. 7 of 12th October, 1981, which established the
Supervised Agricultural Credit Scheme.

2.2. Objectives of the Scheme:

The Supervised Agricultural Credit Scheme has
important role to play in the modernization of agriculture
in Anamnra State. It is expected to assist immensely in
removing the financial constraint inherent in agricultural
production. The scheme will also facilitate the adoption
by farmers of improved technology of crops and livestock

production through the intensive supervision of farmers'
holdings. Thus, the scheme will ultimately enhance the
process of commercialization of agriculture in the State.

2.3. Operations of the Scheme:-

2.3.1. Ordinary Meetings of Scheme Committee:- During
the period under review, the committee held fourteen
ordinary meetings to consider applications for loans,
approve or disapprove them and took decisions on other
issues connected with the management of the fund. Its
standing sub-committee on collateral requirements for loans
also met sixteen times to consider the security provisions
of applicants for loan so as to make recommendations to
the committee.

2.3.2. Lending Policy:- In 1981, the committee took
into consideration, eligibility for loan, security
requirements, interest rate and credit delivery system to
farmers in evolving its loan policy. The scheme gave a
maximum loan of ₦10,000 and a minimum loan of ₦500 to farmers.

For a farmer to qualify for loan, the farmer must have
a good knowledge of the type of farm enterprise to
undertake. In addition, he must either have a minimum
of 100 birds or of 1 hectare of land, and must have
paid his income tax regularly. The rate of interest
charged was 6 per cent.

2.3.3. Operations Method:- Application for loan is made
on prescribed forms obtainable at the zonal agricultural
offices at Abakaliki, Awka, Enugu, Nsukka, and Onitsha
at the cost of ₦10 each. Contact between the committee
and the farmers was through the supervisors both at the
headquarters and in the field. Field investigation
reports were prepared on each application and on the
basis of these, the applicants were screened. The
Zonal officers then sent the completed forms to the
headquarters at Enugu after the preliminary screening
exercise. A committee set up at Enugu does the final
screening and determines successful applicants. This
involves more detailed investigation to ascertain the
loan needs of each farmer. Successful applicants were

then required to provide at least two persons acceptable
to the committee to stand as guarantors to the loan.
Disbursement of approved loans was both in cash and kind.
Cash payments were instalmental and were always preceded
by a satisfactory report of the proper application of the
previous instalment. Credit in kind covered inputs like
fertilizers and improved planting materials. The minimum
and maximum amounts loaned to each farmer during the
period under review is shown in table 2.1.

Table 2.1: Minimum and Maximum Amount Loaned to
each Farmer, 1981.

Project	Minimum (₦)	Maximum (₦)
Maize/Cassava	1,300.00	5,200.00
Rice	900.00	7,200.00
Poultry	3,000.00	10,000.00
Oil Palm (Maintenance, harvesting, and Processing)	-	10,000.00

Source: Supervised Agricultural Credit Scheme, Enugu

2.3.4. Logistic Support:- The credit scheme placed a
lot of emphasis on the supervision of farmers' holdings
for effective transfer of farming technology to farmers
and to avoid diversion of loan to other uses. To
accomplish these aims, mobility of the supervisory staff
becomes of paramount importance. In this connection, two
touring vehicles were added to the vehicle pool. Besides,
two Leyland 5 tonne-lorries were purchased for the haulage
of fertilizers and other inputs meant for the farmers.
Thus, the logistic support available for the operation
of the scheme was strengthened.

2.3.5. Office Accommodation:- The Supervised Agricultural
Credit Scheme was accommodated in the Ministry of Agriculture
premises. The office accommodation includes the
administrative, the finance, and the accounts sections.

2.3.6. Staffing:- To run the Supervised Agricultural
Credit Scheme, staff were seconded from the State Civil
Service and Local Government Commissions. They included,

for the finance section, a senior accountant and one
clerical officer; for the administrative section one
typist, and a messenger, (fig. 1). This complement of
staff was hardly enough to run the scheme.

2.3.7. Finance:- In 1981, ₦688,413.70 was drawn from
the loan of ₦2.6 million advanced to the scheme by the
Nigerian Agricultural and Co-operative Bank Limited and
paid into the fund. Also paid into the fund was an
₦18,000.00 subvention from the Anambra State Government.

2.4. Activities:-
2.4.1. Loan Disbursement to Farmers:- Table 2.2 gives,
on zonal basis, the number of applications received within
the year, the number approved, the number disqualified and
the number receiving attention by the close of the year.
Of the 601 applications received within the year, 366 were
approved and 235 disqualified.

SUPERVISED AGRICULTURAL CREDIT SCHEME (SACS)

CHAIRMAN AND 3 OTHER MEMBERS

MANAGER

ADMINISTRATION
Secretary
Assistant Executive Officer
Clerical Officer
Typist
Office Assistant

LEGAL UNIT
Legal Adviser

FINANCE UNIT

INTERNAL AUDIT
Principal Executive
Officer, Clerical
Officer

ACCOUNTS UNIT
Senior Accountant
Clerical Officer

INVESTMENT/
APPRAISALS
Chief Loans
Officer

OPERATIONS
Assistant Chief
Loans Officer

ZONES

ABAKALIKI ZONE
(4 L.G.A.s)
Credit Officer

AWKA ZONE
(3 L.G.A.s)
Credit Officer

ENUGU ZONE
(6 L.G.A.s)
Credit Officer

NSUKKA ZONE
(5 L.G.A.s)
Credit Officer

ONITSHA ZONE
(5 L.G.A.s)
Credit Officer

LOCAL GOVERNMENT LEVEL

Supervisors

Farmer Beneficiaries

Fig. 1:- ORGANISATIONAL STRUCTURE OF ANAMBRA STATE SUPERVISED AGRICULTURAL CREDIT SCHEME

Table 2.2.   Processing of Applications, 1981

| Zone | Applications | | | TOTAL |
	Approved	Not Approved	To be Processed	
Abakaliki	132	37	-	169
Awka	65	41	-	106
Enugu	98	9	-	107
Nsukka	29	121	-	150
Onitsha	42	27	-	69
TOTAL	366	235	-	601

Source: Supervised Agricultural Credit Scheme, Enugu.

Also within the year under review, a sum of ₦1,460,070.80 was disbursed as loan to 366 farmers in Anambra State. The detailed distribution of this amount is shown in table 2.3.

Table 2.3:   Loan Disbursement to Farmers, 1981

| Project | Zones | | | | | TOTAL (₦) |
	Abakaliki (₦)	Awka (₦)	Enugu (₦)	Nsukka (₦)	Onitsha (₦)	
Maize/Cassava	40,404.99	88,032.66	104,765.88	46,413.80	58,415.66	338,032.99
Rice	270,499.11	38,163.01	49,931.40	49,212.80	18,724.36	426,530.58
Oil Palm	–	1,210.19	5,691.73	2,666.67	–	9,568.58
Poultry	117,001.55	132,953.63	232,348.60	51,162.55	152,472.34	685,938.70
TOTAL (₦)	427,905.65	260,359.49	392,737.61	149,455.82	229,612.36	1460,070.80

Source: Supervised Agricultural Credit Scheme, Enugu.

From the table, it is seen that ₦338,032.99 went to maize/cassava farmers; ₦426,530.58 to rice farmers; ₦9,568.58 to oil palm farmers, and ₦685,938.70 to poultry farmers.

2.4.2. Loan Recovery from Farmers:- In 1981, a total of ₦448,486.94 was recovered from the farmers. This represented mostly repayments made by those farmers who borrowed in 1980. The details of the recoveries by zones and enterprises are shown in table 2.4.

Table 2.4.   Loan Recovery from Farmers, 1981

Project	Zones					TOTAL (₦)
	Abakaliki (₦)	Awka (₦)	Enugu (₦)	Nsukka (₦)	Onitsha (₦)	
Maize/Cassava	11,753.50	5,877.79	13,251.87	3,056.69	3,509.19	37,449.04
Rice	98,681.90	19,342.50	32,089.50	17,347.30	11,129.60	178,590.80
Oil Palm	-	-	-	-	-	-
Poultry	46,203.50	43,276.10	74,527.30	10,007.50	58,432.70	232,447.10
TOTAL (₦)	156,638.90	68,496.39	119,868.67	30,411.49	73,071.49	448,486.94

Source: Supervised Agricultural Credit Scheme, Enugu

2.4.3. Production by Beneficiaries:- During the period under review, beneficiaries of the loan produced 187.7 tonnes of maize grains; 1235 tonnes of garri; 934 tonnes of milled rice; 2.1 million dozens of eggs from 116,982 laying hens and about 116,000 spent layers.

2.4.4. Recovery of Loan from Farmers:- As seen from the record of loan recovery indicated earlier, it is apparent that the committee faced problems in getting the farmers to repay the loans. Although most of the loans issued in 1981 were not due for repayment that year, a recovery of ₦124,579.70 made in 1981 for the 1980 lendings of ₦0.34 million is not impressive. The implication is that the committee is most likely to face an up-hill task in recovering the loans from farmers unless it decides to adopt stern measures like taking the defaulters to the Law Court.

2.5. Conclusion:-

The Supervised Agricultural Credit Scheme had,

CHAPTER III

3.   REVIEW OF LITERATURE

3.1. Evolution of Agricultural Credit Institutions in Nigeria:-

The agricultural credit institutions are the financial intermediaries which provide an important source of funds for agricultural development. Tinnermeir (1977) broadened the concept of rural financial intermediaries as those institutions which affect the accumulation of savings and their use, the allocation of investment capital, the flow and holdings of funds in the rural sector and the integration of rural financial markets with national and international capital markets. The credit institutions are classifed into informal (indigenous) and formal (non-indigenous) lenders. Indigenous credit institutions have existed with the farmers, their practice is not foreign, they are largely unorganised with no form of standardized rules and regulations and

are left on their own as a private business venture. Okorie and Miller (1977) pointed out that before the advent of formal credit institutions the rural communities in Nigeria have evolved their own credit system which is now very prevalent in the villages. These indigenous credit institutions include money lenders, landlords, Esusu clubs, and middlemen. Other indigenous sources of credit include relations, village heads, and friends.

The formal lenders or non-indigenous credit institutions are foreign to the farmers and their operations have recognised standard practices; they are incorporated as a business entity and have set of rules and regulations guiding their operations. They include banks, non-bank financial intermediaries and development banks. Other forms of credit, such as supervised agricultural credit of ministries of agriculture, credit programmes of agricultural development projects, river basin development authorities, and livestock projects are included under the non-indigenous credit institutions.

The informal credit institutions are found to
be inadequate in funding agriculture. Botrall, et al
(1980) showed that in developing countries informal
money markets are not well funded and are unable to
provide effective financial services to the small
farmers, and if commercial banks are unwilling to
extend substantially their services in rural areas,
the major responsibility for credit to farmers falls
upon government agencies. Bourne et al (1983) upheld
the view that there was need for government institutional
and financial reforms to ensure efficient and equitable
distribution of credit in agriculture as in other
sectors.

With the increasing awareness of importance of
credit in Nigeria, various credit agencies were
established to cater solely for the credit need of
farmers. From 1950s to 1960s, various regional
governments established their own credit agencies
responsible for extending credit to farmers. In
Eastern Region, such credit institutions were: Fund

for Agricultural and Industrial Development (FAID),
the credit division of Ministry of Agriculture, and
the Fund for Small Scale Industries (FUSSI). In the
Western Region, there was the Western Region Finance
Corporation, which later became the Agricultural Credit
Corporation. In the Northern Region, three credit
institutions were established to cater for industrial
and agricultural needs. These were the Northern
Region Development Corporation, the Northern Nigeria
Ministry of Agriculture, and the Small Industries Credit
Scheme Fund.

Because of failures of these earlier formal
credit institutions to meet the objectives for which
they were established, the Nigerian Agricultural and
Co-operative Bank (NACB) Limited was established in
1973. In 1977, a decree establishing the Agricultural
Credit Guarantee Scheme Fund (ACGSF) was promulgated.
Various state governments introduced Supervised Agricultural
Credit Schemes (SACS) within their ministries of
agriculture and natural resources. The growing need for

credit in the agricultural sector in the 1980s has encouraged the Federal Government to introduce new measures such as credit programmes in Agricultural Development Projects, River Basin Development Authorities, rural banking scheme, minimum bank loans to agricultural sector, and maximum interest rate for agricultural loans.

3.2 Role of Credit in Developing Agriculture:-

There was a conflict on the proper role of agricultural credit in developing agriculture. Ijere (1972), maintained that the role of credit should be to improve the economic well being of the rural population, to promote development generally and to increase agricultural output. Viewed along this line, a farmer that used credit for health purposes was definitely not increasing the agricultural output, even though the well being of the farmer was being raised. Similarly, credit used for educational purpose may directly contribute to economic development but not directly to agricultural output.

Hazari (1976) opined that the role of credit in developing agriculture should be to enable the farmer to move on to a level of technology that would create a sustained basis for increasing the following: agricultural output, number of man-days in employment, and indicators of development in terms of land and human beings. He further maintained that credit should not mean merely giving out money to the farmers or replacing the money lenders.

The above view was upheld by King (1976), with a slight difference. According to King, giving credit to farmers did not necessarily promote agricultural development. In many cases, the farmers' environment of social obligations and non-farm investment opportunities induced him to use available money for purposes other than investment in agricultural capital. Agricultural development was best promoted not by giving loans, but by creating conditions which would make agricultural investment more profitable. These

conditions were better created through supporting new
village savings institutions than by injecting finance
from outside the community in credit schemes. By this
view, the current emphasis on giving loans to farmers
in Nigeria without the corresponding mobilization of
rural savings was deemed inadequate.

Thus, the various views on the role of credit in
agriculture include making the rural farmers more liquid, and
promoting the level of technology whereby investments
in agriculture by farmers would be most profitable.

3.3. Credit Use by Farmers:-

Related to the role of credit in agriculture is
the use of credit by farmers. Ninety per cent of the
food produced in the country is by the rural farmers.
Would the credit given to them be used directly for
production or would it be diverted to other purposes
that are more important to them than increasing farm
output?

Many people's views were that the farmers used their credit for purposes other than farming. In his study of agricultural credit in Northern Nigeria, Vigo (1958) observed that only one fifth of the money borrowed was used for agricultural purpose, the balance was used for food, clothing, religious, social and other purposes. Galletti (1956) noted that 40% of loans obtained by Western Nigerian cocoa farmers was used for farming and the rest for non-farming purposes. Osuntogun (1980) found that co-operative farmers of Ogun, Oyo, and Ondo States used credit for both farming and non-farming purposes but less than 40% of their loans were for farming and the rest for welfare services such as education, children, housing etc. Thus, it is generally accepted that rural farmers use their loans for both farming and non-farming purposes.

Miller (1977) observed that credit can only be useful to the rural farmers under certain conditions, otherwise, extending credit to them may mean increasing their debt obligations with little or no income to repay

the debt. Such conditons were: (1) That agricultural
research has developed improved technology which is
clearly superior to traditional methods; (2) That farmers
have seen practical demonstration of the new technology,
understand it and are anxious to use it; (3) That farmers
have confidence that fertilizers, seeds, pesticides, and
equipment needed to adopt the new practice will be
available in the village at the proper time and in the
amount required; (4) That the necessary credit to
purchase these inputs will be made at the right time; and
(5) That the farmers have been assured there will be a
market for the extra production at prices which will
make the financial rewards of adopting the improved
technology well worth the weather, biological and
market risks involved. Efferson (1953) stated that
farmers should resort to using credit financing only
when it is truely needed and can be repaid without
undue hardship.

In Nigeria today, most of the conditions stated
above are absent and thus most credit are likely to be
diverted to the non-farm areas.

3.4.   Problems and Solutions of Agricultural Credit
       in Nigeria:-

A lot of writers have investigated the problems
of agricultural credit in Nigeria. Bauman (1966) traced
the evolution and performance of various agricultural
credit institutions (both indigenous and non-indigenous)
in Nigeria. He noted that agricultural credit institutions
in Nigeria in the 1960s were trials, errors and
failures as far as extending credit to the agricultural
sector was concerned. Some authors viewed the problems
from the institutions side only. Famoriyo (1980)
outlined the major problems confronting the formal
credit institutions as inadequacy of funds, lack of
co-ordination, lack of identification with farmers'
problems, inadequate executive power of the officials
and locational distribution of the institutions.
These especially affected government established credit
institutions such as the Nigerian Agricultural and
Co-operative Bank. Ijere (1972) upheld the same view
but added that these government agricultural credit

institutions operated under political considerations
rather than economic considerations and this eventually
caused their failures. Drawing from the experience of
the government agricultural credit institutions of the
former East Central State, he noted that the institutions
were faced with problems of corrupt officials, cumbersome
and time consuming procedures for granting loans to
illiterate farmers, and delays in approving loans. He
recommended credit supervision as one of the effective
ways of solving the problems.

Adeyemo (1982) held a different view about the
problems of government agricultural credit institutions
in Nigeria. He noted that in the 1960s the problems were
quite enormous but that the recent government institutions
such as NACB and ACGSF have performed far better.
He was of the opinion that the good performance of
these recent institutions was due to the fact that their
board members maintained personal contacts with the
officers, officials of ministries of agriculture, and
with farmers, thereby appreciating the problems

encountered with credit administration to farmers.
After analysing the operations of the NACB and ACGSF,
he formulated possible strategies for improving
agricultural credit in Nigeria. These were decentralising
and channelling loans through co-operative societies,
involving the farming communities in operating the
institution, promoting savings among the farmers and
establishing research and experimental station units
for the banks. Nwagbo and Famoriyo (1981) suggested ways
of improving the agricultural credit system as:
provision of adequate funds, identification of the right
farmers who would benefit from such funds, and the
extension of credits to these farmers at conditions
agreeable to both lenders and borrowers. Arene (1988)
concluded that policy decision on the provision of
credit to Nigerian farmers at present must be the sole
responsibility of the governments.

Commercial banks, though formal lenders, are not
government sponsored credit institutions. A lot of
observations have been made about their inadequacies in

funding agriculture. Ollor and Okoye (1983) used a cost-benefit analytical framework to assess the performance of Nigerian commercial banks in providing credit to agriculture. They noted a negative relationship between the net income of commercial banks and the amount of credit lent to the agricultural sector during 1970 - 1980 period. This view was supported by Ihimodu (1983) who on Kwara State, observed that commercial banks were reluctant to provide loans to agriculture because of the more attractive returns from other sectors of the economy.

Some writers viewed the problems of commercial banks funding of Nigerian agriculture (which is basically the rural farmers) from two perspectives: viz: from the farmers point of view and from the banks point of view. In separate investigations, Chidebelu (1983) and Uzoaga (1977) noted that the farmer related problems with the commercial banks were: non-repayment of loans, illiteracy, small scattered farm-holdings of less than 4 hectares, diversion of funds for agriculture to other

areas, inadequate appreciation of borrowers obligations, lack of adequate security/collateral, high risk associated with Nigerian agriculture, and distance of the farms from the commercial banks. The banks related problems were: Late-timing of release of approved loans, lack of trained staff, bank officials' inability to appreciate farming problems, concentration of the banks in the urban areas away from the farmers, corrupt officials, lack of loan supervision, cumbersome procedure in securing the loans and political influence which often supersede economic considerations in approving loans. These two investigations concluded that commercial banks were ill-equipped to give small-holder loans and that the small-holder food farmers must prove their ability to use agricultural credit through prompt repayment, adoption of improved management and cultural techniques, and less wasteful social ceremonies. Also, on the farmer related problems, Nweke and Obi (1982) stated that the smallholder credit problem is more complex than simply that of lending costs. Lending

to smallholders through co-operatives is effective in
solving high lending cost problems. However, small-
holder credit problems resulting from the low cash
value of their farming activities cannot be resolved by
lending through co-operatives.

It was not only the formal credit institutions
that had problems with supplying agricultural credit to
farmers in Nigeria. The informal or indigenous credit
institutions were known to be usurious. Botrall et al
(1980) pointed out that the operations of informal
money markets in the Less Developed Countries (LDCs)
were limited by inadequate funds. However, the
informal credit institutions were very accessible to
farmers, and remained the major source of credit to
rural farmers.

The problem of credit institutions in not making
significant impact in agricultural sector was not only
peculiar to Nigeria alone. Stickely et al (1980) observed
similar problems with the National Agricultural Credit
Bank of Upper Volta. They noted that the bank was

bedeviled with the problems of mismanagement, financial

inadequacy, lack of trained staff and inappropriate

banking policies. Bourne et al (1983) observed that

the poor performance of agricultural credit institutions

in less developed countries (LDCs) was as a result of

widespread economic disequilibria. Using a simple

model, it was shown how disequilibria in the product,

fator and financial markets of the economy were

transmitted to rural financial markets through their

farm outputs, debt, savings capacity and debt services.

Unless these disequilibria were removed the formal

credit institutions would continue to perform badly.

But Adams (1982) was of the opinion that the causes of

bad performance of credit institutions in developing

countries were savings and loans policy, product price

policy, and policies affecting production costs and

crop yields. However, in another study, the same

Adams (1980) noted that the causes of poor performance and

inadequacy of credit institutions in the developing

countries were due to incorrect assumptions about money

markets and the behaviours of lenders and borrowers.

3.5. Supervised Agricultural Credit Delivery System:

In general, supervised agricultural credit delivery
programmes are usually social action programmes with
educational and financial content. Alvarez-quintero
(1975). There is lack of well established set of
criteria concerning the constituents of a successful
supervised credit programme.

Supervised credit is a production credit which
is offered in conjunction with technical advice and
assistance. The credit agent, who must be a trained
agricultural extension worker, first helps the farmer
to make a production plan for his farm for the coming
year. It includes an estimate of the amount of credit
needed to finance the plan and the probable value of
the increased product. Credit is then provided either
in cash or in the form of specific supplies and
equipment needed. The credit agent visits the farmer
from time to time, giving technical advice and checking

that the farmer is followeing the plan drawn up. In
some cases, new inputs such as new seeds, fertilizers
or machinery services are offered. Thus, the credit and
technical assistance are complementary to each other.
The credit ensures that the farmer can finance the new
techniques and these in turn ensure sufficient increase
in income to repay the loans with interest. The close
supervision ensures that credit is used productively.

Belshaw (1959) outlined the objectives of supervised
credit as follows:- (1) to teach improved farm and
home practices to the small farmers, their wives and
children, through supervisors who are trained and who
work directly with these farm families; (2) to place
adequate credit facilities within the reach of these
farmers. This credit is to be executed upon a production
capacity basis as determined by a previously prepared
farm management plan, and not upon a collateral basis.
The interest rate is to be modest and the period of
repayment extended over sufficient time to facilitate

amortization; (3) to assist farmers to select and
obtain those implements, seeds, and necessary supplies
that most adequately serve their needs at the most
reasonable prices possible; (4) to promote and assist,
first, in the development of agricultural co-operatives,
and later, agricultural purchasing and marketing
co-operatives; (5) to assist in the redistribution of
land and adjustment of families to the land through
leases and loans for the purchase of additional land,
and possibly through colonization of new areas by farm
families now living in congested areas; and above all
(6) to teach farm families how to improve their farming
programmes in order to produce sufficient food to
satisfy their own and their country's needs.

Brossard (1952), regards credit as a rural
welfare service, for credit is only a part, indeed a very
essential one of the system. The basis of any supervised
credit programme was education, not only to teach the
farmer farm practices but also to educate his entire
family (regarded as a basic unit in rural progress).

He emphasized that the welfare of the farmer's family was a fundamental concern of a rural credit programme.

Maris (1953) elaborated that supervised credit did not end with the individual who obtained the loan but was also concerned with those group and co-operative relationships of the borrower which tended to improve his financial status. For example, a loan could be more safely made to a farmer who was in a position to buy and sell advantageously than a farmer who was not.

In conclusion, the supervised agricultural credit delivery system should not be regarded as a banking system, but as a public service for rural welfare. The obstacles which supervised credit is designed to overcome exist whether a particular approach of extension system is attempted or not, and in any case, the whole arguement of this study is that special measures in the establishment of supervised agricultural credit scheme are required to minimise the obstacles whatever their form.

3.6. Analytical Procedure:-

Several models and analytical procedures have
been used to study the problems of small-scale farms
in developing countries. These models vary according
to the nature of work. In this section, models
specified by other researchers for analysis of returns
to scale and classification of objects by a set of
independent variables into two or more mutually
exclusive categories are reviewed.

3.6.1. Regression Analysis Model:

For analysing dependence, regression analysis
is the most commonly used technique. Its underlying
theory is also the most developed. In regression
analysis, a single interval-scaled dependent variable
is to be predicted or explained by a set of independent
variables which are assumed to be interval scaled.
Massy (1966) provided a solid theoretical foundation
for the analysis of dependence in general and regression

analysis in particular. He presented a lucid discussion
of such issues as bias, efficiency, and multicollinearity,
all of which pervade the analysis of dependence. Bias
in a parameter estimate can be caused by several
problems, but one of the most serious is that of model
misspecification. For example, the omission of an
independent variable that should be included. If the
omitted variable is related to or correlated with an
included variable, the co-effcient of the included one
will, in part, represent the indirect impact of the
omitted one and thus be biased. The object of
statistical parameter estimation is usually to obtain
estimates that are unbiased and have small variances.
Multicollinearity arises when independent variables are
correlated and it becomes difficult to separate the
individual effects of the variables involved. It is
not enough to learn how to interpret a model. The
underlying assumptions must be evaluated. Palda (1963)
discussed the evaluation of regression results. He
presented the R^2 statistic, which represents the

percentage of the original dependent variable

variation that has been explained by the model. This

statistic is a descriptive and widely used measure of

a regression model. A property of the assumptions of

the regression model is that if one fails, there is

a good chance that others will, too. Further, it is

often possible to correct matters by making a

transformation, such as logarithmic, on all or some

of the variables involved, (Frank, 1966). Although the

independent variables are assumed to be interval

scaled in regression analysis, norminal variables are

sometimes also inserted. For many applications, the

analyst can proceed with the normal interpretation

of the results. Claycamp (1968) presented a model that

uses 0-1 binary variables termed dummy variables. His

model is a time-series model, which means that the data

represent successive time periods. In such a model,

the analyst must be concerned with serial correlation.

The error terms are not independent. A large positive

error in one period is likely to be followed by another

positive error in the next period. Serial correla-

tion was not a problem in his study, but when it

exists, it can cause inefficient parameter (co-

efficient) estimates and biased (understated) estimates

of parameter (co-efficient) variances. The Durbin-

Watson test for serial correlation is often used in

time-series studies when this problem is suspected.

The author also presented a distributed-lag model, a model

that handles carry-over effects, the effects that

carry-over from one time period to the next. Hughes

(1966) presented a cross-section model for which data

were gathered across people instead of through time.

Hence serial correlation and carry-over effects are not

a problem.

A central tool of regression analysis is the

hypothesis test that a regression co-efficient is

actually zero, and that a non-zero co-efficient appeared

only by chance. The test uses the t-value, which is

the estimated regression co-efficient divided by its

standard error. For example, if the normal distribution

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was used to approximate the t-distribution and the
real co-efficient was actually zero, there would be
only one chance in twenty that a t-value would
exceed 1.96. If a t-value of such magnitude occurred,
the analyst would be reasonably confident that the
co-efficient was not zero.

3.6.2. Discriminant Analysis Model:

In discriminant analysis, the dependent variable
is nominal. For example, an agricultural credit
manager might want to classify a farmer as either a good
or poor credit risk. In this case, the farmers would
fall into two groups or classifications. The
predictive problem in discriminant analysis is to
predict to which group a subject will belong on the
basis of a set of independent variables. In a
structural sense, the analyst may want to identify
those variables that are effective in predicting
group membership or what variables discriminate well
between groups. Massy (1965) provided a good introduction

to discriminant analysis. He described the confusion
matrix, one that summarises the number of correct and
incorrect classifications that were obtained by the
discriminant analysis. The confusion matrix, as the
author illustrated, can be used to test the discriminant
model and to interpret the relationship between the
groups. In the context of an example, the discriminant
co-efficients are used to characterise the different
groups in terms of the variables. Morrison (1969)
presented some comments on the interpretation of
discriminant analysis. His suggestion on normalising
the independent variables by dividing the variable
standard deviation is applicable to other multi-variate
technique as well. If the dependent variable is also
normalised, the resulting co-efficients are called
beta co-efficients and are often used to report
results. In either case, the resulting co-efficients
indicate the relative contribution made by the
corresponding variables in predicting the dependent
variable, whether the independent variables are measured

in any unit. When the analysis uses data on
n-observations to calculate the discriminant function
(the set of discriminant co-efficients), and then
classifies these same n-observations with this
function, the confusion matrix will be biased. There
will tend to be more correct classifications than the
discriminant function is capable of delivering under
more realistic conditions. There are two sources of
bias. The first is a bias that might be created by
the model-building process. The second bias is caused
by sampling error. Robertson and Kennedy (1968)
applied discriminant analysis to the problem of
predicting whether consumers are innovative in their
buying habits. They presented a manual technique to
calculate discriminant weights or co-efficients, which
provides additional insight into their meaning. They
also presented an example of the use of split-example
approach to eliminate the biases discussed above.

A major advantage of the discriminant model is
that the particular simple form of $Z_i = b_0 + b_1 X_{1i} + b_2 X_{2i} + \cdots$

$+b_n X_{ni}$ allows a clear interpretation of the effect of each of the independent variables. Suppose the independent variable X_3 is income, and the classification procedure is if $Z_i \underline{\quad}$ Zcrit, classify the individual as being credit-worthy, that is, the higher the value of Z_i, the more likely the individual is credit-worthy. If the sign of the b_3 is positive, then higher income implies a better credit worthiness, and the larger the size of the b_3, the more important variable X_3 is in discriminanting between group 1 and group 2 individuals. Clearly if $b_3 = 0$, then X_3 has no effect. If there is a more complex discriminant function, it becomes difficult to isolate the effect of each variable. Suppose there is a nonlinear discriminant function of the form: $Z_i^1 = a + b X_i + c X_i^2 + d Y_i + e Y_i^2 + f X_i Y_i$, the effects on Z_i^1 of increasing X_i by one unit depends on the value of X,b,c,f, and evey Y. Hence, for interpretation, a linear discriminant function is highly desirable.

CHAPTER IV

4.   RESEARCH METHODOLOGY

This research was conducted in all the former twenty-three local government areas of Anambra State. All the five agricultural zones of the state were represneted (fig. 2).

4.1 Sampling Plan:

Cluster sampling technique was used and it involved random sampling without replacement of a total population of about 700 farmers in the state. The five agricultural zones of Abakaliki, Awka, Enugu, Nsukka, and Onitsha are the clusters. Three hundred farmers, 60 from each cluster, were selected. The supervisors who supervised the farmer borrowers in the scheme were likewise interviewed. The random cluster sampling techniqe was used so as to reduce travelling costs. This technique is particularly useful where there is a

BENUE STATE

IGBO-
EZE
Enugu
Ezike

NSUKKA
Nsukka   K K ISI UZO   A
N S U
IGBO ETITI   Ikem
UZO UWANI
Umulokpa   Ogbede
UDI   E N U G U   ISHIELU   6 30
ANAMBRA   ENUGU   Izzamgbo   ABAKALIKI   Abakaliki
Oguobu-   NKANU
AWKA   Owa   ABAKALIKI
Otuocha   Awka   EZEAGU   Agbani
Abagana   Udi   Onueke   IKWO
NJIKOKA   OJI RIVER   Oji River   IZZA   Echara-
Ogidi   AWGU   Onuaboyi
Onitsha   AGUATA   Awgu   CROSS   RIVER
IDEMILI   Aguata   STATE   6 0
Nnewi
NNEWI   IMO STATE
Ihiala
IHIALA

5 30N   7°0E   7°30   8°0'   5°30N

Scale:— 0   10   20   30   40 Kms

KEY

⌁⌁⌁⌁✕	State Boundary	⋯⋯⋯ Local Govt. Area Boundary
—⋅—⋅—	Zonal "	o " " " Headquarter
▣	Zonal Headquarters	

FIG. 1: MAP OF ANAMBRA STATE SHOWING THE FIVE
AGRICULTURAL ZONES

large dispersed population or where means of communications are bad.

4.2. Data Collection:

Data for this study were collected from secondary and primary sources. Secondary sources include Anambra State Ministry of Agriculture, published and unpublished reports of the Anambra State Supervised Agricultural Credit Scheme. Primary sources comprised structured questionnaires for the farmers and the supervisors of the Supervised Agricultural Credit Scheme.

Three questionnaires were developed. The first and second questionnaires were for crop and livestock farmers respectively, while the third questionnaire was for the supervisors.

4.3. Method of Data Analysis:-

Descriptive statistics was used to analyse the data and draw conclusions on objectives 1 and 2. For objectives 3 and 4, multiple regression and correlation

analyses were used respectively, while discriminant
analysis was employed to achieve objective number 5.

4.3.1. Model Specification: The regression analysis
model measured loan repayment (Y_L) as a function of
the various variable factors ($X_1X_2X_3...X_n$) which
affect its value. The function is represented
explicitly in three functional forms namely Linear,
Semi-Logarithmic, and Double-Logarithmic forms as
follows:

(I) Linear Form:

$$Y_L = a+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+b_6X_6+b_7X_7+b_8X_8+b_9X_9+b_{10}X_{10}+e$$

(II) Semi-Logarithmic Form:

$$Y_L = a+b_1\log X_1+b_2\log X_2+b_3\log X_3+b_4\log X_4+b_5\log X_5+b_6\log X_6+b_7\log X_7$$
$$+ b_8\log X_8+b_9\log X_9+b_{10}\log X_{10}+ e.$$

(III) Double-Logarithmic Form:

$$\log Y_L = a+b_1\log X_1+b_2\log X_2+b_3\log X_3+b_4\log X_4+b_5\log X_5+b_6\log X_6+$$
$$b_7\log X_7+b_8\log X_8+b_9\log X_9+b_{10}\log X_{10}+e.$$

where Y_L = Loan repayment rate in %

X_1 = Size of Loan in Naira

X_2 = Farm size in Hectares/Number of birds

X_3 = Income in Naira

X_4 = Age of farmers in years

X_5 = Number of years of farming experience

X_6 = Distance between home and source of loan in kilometres

X_7 = Level of formal education of farmers in years

X_8 = Household size

X_9 = Adoption of innovations (Dummy variable)

= 1.0 for adopting three farming innovations and above

= 0.0 for adopting less than three farming innovations

X_{10} = Credit needs (Dummy variable)

= 1.0 for giving two needs and above

= 0.0 for giving less than two needs

a = Intercept

$b_i s$ = Marginal responses of the xth variable

factor.

e = Stochastic error term.

These are for both the crop and livestock farmers, and any form that best explains the dependent variable (Y_L) will be chosen.

The multiple correlation analysis model measured the degree of relationship between the selected supervisory characteristic ($X_1 X_2 ... X_n$) and the farmers' income (Y). The model is presented explicitly as:

$$y X_1 X_2 X_3 X_4 = \text{Cov} (Y X_1 X_2 X_3 X_4)$$

Where r = Correlation co-efficient

Y = Income in Naira

X_1 = Number of farmers supervised

X_2 = Length of service as supervisors in years

X_3 = Formal training in agriculture in years

X_4 = Number of farm visits/time period

Cov = Co-variance.

The discriminant analysis model classified the farmers, by the same set of independent variables used in regressing against loan repayment rate (Y_L), into two mutually exclusive and exhaustive categories. The model is presented explicitly as: $Z_i = b_0+b_1X_{1i}+b_2X_{2i}+\cdots+b_nX_{ni}$

Where Z_i = the ith individual's discriminant score

Z_{crit} = the critical value for the discriminant score.

X_{ji} = the ith individual's value of the jth independent variable.

b_i = the discriminant co-efficient for j^{th} variable.

For the classification procedure, let each individual's discriminant score Z_i be a function of the independent variables. That is $Z_i = b_0+b_1X_{1i}+b_2X_{2i}+\cdots+b_nX_{ni}$. The classification procedure is as follows: if $Z_i \geq Z_{crit}$, classify individual i as belonging to group I (credit worthy - cw), and if $Z_i < Z_{crit}$, classify individual i as belongingg to II (Non credit

worthy - NCW). The classification boundary is then the locus of points where $b_0+b_1X_{1i}+b_2X_{2i}+...+b_nX_{ni} = Z_{crit}$

Cut-off Point:

The exact value of the limit of each group for purpose of classification depends on how much premium is put on the relative cost of misclassification to the investigator. More frequently, the cut-off point is usually taken as the mid-point of Z_{cw} and $Z_{NCW} = \frac{1}{2}(Z_{cw} + Z_{NCW})$ because discriminant function analysis itself assumes equal cost of misclassification (Green and Tull 1975; Bauer and Jordan 1971; Peters and Summers 1968).

Assumptions of the Models:

(1) e_i is a random real variable. The value which U_i may assume in any one period depends on chance.

(2) The mean value of e in any particular period is zero. With this assumption it can be said that $Y_i = a+b_1X_i$ gives the relationship between X and Y on the average.

(3) The variance of e_i is constant in each period
(homoscedasticity). In figure 3, this assumption
is denoted by the fact that values that e may
assume lie within the same limits, irrespective
of the value of X: for X_1, e can assume any value
within the range AB: for X_2, e can assume any
value within the range CD which equal to AB and
so on.
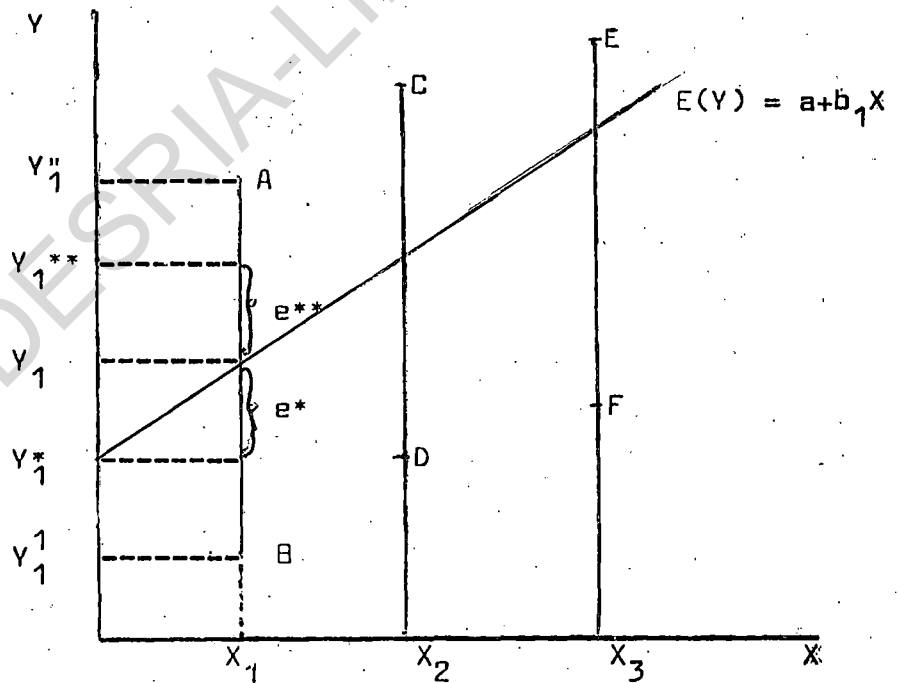
Fig. 3. Homoscedasticity.

(4) The variable e_i has a normal distribution. This may be summarised by the expression $e \sim N(0, \sigma_e^2)$ and is shown in figure 4.
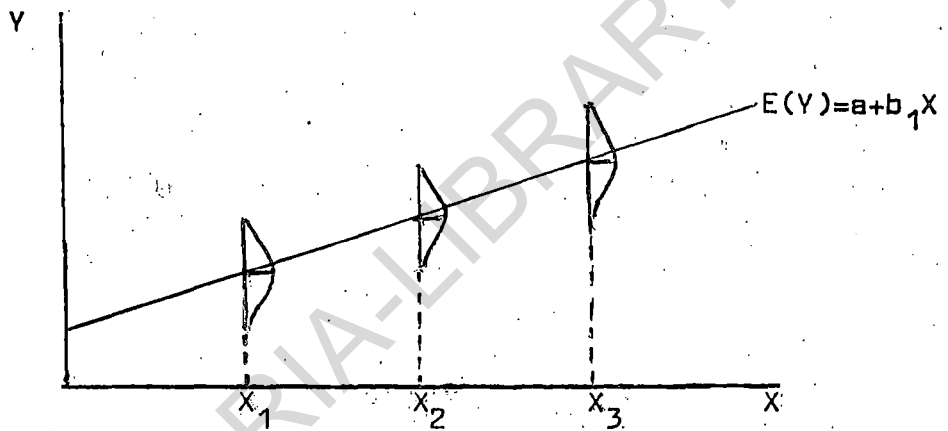
Fig. 4. Normal Distribution.

(5) The random terms of different observations (e_i, e_j) are independent. Mathematically $\text{Cov}(e_i, e_j) = E\{[e_i - E(e_i)][(e_j - E(e_j)]\} = 0.$

(6) e is independent of the explanatory variable(s) Mathematically $\text{Cov}(X_e) = E\{[X_i - E(X_i)][e_i - E(e_i)]\} = 0.$

(7) The $X_i's$ are a set of fixed values in the hypothetical process of repeating sampling which underlies the linear regression model. Because

$$\text{Cov}\ (X_e) = E\left\{[X_i-E(X_i)][e_i-E(e_i)]\right\} = E\left\{[X_i-E(X_i)]e_i\right\}$$

given $E(e_i) = 0$

$= E(X_i e_i) - E(X_i)E(e_i) = E(X_i e_i) = X_i E(e_i)$ (given that the $X_i's$ are fixed) $= 0$.

(8) The explanatory variable(s) are measured without error. e absorbs the influence of omitted variables and possibly errors of measurement in Y's.

(9) The explanatory variables are not perfectly linearly correlated. If there is more than one explanatory variable in the relationship it is assumed that they are not perfectly correlated with each other.

(10) The macro variables should be correctly aggregated. Usually the variables X and Y are aggregative variables, representing the sum of individual items. It is assumed that appropriate aggregation procedure has been adopted in compiling the aggregate variables.

(11) The relationship being estimated is identified.

(12) The relationship is correctly specified. It is
assumed that no specification error has been
committed in determining the explanatory
variables.

CHAPTER V

5.   CHARACTERISTICS OF AGRICULTURAL PRODUCTION
        IN THE SCHEME AREA OF OPERATION.

An appreciation of the characteristics of
agricultural production in the scheme area of
operation is essential to the evaluation of profita-
bility of credit to small-scale farmers and the problems
of the scheme.

5.1. Size of Loan, Farm Size, and Farm Income:- During
the period studied a maize farmer, on the average,
received ₦1,178.95; rice farmer, ₦1,385.45; and
poultry farmer ₦6,117.89. The scheme considered
poultry business more capital intensive and so gives
it higher credit.

Farm size ranged from one hectare to four hectares.
About 22% of maize farmers had one hectare farms.

Forty-seven per cent of farmers had two hectare farms while twenty-seven and three per cent of the farmers had three and four hectares respectively. With respect to poultry, of the 150 selected farmers, about 35% of them kept less than 200 birds; 25% kept between 200-300 birds; 6% kept between 401-500 birds; 16% kept between 501-600 birds and the same percentage kept between 601-700 birds. Only 2% kept between 701-800 birds, while none was in the range of 301-400 birds.

An analysis of income distribution of the farmers revealed that the average maize farmer had an income of about ₦3,164.20; the average rice farmer had about ₦78,610.90; while that of the average poultry farmer was about ₦15,685.60.

5.2. Ages, Household Sizes, and Farm Enterprise:- The age distribution of the farmers studied derived its importance from the fact that agricultural production requires the use of large amount of labour input, which is best provided by able-bodied and energetic individuals.

From table 5.1, it is observed that 1.33% of the crop farmers are less than 30 years, while none of the livestock farmers is within the same age range. Also, none of the crop and livestock farmers are aged from 60 years and above. An interesting factor from

Table 5.1: Age Distribution of Selected Farmers in the Study Area.

Age Range	CROP FARMERS				Livestock Farmers	%
	Maize	%	Rice	%		
Less than 30	2	2	-	-	-	-
30 - 40	52	54.74	2	3.64	52	34.67
41 - 50	40	42.11	23	41.82	84	56.00
51 - 60	5	5.26	30	54.55	14	9.33
61 - 70	-	-	-	-	-	-
More than 70	-	-	-	-	-	-
TOTAL	95	100.00	55	100.00	150	100.00

Source:- Field Survey, 1989.

the data is that about 98% of the farmers in the area are between 30 and 60 years. The zero percentage of the farmers above 60 years was explained to be as a result of farmers retiring about that age and there- after depending on their grown up children for maintenance.

There was an average of about 10 dependants per maize farmer; 17 per rice farmers; and 9 per poultry farmer. This is an important consideration when it is noticed that agricultural production in the study area is mainly labour intensive. This labour comes mainly from the farmers.

The average number of years of farming experience for the crop farmers is 22 while that of the livestock farmers is about 8.

5.3. Level of Formal Education of the Farmers: The analysis of level of formal education of the farmers in the study area is of prime importance because it partly determines their ability to effectively manage

the loans granted to them. The results are presented
in table 5.2.

Table 5.2: Farmers' Level of Formal Education in the
Study Area.

Level of Formal Education	Crop Farmers		Livestock Farmers	
	No.	%	No.	%
No Formal Education	31	20.67	-	0.00
Primary School Incomplete	25	16.67	-	0.00
Primary School Complete	52	34.67	34	22.67
Secondary School Incomplete	42	28.00	43	28.67
Secondary School Complete	-	0.00	34	22.67
Others	-	0.00	39	26.00
Total	150	100.00	150	100.00

Source: Field Survey, 1989.

For example while about 21% of the crop farmers had
no form of formal education, all the livestock farmers,
that is, 100% had some form of formal education. Careful

observation of the table shows that there are more
educated farmers in the livestock enterprise than in the
crop enterprise.

Also related to the level of formal education of
the farmers is their level of adoption of innovations.
The analysis revealed that while about 81% of the crop
farmers are adopters of innovations, the rest are non-
adopters. Ninety-eight per cent of the livestock
farmers are adopters of innovations while only 2% are
non-adopters pointing to the importance of formal
education to farmers.

5.4. Some Issues in the Operation/Performance of the
Supervised Agricultural Credit Scheme.

5.4.1 Distance from Home to the Lending Institution:- The
average distance between farmers' home and source of
loan is about 78 kilometres. It is important to note that
in a supervised credit programme for small farmers,
decentralization of credit offices is necessary for
closer supervision and ease of the loans given to the

farmer beneficiaries. This discourages or minimises
loan diversion and defaults.

5.4.2. Farmers' Objectives in Borrowing:- The farmers
interviewed gave several reasons for borrowing as can
be seen in taule 5.3.

Table 5.3: Farmers' Objectives in Borrowing in the
            Study Area.

Objective	No. of farmers	% Total
To increase Hectares under Cultivation	150	50.00
To buy Planting Materials	8	2.67
To buy Fertilizers and Chemicals	98	32.67
To increase stock of Livestock	150	50.00
To buy more feeds	150	50.00
To buy more drugs	147	49.00
Total	703	

Note:- The total is more than 300 because some farmers
        had more than one objective in borrowing.

Source:- Field Survey, 1989.

From the table, a major objective for borrowing was to
increase hectarage under cultivation for the crop
farmers, and for the livestock farmers all the
objectives were major. Furthermore, all the farmers
indicated that the size of loan given to them by the
scheme was not sufficient for achieving their various
objectives. This again highlights the need for
increases in the size of loanable funds to farmers.

5.4.3. Loan Default Measurement:- For the efficient
working of credit systems, it is important that default
in repayment should be as low as possible because
viability of the lending agencies is highly dependent
on the amount of loans recovered. Table 5.4. presents
results of loan default measures for the selected
farmers. From the table, it can be seen that none of
the maize farmers was able to repay loan completely
while 94.55% of the rice farmers were able to repay
theirs completely. In the case of livestock (poultry)
farmers, 16% of them were able to repay completely.

Table 5.4. - Loan Default Measures for the Farmers in the Study Area.

Loan Repayment	Crop Farmers								Livestock Farmers (Poultry)			
	Maize				Rice							
	No.	%	Amount Repaid (₦)	Amount Outstanding (₦)	No.	%	Amount Repaid (₦)	Amount Outstanding (₦)	No.	%	Amount Repaid (₦)	Amount Outstanding (₦)
Able to repay loan completely	-	0.00	-	-	52	94.55	63464.48	-	24	16.00	16006.00	-
Not able to repay loan completely	95	100	36224.00	83896.00	3	5.45	3715.00	443.00	126	84.00	642842.00	257041.50
Total	95	100	36224.00	83896.00	55	100	67179.48	443.00	150	100	802902.00	257041.50

Source: Field Survey, 1989.

5.4.4. Farmers' Evaluation of Interest Rates: All the farmers indicated that the interest rate charged was too high. They preferred lower interest rates instead of the present rate of 15.5%.

5.4.5. Farmers' Evaluation of the Lending Exercise: The farmers all agreed that the lending process was time-consuming and cumbersome. They received their loans during planting/stocking. Prompt release of funds is vital to the efficient use of loans.

5.4.6. Form of Loan Disbursement to Farmers: While 96% of the farmers preferred their loans in cash, only 4% of them preferred theirs in both cash and kind. All the loans were made in cash.

5.4.7. Problems of the Scheme Operators and the Recipients: The scheme operators listed the following as their problems in the operation of the scheme:

1. Scarcity of supervisory field staff;

2. Diversion of loan to other uses by the farmers;

3. So many defaults on the part of the farmers;

4. Lack of adequate and necessary facilities for the
    smooth running of the scheme operations; and

5. Job stagnation.

Common problems reported by the recipients
(farmers) are (1) Bad weather; (2) Pests and diseases;
(3) Low yield; (4) Low prices of their farm products,
especially during the harvest period; (5) High cost of
farm inputs; and (6) High interest charges.

5.4.8. Causes of Poor Loan Repayment: The two groups
of respondents (the scheme operators and the farmer
beneficiaries) indicated basic causes of poor loan
repayment. Causes of poor repayment differed among the
operators and the farmers.

The causes reported by the operators include
diversion of funds, low prices of farm products, poor
marketing, low yield and negative attitude of farmers

towards government owned credit agencies. These are
ranked as shown in table 5.5.

Table 5.5:   Causes of Poor Loan Repayment in the
             Study Area as indicated by the Scheme
             Operators.

The Supervised Agricultural Credit Scheme (SACS)	
Rank	Causes
1	Diversion of funds
2	Poor marketing opportunity
3	Low price of farm products
4	Low yield
5	Negative attitude of farmers towards government owned credit agencies

Source: Field Survey, 1989.

The causes reported by the farmers include
bad weather, pests and diseases, and low price of
farm products (especially during harvest time)
(table 5.6).

Table 5.6. Common Causes of Low repayment as seen

by Farmers.

Causes[a]	Percentage
1. Bad weather condition	87
2. Pests and Diseases	76
3. Low price of farm products	69

[a]Respondents indicated more than one cause.

Source: Field survey, 1989.

Based on total responses, the most common causes
of poor loan repayment are diversion of funds, bad
weather condition, pests and diseases, poor marketing
opportunity, and low price of farm products.

Interpretation of these causes must be with
caution owing to the subjective nature of the responses.

5.5. Farmer and Farm Characteristics between

Repayment Groups, 300 SACS farmer-Borrowers:

Farmer-borrowers were dichotomized into low and high
repayment groups. Low repayment farmers were those with 0 to 50

per cent repayment rate while those categorized as high
repayment were those with 51 to 100 per cent repayment rate.

Size of Loan (X_1): The average size of loan for all the maize
farmers was ₦1511.37. The low repayment farmers borrowed an
average of ₦1022.73 while the high repayment ones borrowed an
average of ₦2000. In the case of rice farmers, all of them
were in the high repayment category, with the average size of
loan of ₦1380. For the poultry farmers, the average size of
loan was ₦7027.40. Low repayment farmers borrowed loans
averaging ₦7,500 while high repayment farmers borrowed loans
amounting to ₦6554.79 on the average, tables 5.7, 5.8, and 5.9.

Farm Size (X_2): The average farm size operated by maize farmer-
borrowers was 2.59 hectares. Low repayment farmers had an
average farm size of 2.03 hectares while high repayment farmers
had an average of 3.14 hectares (table 5.7). The average farm
size operated by rice farmer-borrowers was 3.35 hectares. All
the farmers were in the high repayment category (table 5.8).
In the case of poultry farmers, the average stock size operated
by the farmer-borrowers was about 425 birds. Low repayment
farmers had an average stock size of about 502 birds while high
repayment farmers had an average farm size of about 347 birds
(table 5.9).

Table 5.7: Farmer and Farm Characteristics between Repayment Groups. 95 SACS Maize Farmer-Borrowers.

Characteristics	Repayment Group[a]		
	Low	High	Average
Size of Loan (₦)	1022.73	2000.00	1511.37
Farm Size (ha)	2.03	3.14	2.59
Income (₦)	2912.51	6327.29	4619.90
Age of Farmers (Years)	35.55	46.29	40.92
Number of Years of Farming Experience	18.24	23.43	20.84
Distance between Home and Source of Loan (kms)	79.81	67.86	73.84
Level of Formal Education of Farmers (Years)	6.42	6.00	6.21
Household Size (Persons)	8.55	10.71	9.63
Adoption of Innovations (Dummy)			
Adopters	85 (96.59)	7 (100.00)	
Non-Adopters	3 (3.41)	0 (0.00)	
Credit Needs (Dummy)			
High Credit Needs	78 (88.64)	6 (85.71)	
Low Credit Needs	10 (11.36)	1 (14.29)	

[a] Farmers were grouped into two according to their repayment rates, low - 0 to 50 per cent repayment and high - 51 to 100 per cent repayment.

Table 5.8: Farmer and Farm Characteristics between Repayment
Groups. 55 SACS Rice Farmer-Borrowers.

Characteristics	Repayment Group[a]		
	Low	High	Average
Size of Loan (₦)	0.00	1380.00	1380.00
Farm Size (ha)	0.00	3.35	3.35
Income (₦)	0.00	78676.36	78676.36
Age of Farmers (Years)	0.00	50.51	50.51
Number of Years of Farming Experience	0.00	28.45	28.45
Distance between Home and Source of Loan (kms)	0.00	87.78	87.78
Level of Formal Education of Farmers (Years)	0.00	2.64	2.64
Household Size (Persons)	0.00	15.60	15.60
Adoption of Innovations (Dummy)			
Adopters	0 (0.00)	30 (54.55)	
Non-Adopters	0 (0.00)	25 (45.45)	
Credit Needs (Dummy)			
High Credit Needs	0 (0.00)	23 (41.82)	
Low Credit Needs	0 (0.00)	32 (58.18)	

[a]Farmers were grouped into two according to their repayment rates, low - 0 to 50 per cent repayment and high - 51 to 100 per cent repayment.

Table 5.9: Farmer and Farm Characteristics between

Repayment Groups. 150 SACS Poultry Farmer-

Borrowers

Characteristics	Repayment Group[a]		
	Low	High	Average
Size of Loan (₦)	7500.00	6554.79	7027.40
Farm Size (No. of birds)	502.50	346.70	424.70
Income (₦)	22059.50	15640.32	18849.91
Age of Farmers (Years)	35.00	43.99	39.50
Number of Years of Farming Experience	6.50	7.75	7.13
Distance between Home and Source of Loan (kms)	61.75	79.32	70.54
Level of Formal Education of Farmers (Years)	13.00	9.93	11.47
Household Size (Persons)	4.50	7.93	6.22
Adoption of Innovations (Dummy)			
Adopters	3 (25.00)	146 (100.00)	
Non-Adopters	1 (75.00)	0 (0.00)	
Credit Needs (Dummy)			
High Credit Needs	2 (50.00)	146 (100.00)	
Low Credit Needs	2 (50.00)	0 (0.00)	

[a]Farmers were grouped into two according to their repayment
rates, low - 0 to 50 per cent repayment and high - 51 to 100
per cent repayment.

Number of Years of Farming Experience (X_5): Tables
5.7 and 5.9 show that maize and poultry farmers had an
average of about 20.84 and 7.13 years in farming respectively. Low
repayment maize farmer-clients had an average of about
18.24 years in farming while those at the high
repayment category had about 23.43 years in farming on the
average. Low repayment poultry farmer-clients had an average of
about 6.50 years in farming while those at the high repayment
category had about 7.75 years in farming on the average.
None of the rice farmer-clients was in the low repayment
category and they had an average of about 28.45 years in
farming (table 5.8).

Distance between Home and Source of Loan (X_6): Maize
farmer-borrowers surveyed had an average distance of about
73.84 kilometres from the source of loan. Homes of
more delinquent farmers were about 79.81 kilometres away
while those of less delinquent borrowers were about 67.86
kilometres away from the source of loan on the average

(table 5.7). Rice farmer-borrowers surveyed had an average distance of about 87.78 kilometres away from the source of loan. All the farmers were less delinquent in terms of repayment (table 5.8). Poultry farmer-borrowers surveyed had an average distance of about 70.54 kilometres away from the source of loan. Homes of more delinquent farmers were about 61.75 kilometres away while those of less delinquent borrowers were about 79.32 kilometres away from the source of loan on the average (table 5.9).

Level of Formal Education of Farmers (X_7): Maize farmer-borrowers had an average of about 6.21 years of schooling. More delinquent farmers had about 6.42 years while less delinquent farmers had about 6 years on the average. Rice farmer-borrowers had an average of about 2.64 years of schooling. All the rice farmers were less delinquent in terms of repayment. Poultry farmer-borrowers had an average of about 11.47 years in schooling. More delinquent farmers had about 13 years while less delinquent farmers had about 9.93 years on the average (tables 5.7, 5.8, and 5.9).

Household Size (X_8): There is an average of about 10 members per household among maize farmer-respondents. Between repayment

categories, however, there were about 9 and 11 members in low and high repayment groups respectively. There is an average of about 16 members per household among the rice farmer-respondents. Between repayment categories, however, all the members were in the high repayment category as there were no low repayment farmers in the enterprise. There is also an average of about 6 members per household among poultry farmer-respondents. Between repayment categories, however, there were about 5 and 10 members in low and high repayment groups respectively. These are shown in tables 5.7, 5.8, and 5.9.

Adoption of Innovations (X_g): Eighty-five low repayment maize farmers out of 88 were adopters of innovations while all the 7 high repayment ones were non-adopters. Percentage wise, only about 97 per cent of low repayment maize farmers were adopters of innovations while about 100 per cent of high repayment farmers were adopters. Thirty of the high repayment rice farmers out of 55 were adopters of innovations. Percentage wise, about 55 per cent of the high repayment rice farmers were adopters of innovations while about 45 per cent of them were non-adopters of innovations. All the rice farmers were in the high repayment category. Three low repayment poultry farmers out of 4 were adopters of innovations while all the 146

high repayment poultry farmers were adopters.

Percentage wise, only 25 per cent of low repayment poultry farmers were adopters of innovations while 100 per cent of the high repayment ones were adopters. These are indicated in tables 5.7, 5.8, and 5.9.

Credit Needs (X_{10}): Seventy-eight low repayment maize farmers out of 88 had high credit needs while 6 out of 7 high repayment ones had high credit needs. Percentage wise, about 89 per cent of low repayment maize farmers had high credit needs while about 86 per cent of high repayment ones had high credit needs. Twenty-three of the high repayment rice farmers out of 55 had high credit needs. Percentage wise, about 42 per cent of the high repayment rice farmers had high credit needs, while about 58 per cent of them had low credit needs. All the rice farmers were in the high repayment category. Two low repayment poultry farmers out of 4 had high credit needs while all the 146 high repayment ones had high credit needs. Percentage wise, only 50 per cent

96

of low repayment poultry farmers had high credit needs
while 100 per cent of the high repayment ones had high
credit needs. These are illustrated in tables 5.7, 5.8,
and 5.9.

CHAPTER VI

6. FACTORS INFLUENCING RATE OF REPAYMENT

Independent variables (X's) were regressed
with repayment rate as the dependent variable (Y_L).
These independent variables were size of loan,
farm size, income, age of farmers, number of years of
farming experience, distance between farm and source
of loan, level of formal education of farmers, household
size, adoption of innovations, and credit needs.
Frisch's Confluence (Bunch-Map) Analysis Method was
used to test for existence of multicollinearity.
Results of the regression analysis are given in tables
6.1, 6.2, 6.5, 6.6, 6.9 and 6.10.

6.1: Factors that Infleunce Repayment Rates Among
     Maize Farmers.

Size of Loan (X_1): As shown in table 6.1, size of

loan has a marginal contribution of 17.6467. The t-value
is 6.597 which is highly significant at 1% level of
probability. Thus, there is a high degree of contribution
of size of loan on repayment performance of the farmers.
The result also shows that size of loan has a positive
relationship with repayment, that is, as size of loan
increases, repayment rate likewise increases. Thus,
size of loan is a relatively significant determinant of
repayment.

Farm Size (X_2): The marginal contribution of farm size
is 8.0207. The t-value is 1.881 which is significant at
10 per cent level of probability. Thus, farm size is
directly related to repayment (table 6.1).

Income (X_3): Income has a marginal contribution of
13.7265 and a t-value of 3.978, which is highly
significant at 1 per cent level of probability. This
also indicates that income is an important determinant
of repayment of these farmers (table 6.1).

Age of Farmers (X_4): Table 6.1 indicates that age of farmers has a marginal contribution of 16.8668 and a t-value of 1.760 which is significant at 10 per cent level of probability. The result also shows that age has a positive relation to repayment, that is, as age of farmers increases, repayment performance also increases. Thus, age is a relatively significant determinant of repayment.

Number of Years of Farming Experience (X_5): This variable as indicated in table 6.1, has a marginal contribution of 7.2508. It has a t-value of 2.155, which is significant at 1% level of probability. It has a direct relationship with repayment performance.

Distance between Home and Source of Loan (X_6): The marginal contribution of this variable is -0.3593 (table 6.1). The t-value, however, of -0.388 is not significant at any of the set levels of significance.

Nevertheless, the result shows that there is an inverse relation between this variable and repayment. It is to be expected that farmers staying far from the source of loan are less able and willing to repay.

Level of Formal Education of Farmers (X_7): This variable has a marginal contribution of 2.2421 and a t-value of 1.615 which is significant statistically at 10 per cent level (table 6.1). The result shows that level of formal education is directly related to repayment performance.

Household Size (X_8): Household size takes an estimated marginal contribution of -0.6127 and at t-value of -0.271 which is not significant. Although not a strong determinant of repayment rate, it is inversely related to it, which is expected because of the high cost of running large homes in the study area.

Adoption of Innovations (X_9): Adoption of innovations has a marginal contribution of 2.4403 and a t-value of

2.607 which is highly significant at 1 per cent level
of probability. Thus, there is a high degree of contribution
of this variable to repayment performance of the farmers
(table 6.1).

Credit Needs (X_{10}): In table 6.1, credit needs has
a marginal contribution of -0.0847 with a t-value of
-0.143, which is not significant at any of the set
levels of probability.

Table 6.1: Regression Co-efficients, t-Values and

Levels of Significance of Ten Independent

Variables Related to Repayment Rate of SACS

Maize Farmers.

Varia-bles	Regression Co-efficients	Standard Errors	t-Values	Levels of Significance
X_1	17.6467	2.67501	6.597	0.01
X_2	8.0207	4.42831	1.811	0.10
X_3	13.7265	3.45101	3.978	0.01
X_4	16.8668	9.58098	1.760	0.10
X_5	7.2508	3.36473	2.155	0.01
X_6	-0.3593	0.92495	-0.388	N.S.
X_7	2.2421	1.38805	1.615	0.10
X_8	-0.6127	2.25777	-0.271	N.S.
X_9	2.4403	0.93620	2.607	0.01
X_{10}	-0.0847	0.59188	-0.143	N.S.

d.f. = 94

R^2 = 0.916

a = 253.34

N.S. = Not significant beyond 10% level of

confidence.

The co-efficient of multiple determination
(R^2) for loan repayment rate of these farmers is 91.6
per cent. This was tested for significance with the
F-statistic. The result shows that the combined effects
of size of loan, farm size, income, age of farmers,
number of years of farming exprience, distance from
home to source of loan, level of formal education,
household size, adoption of innovations, and credit
needs explained 91.6 per cent of the variability of
repayment and F-test was 91.001 indicating a very high
significant impact of these variables on repayment rate
(table 6.2).

Table 6.2: Analysis of Covariance for Testing the
           Combined Significance of the Ten Independent
           Variables Related to Repayment Rate of SACS
           Maize Farmers.

Multiple R	0.95682	Anova	D.F.	S.S	M.S.	F
R Square	0.91550	Regres-sion	10	14296.61647	1429.66165	91.01081
Adjusted R Square	0.90544	Residual	84	1319.53090	15.70870	$F_{tab(0.01}$
Standard Error	3.96342					= 2.63

Anova = Analysis of Covariance   D.F. = Degree of Freedom
S.S. = Sum of Squares. M.S. = Mean Square F = F-Statistic.

The foregoing discussion shows that among the independent variables hypothesized as having significant effects on repayment rate among the maize farmers, the following are to be accepted and considered as strong determinants of repayment: Size of loan, Farm size, Income Age of farmers, Number of years of farming experience, Level of formal education, and Adoption of innovations.

6.1.1 Relationship between selected Supervisory Characteristics and Income among Maize Farmers.

Number of Farmers Supervised (X_1): There is an inverse relationship between income of the farmers (Y) and the number of farmers supervised. The correlation co-efficient is -0.79507 (table 6.3). This means that income increases as the number of farmers supervised decreases. Furthermore, it implies that the less the number of farmers being supervised, the better is the quality of supervision.

Length of Service as Supervisors (X_2): Length of
service as supervisors is positively related to income.
The correlation co-efficient of this variable with income
is 0.84896. This means that the more experience the
supervisors have on the job, the more they can
effectively handle farmers problems and consequently
enhance increased income of the farmers.

Level of Formal Training in Agriculture (X_3): This
supervisory characteristics has a direct relationship
with the farmers income. The correlation co-efficient is
0.83956 (table 6.3). In other words, the more
supervisors are trained in agriculture, the farmers
they supervise will likely have higher income, because
they can impact more knowledge.

Number of Farm Visits (X_4): The number of farm visits
is directly related to the farmers' income, with a corre-
lation co-efficient of 0.96652 (table 6.3). This means
that as supervisors visit more their supervised farmers,

income increases. The frequent farm visits could
bolster the farmers' confidence in the acceptance of
new technology since the supervisors could help them
solve their technical problems.

Table 6.3. Correlation Co-efficients between Selected
Supervisory Characteristics and Income
among Maize Farmers.

	Y	X_1	X_2	X_3	X_4
Y	1.00000	-0.79507	0.84896	0.83956	0.96652
X_1	-0.79507	1.00000	-0.66158	-0.92528	-0.80218
X_2	0.84896	-0.66158	1.00000	0.87287	0.91018
X_3	0.83956	-0.92528	0.87287	1.00000	0.87086
X_4	0.96652	-0.80218	0.91018	0.87086	1.00000

Table 6.4:   Summary Table of Hypotheses

Hypotheses	Accepted	Rejected
1. Loan repayment does not depend on size of loan		rejected
2. Loan repayment does not depend on farm size		rejected
3. Loan repayment does not depend on the farmers' income		rejected
4. Loan repayment does not depend on the farmers' age		rejected
5. Loan repayment does not depend on number of years of farming experience		rejected
6. Loan repayment does not depend on the distance between the farmers' home and source of loan	accepted	
7. Loan repayment does not depend on level of formal education of the farmers		rejected

Table 6.4 (Contd.)

	Hypotheses	Accepted	Rejected
8.	Loan repayment does not dpend on household size of the farmers	accepted	
9.	Loan repayment does not depend on adoption of innovations by farmers		rejected
10.	Loan repayment does not depend on credit needs of the farmers	accepted	

6.2.: Factors that Influence Repayment Rates among

Rice Farmers.

Size of Loan (X_1): The marginal contribution of size of loan is 0.0004 which is very negligible to affect repayment. The t-value, which is less than one $(t < 1)$ shows that the effect of size of loan on repayment is not significant (table 6.5). The estimated co-efficient, however, shows that as the size of loan increases, repayment rate also increases. It must be noted, too, that some farmers who could partly self-finance did not borrow the corresponding amount of loan per hectare.

Farm Size (X_2): Farm size is directly related to repayment rate. It has a marginal contribution of 29.358 with a t-value of 5.089 which is highly significant statistically at the 1 per cent level of confidence.

Income (X_3): Income is a significant determinant of repayment. It has a marginal contribution of 0.0014 with a t-value of 5.744 (table 6.5).

Age of Farmers (X_4):   Result shows that age is a significant determinant of repayment.   As shown in the table, age of farmers has a marginal contribution of -0.1394 and a computed t-value of -1.506 which is statistically significant at 10 per cent level.   The result also shows that age is inversely related to repayment.

Number of Years of Farming Experience (X_5):   The marginal contribution of this variable is 0.0208 with a t-value of less that one ($t < 1$), which is not significant at any of the set levels of confidence.

Distance between Home and Source of Loan (X_6):   The marginal contribution of this variable is -0.1063 (table 6.5).   The t-value, however, of -2.173 is significant at 1 per cent level of confidence.   It is expected from the result, therefore, that farmers staying far from the source of loan are less able and willing to pay back their loans.

Level of Formal Education of Farmers (X_7): This
variable has a marginal contribution of 0.2192 and a
t-value of 1.595 which means that loan repayment is
significantly affected by level of education of
farmers at 10 per cent level of probability.

Household Size (X_8): Household size takes an estimated
marginal contribution of 0.0530 and a t-value that is
less than one ($t < 1$) which is not significant. However,
the sign of the marginal contribution shows that as
household size increases, repayment also increases.
This phenomenon may have been accounted for by the fact
that rice production in the state is labour-intensive and
labour incurs highest cost of all the variable farm
inputs, and so larger household tends to offset part
of the high cost of hired-labour by way of providing
family labour which has zero cost.

Adoption of Innovations (X_9): Table 6.5 shows that this
variable has no significant influence on repayment rate of

the farmers. The marginal contribution of this
variable is 0.5390 and its t-value is 0.074. However,
the sign of the marginal contribution shows that there is
direct relationship between repayment rate and adoption
of innovations. It must be noted that rice production in
the state is monocultural and most of these farmers tend
to be familiar with the traditional techniques of production of
the crop.

Credit Needs (X_{10}): In table 6.5, credit needs has a
marginal contribution of 0.3522 and a t-value of 3.915 which is
highly significant at 1 per cent level of confidence. The
positive sign of the marginal contribution of this variable
shows that as credit needs of the farmers increase, their
loan repayment rates also increase. This phenomenon may be
accounted for by the fact that rice production in the state
at the time of this research is highly profitable and
the more reasons they give for seeking credit the larger the
size of loan since this factor (credit needs) is strongly

considered by the lending agency in determining the
size of loan given to the farmers as can be seen in
the Loan Application Form Format (Appendix XX). It
must be noted again that size of loan is directly related
to repayment performance (table 6.5).

Table 6.5: Regression Co-efficients, t-Values and Levels
of Significance of Ten Independent Variables
Related to Repayment Rate of SACS Rice Farmers

Varia-bles	Regression Co-efficients	Standard Errors	t-Values	Levels of Significance
X_1	0.0004	0.00042	0.875	N.S
X_2	29.358	5.76938	5.089	0.01
X_3	0.0014	0.00025	5.744	0.01
X_4	-0.1394	0.09258	-1.506	0.10
X_5	0.0208	0.06482	0.321	N.S
X_6	-0.1063	0.00489	-2.173	0.01
X_7	0.2192	0.13743	1.595	0.10
X_8	0.0530	0.06402	0.828	N.S
X_9	0.5390	0.07316	0.074	N.S
X_{10}	0.3522	0.08998	3.915	0.01

d.f. = 54 R^2 = 0.856   a = 88.36179

N.S. = No Significant beyond 10% level of confidence.

The co-efficient of multiple determination (R^2) for loan repayment rate of these farmers is 85.6 per cent. This was tested for significance with the F-statistic. The result shows that the combined effects of size of loan, farm, income, age of farmers, number of years of farming experience, distance between home and source of loan, level of formal education of farmers, household size, adoption of innovations, and credit needs explained 86 per cent of the variability of repayment and F-test was 26.13420 indicating a significant impact of these variables on repayment rate (table 6.6).

Table 6.6: Analysis of Covariance for Testing the Combined Significance of the Ten Independent Variables Related to Repayment Rate of SACS Rice Farmers.

		Anova	D.F.	S.S.	M.S.	F
Multiple R	0.92515	Anova				
R Square	0.85590	Regres-sion	10	287.05306	28.70531	26.13420
Adjusted R Square	0.82315	Residual	44	48.32876	1.09838	$F_{tab(0.01)} =$ 2.80
Standard Error	1.04804					

Anova = Analysis of Covariance   D.F. = Degree of Freedom
S.S. = Sum of Squares   M.S. = Mean Square   F = F-statistic.

The foregoing discussion shows that among the
independent variables hypothesized as having significant
effects on repayment, the following are to be accepted
and considered as strong determinants of repayment; Farm
size, income, age of farmers, distance between home and
source of loan, level of formal education of farmers,
and credit needs.

6.2.1: Relationship between Selected Supervisory
        Characteristics and Income among Rice Farmers.

Number of Farmers Supervised (X_1): There is an inverse
relationship between income of the farmers (Y) and the
number of farmers supervised. The correlation co-efficient
is -0.44081 (table 6.7). This means that income
increases as the number of farmers supervised decreases.
Furthermore, it implies that the less the number of
farmers being supervised, the better is the quality of
supervision.

Length of Service as Supervisors (X_2): Length of service
as supervisors is positively related to income. The
correlation co-efficient of this variable with income is

0.26442. This means that the more experience the supervisors have on the job, the more they can effectively handle farmers problems and consequently enhance increased income of the farmers.

Level of Formal Training in Agriculture (X_3): This supervisory characteristics has a direct relationship with the farmers' income. The correlation co-efficient is 0.95669 (table 6.7). In other words, the more supervisors are trained in agriculture, the farmers they supervise will likely have higher income, because they can impact more knowledge.

Number of Farm Visits (X_4): The number of farm visits is directly related to the farmers' income, with a correlation co-efficient of 0.89077 (table 6.7). This means that as supervisors visit more their supervised farmers, income increases. The frequent farm visits could bolster the farmers' confidence in the acceptance of new technology since the supervisors could help them solve their technical problems.

Table 6.7:   Correlation Co-efficients between Selected

Supervisory Characteristics and Income

among Rice Farmers.

	Y	X_1	X_2	X_3	X_4
Y	1.00000	−0.44081	0.26442	0.95669	0.89077
X_1	−0.44081	1.00000	−0.76271	−0.64068	−0.43685
X_2	0.26442	−0.76271	1.00000	0.32733	0.21004
X_3	0.95669	−0.64068	0.32733	1.00000	0.87086
X_4	0.89077	−0.43685	0.21004	0.87086	1.00000

Table 6.8: Summary Table of Hypotheses

Hypotheses	Accepted	Rejected
1. Loan repayment does not dpend on size of loan	accepted	
2. Loan repayment does not depend on farm size		rejected
3. Loan repayment does not depend on farmers income		rejected
4. Loan repayment does not depend on the farmers age		rejected
5. Loan repayment does not depend on number of years of farming experience	accepted	
6. Loan repayment does not depend on the distance between the farmers' home and source of loan		rejected
7. Loan repayment does not depend on level of formal education of the farmers		rejected

Table 6.8 (Contd.)

	Hypotheses	Accepted	Rejected
8.	Loan repayment does not depend on household size of the farmers	accepted	
9.	Loan repayment does not depend on adoption of innovations by farmers	accepted	
10.	Loan repayment does not depend on credit needs of the farmers		rejected

6.3: Factors that Influence Repayment Rates among Poultry Farmers

Size of Loan (X_1): The marginal contribution of size of loan is 23.3272 which is significant to affect repayment. The t-value which is 1.947 shows that the effect of loan size on repayment is significant (table 6.9). The estimated co-efficient indicates that as the size of loan increases, repayment also increases.

Farm Size (X_2): Farm size is directly related to repayment rate. It has a marginal contribution of 46.7649 with a t-value of 2.0298 which is significant at 1 per cent level of probability.

Income (X_3): This variable has a marginal contribution of 70.8840 and a t-value of 2.544 which is significant at 1 per cent level. This means that a unit increase in income of the farmers will correspondingly result to 70.8840 units increase in repayment.

Age of Farmers (X_4): As indicated in table 6.9, age of farmers has a marginal contribution of 84.1092 and a computed t-value of 5.954 which is statistically significant at 1 per cent level. The result also shows that age has a positive relationship with repayment, that is, as age increases, repayment performance likewise increases. Thus, age is a relatively significant determinant of repayment.

Number of Years of Farming Experience (X_5): The marginal contribution of this variable is 24.3919 with a t-value of 2.365 which is significant at 1 per cent level of confidence (table 6.9). This means that the more experienced they farmers are, the better their repayment performance.

Distance between Home and Source of Loan (X_6): The marginal contribution of this variable is -1.4589 (table 6.9). The t-value, however, of -0.972 is not significant at any of the set levels of significance.

Nevertheless, the result shows that there is an inverse relationship between distance between home and source of loan and repayment. It is expected that farmers staying far from the credit agency (SACS) are less able and willing to repay.

Level of Formal Education of Farmers (X_7): This variable has a marginal contribution of 5.9244 and a t-value of 1.622 which is significant at 10 per cent level of confidence. The result also revealed that level of formal education is directly related to repayment performance (table 6.9).

Household Size (X_8): The marginal contribution of household size is 4.1497 and its t-value is 1.041 which is not significant at any of the set levels of significance, although it has a direct relationship with repayment performance.

Adoption of Innovations (X_9): Adoption of innovations has a marginal contribution of 9.5179 with a t-value

of 3.662 which is significant at 1 per cent level of probability (table 6.9). This means than an increase in the level of adoption of innovations by these farmers significantly increases their repayment performance.

Credit Needs (X_{10}): This variable, as shown in table 6.9, has a marginal contribution of 7.5436 and a t-value of 2.994 which is significant at 1 per cent level of probability. This means that credit needs is directly related to repayment performance. The scheme gave more loan to poultry farmers who indicated more reasons for seeking credit. This is further explained by the impact of size of loan on repayment performance (table 6.9).

Table 6.9: Regression Co-efficients, t-Values and
Levels of Significance of Ten Independent
Variables Related to Repayment Rate of
SACS Poultry Farmers.

Varia-bles	Regression Co-efficients	Standard Errors	t-Values	Levels of Significance
X_1	23.3272	11.98317	1.947	0.10
X_2	46.7649	23.03879	2.030	0.01
X_3	70.8840	27.86268	2.544	0.01
X_4	84.1092	14.12659	5.954	0.01
X_5	24.3919	10.31235	2.365	0.01
X_6	-1.4589	1.50025	-0.972	N.S.
X_7	5.9244	3.65189	1.622	0.10
X_8	4.1497	3.98717	1.041	N.S.
X_9	9.5179	2.59927	3.662	0.01
X_{10}	7.5436	2.51927	2.994	0.01

d.f. = 149

R^2 = 0.638

a = 31.49274

N.S. = Not significant beyond 10% level of confidence.

The co-efficient of multiple determination
(R^2) for loan repayment rate of these farmers is 63.812
per cent. This was tested for significance with the
F-statistic. The result shows that the combined effects
of size of loan, farm size, income, age of farmers,
number of years of farming experience, distance between
home and source of loan, level of formal education of
farmers, household size, adoption of innovations, and
credit needs explained 64 per cent of the variability of
repayment and F-test was 24.51058 which also shows a
significant impact of these variables on repayment rate
(table 6.10).

Table 6.10: Analysis of Covariance for Testing the
Combined Significance of the Ten
Independent Variables Related to
Repayment Rate of SACS Poultry Farmers.

Multiple	0.79882	Anova	D.f.	S.S.	M.S.	F
R Square	0.63812	Regres-sion	10	21329.79959	2132.97996	24.51058
Adjusted R Square	0.61209	Residual	139	12096.17375	87.02283	$F_{tab(0.01)}$ = 2.32
Standard Error	9.32860					

Anova   =   Analysis of covariance

D.F.   =   Degree of Freedom

S.S.   =   Sum of Squares

M.S.   =   Mean Square

F   =   F-statistic.
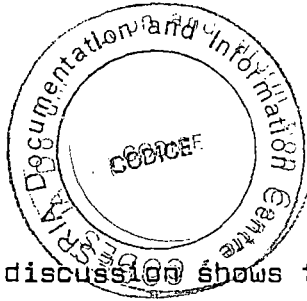
The foregoing discussion shows that among the
independent variables hypothesized as having significant
effects on repayment, the following are to be accepted and
considered as strong determinants of repayment: Farm size,
income, age of farmers, number of years of farming
experience, adoption of innovations, credit needs, level of
formal education, and size of loan.

6.3.1:   Relationship between Selected Supervisory
         Characteristics and Income among Poultry Farmers.

Number of Farmers Supervised (X_1):   There is an inverse
relationship between income of the farmers (Y) and the
number of farmers supervised.   The correlation co-efficient
is -0.89410 (table 6.11).   This means that income increases as
the number of farmers supervised decreases.   Furthermore, it
implies that the less the number of farmers being supervised,
the better is the quality of supervision.

Length of Service as Supervisors (X_2):   Length of service
as supervisors is positively related to income.   The

correlation co-efficient of this variable with income is
0.71168. This means that the more experience the supervisors
have on the job, the more they can effectively handle
farmers problems and consequently enhance increased income
of the farmers.

Level of Formal Training in Agriculture (X_3): This
supervisory characteristics has a direct relationship with
the farmers' income. The correlation co-efficient is
0.97813 (table 6.11). In other words, the more supervisors
are trained in agriculture, the farmers they supervise will
likely have higher income, because they can impact more
knowledge.

Number of Farm Visits (X_4): The number of farm visits is
directly related to the farmers' income, with a correlation
coiefficient of 0.097095 (table 6.11). This means that as
the supervisors visit more their supervised farmers, income
increases. The frequent farm visits could bolster the farmers'
confidence in the acceptance of new technology since the
supervisors could help them solve their technical problems.

Table 6.11: Correlation Co-efficients between Selected
Supervisory Characteristics and Income among
Poultry Farmers.

	Y	X_1	X_2	X_3	X_4
Y	1.00000	-0.89410	0.71168	0.97813	0.097095
X_1	-0.89410	1.00000	-0.92112	-0.81877	-0.85655
X_2	0.71168	-0.92112	1.00000	0.66667	0.61237
X_3	0.97813	-0.81877	0.66667	1.00000	0.91856
X_4	0.97095	-0.85655	0.61237	0.91856	1.00000

Table 6.12: Summary Table of Hypotheses

Hypotheses	Accepted	Rejected
1. Loan repayment does not depend on size of loan		rejected
2. Loan repayment does not depend on farm size		rejected
3. Loan repayment does not depend on income		rejected
4. Loan repayment does not depend on age of farmers		rejected
5. Loan repayment does not depend on number of years of farming experience		rejected
6. Loan repayment does not depend on the distance between home and source of loan	accepted	
7. Loan repayment does not depend on level of formal education of farmers		rejected

Table 6.12 (Contd.)

Hypotheses	Accepted	Rejected
8. Loan repayment does not depend on household size	accepted	
9. Loan repayment does not depend on adoption of innovations by farmers		rejected
10. Loan repayment does not depend on credit needs of the farmers		rejected

CHAPTER VII

7. FACTORS INFLUENCING CREDIT POTENTIAL

The objective here is to classify the farmers
(Maize, Rice, and Poultry) as either credit-worthy or non-
credit worthy and to evaluate the discriminating powers
of the independent variables involved. In this case, the
set of independent variables involved are size of loan
(X_1), farm size (X_2), income (X_3), age of farmers (X_4),
number of years of farming experience (X_5), distance between
home and source of loan (X_6), level of formal education
on farmers (X_7), household size (X_8), adoption of innovations
(X_9), and credit needs (X_{10}).

7.1. Factors that Influence Credit Potentials among Maize Farmers

Grouping of maize farmers into two was based on loan
repayment level(Y values). Those whose loan repayment levels
are greater than or equal to 40 per cent ($Y \geq 40$) were
assigned to Group I while those below 40 were assigned to
Group II. Those under group I were assumed to be relatively
credit worthy while those in group II were assumed to be
relatively non-credit worthy. Seventeen farmers were on this

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basis found to be relatively credit-worthy while the remaining 78 were relatively non-credit worthy. The estimated function for the farmers is stated in table 7.1.

Table 7.1. Standardized Canonical Discriminant Function Co-efficients (Theoretical).

Variables	Discriminant Co-efficients
X_1 = Size of loan (₦)	0.86836
X_2 = Farm size (Ha)	0.84598
X_3 = Income (₦)	-0.19814
X_4 = Age of farmers (Yrs)	0.76028
X_5 = Number of years of farming experience	-1.05153
X_6 = Distance between home and source of loan (kms)	0.30586
X_7 = Level of formal education of farmers (Yrs)	-0.31952
X_8 = Household size	0.14760
X_9 = Adoption of innovations (Dummy variable)	0.10605
X_{10} = Credit needs (Dummy variable)	0.09172

The estimated centroid for relatively credit worthy farmers was found to be 2.93651 while that of the relatively non-credit worthy farmers was found to be -0.64001. This means that the higher the composite score of any farmer, the higher the probability that the farmers will be classified as being relatively credit-worthy and vice-versa (Appendix IX).

The contribution of variables to the total discriminant score was estimated and expressed in percentage form. The result is presented in table 7.2.

Table 7.2. Percentage Contribution of Individual Variables to the Total Discriminant Score.

Variables	Co-efficients	Mean Difference	Product	% Contri-bution
X_1	0.86836	529.41176	459.71999	46.378
X_2	0.84598	1.29185	1.0928792	0.110
X_3	-0.19814	2580.0346	511.20805	51.572
X_4	0.76028	6.89744	5.2439856	0.529
X_5	-1.05153	7.05279	7.4162202	0.748
X_6	0.30586	17.17647	5.2535951	0.530
X_7	-0.31952	1.97888	0.6322917	0.064
X_8	0.14760	3.51132	0.5182708	0.052
X_9	0.10605	0.47436	0.0503058	0.005
X_{10}	0.09172	1.18175	0.1083901	0.011

It will be noted from table 7.2 that some variables
made positive contributions to the total discriminant score
while others made negative contributions. Income contributed
about 52% of the total value of the discriminant score for
the function. The negative sign obtained for income suggests
that a farmer's chance of belonging to the group of
relatively credit-worthy farmers reduces as his income
increases. Also a farmer's credit-worthiness will improve
when size of loan increases. All the other variables in the
function had little or no contributions to the farmers'
credit-worthiness.

The group means and differences in mean between the
credit-worthy and non-credit-worthy farmers are set out in
table 7.3.

Table 7.3. Group Means and Mean Differences for the
Discriminating Variables.

Variables	Credit-worthy Farmers	Non-Credit-worthy farmers	Mean Differences
X_1	1529.412	1000.000	529.412
X_2	3.176	1.885	1.292
X_3	5282.471	2702.436	2580.035
X_4	47.000	40.103	6.897
X_5	24.412	17.359	7.053
X_6	64.824	82.000	17.176
X_7	6.744	4.765	1.979
X_8	8.077	11.588	3.511
X_9	10.000	9.526	0.474
X_{10}	9.064	7.882	1.182

The table shows that credit-worthy farmers have relatively positive attitude towards credit than non-credit-worthy farmers.

The estimated function was subjected to a chi-square test of significance. The result of the test is presented in table 7.4.

Table 7.4.   Chi-squared Test of Significance for the Discriminant Function.

Chi-squared	94.293
D.F.	10

The calculated chi-squared at 5% level of significance was found to be 94.293. The tabulated value at the same level is 18.310.

Since $\chi^2_{cal} = 94.293 > \chi^2_{tab} = 18.310$, then the hypothesis that all the discriminant co-efficients were equal to zero is rejected. This means that the estimated function can be used to discriminate between relatively creditworthy and relatively non-creditworthy farmers as initially defined.

In order to know how well the function developed in the course of this study will perform in classifying the farmers,

the function was evaluated for each of the 95 farmers involved.
The result obtained is given in table 7.5.

Table 7.5.   Classification Performance of the Estimated
             Discriminant Function (Theoretical)

Actual Group	No. of Cases	Predicted Group Membership 1	2
Group 1	17	13	4
Subfile Group 1		76.5%	23.5%
Group 2	78	1	77
Subfile Group 2		1.3%	98.7%

Percentage of "Grouped" cases Correctly Classified: 94.74%

The proportion of relatively credit worthy farmers
erroneously classified as being relatively non-credit worthy
forms about 1% of the 78 known relatively non-credit worthy
farmers subjected to the classification. This kind of error
constitutes a risk in agricultural credit administration.
Whereas the 1% misclassification of relatively creditworthy
farmers for relatively non-credit worthy farmers will mainly
affect interest earnings foregone, the 24% relatively non-credit

worthy farmers may default in the repayment of accruable

interest as well as the principal loan. The totality of both

may be high enough to reduce amount of loan available for

subsequent operations. Because of the dual nature of losses

to credit agencies, misclassification errors may lead

eventually to loan shrinkage, ineffectiveness, and liquidation.

However, the overall classification performance of the function,

which is about 95% is sufficiently high to alleviate the fear

associated with misclassification error.

It is important to note here that the above analysis is the

direct method which is mainly for theoretical purposes.

For practical purposes and policy implementations, the

stepwise discriminant selection method is used. The estimated

function for the farmers is stated in table 7.6.

Table 7.6.   Standardized Canonical Discriminant Function

Co-efficients (Practical)

Variables	Discriminant Co-efficients
X_1 = Size of loan (₦)	0.80779
X_2 = Farm size (Ha)	0.63828
X_4 = Age of farmers (Yrs)	0.71118
X_5 = Number of years of farming experience	0.87357
X_6 = Distance between home and source of loan (kms)	-0.26512
X_7 = Level of formal education of farmers (Yrs)	0.35557

The estimated centroid for relatively creditworthy farmers was found to be 2.89383, while that of relatively non-creditworthy farmers was found to be -0.63071. This means that the higher the composite score of any farmer, the higher the probability that the farmer will be classified as being relatively creditworthy and vice-versa (Appendix X).

Relative contribution of variables to the total discriminant score was estimated and expressed in percentage form. The result is presented in table 7.7.

Table 7.7.   Percentage Contribution of Individual

Variables to the Total Discriminant Score

Variables	Co-efficients	Mean Difference	Product	% Contri-bution
X_1	0.80779	529.41176	427.65352	96.145
X_2	0.63828	1.29185	0.824562	0.185
X_4	0.71118	6.89744	4.9053213	1.103
X_5	0.87357	7.05279	6.1611057	1.385
X_6	-0.26512	17.17647	4.5538257	1.024
X_7	0.35557	1.97888	0.7036303	0.158

It will be noted from table 7.7 that all the variables in the
function made some contributions to the farmers' credit-worthiness.
Size of loan, farm size, age of farmers, number of years of
farming experience, and level of formal education of farmers
made positive contributions while distance between home and
source of loan made negative contribution.   The positive signs
obtained for size of loan, farm size, age of farmers, number
of years of farming experience, and level of formal education
of farmers suggest that a farmer's chance of belonging to the
group of relatively creditworthy farmers improves as his size
of loan, farm size, age, number of years of farming experience,

and level of formal education increase, while the negative
sign obtained for distance between his home and source of loan
suggests that a farmer's chance of belonging to the group of
relatively non-creditworthy farmers increases as the distance
between his home and source of loan increases. Size of loan
alone accounts for about 96% of the total contribution to the
total discriminant score.

The group means and differences in mean between the credit-
worthy and non-credit worthy farmers are set out in table 7.8.

Table 7.8: Group Means and Mean Differences for Discriminanting
Variables.

Variables	Credit-worthy Farmers	Non-Credit-worthy Farmers	Mean Difference
X_1	1529.412	1000.000	529.412
X_2	3.176	1.885	1.292
X_4	47.000	40.103	6.897
X_5	24.412	17.359	7.053
X_6	64.824	82.000	17.176
X_7	6.744	4.765	1.979

The table shows that creditworthy farmers have relatively
positive attitude towards credit than non-credit worthy farmers.

The estimated function was subjected to a chi-squared test of significance. The result of the test is presented in table 7.9.

Table 7.9. Chi-squared Test of Significance for the Discriminant Function.

Chi-squared	94.713
D.F.	6

The calculated chi-squared at 5% level of significance was found to be 94.713. The tabulated value at the same level is 12.590.

Since $\chi^2_{cal} = 94.713 > \chi^2_{tab} = 12.590$, then the hypothesis that all the discriminant co-efficients were zero is rejected. This means that the estimated function can be used to discriminate between relatively creditworthy and relatively non-creditworthy farmers as initially defined.

In order to know how well the function developed in the course of this study will perform in classifying the farmers, the function was evaluated for each of the 95 farmers involved.

The result is given in table 7.10. The proportion

Table 7.10. Classification Performance of the Estimated

Discriminant Function (Practical)

Actual Group	No. of Cases	Predicted Group Membership 1	2
Group 1	17	12	5
Subfile Group 1		70.6%	29.4%
Group 2	78	1	77
Subfile Group 2		1.3%	98.7%
Percentage of "Grouped" Cases Correctly Classified: 93.68%			

of relatively creditworthy farmers erroneously classified as

being relatively non-creditworthy forms about 1% of the 78

known relatively non-credit worthy farmers subjected to the

classification. This kind of error constitutes a risk in

agricultural credit administration. Whereas the 1% misclassi-

cation of relatively creditworthy farmers for relatively

non-creditworthy farmers will mainly affect interest earnings

foregone, the 29% relatively non-creditworthy farmers may

default in the repayment of accruable interest as well as the

principal loan. The totality of both may be high enough to

reduce amount of loan available for subsequent operations.

Because of the dual nature of losses to credit agencies, misclassification errors may lead eventually to loan shrinkage, ineffectiveness, and liquidation. However, the overall classification performance of the function, which is about 94%, is sufficiently high to alleviate the fear associated with misclassification error.

7.2. Factors that Influence Credit Potentials among Rice
      Farmers.

Grouping of rice farmers into two was based on loan repayment level (Y values). Those whose loan repayment levels are equal to 100 (Y = 100) were assigned to Group I while those below 100 were assigned to Group II. Those under group I were assumed to be creditworthy while those in group II were assumed to be non-creditworthy. Fifty-two farmers were on this basis found to be creditworthy while the remaining 3 were non-creditworthy. The estimated function for the farmers is stated in table 7.11.

The estimated centroid for creditworthy farmers was found to be 0.47956 while that of non-creditworthy farmers was found to be -8.31234. This means that the higher the composite score of any farmer, the higher the probability that the farmer

Table 7.11. Standardized Canonical Discriminant Function

Co-efficients (Theoretical)

Variables	Discriminant Co-efficients
X_1 = Size of loan (₦)	0.13567
X_2 = Farm size (Ha)	-12.00468
X_3 = Income (₦)	13.85281
X_4 = Age of farmers (Yrs)	-0.90361
X_5 = Number of years of farming experience	-0.04345
X_6 = Distance between home and source of loan (kms)	-0.30679
X_7 = Level of formal education of farmers (Yrs)	0.41046
X_8 = Household size	0.61351
X_9 = Adoption of innovations (Dummy variable)	0.30494
X_{10} = Credit needs (Dummy variable)	1.19702

will be classified as being creditworthy and vice-versa (Appendix XIII).

The contribution of variables to the total discriminant score was estimated and expressed in percentage form. The result is presented in table 7.12.

Table 7.12. Percentage Contribution of Individual Variables
to the Total Discriminant Score.

Variables	Co-efficients	Mean Difference	Product	% Contri-bution
X_1	0.13567	190.38462	25.829481	0.005
X_2	-12.00468	1.77564	21.315989	0.004
X_3	13.85281	40696.154	563756.07	99.990
X_4	-0.90361	5.80769	5.2478867	0.001
X_5	-0.04345	6.92308	0.3008078	0.0001
X_6	-0.30679	22.08975	6.7769144	0.001
X_7	0.41046	1.73077	0.7104118	0.0001
X_8	0.61351	3.24359	1.9899749	0.0004
X_9	0.30494	5.19231	1.583343	0.0003
X_{10}	1.19702	4.15385	4.9722415	0.001

It will be noted from table 7.12 that some variables made
positive contributions to the total discriminant score while some
others made negative contributions. Income contributed about
100% of the total value of the discriminant score for the
function. The positive sign obtained for income suggests that a
farmers chance of belonging to the group of creditworthy farmers

increases as his income increases. All the other variables
in the function had little or no contribution to the farmers'
credit worthiness.

The group means and differences in mean between the
credit worthy and non-creditworthy farmers are set out in
table 7.13. The table shows that creditworthy farmers have
relatively positive attitude towards credit than non-credit
worthy farmers.

Table 7.13. Group Means and Mean Differences for the
Discriminating Variables

Variables	Creditworthy Farmers	Non-Creditworthy Farmers	Mean Differences
X_1	1390.385	1200.000	190.385
X_2	3.442	1.667	1.776
X_3	80896.154	40200.000	40696.154
X_4	50.192	56.000	5.808
X_5	35.000	28.077	6.923
X_6	86.577	108.667	22.090
X_7	2.731	1.000	1.731
X_8	15.423	18.667	3.244
X_9	6.192	1.000	5.192
X_{10}	5.154	1.000	4.154

The estimated function was subjected to a chi-squared
test of significance. The result of the test is presented in
table 7.14.

Table 7.14. Chi-squared Test of Significance for the

Discriminant Function

Chi-squared	78.547
D.F.	10

The calculated chi-squared at 5% level of significance was
found to be 78.547. The table value at the same level is 18.310.
Since $\chi^2_{cal} = 78.547 > \chi^2_{tab} = 18.310$, then the
hypothesis that all the discriminant co-efficients were equal to
zero is rejected. This means that the estimated function can
be used to discriminate between creditworthy and non-creditworthy
farmers as initially defined.

In order to know how well the function developed in the
course of this study will perform in classifying the farmers, the
function was evaluated for each of the 55 farmers involved.

The result obtained is given in table 7.15.

Table 7.15. Classification Performance of Estimated

Discriminant Function (Theoretical)

Actual Group	No. of Cases	Predicted Group Membership 1	2
Group 1	52	52	0
Subfile Group 1		100.0%	0.0%
Group 2	3	0	3
Subfile Group 2		0.0%	100.0%
Percentage of "Grouped" Cases Correctly Classified: 100.00%			

There was no error of misclassification and the overall
classification performance of the function, which is 100%,
is sufficiently high to alleviate the fear associated with
misclassification errors.

It is important to note here that the above analysis
is the direct method which is mainly for theoretical purposes.

For practical purposes and policy implementations, the
stepwise discriminant selection method is used. The estimated
function for the farmers is stated in table 7.16.

Table 7.16.   Standardized Canonical Discriminant Function

Co-efficients (Practical)

Variables	Discriminant Co-efficients
X_2 = Farm size (Ha)	12.96211
X_3 = Income (₦)	14.77369
X_5 = Number of years of farming experience	0.40415
X_6 = Distance between home and source of loan (kms)	-0.33505
X_7 = Level of formal education of farmers (Yrs)	0.40610
X_{10} = Credit needs (Dummy variable)	1.42151

The estimated centroid for creditworthy farmers was found to be 0.45428, while that of non-crditworthy farmers was found to be -7.87424. This means that the higher the composite score of any farmer, the higher the probability that the farmer will be classified as being creditworthy and vice-versa (Appendix XIV).

The contribution of variables to the total discriminant score was estimated and expressed in percentage form. The result is presented in table 7.17.

Table 7.17. Percentage Contribution of Individual Variables to the Total Discriminant Score.

Variables	Co-efficients	Mean Difference	Product	% Contri-bution
X_2	12.96211	1.776	23.020707	0.004
X_3	14.77369	40696.154	601232.34	99.99
X_5	0.40415	6.923	2.7979304	0.0005
X_6	-0.33505	22.090	7.4012545	0.001
X_7	0.40610	1.731	0.7029591	0.0001
X_{10}	1.42151	4.154	5.9049525	0.001

It will be noted from table 7.17 that all the variables in the function made some contributions to the total discriminant score. Income alone contributed about 100% of the total value of the discriminant score for the function. The positive

sign obtained for income suggests that a farmer's chance
of belonging to the group of creditworthy farmers increases
as his income increases. All the other variables in the
function had very little contribution to the farmers'
credit-worthiness.

The group means and differences in mean between the
creditworthy and non-creditworthy farmers are set out in
table 7.18. The table shows that creditworthy farmers have
relatively positive attitude towards credit than non-credit
worthy farmers.

Table 7.18.   Group Means and Mean Differences for the
Discriminating Variables.

Variables	Creditworthy Farmers	Non-Creditworthy Farmers	Mean Difference
X_2	3.442	1.667	1.776
X_3	80896.154	40200.000	40696.154
X_5	35.000	28.077	6.923
X_6	86.577	108.667	22.090
X_7	2.731	1.000	1.731
X_{10}	5.154	1.000	4.154

The estimated function was subjected to a chi-squared
test of significance. The result of the test is presented
in table 7.19. The calculated chi-squared at 5% level of
significance was found to be 77.507. The table value at the
same level is 12.590.

Table 7.19.   Chi-squared Test of Significance for the
Discriminant Function.

Chi-squared	77.507
D.F.	6

Since $\chi^2_{cal} = 77.507 > \chi^2_{tab} = 12.590$, then the
hypothesis that all the discriminant co-efficients were equal
to zero is rejected. This means that the estimated function
can be used to discriminate between creditworthy and non-
creditworthy farmers as initially defined.

In order to know how well the function developed in
the course of this study will perform in classifying the farmers,
the function was evaluated for each of the 55 farmers
involved.

The result obtained is given in table 7.20.

Table 7.20. Classification Performance of Estimated

Discriminant Function (Practical)

Actual Group	No. of Cases	Predicted Group Membership 1	2
Group 1	52	52	0
Subfile Group 1		100.0%	0.0%
Group 2	3	0	3
Subfile Group 2		0.0%	100.0%
Percentage of "Grouped" Cases Correctly Classified:			100.00%

There was no error of misclassification and the overall
classification performance of the function, which is 100%,
is sufficiently high to alleviate the fear associated with
misclassification error.

7.3. Factors that Influence Credit Potentials
among Poultry Farmers.

Grouping of poultry farmers into two was based on loan
repayment level (Y values). Those whose loan repayment levels
are equal to 100 per cent (Y = 100) were assigned to Group I
while those below 100 were assigned to Group II. Those under
group I were assumed to be creditworthy while those in group
II were assumed to be non creditworthy. Twenty-four farmers
were on this basis found to be creditworthy while the
remaining 126 were non-creditworthy. The estimated function
for the farmers is stated in table 7.21.

Table 7.21. Standardized Canonical Discriminant Function

Co-efficients (Theoretical)

Variables	Discriminant Co-efficients
X_1 = Size of loan (₦)	-0.55340
X_2 = Farm size (No. of birds)	0.24912
X_3 = Income (₦)	0.00000
X_4 = Age of farmers (Yrs)	1.07550
X_5 = Number of years of farming experience	-0.46257
X_6 = Distance between home and source of loan (kms)	0.31091
X_7 = Level of formal education of farmers (Yrs)	-0.47801
X_8 = Household size	0.23944
X_9 = Adoption of innovations (Dummy variable)	-0.12101
X_{10} = Credit needs (Dummy variable)	0.10280

The estimated centroid for creditworthy farmers was found to be 1.09846 while that of non-creditworthy farmers was found to be -0.20923. This means that the higher the

composite score of any farmer, the higher the probability

that the farmer will be classified as being creditworthy

and vice-versa (Appendix XVII).

The contribution of variables to the total discriminant

score was estimated and expressed in percentage form. The

result is presented in table 7.22.

Table 7.22. Percentage Contribution of Individual Variables
to the Total Discriminant Score.

Variables	Co-efficients	Mean Difference	Product	% Contribution
X_1	-0.55340	95.2381	52.704764	71.039
X_2	0.24912	41.40675	10.315249	13.904
X_3	0.00000	1372.62	0.00000	0.000
X_4	1.07550	6.35317	6.8328343	9.210
X_5	-0.46257	0.92857	0.4295286	0.579
X_6	0.31091	5.82738	1.8117907	2.442
X_7	-0.47801	2.68651	1.2841786	1.731
X_8	0.23944	3.11706	0.7463488	1.006
X_9	-0.12101	0.29365	0.0355345	0.048
X_{10}	0.10280	0.30159	0.0310034	0.042

It will be noted from table 7.22 that some variables made positive contributions to the total discriminant score while some others made negative contributions. Income made no contribution at all because the variable did not pass the tolerance test. Size of loan contributed about 71% of the total discriminant score for the function. The negative sign obtained for this variable suggests that a farmer's chance of belonging to the group of creditworthy farmers reduces as his size of loan increases. The other variables that made some contribution are farm size, age of farmers, distance between home and source of loan, level of formal education of farmers, and household size.

The group means and differences in mean between the creditworthy and non-creditworthy farmers are set out in table 7.23. The table shows that creditworthy farmers have relatively positive attitude towards credit than non-creditworthy farmers.

Table 7.23. Group Means and Mean Differences for the
Discriminating Variables.

Variables	Creditworth Farmers	Non-creditworthy Farmers	Mean Differences
X_1	6595.238	6500.000	95.238
X_2	385.042	343.635	41.407
X_3	16964.500	15591.881	1372.620
X_4	49.083	42.730	6.353
X_5	8.500	7.571	0.929
X_6	73.958	79.786	5.827
X_7	10.437	7.750	2.687
X_8	10.458	7.341	3.117
X_9	10.000	9.706	0.294
X_{10}	10.000	9.747	0.302

The estimated function was subjected to a chi-squared test of significance. The result of the test is presented in table 7.24.

Table 7.24. Chi-Squared Test of Significance for the Discriminant Function.

Chi-Squared	30.049
D.F.	9

The calculated chi-squared at 5% level of significance was found to be 30.049. The tabulated value at the same level is 16.920.

Since $\chi^2_{cal} = 30.049 > \chi^2_{tab} = 16.920$, then the hypothesis that all the discriminant coefficients were equal to zero is rejected. This means that the estimated function can be used to discriminate between creditworthy and non-creditworthy farmers as initially defined.

In order to know how well the function developed in the course of this study will perform in classifying the farmers,

the function was evaluated for each of the 150 farmers involved.

The result obtained is given in table 7.25.

Table 7.25. Classification Performance of Estimated Discriminant Function (Theoretical)

Actual Group	No. of Cases	Predicted Group Membership 1	2
Group 1	24	20	4
Subfile Group 1		83.3%	16.7%
Group 2	126	41	85
Subfile Group 2		32.5%	67.5%
Percentage of "Grouped" Cases Correctly Classified:			70.00%

The proportion of non-creditworthy farmers erroneously classified as being creditworthy farmers forms about 17% of the 24 known creditworthy farmers subjected to the classification. This kind of error constitutes the greatest

risk in agricultural credit administration. Whereas the

17% misclassification of non-creditworthy farmers for

creditworthy farmers may lead to default in the repayment

of accruable interest as well as the principal loan, the

33% misclassification of creditworthy farmers for non-credit

worthy farmers will mainly affect interest earnings foregone.

The totality of both may be high enough to reduce amount of

loan available for subsequent operations. Because of the

dual nature of losses to credit agencies, misclassification

errors may lead eventually to loan shrinkage, ineffectiveness,

and liquidation. The classification performance of the function,

which is 70%, is not sufficiently high enough to alleviate

the fear associated with misclassification errors. The result

will no doubt be improved upon by searching for more discriminating

characteristics.

Again, it is important to note here that the above analysis

is the direct method approach, which is mainly for theoretical

purposes.

For practical purposes and policy implementations,
the stepwise discriminant selection method is used. The
estimated function for the farmers is stated in table
7.26.

Table 7.26.   Standardized Canonical Discriminant Function
              Co-efficients (Practical)

Variables	Discriminant Co-efficients
X_4 = Age of Farmers (Yrs)	0.79863
X_6 = Distance between home and source of loan (kms)	-0.25264
X_7 = Level of formal education of farmers (Yrs)	0.31171

The estimated centroid for creditworthy farmers was found
to be 1.03765, while that of non-creditworthy farmers was
found to be -0.19765. This means that the higher the composite
score of any farmer, the higher the probability that the
farmer will be classified as being creditworthy and vice-versa
(Appendix XVIII).

The contribution of variables to the total discriminant scores was estimated and expressed in percentage form. The result is presented in table 7.27.

Table 7.27. Percentage Contribution of Individual Variables to the Total Discriminant Score.

Variables	Co-efficients	Mean Difference	Product	% Contri- bution
X_4	0.79863	6.35317	5.0738321	68.719
X_6	-0.25264	5.82738	1.4722292	19.940
X_7	0.31171	2.68651	0.837412	11.342

It will be noted from table 7.27 that all the variables made some contributions to the farmers' credit-worthiness. Age of farmers and level of formal education of farmers made positive contributions while distance between home and source of loan made negative contribution. The positive signs obtained for age of farmers and level of formal education of farmers suggest

that a farmer's chance of belonging to the group of
creditworthy farmers increases as his age and level of
formal education increase, while the negative sign
obtained for distance between home and source of loan
suggests that a farmer's chance of belonging to the group
of non-creditworthy farmers increases as the distance between
his home and source of loan increases. Age of farmers alone
accounts for about 69% of the total contribution to the
total discriminant score.

The group means and differences in mean between
the creditworthy and non-creditworthy farmers are set out in
table 7.28.

Table 7.28.   Group Means and Mean Differences for Discriminating
Variables.

Variables	Creditworthy Farmers	Non-Creditworthy Farmers	Mean Differences
X_4	49.083	42.730	6.353
X_6	73.958	79.786	5.827
X_7	10.437	7.750	2.687

The table shows that creditworthy farmers have relatively

positive attitude towards credit than non-creditworthy farmers.

The estimated function was subjected to a chi-squared

test of significance. The result of the test is presented in

table 7.29.

Table 7.29. Chi-Squared Test of Significance for the

Discriminant Function.

Chi-Squared	27.667
D.F.	3

The calculated chi-squared at 5% level of significance

was found to be 27.667. The tabulated value at the same level

is 7.810.

Since $\chi^2_{cal} = 27.667 > \chi^2_{tab} = 7.810$, then the hypothesis

that all the discriminant co-efficients were equal to zero is

rejected. This means that the estimated function can be used

to discriminate between creditworthy and non-creditworthy

farmers as initially defined.

In order to know how   well the function developed in the course of this study will perform in classifying the farmers, the function was evaluated for each of the 150 farmers involved.

The result ontained is given in table 7.30.

Table 7.30.   Classification Performance of Estimated

Discriminant Function (Practical)

Actual Group	No. of Cases	Predicted Group Membership 1	2
Group 1	24	18	6
Subfile Group 1		75.0%	25.0%
Group 2	126	41	85
Subfile Group 2		32.5%	67.5%
Percentage of "Grouped" Cases Correctly Classified:			68.67%

The proportion of non-creditworthy farmers erroneously classified as being creditworthy farmers forms about 25% of the 24 known creditworthy farmers subjected to the classification. This kind of error constitutes the greatest risk in agricultural credit administration. Whereas the 25% misclassification of

non-creditworthy farmers for creditworthy farmers may lead

to default in the repayment of accurable interest as well as

the principal loan, the 33% misclassification of creditworthy

farmers for non-creditworthy farmers will mainly affect

interest earnings foregone. The totality of both may be

high enough to reduce amount of loan available for subsequent

operations. Because of the dual nature of losses to credit

agencies, misclassification errors may lead eventually to loan

shrinkage, ineffectiveness, and liquidation. The classification

performance of the function, which is about 69%, is not

sufficiently high to alleviate the fear associated with

misclassification errors. The result will no doubt be improved

by searching for more discriminating characteristics.

Table 7.31. Summary Table of Indices

Type of Enterprise	Index (Theoretical)	Index (Practical)
Maize	1.14825	1.13156
Rice	-3.91639	-3.70998
Poultry	0.444615	0.4200

CHAPTER VIII

8.   SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

8.1 Summary and Conclusions:-

With emphasis on credit extension decisions, the
performance of Anambra State Supervised Agricultural
Credit Scheme (SACS) was evaluated.

The study found that, on the average, the size of
loan given to maize farmers was ₦1178.95; rice farmers,
₦1385.45; and poultry farmers, ₦6117.89, indicating that
poultry farmers received higher unit loans.

One of the greatest problems to increased farm
output and enhanced income for crop farmers in Anambra
State was the scarcity of land. On the average, maize
farmers had 2.11 hectares of farm; and rice farmers,
3.55 hectares. Although 3% of the maize farmers had
4 hectares, 27% of the farms were 3 hectares; 47%,
2 hectares; while 22% were 1 hectare. In the
case of rice farmers, 44% of them had farm size of 4
hectares; 49% were 3 hectares; 5% were 2 hectares; while
about 2 were 1 hectare. This shows that rice

For the poultry farmers, 35% of them were between 30 and 40 years old; 56% were between 41 and 50 years; while 55% were between 51 and 60 years of age. These indicate that there are older farmers in rice than in maize and poultry showing that rice farming is more of a tradition in the parts of the state where they are cultivated.

Each maize farm family was made up of about 10 individuals; rice farm family about 17 individuals; and poultry farm family about 9 individuals, revealing that rice farmers had the highest number of dependants.

The number of years of farming experience of the maize farmers, on the average was about 19 years; that of rice farmers, about 28 years; while that of the poultry farmers was about 8 years, indicating that rice farming has been the traditional mainstay of the people of the areas studied.

The average distance between home and source of loan
for the farmers is about 78.45 kilometres.

On the level of formal education of the farmers,
about 97% of the maize farmers had formal education;
about 49% for rice farmers; while all the poultry
farmers received formal education, indicating that
there were less educated farmers in rice production in the
state.

Ninety-seven per cent of the maize farmers adopted
innovations; 55% adopted in rice production; while about
98% adopted in poultry production.

On why they sought credit, 88% of the maize
farmers gave more than one reason for seeking credit; 40%
gave more than one reason in the case of rice farmers;
while about 99% gave more than one in the case of poultry
farmers.

On loan repayment rate, all the maize farmers
could not repay their loans. Only 5% of the rice farmers

could not repay theirs; while 84% of the poultry farmers
could not repay theirs completely. This indicates that
rice farmers were doing very well in loan repayment
performance.

On interest rate, all the farmers agreed that
interest charges are too high and preferred interest
charge of about 2% instead of the present rate of 15.5%.
Also all the farmers agreed that the lending exercise is
time consuming and concluded that the lending should be
done before the month of March to enable them prepare for
planting.

On form of loan disbursement to farmers, 96% of
the farmers preferred their loans in cash, while 4% of
them preferred it in both cash and kind.

The scheme operators, that is, the scheme supervisors
had some problems such as inadequate fund for maintaining
the vehicles used for field work, lack of Local Transport
and Travelling Allowance (L.T. and T.), and job
stagnation.

The common problems indicated by the farmers
include bad weather, pests and diseases, and low price

of their farm products, especially during harvest time.
About 87% of the farmers indicated bad weather condition;
76% indicated pests and diseases; while 69% indicated low
price of farm products.

On farmer and farm characteristics between repayment
groups, low repayment maize farmers had an average loan
size of ₦1022.73 while high repayment ones had ₦2000 on the
average. Low repayment maize farmers had an average
farm size of 2.03 hectares while high repayment ones had
an average of 3.14 hectares. Low repayment maize farmers
had an average income of ₦2912.51 while high repayment
ones had ₦6327.29, on the average. Low repayment
maize farmers had an average of 35.55 years while high
repayment ones were 46.29 years old, on the average. The
average number of years of farming experience of low
repayment maize farmers was 18.24 years while that of the
high repayment ones was, on the average 23.43 years.
The average distance between home and source of loan
for the low repayment maize farmers was 79.81 kilometres
while that of the high repayment ones was 67.86 kilometres,

on the average. The average level of formal education of low repayment maize farmers was 6.42 years while that of high repayment ones was 6.00 years. The average number of dependants for low repayment maize farmers was 9 persons; while that of high repayment ones was 11 persons. Ninety-seven per cent of the low repayment maize farmers adopted innovations, while 3% of them did not adopt any innovation. All the high repayment maize farmers adopted innovations. Eighty-nine per cent of the low repayment maize farmers had high credit needs, while 11% of them had low credit needs. Eighty-six per cent of the high repayment maize farmers had high credit needs, while 14% of them had low credit needs.

In the case of rice farmers, the average size of loan for all the rice farmers was about ₦1380. All of them were in the high repayment category. The average farm size operated by rice farmer-borrowers was about 3.35 hectares. All the farmers were in the high repayment category. The average income among the rice farmer-loan beneficiaries surveyed was about ₦78676. All the farmers were in the high repayment category. The average age of rice farmer-borrowers was about 50.51 years old.

All the farmer-borrowers belong to the high repayment category. None of the rice farmer-clients was in the low repayment category and they had an average of about 28.45 years in farming. Rice farmer-borrowers surveyed had an average distance of about 87.78 kilometres away from the source of loan. All the farmers were less delinquent in terms of repayment. Rice farmer-borrowers had an average of about 2.64 years of schooling. All the farmers were less delinquent in terms of repayment. There is an average of about 16 members per household among the rice farmer-respondents. Between repayment categories, however, all the members were in the high repayment category as there were no low repayment farmers in the enterprise. Thirty of the high repayment rice farmers were adopters of innovations, indicating that 55 per cent of the high repayment rice farmers were adopters of innovations while about 45 per cent of them were non-adopters. All the rice farmers were in the high repayment category. Twenty-three of the high repayment rice farmers had high credit needs, indicating that about 42 per cent of the high repayment rice farmers had high credit needs while about 58 per cent of them had low credit needs. All the rice farmers were in the high repayment category.

In the case of poultry farmers, low repayment poultry farmers had an average size of loan of ₦7500.00 while the high repayment ones had ₦6554.79. Low repayment poultry farmers had an average farm size of 503 birds while that of high repayment ones was 347 birds. Low repayment poultry farmers had, on the average, income of ₦22,059.50 while that of high repayment ones was ₦15,640.32. The average age of low repayment poultry farmers was 35 years while that of high repayment ones was 43.99 years old. Low repayment poultry farmers had an average number of years of farming experience of 6.50 years while that of high repayment ones was 7.75 years. Low repayment poultry farmers, on the average, had 61.75 kilometres as distance from their homes to the source of loan while that of high repayment ones was 79.32. Low repayment poultry farmers had 13.00 years as level of education, on the average, while that of high repayment farmers was 9.93 years. The average number of dependants for low repayment poultry farmers was 5 persons while that of high repayment farmers was 8 persons. Twenty-five per cent of the low repayment poultry farmers adopted innovations while 75% of them did not adopt. Also 50% of the low repayment

poultry farmers had high credit needs while 50% of them had low credit needs.

In conclusion, it is clear that poultry farmers were not consistent in their repayment characteristics compared to maize and rice farmers. This is evident from the high misclassification error recorded among poultry farmers as compared to maize and rice farmers. Efforts should, therefore, be made by the scheme authorities to identify and give loans to credit-worthy poultry farmers. It should be noted, at this point, that the Anambra State Supervised Agricultural Credit Scheme (SACS) has stopped giving out loans to poultry farmers in the state.

Although loan repayment performance was poorest among the maize farmers, there is much room for improvement on their repayment performance, considering the fact that their characteristics were more consistent than those of the poultry farmers in terms of repayment rate. What is needed is intensive efforts by the supervisors to look into their production and marketing problems. Rice farmers had little problem in their repayment performance.

The results of the multiple regression analysis
showed that among the independent variables hypothesized as
having effects on the repayment rate of maize farmers, size
of loan, farm size, income, age of farmers, number of
years of farming experience, level of formal education,
and adoption of innovations were strong determinants of
repayment rate. In the case of rice farmers, farm-size,
income, age of farmers, distance between home and source
of loan, level of formal education, and credit needs
were strong determinants of repayment rate; and in the
case of poultry farmers, size of loan, farm-size, income,
age of farmers, number of years of farming experience,
level of formal education, adoption of innovation, and
credit needs were strong determinants of repayment rate.

The results of the multiple correlation analysis
revealed that among the independent variables hypothesized
as having relationships with the farmers' income, number
of farmers supervised had an inverse relationship with
the farmers' income, while length of service as supervisors,
level of formal training in agriculture, and number of
farm visits showed direct relationship.

The results of the discriminant analysis revealed
that among the independent variables hypothesized as
having effects on the credit-worthiness of the maize farmers,
size of loan, farm size, age of farmers, number of years
of farming experience, distance between home and source of
loan, and level of formal education of farmers were strong
determinants of credit-worthiness. In the case of rice
farmers, farm size, income, number of years of farming
experience, distance between home and source of loan, level
of formal education of farmers, and credit needs were
strong determinants of credit-worthiness, and in the case of
poultry farmers, age of farmers, distance between home and
source of loan, and level of formal education of farmers were
strong determinants of credit-worthiness.

The critical value of the discriminant score for the
maize farmers was theoretically 1.14825, and practically 1.13156.
The critical value of the discriminant score for the rice
farmers was theoretically -3.91639, and practically -3.70998.
That of the poultry farmers was theoretically 0.444615, and

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practically 0.4200. Twenty-nine per cent of the maize

farmers who were given loan were not qualified while 1%

of those who were not given were qualified, and therefore,

the percentage of "grouped" cases correctly classified

was 94%. In the case of rice farmers, all the farmers who

were qualified for loan were given loan indicating that the

percentage of "grouped" cases correctly classified was 100%,

and in the case of poultry farmers, 25% of poultry farmers

who were given loan were not qualified while 33% of poultry

farmers who were not given loan were qualified and, therefore,

the percentage of "grouped" cases correctly classified was

69%. This indicates that there were more credit-worthy farmers

who were not given loan among the poultry farmers compared to

maize and rice farmers.

The conclusions which are derived from this study are

as follows:

1. Loan repayment rate of maize farmers is directly

related to size of loan, farm size, income, age of

farmers, number of years of farming experience,

level of formal education of farmers, and
adoption of innovations. Highly significant
determinants of loan repayment are size of loan,
income, number of years of farming experience,
and adoption of innovations. The farmers'
credit-worthiness is directly related to size of
loan, farm size, age of farmers, number of years
of farming experience, and level of formal education
of farmers, and inversely related to distance
between home and source of loan. Highly significant
discriminator of credit-worthiness for the farmers
is size of loan.

2. Loan repayment rate of rice farmers is directly
related to farm size, income, level of formal
education, and credit needs, and inversely
related to age of farmers, and distance between
home and source of loan. Highly significant
determinants of loan repayment are farm size, income,
distance between home and source of loan, and
credit needs. The farmers' credit-worthiness is

directly related to farm size, income, number of
years of farming experience, level of formal education
of farmers, and credit needs, and inversely related to
distance between home and source of loan. Highly
significant discriminator of credit-worthiness for
the farmers is income.

3. Loan repayment rate of poultry farmers is directly
related to size of loan, farm size, income, age of
farmers, number of years of farming experience, level
of formal education of farmers, adoption of innovations,
and credit needs. Highly significant determinants of
loan repayment are farm size, income, age of farmers,
number of years of farming experience, adoption of
innovations, and credit needs. The farmers' credit-
worthiness is directly related to age of farmers and
level of formal education of farmers, and inversely
related to distance between home and source of loan.
Highly significant discriminators of credit-worthiness
for the farmers are age of farmers, distance between
home and source of loan, and level of formal education
of farmers.

4. Income of maize farmers is positively correlated
    with length of service of the supervisors as
    supervisors, level of formal training in agriculture,
    and number of farm visits by the supervisors, and
    negatively correlated with number of farmers supervised
    by the supervisors.

5. Income of rice farmers is positively correlated with
    length of service of the supervisors as supervisors,
    level of formal training in agriculture, and number
    of farm visits by the supervisors, and negatively
    correlated with number of farmers supervised by the
    supervisors.

6. Income of poultry farmers is positively correlated
    with length of service of the supervisors as supervisors,
    level of formal training in agriculture, and number of
    farm visits by the supervisors, and negatively correlated
    with number of farmers supervised by the supervisors.

8.2 Recommendations:-

Farmers encountered many problems in trying to secure
loans while the Supervised Agricultural Credit Scheme also had

problems in the disbursement and collection of their loans. Considering the immense benefits that can be derived from a well administered credit scheme, some recommendations are offered below:

1. Effort should be made to improve on the level of income of these farmers, especially maize and poultry farmers, through increasing the resources controlled in improvement of production technology.

2. Credit agencies should be readily accessible at the village level if their impact is to be felt by small farmers. This should be done by decentralization of the operations of the scheme, although it will incure some high administrative costs in the short-run.

3. Because of its usefulness, farmers should be given training on basic farm management and production techniques by the supervisors of the Supervised Agricultural Credit Scheme.

4. It has been documented by some authors that group
   farmers generally perform better than individual
   farmers in the repayment of their loans. Here, it
   is suggested that a co-ordinated credit delivery system
   be evolved by the Scheme. This can be done by the
   Supervised Agricultural Credit Scheme giving loans
   to farmers through their co-operative societies.
   This will be doubly beneficial since it will make for
   easier access to loans on the part of the farmers and
   a high recovery rate for the scheme. This is a more
   effective way of credit recovery.

5. Since agricultural production has the characteristics
   of being seasonal, the Supervised Agricultural Credit
   Scheme should process farmers' applications with
   despatch. This will enable the farmers to buy production
   inputs and carry out other requisite operations at
   appropriate periods.

6. The success of the scheme depends, to a large extent,
   on the staff of these institutions. Where they are
   well remunerated, they will be in a position to give
   out their best. Thus, it is suggested that the
   supervisors of the scheme be given adequate
   encouragement and incentives in the job. There is also
   the possibility of improving the farmers' welfare by
   employing more number of qualified and experienced
   supervisory staff since it has been shown that the
   number of farmers supervised by a supervisor has an
   inverse relationship with the farmers' income.

7. Maize farmers who have relatively large farm size,
   are older in age, have high number of years of farming
   experience, short distance between home and source
   of loan, and high level of formal education should be
   given loan.

8. Rice farmers who have large farm size, high income, high number of years of farming experience, short distance between home and source of loan, high level of formal education, and high credit needs should be given loan.

9. Poultry farmers who are older in age, have short distance between home and source of loan, and high level of formal education should be given loan.

10. Finally, the administration of Anambra State Supervised Agricultural Credit Scheme should consider these recommendations critically and possibly restructure the contents of the loan application forms issued to farmers by emphasising more on these farmer characteristics as may affect the overall performance of the scheme.

8.3. Limitations of the Study and Suggestions for

Further Study:

In the course of this study, certain deficient
areas of interest were identified on which further
investigation need to be conducted. These include:
1. The identification problem. It is obvious from

this study that factors influencing the repayment

rate and credit-worthiness of maize and rice

farmers, though similar, should be quite different

from those affecting those of poultry farmers

generally. This is evident from the relatively

low co-efficient of determination, low canonical

correlation co-efficient, and high Wilks' Lambda values

for poultry farmers. Thus, the characteristics of

maize and rice production are both agronomically and

socio-economically similar compared to those of

poultry production. Further research should,

therefore, be carried out to identify those other

factors that are peculiar to poultry production

which can greatly influence the repayment performance

and credit-worthiness of poultry farmers. These

other factors, when identified, could immensely

help the Anambra State Supervised Agricultural

Credit Scheme in the finance of poultry production.

The scheme has stopped financing poultry production

in the State.

2. The need to compare the agricultural zones. Further

study needs to be carried out to compare income,

repayment performance, and credit-worthiness of the

farmers in the five agricultural zones of the state.

This is necessitated by the fact that agricultural

production and marketing in these zones may not be

similar and may, therefore, give rise to

differentials in the farmers' loan repayment

performance, and credit-worthiness. If these

differentials happen to exist and are detected, the

scheme will be in a good position to formulate a

more effective agricultural credit policy for the

farmers in the State.

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APPENDIX I

FOOD PRODUCTION IN MILLION TONNES, 1974 - 1978

S/No.	Items	1974	1976	1977	1978
1.	Millet	5.60	2.60	2.90	2.90
2.	Guinea Corn	5.60	2.60	3.30	3.30
3.	Maize	0.53	1.33	0.77	1.14
4.	Cowpea	-	0.86	0.41	0.71
5.	Yam	-	8.62	6.69	7.70
6.	Cassava	-	2.52	1.97	2.20
7.	Groundnut	1.95	0.45	0.59	0.52
8.	Melon	0.05	0.21	0.14	0.18
9.	Rice	0.53	0.52	0.41	0.42
10.	Cocoyam	0.48	0.50	0.40	0.50
11.	Poultry (Million nos.)	-	110.67	66.33	81.89
12.	Cattle (Million nos.)	-	5.89	3.44	4.74

Source: Central Planning Office, Lagos.

APPENDIX II

GROSS DOMESTIC PRODUCT (GDP) AT 1977/78 FACTOR COST (₦' Million)

Activity Sector	1984 (1)	1985* (2)	1986+ (3)	% Share in Total 1984	1985	1986	% change between 1 and 2	2 and 3
1. Agriculture, including livestock, forestry and Fishing	6691	6948	7097	25.90	26.60	28.10	+3.80	+2.10
2. Crude Petroleum	4501	4886	4346	17.40	18.70	17.20	+8.60	-11.10
3. Other Mining and Quarrying	374	299	304	1.50	1.10	1.20	-20.10	+1.70
4. Manufacturing	2968	2434	2279	11.50	9.30	9.00	-18.00	-6.40
5. Utilities	205	214	215	0.80	0.80	0.80	+4.40	+0.50
6. Construction	1684	1347	1280	6.50	5.20	5.10	-20.00	-5.00
7. Transport	821	690	700	3.20	2.60	2.80	-16.00	+1.40
8. Communication	58	56	60	0.20	0.20	0.20	-3.40	+7.10
9. Wholesale and Retail Trade	4560	5012	4761	17.60	19.20	18.80	+9.90	-5.00
10 Hotels and Restaurants	136	131	133	0.50	0.50	0.50	-3.70	+1.50
11 Finance and Insurance	830	916	937	3.20	3.50	3.70	+10.40	+2.30
12 Real Estate and Business Services	50	54	56	0.20	0.20	0.20	+8.00	+3.70
13 Housing	793	1032	929	3.10	3.90	3.70	+30.10	-10.00
14 Producers of Government services	2184	2140	2193	8.40	8.20	8.70	-2.00	+2.50
15 Total	25855	26159	25290	100.00	100.00	100	+1.20	-3.30

*Revised
+Estimate by the Federal Ministry of National Planning, Lagos.

Source: Federal Office of Statistics, Lagos.

APPENDIX III

GROSS DOMESTIC PRODUCT (GDP) AT 1984 FACTOR COST (₦'Billion)

Activity Sector	1985 (1)	1986* (2)	1987+ (3)	% share in Total 1985	1986	1987	% change between 1 & 2	2 & 3
1. Agriculture	17.52	18.00	17.92	23.53	24.69	24.29	2.74	-0.44
2. Livestock	5.86	5.92	6.01	7.87	8.12	8.15	1.02	1.52
3. Forestry	2.29	2.29	2.29	3.08	3.14	3.10	0.00	0.00
4. Fishing	1.34	1.25	1.29	1.80	1.71	1.75	-6.72	3.20
5. Crude Petroleum	11.65	10.91	9.94	15.64	14.97	13.47	-6.35	-8.69
6. Mining and Quarrying	0.29	0.20	0.21	0.39	0.27	0.28	-31.03	5.00
7. Manufacturing	4.23	4.23	4.65	5.68	5.80	6.30	0.00	9.93
8. Utilities	0.39	0.39	0.41	0.52	0.53	0.56	0.00	5.13
9. Building and Construction	1.05	0.90	0.92	1.41	1.23	1.25	-44.29	2.22
10. Transportation	3.10	3.10	3.21	4.16	4.25	4.35	0.00	3.5
11. Communication	0.10	0.10	0.10	0.13	0.14	0.14	0.00	0.
12. Wholesale and Retail Trade	19.80	18.81	19.75	26.59	25.80	26.77	-5.00	5.00
13 Hotels and Restaurants	0.20	0.20	0.21	0.28	0.27	0.28	-4.76	5.00
14. Finance and Insurance	1.30	1.40	1.55	1.75	1.92	2.10	7.69	10.71
15. Real Estates and Business Services	0.20	0.21	0.22	0.27	0.29	0.30	5.00	4.76
16. Housing	2.36	2.36	2.43	3.17	3.24	3.29	0.00	2.97
17. Producers of Government Services	2.78	2.63	2.66	3.73	3.61	3.61	-5.40	1.14
Total	74.47	72.90	73.77	100	100	100	-2.11	1.20

*Revised

+Estimates by the Federal Ministry of Finance and Economic Development, Lagos.

Source: Federal Office of Statistics, Lagos.

APPENDIX IV

ESTIMATED OUTPUT OF MAJOR AGRICULTURAL COMMODITIES ('000 Tonnes, Except Otherwise Stated).

Commodities	1984[1] (1)	1985[1] (2)	1986[2] (3)	% Change between (1) and (2)	% Change between (2) and (3)
1 CROPS					
Maize	1058	1190	1336	12.50	12.30
Millet	3349	3684	4111	10.00	11.60
Sorghum	4608	4991	5455	8.30	9.30
Rice	157	196	283	24.80	13.80
Beans	477	611	732	28.10	19.80
Cassava	1209	1378	1564	14.00	13.50
Yam	4600	4738	5209	3.00	9.90
Plantain	1086	1113	1127	2.50	1.30
Soyabeans	43	60	73	39.50	21.70
Melon	143	147	153	2.80	4.10
Groundnut	591	621	640	5.10	3.10
Beniseed	31	35	35	12.90	0.00
Coconut	101	102	104	1.00	2.00
Sheanut	99	100	103	1.00	3.00
Cotton seed	108	114	100	5.60	-12.30
Palm kernel	340	360	350	5.90	-2.80
Palm Oil	550	615	650	11.80	5.70
Cocoa	140	160	123	14.30	-23.10
Rubber	199	226	190	13.60	-15.90
Sugar Cane	821	862	897	5.00	4.10
2 LIVESTOCK					
Poultry	62	64	67	3.20	4.70
Goat Meat	177	186	192	5.10	3.20

APPENDIX IV (CONTD.)

Lamb and Mutton	65	66	68	1.50	3.00
Beef	199	212	223	6.50	5.20
Pork	28	31	33	10.70	6.50
Milk	164	172	180	4.90	4.70
Eggs	380	390	399	2.60	2.30

3 FISH

Artisanal Coastal and Brackish Water Catches	228	142	128	-37.70	-9.90
Inland Lakes and River Catches	92	61	104	-33.70	70.50
Fish farm	22	15	n.a.	-31.80	-
Industrial coastal Fish and Shrimp	25	25	14	0.00	-44.00

4 FORESTRY ('000 Cubic metres)

Roundwood	89843	92538	92562	3.00	0.00
Sawn wood	900	910	926	1.10	1.80
Wood based panels	110	113	118	2.70	4.40
Paper and Paper Boards	12	13	14	8.30	7.70

[1] Revised

[2] Provisional

Source:- Federal Office of Statistics, Lagos.

APPENDIX V

ESTIMATED OUTPUT OF MAJOR AGRICULTURAL COMMODITIES ('000 Tonnes
Except otherwise Stated)

Commodities	1985[1]	1986[1]	1987[2]	% Change between	
	(1)	(2)	(3)	(1) and (2)	(2) and (3)
1 CROPS					
Maize	1190	1336	1202	12.30	-10.00
Millet	3684	4111	3905	11.60	-5.00
Sorghum	4991	5455	5182	9.30	-5.00
Rice	196	.283	297	44.40	4.90
Wheat	113	132	139	16.80	5.30
Acha	25	27	26	8.00	-3.70
Beans	611	732	688	19.80	-6.00
Cassava	1378	1564	1486	13.50	-5.00
Potato	43	46	45	7.00	-2.20
Yam	4738	5209	4886	9.90	-6.60
Cocoyam	232	373	354	60.80	-5.10
Plantain	1113	1127	1071	1.30	-5.00
Vegetables	1254	1293	1241	3.10	4.00
OTHER CROPS					
Melon	147	153	145	4.10	-5.20
Groundnut	621	640	657	3.10	2.70
Beniseed	35	35	34	0.00	-2.90
Coconut	102	104	105	2.00	1.00
Sheanut	100	103	104	3.00	1.00
Soyabeans	114	100	107	-12.30	7.00
Cotton seed	46	30	32	-34.80	6.70
Palm kernel	360	350	353	-2.80	0.90
Cocoa	110	100	105	-9.10	5.00

APPENDIX V (CONTD.)

Coffee	6	6	6	0.00	0.00
Rubber	58	60	51	3.40	-15.00
Sugar Cane	862	897	852	4.10	-5.00
Palm wine	4882	4940	4951	1.20	0.20
Tobacco	22	25	26	13.60	4.00
2 LIVESTOCK					
Poultry	44	67	56	4.70	-16.40
Goat Meat	186	192	206	3.20	5.10
Lamb/Mutton	66	68	75	3.00	10.20
Beef	212	223	232	5.20	4.00
Pork	31	33	34	6.50	3.00
Milk	172	180	182	4.70	1.10
Eggs	390	399	332	2.30	-16.80
3 FISH					
Artisanal Coastal and Brackish Water Catches	140.90	137.20	143.10	-2.60	4.30
Inland Lakes and Rivers	60.50	107.00	233.10	76.90	117.90
Fish Farming/ Inshore Fishing	38.80	37.20	15.70	-4.10	-57.80
Shrimps	1.50	1.60	1.30	6.70	-18.80
Distant water	61.70	65.20	85.80	5.70	31.60
4 FORESTRY ('000 Cubic metres)					
Round wood	92538	92562	95524	0.00	3.20
Sawnwood	910	926	939	1.80	1.40
Wood Based Panels	113	118	118	4.40	0.00
Paper and Paper Boards	13	14	14	7.70	0.00

[1]Revised   [2]Provisional

Source: Federal Office of Statistics, Lagos.

APPENDIX VI

IMPORTS BY S.I.T.C. SECTION (₦'million)

Sections	1984[1] (1)	1985[2] (2)	1986[2] (3)	% Change between (1)and(2)	(2)and(3)
0 Food and Live Animals	1052.10	686.10	534.40	-34.80	-22.10
1 Beverages and Tobacco	7.00	6.30	13.00	-10.00	+106.30
2 Crude Materials	143.50	185.00	159.00	+28.90	-14.10
3 Mineral Fuels	111.30	160.10	35.60	+43.80	-77.80
4 Animal and Vegetable Oils and Fats	84.90	79.80	199.10	-6.00	+149.50
5 Chemicals	852.30	1453.70	720.70	+70.60	-50.40
6 Manufactured goods	1241.70	1670.40	1053.60	+34.50	-36.90
7 Machinery and Transport Equipment	3256.60	3444.50	2518.90	+5.80	-26.90
8 Miscellaneous Manufactured articles	418.30	234.40	234.30	-44.00	-0.04
9 Miscellaneous Transactions unclassified	10.60	12.60	1.20	+18.90	-90.50
Total	7178.30	7932.90	5469.70	+10.50	-31.10

[1] Provisional

[2] C.B.N. Estimates

Source: Compiled from Data supplied by Exchange Control Department and Federal Office of Statistics, Lagos.

APPENDIX VII

IMPORTS BY S.I.T.C. SECTION (₦' Million)

Sections	1985[1] (1)	1986[1] (2)	1987[2] (3)	% Change between (1)and(2)	(2)and(3)
0 Food and Live Animals	1199.80	802.10	1573.70	-33.10	+96.20
1 Beverages and Tobacco	9.40	14.50	38.60	+54.30	+166.20
2 Crude Minerals	350.50	193.90	879.50	-44.70	+353.60
3 Mineral Fuels	61.20	42.20	86.80	-31.00	+105.70
4 Animal and Vegetable Oils and Fats	71.10	124.80	65.20	+75.50	-47.80
5 Chemicals	1108.30	1039.00	2923.30	-6.30	+181.40
6 Manufactured Goods	1611.70	1237.10	4648.40	-23.20	+275.70
7 Machinery and Transport Equipment	2414.40	2277.80	7034.60	-5.70	+208.80
8 Miscellaneous Manufactured Articles	224.50	246.30	606.00	+9.70	+146.00
9 Miscellaneous Transactions Unclassified	11.70	5.90	5.60	-49.60	-5.10
Total	7062.60	5983.60	17861.70	-15.30	+198.50

[1]Revised

[2]C.B.N. Estimates

Source: Compiled from Data Supplied by Federal Office of

Statistics, Lagos.

APPENDIX VIII

GROUPING OF MAIZE FARMERS

S/N	Y_M	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	GROUPS
1.	59	2000	4	5393	54	33	92	0	18	1	0	1
2.	58	2000	3	6483	49	23	60	6	11	1	1	1
3.	57	2000	3	6483	41	18	61	8	8	1	1	1
4.	55	2000	3	6483	45	24	58	8	9	1	1	1
5.	54	2000	3	6483	47	25	91	6	10	1	1	1
6.	53	2000	3	6483	48	24	54	6	11	1	1	1
7.	51	2000	3	6483	40	17	59	8	8	1	1	1
8.	50	2000	3	6483	46	21	57	6	9	1	1	1
9.	50	2000	4	5376	47	35	29	0	20	1	0	1
10.	47	1000	4	5376	58	34	27	0	22	1	0	1
11.	46	1000	3	4045	46	22	93	6	12	1	1	1
12.	44	1000	3	4045	48	23	97	6	10	1	1	1
13.	43	1000	3	4032	40	17	87	3	8	1	1	1
14.	42	1000	3	4032	50	30	29	3	16	1	1	1
15.	41	1000	3	4045	44	21	86	6	9	1	1	1
16.	40	1000	3	4032	47	24	22	3	6	1	1	1
17.	40	1000	3	4045	49	24	100	3	10	1	0	1
18.	39	1000	3	4032	46	25	20	6	11	1	0	2
19.	38	1000	3	4032	49	30	25	3	11	1	1	2
20.	37	1000	3	4045	48	24	120	3	9	1	0	2

APPENDIX VIII (CONTD.)

21.	37	1000	3	4032	48	27	20	6	10	1	1	2
22.	37	1000	3	4032	50	31	30	6	17	1	1	2
23.	36	1000	2	4032	38	17	119	8	7	1	1	2
24.	35	1000	3	4032	52	29	30	3	14	1	1	2
25.	34	1000	2	4932	40	17	121	8	8	1	1	2
26.	33	1000	2	4032	41	17	137	6	7	1	1	2
27.	33	1000	3	4032	49	27	19	6	8	1	1	2
28.	33	1000	3	4032	51	29	30	6	12	1	1	2
29.	33	1000	3	4032	51	29	39	6	18	1	1	2
30.	33	1000	3	4032	45	20	38	6	9	1	1	2
31.	32	1000	2	4322	37	16	99	8	6	1	1	2
32.	32	1000	2	4322	37	15	160	8	8	1	1	2
33.	31	1000	2	2688	38	10	19	8	6	1	1	2
34.	31	1000	2	4322	39	12	140	8	8	1	1	2
35.	30	1000	3	4032	47	25	39	3	9	1	1	2
36.	30	1000	2	4322	40	15	62	8	11	1	1	2
37.	29	1000	2	4322	39	19	145	8	6	1	1	2
38.	28	1000	2	2697	37	14	111	6	7	1	1	2
39.	28	1000	2	2697	42	19	120	6	7	1	1	2
40.	28	1000	2	2697	40	19	121	6	5	1	1	2

APPENDIX VIII (CONTD.)

41.	28	1000	2	2697	39	12	119	6	9	1	1	2
42.	28	1000	2	2697	40	20	118	6	8	1	1	2
43.	28	1000	2	2697	41	18	112	8	6	1	0	2
44.	28	1000	3	4032	47	26	35	3	10	1	1	2
45.	28	1000	2	2688	37	14	38	8	6	1	1	2
46.	28	1000	2	2688	40	18	36	8	7	1	0	2
47.	28	1000	2	2688	39	10	33	8	6	1	1	2
48.	28	1000	2	2688	44	21	60	6	9	1	1	2
49.	28	1000	2	2688	42	21	62	6	10	1	1	2
50.	28	1000	2	2688	26	5	90	6	4	1	1	2
51.	28	1000	2	2697	41	16	110	6	7	1	1	2
52.	27	1000	2	2688	46	25	62	8	8	1	1	2
53.	27	1000	2	2688	48	26	61	6	12	1	1	2
54.	26	1000	2	2688	40	15	62	8	9	1	1	2
55.	26	1000	2	2688	39	16	34	8	7	1	1	2
56.	26	1000	2	2688	29	8	93	6	4	1	1	2
57.	25	1000	2	2688	33	12	91	6	5	1	1	2
58.	24	1000	2	2688	38	15	31	6	6	1	1	2
59.	24	1000	2	2688	48	26	63	6	10	1	1	2
60.	23	1000	2	2688	36	12	38	8	6	1	0	2

APPENDIX VIII (CONTD.)

61.	23	1000	2	2688	43	16	64	6	11	1	1	2
62.	23	1000	2	2688	41	16	64	8	9	1	1	2
63.	22	1000	2	2688	35	15	94	3	5	1	1	2
64.	22	1000	2	2697	38	15	126	6	8	1	1	2
65.	21	1000	2	2688	47	22	66	6	10	1	1	2
66.	21	1000	2	2688	40	17	33	8	8	1	0	2
67.	21	1000	2	2697	40	16	124	8	5	1	0	2
68.	21	1000	2	2688	40	16	65	6	8	1	1	2
69.	20	1000	2	2688	49	28	76	8	12	1	1	2
70.	19	1000	2	2688	48	27	68	6	12	1	1	2
71.	19	1000	2	2688	40	16	114	8	8	1	1	2
72.	19	1000	1	1344	37	14	78	8	7	1	1	2
73.	18	1000	2	2688	47	24	80	6	11	1	1	2
74.	17	1000	2	2688	41	20	40	6	7	1	1	2
75.	16	1000	1	1344	38	15	72	6	7	1	1	2
76.	16	1000	2	2700	39	16	117	6	10	0	1	2
77.	14	1000	1	1348	35	13	121	8	6	1	1	2
78.	14	1000	1	1348	30	7	120	8	5	1	1	2
79.	14	1000	1	1344	36	12	70	8	7	1	1	2
80.	14	1000	1	1348	31	9	122	8	6	1	1	2

APPENDIX VIII (CONTD.)

81.	13	1000	1	1344	36	13	75	8	6	1	1	2
82.	13	1000	1	1344	38	13	76	8	6	1	1	2
83.	12	1000	1	1348	33	12	129	8	5	1	1	2
84.	12	1000	1	1348	36	13	128	8	5	1	1	2
85.	12	1000	1	1344	37	12	77	8	11	1	1	2
86.	11	1000	1	1344	39	14	78	6	8	1	1	2
87.	11	1000	1	1348	35	12	130	8	6	1	1	2
88.	10	1000	1	1348	32	11	126	8	5	1	1	2
89.	10	1000	1	1348	30	9	132	8	5	1	1	2
90.	10	1000	1	1344	39	12	73	6	9	0	1	2
91.	9	1000	1	1344	40	14	75	6	10	0	1	2
92.	9	1000	1	1348	34	10	132	8	6	1	1	2
93.	8	1000	1	1348	34	15	134	8	7	1	1	2
94.	8	1000	1	1344	36	14	70	8	7	1	1	2
95.	6	1000	1	1348	37	15	135	8	9	1	1	2

APPENDIX IX

CANONICAL DISCRIMINANT FUNCTIONS EVALUATED AT

GROUP MEANS (Group Centroids) (THEORETICAL)

Group	Func 1
1	2.93651
2	-0.64001

Critical Region = 1.14825

S/No.	Group	Actual Group	Discriminant Scores
1	1	1	6.4803
2	1	1	4.6637
3	1	1	3.9146
4	1	1	3.4401
5	1	1	4.2439
6	1	1	4.3004
7	1	1	3.9346
8	1	1	4.4784
9	1	1	4.7390
10	1	1	2.4483
11	1	1***	1.1355
12	1	1	1.1751
13	1	1	1.5160
14	1	1***	0.5268
15	1	1***	0.8329

APPENDIX IX (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
16	1	1***	0.6282
17	1	1	1.4629
1	2	2	-0.3108
2	2	2	0.1169
3	2	2***	1.4415
4	2	2	-0.1582
5	2	2	-0.1659
6	2	2	-0.9459
7	2	2	0.8921
8	2	2	-0.6046
9	2	2	0.0005
10	2	2	-0.1232
11	2	2	0.0848
12	2	2	0.4450
13	2	2	0.7536
14	2	2	-1.1217
15	2	2	-0.3483
16	2	2	-0.2816
17	2	2	0.2897
18	2	2	0.7361
19	2	2	-0.5974

S/No.	Group	Actual Group	Discriminant Scores
20	2	2	-0.9912
21	2	2	0.0653
22	2	2	-0.0438
23	2	2	-0.4081
24	2	2	-0.7230
25	2	2	-0.4651
26	2	2	-0.7766
27	2	2	0.5755
28	2	2	-0.9646
29	2	2	-1.4923
30	2	2	-0.0277
31	2	2	-0.5147
32	2	2	-0.7277
33	2	2	-0.1962
34	2	2	0.2609
35	2	2	-1.3520
36	2	2	-0.3833
37	2	2	-1.0233
38	2	2	-0.2814
39	2	2	-0.3970
40	2	2	-0.6767
41	2	2	-0.7643

APrENDIX IX (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
42	2	2	-0.7643
43	2	2	-1.0263
44	2	2	0.3513
45	2	2	-0.4035
46	2	2	-0.0475
47	2	2	0.2000
48	2	2	-0.1771
49	2	2	-1.2941
50	2	2	-0.5135
51	2	2	-1.0702
52	2	2	-1.1560
53	2	2	-0.8030
54	2	2	-0.1776
55	2	2	-1.7230
56	2	2	-0.3646
57	2	2	-1.0154
58	2	2	-1.4269
59	2	2	-0.3263
60	2	2	-1.5189
61	2	2	-1.2162

APPENDIX IX (CONTED.)

S/No.	Group	Actual Group	Discriminant Scores
62	2	2	-1.5770
63	2	2	-1.3640
64	2	2	-1.7588
65	2	2	-1.4733
66	2	2	-1.6025
67	2	2	-1.3703
68	2	2	-1.1901
69	2	2	-1.0160
70	2	2	-1.2695
71	2	2	-1.5906
72	2	2	-1.4678
73	2	2	-1.1692
74	2	2	-1.3170
75	2	2	-1.0411
76	2	2	-1.8532
77	2	2	-1.9276
78	2	2	-1.3338

*** = Not Correctly Classified.

The Percentage of "Grouped" Cases Correctly

Classified = 94.74%

APPENDIX X

CANONICAL DISCRIMINANT FUNCTIONS EVALUATED AT GROUP

MEANS (Group Centroids) (PRACTICAL)

Group	Func 1
1	2.89383
2	-0.63071

Critical Region = 1.13156

S/No.	Group	Actual Group	Discriminant Scores
1	1	1	6.1909
2	1	1	4.6577
3	1	1	3.9304
4	1	1	3.5539
5	1	1	4.3287
6	1	1	4.3396
7	1	1	3.9320
8	1	1	4.5385
9	1	1	4.5422
10	1	1	2.3141
11	1	1***	0.8648
12	1	1***	1.0071
13	1	1	1.4102
14	1	1***	0.3904
15	1	1***	0.7012

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APPENDIX X (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
16	1	1***	0.8340
17	1	1	1.6506
1	2	2	-0.0935
2	2	2	0.2412
3	2	2***	1.6639
4	2	2	-0.1254
5	2	2	-0.3771
6	2	2	-0.7328
7	2	2	0.8114
8	2	2	-0.4593
9	2	2	0.2100
10	2	2	-0.0030
11	2	2	0.0437
12	2	2	0.1080
13	2	2	0.6334
14	2	2	-0.8598
15	2	2	-0.2783
16	2	2	-0.4282
17	2	2	0.2748
18	2	2	0.8099
19	2	2	-0.5896

APPENDIX X (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
20	2	2	-0.7086
21	2	2	-0.0575
22	2	2	-0.0730
23	2	2	-0.3251
24	2	2	-0.7602
25	2	2	-0.4921
26	2	2	-0.5395
27	2	2	0.6357
28	2	2	-1.0044
29	2	2	-1.2122
30	2	2	-0.1985
31	2	2	-0.5336
32	2	2	-0.7786
33	2	2	-0.3231
34	2	2	0.1627
35	2	2	-1.2678
36	2	2	-0.7359
37	2	2	-0.5896
38	2	2	-1.0649
39	2	2	-0.3495
40	2	2	-0.4277
41	2	2	-0.6450

APPENDIX X (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
42.	2	2	-0.7216
43	2	2	•-0.8428
44	2	2	0.0933
45	2	2	-0.5913
46	2	2	0.0543
47	2	2	0.0337
48	2	2	-0.2474
49	2	2	-1.0880
50	2	2	-0.2922
51	2	2	-0.2884
52	2	2	-1.2156
53	2	2	-0.8315
54	2	2	-0.3637
55	2	2	-1.7676
56	2	2	-0.4386
57	2	2	-0.9198
58	2	2	-1.4011
59	2	2	-0.0465
60	2	2	-1.5740
61	2	2	-1.3558
62	2	2	-1.6632

APPENDIX X (CONTD..)

S/No.	Group	Actual Group	Discriminant Score
63	2	2	-1.5030
64	2	2	-1.7731
65	2	2	-1.5067
66	2	2	-1.6305
67	2	2	-1.3944
68	2	2	-1.4835
69	2	2	-1.0830
70	2	2	-1.3641
71	2	2	-1.6360
72	2	2	-1.5612
73	2	2	-0.8275
74	2	2	-0.9748
75	2	2	-1.1883
76	2	2	-1.9020
77	2	2	-1.9544
78	2	2	-1.5059

*** = Not Correctly Classified

The Percentage of "Grouped" Cases Correctly

Classified = 93.68%

APPENDIX XI

STATISTICAL TEST OF SIGNIFICANCE FOR MAIZE
DISCRIMINANT FUNCTION

THEORETICAL

Canonical Correlation	0.8108708
Wilks' Lambda	0.3424886
Chi-Squared	94.293
D.F.	10

PRACTICAL

Canonical Correlation	0.8067765
Wilks' Lambda	0.3491117
Chi-Squared	94.713
D.F.	6

APPENDIX XII

GROUPING OF RICE FARMERS

S/N	Y_R	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	GRO-UPS
1	100	1200	4	93600	56	34	76	0	22	0	0	1
2	100	2400	4	93600	54	30	70	0	20	0	0	1
3	100	1200	3	70200	49	29	71	0	12	1	1	1
4	100	1200	4	93600	53	29	92	0	17	0	0	1
5	100	1200	3	70200	47	27	84	3	17	1	1	1
6	100	1200	3	70200	49	30	62	0	16	1	1	1
7	100	1200	3	70200	42	20	64	3	12	1	1	1
8	100	2400	4	93600	52	30	95	0	24	0	0	1
9	100	1200	4	93600	57	31	93	0	23	0	0	1
10	100	1200	4	93600	58	36	90	0	19	0	0	1
11	100	2400	4	93600	51	32	89	0	14	0	0	1
12	100	1200	4	93600	50	32	84	0	18	0	0	1
13	100	1200	3	70200	41	18	80	6	11	1	1	1
14	100	1200	3	70200	43	20	82	3	9	1	1	1
15	100	1200	4	93600	56	35	88	0	20	0	0	1
16	100	1200	3	70200	46	24	72	3	10	1	1	1
17	100	2400	4	93600	51	31	77	0	12	0	0	1
18	100	1200	3	70200	39	17	63	6	6	1	1	1
19	100	1200	3	70200	42	19	60	3	8	1	1	1
20	100	1200	3	70200	48	30	68	3	14	1	1	1

APPENDIX XII (CONTD.)

21	100	1200	4	93600	52	30	63	0	16	0	0	1
22	100	1200	4	93600	49	30	66	3	13	1	0	1
23	100	1200	3	70200	44	23	69	3	12	1	1	1
24	100	2400	4	93600	55	35	99	0	19	0	0	1
25	100	1200	3	70200	50	28	84	0	17	1	1	1
26	100	1200	2	48600	45	22	81	6	10	1	1	1
27	100	1200	3	72900	52	31	80	0	19	0	0	1
28	100	1200	3	72900	56	35	83	3	21	1	0	1
29	100	1200	3	72900	58	35	85	3	19	1	0	1
30	100	1200	3	72900	56	33	82	0	24	0	0	1
31	100	1200	3	72900	57	36	86	3	18	1	0	1
32	100	1200	3	72900	55	35	86	6	22	1	0	1
33	100	1200	4	93600	54	30	16	0	19	0	0	1
34	100	1200	4	93600	58	38	18	0	19	0	0	1
35	100	1200	4	93600	56	35	18	0	20	0	0	1
36	100	1200	4	93600	56	34	16	0	21	0	0	1
37	100	2400	4	93600	55	20	19	0	23	0	0	1
38	100	1200	4	93600	52	30	17	3	14	1	0	1
39	100	1200	3	70200	48	27	124	3	14	1	1	1
40	100	2400	4	93600	57	35	128	0	19	0	0	1

APPENDIX XII (CONTD.)

41	100	1200	3	70200	40	17	124	6	6	1	1	1
42	100	1500	3	70200	49	25	134	6	13	1	1	1
43	100	2400	4	93600	54	31	128	0	18	0	0	1
44	100	1200	3	70200	45	20	130	8	12	1	1	1
45	100	1200	3	70200	44	20	157	6	10	1	1	1
46	100	1200	3	70200	43	20	131	6	7	1	1	1
47	100	1500	3	70200	43	18	135	6	8	1	1	1
48	100	1200	4	93600	55	34	135	0	20	0	0	1
49	100	1200	4	93600	52	30	147	2	17	1	1	1
50	100	1200	3	70200	40	19	126	6	8	1	1	1
51	100	1200	4	93600	50	27	135	2	13	1	0	1
52	100	1200	3	70200	46	23	140	6	7	1	1	1
53	92	1200	2	48600	56	37	100	0	15	0	0	2
54	89	1200	2	48600	59	38	100	0	22	0	0	2
55	87	1200	1	23400	53	30	126	0	19	0	0	2

APPENDIX XIII

CANONICAL DISCRIMINANT FUNCTIONS EVALUATED AT

GROUP MEANS (Group Centroids) (THEORETICAL)

Group	Func 1
1	0.47956
2	-8.31234
Crtical Region =	-3.91639

S/No.	Group	Actual Group	Discriminant Scores
1	1	1	0.3158
2	1	1	0.8625
3	1	1	-0.5960
4	1	1	0.1005
5	1	1	0.6420
6	1	1	-0.0406
7	1	1	1.0802
8	1	1	1.4605
9	1	1	0.1475
10	1	1	-0.5117
11	1	1	0.4500
12	1	1	0.7623
13	1	1	1.6010
14	1	1	0.3970
15	1	1	-0.0373

APPENDIX XIII (CONTD.)

S/No	Group	Actual Group	Discriminant Scores
16	1	1	0.0827
17	1	1	0.3182
18	1	1	1.4774
19	1	1	0.6370
20	1	1	0.2304
21	1	1	0.3866
22	1	1	1.5141
23	1	1	0.6869
24	1	1	0.2910
25	1	1	-0.2591
26	1	1	-1.1772
27	1	1	-0.3590
28	1	1	0.1955
29	1	1	-0.3928
30	1	1	-0.4418
31	1	1	-0.3655
32	1	1	1.0567
33	1	1	0.8269
34	1	1	0.0949
35	1	1	0.5663

APPENDIX XIII (CONTD..)

S/No.	Group	Actual Group	Discriminant Scores
36	1	1	0.7120
37	1	1	1.5733
38	1	1	1.5649
39	1	1	-0.2310
40	1	1	-0.2878
41	1	1	0.7870
42	1	1	0.0129
43	1	1	0.1127
44	1	1	1.0202
45	1	1	0.3084
46	1	1	0.3333
47	1	1	0.5294
48	1	1	-0.2711
49	1	1	3.0311
50	1	1	0.9978
51	1	1	2.9999
52	1	1	-0.2589
1	2	2	-6.6998
2	2	2	-6.3514
3	2	2	-11.8858

The Percentage of "Grouped" Cases Correctly Classified = 100%

APPENDIX XIV

CANONICAL DISCRIMINANT FUNCTIONS EVALUATED AT

GROUP MEANS (Group Centroids) (PRACTICAL)

Group	Func 1
1	0.45428
2	-7.87424
Critical Region =	-3.70998

S/No.	Group	Actual Group	Discriminant Scores
1	1	1	0.2747
2	1	1	0.5978
3	1	1	-0.4119
4	1	1	0.4572
5	1	1	-0.0044
6	1	1	-0.3937
7	1	1	0.6504
8	1	1	0.3623
9	1	1	0.3145
10	1	1	0.0096
11	1	1	0.2856
12	1	1	0.3327
13	1	1	1.2280
14	1	1	0.4809
15	1	1	0.0951

APPENDIX XIV (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
16	1	1	0.3085
17	1	1	0.4652
18	1	1	1.4547
19	1	1	0.7547
20	1	1	-0.0536
21	1	1	0.6637
22	1	1	1.0321
23	1	1	0.4034
24	1	1	-0.0085
25	1	1	-0.4677
26	1	1	-0.8460
27	1	1	-0.2872
28	1	1	-0.1853
29	1	1	-0.2042
30	1	1	-0.4393
31	1	1	-0.2802
32	1	1	0.3814
33	1	1	1.1064
34	1	1	0.5545
35	1	1	0.7544
36	1	1	0.8398

APPENDIX XIV (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
37	1	1	1.7445
38	1	1	1.4936
39	1	1	-0.3811
40	1	1	-0.2816
41	1	1	0.8802
42	1	1	0.2529
43	1	1	-0.0151
44	1	1	1.0204
45	1	1	0.3695
46	1	1	0.6144
47	1	1	0.7100
48	1	1	-0.2809
49	1	1	2.9497
50	1	1	0.7281
51	1	1	3.2626
52	1	1	0.3297
1	2	2	-5.8948
2	2	2	-5.9614
3	2	2	-11.7665

The percentage of "Grouped" Cases Correctly Classified = 100%

APPENDIX XV

STATISTICAL TEST OF SIGNIFICANCE FOR RICE DISCRIMINANT

FUNCTION

THEORETICAL

Canonical Correlation	0.8973970
Wilks' Lambda	0.1946786
Chi-squared	78.547
D.F.	10

PRACTICAL

Canonical correlation	0.8875705
Wilks' Lambda	0.2122185
Chi-Squared	77.507
D.F.	6

APPENDIX XVI

GROUPING OF POULTRY FARMERS

S/No.	Y_P	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	GROUPS
1.	100	5000	248	10887	43	8	74	13	9	1	1	1
2.	100	5000	253	11107	52	9	74	6	18	1	1	1
3.	100	5000	249	10931	52	9	72	6	15	1	1	1
4.	100	5000	247	10843	45	8	74	8	6	1	1	1
5.	100	5000	247	10843	49	8	70	6	9	1	1	1
6.	100	10000	701	30774	50	9	65	6	15	1	1	1
7.	100	9000	698	30642	48	8	65	8	8	1	1	1
8.	100	10000	702	30818	51	9	65	6	13	1	1	1
9.	100	10000	732	32135	53	9	65	6	16	1	1	1
10.	100	9000	693	30423	49	8	65	6	12	1	1	1
11.	100	9000	602	26428	52	9	7	6	13	1	1	1
12.	100	9000	613	26911	50	9	4	8	9	1	1	1
13.	100	9000	600	26340	47	8	5	6	10	1	1	1
14.	100	9000	604	26986	53	9	6	6	6	1	1	1
15.	100	4000	185	8122	51	9	92	6	10	1	1	1
16.	100	4000	177	8770	47	8	62	8	8	1	1	1
17.	100	4000	193	8473	53	9	62	6	12	1	1	1
18.	100	5000	207	9087	48	8	99	11	9	1	1	1
19.	100	5000	215	9436	49	9	140	11	8	1	1	1
20.	100	5000	218	9570	49	9	99	11	10	1	1	1

APPENDIX XVI (CONTD.)

21.	100	5000	208	9131	44	8	150	11	7	1	1	1
22.	100	5000	221	9702	52	9	120	6	13	1	1	1
23.	100	5000	211	9263	40	6	115	13	5	1	1	1
24.	100	5000	217	9526	51	9	125	6	10	1	1	1
25.	98	4000	180	7902	49	9	50	6	11	1	1	2
26.	98	5000	200	8780	45	8	111	13	7	1	1	2
27.	98	4000	199	8736	45	8	112	13	7	1	1	2
28.	97	4000	160	7024	39	7	72	11	6	1	1	2
29.	97	5000	203	8911	48	8	102	11	9	1	1	2
30.	97	4000	199	8736	47	8	123	11	8	1	1	2
31.	96	5000	237	10404	41	8	79	6	5	1	1	2
32.	96	9000	670	29413	50	9	73	8	13	1	1	2
33.	96	9000	517	25067	50	9	24	6	12	1	1	2
34.	96	4000	163	7156	43	8	65	8	7	1	1	2
35.	96	4000	169	7419	50	9	55	6	10	1	1	2
36.	96	4000	196	8604	49	8	95	8	10	1	1	2
37.	96	4000	198	8692	47	8	95	8	9	1	1	2
38.	96	5000	200	8780	49	8	90	11	8	1	1	2
39.	95	8000	591	25945	50	9	23	8	12	1	1	2
40.	95	4000	170	7463	49	9	66	6	7	1	1	2

APPENDIX XVI (CONTD.)

41.	95	4000	175	7683	52	9	82	6	12	1	1	2
42.	95	4000	171	7507	33	5	52	13	4	1	1	2
43.	95	4000	197	8648	46	8	107	11	8	1	1	2
44.	95	5000	237	10404	49	9	78	8	11	1	1	2
45.	95	4000	197	8648	46	8	91	13	8	1	1	2
46.	95	4000	195	8561	38	7	120	13	5	1	1	2
47.	94	5000	235	10317	50	9	76	6	18	1	1	2
48.	94	9000	665	29194	52	9	74	6	14	1	1	2
49.	94	9000	584	25638	41	8	24	11	8	1	1	2
50.	94	4000	187	8209	38	7	100	13	5	1	1	2
51.	93	9000	665	29194	48	8	70	8	8	1	1	2
52.	93	9000	572	25111	49	9	24	11	11	1	1	2
53.	93	4000	166	7287	47	8	51	8	9	1	1	2
54.	93	4000	192	8429	50	9	112	8	10	1	1	2
55.	93	4000	193	8473	49	8	92	11	10	1	1	2
56.	92	5000	230	10097	46	8	79	8	7	1	1	2
57.	92	5000	231	10141	51	9	78	6	14	1	1	2
58.	92	9000	661	29018	47	8	72	8	6	1	1	2
59.	92	8000	574	25199	44	8	25	11	8	1	1	2
60.	92	4000	161	7068	44	8	64	8	8	1	1	2

APPENDIX XVII (CONTD.)

61.	92	4000	168	7375	41	7	57	8	5	1	1	2
62.	92	4000	172	7551	45	8	52	11	8	1	1	2
63.	92	4000	189	8297	43	8	119	11	7	1	1	2
64.	92	4000	191	8385	35	4	118	13	4	1	1	2
65.	91	5000	228	10009	50	9	78	6	15	1	1	2
66.	91	5000	228	10009	48	8	80	8	10	1	1	2
67.	91	9000	662	29062	49	8	71	8	10	1	1	2
68.	91	8000	570	25023	49	9	26	8	6	1	1	2
69.	91	4000	160	7024	40	7	63	8	8	1	1	2
70.	91	4000	192	8429	53	9	121	13	9	1	1	2
71.	91	4000	190	8341	43	8	121	13	7	1	1	2
72.	90	4000	168	7375	47	8	53	8	8	1	1	2
73.	90	4000	188	8253	43	8	95	13	6	1	1	2
74.	90	4000	193	8473	36	5	94	13	4	1	1	2
75.	89	5000	222	9746	47	8	81	8	6	1	1	2
76.	89	4000	149	6541	42	8	75	8	6	1	1	2
77.	88	5000	223	9790	40	8	89	13	9	1	1	2
78.	88	5000	221	9702	39	8	81	11	7	1	1	2
79.	88	5000	220	9658	45	8	89	8	10	1	1	2
80.	88	9000	654	28711	46	8	85	8	8	1	1	2

APPENDIX XVII (CONTD.)

81.	88	4000	180	7902	40	7	97	13	5	1	1	2
82.	88	5000	219	9614	42	8	80	6	6	1	1	2
83.	87	4000	147	6453	38	7	96	11	7	1	1	2
84.	87	4000	144	6322	43	8	75	6	6	1	1	2
85.	87	5000	217	9526	38	7	82	13	5	1	1	2
86.	86	5000	217	9526	44	8	88	8	6	1	1	2
87.	86	9000	660	28974	47	8	78	8	10	1	1	2
88.	86	9000	566	24847	40	7	26	11	6	1	1	2
89.	86	4000	159	6980	44	8	77	8	7	1	1	2
90.	86	4000	172	7551	38	7	99	13	5	1	1	2
91.	85	9000	652	28623	44	8	79	13	8	1	1	2
92.	85	8000	562	24672	48	8	31	8	8	1	1	2
93.	85	5000	223	9790	40	8	80	11	6	1	1	2
94.	85	5000	210	9219	37	7	88	11	6	1	1	2
95.	85	4000	153	6717	36	6	99	11	7	1	1	2
96.	85	4000	155	6805	39	8	72	8	5	1	1	2
97.	85	4000	167	7331	35	5	27	13	4	1	1	2
98.	84	5000	207	9087	37	7	80	11	5	1	1	2
99.	84	5000	213	9351	44	8	88	13	9	1	1	2
100.	84	5000	209	9175	39	8	89	13	8	1	1	2

APPENDIX XVII (CONTD.)

101.	84	9000	644	28272	45	8	79	11	9	1	1	2
102.	84	9000	641	28140	45	8	80	11	10	1	1	2
103.	84	4000	142	6234	39	7	74	8	5	1	1	2
104.	84	4000	156	6848	50	9	78	6	11	1	1	2
105.	83	5000	216	9482	42	8	90	6	8	1	1	2
106.	83	8000	566	24847	47	8	28	8	10	1	1	2
107.	83	8000	561	24628	46	8	29	8	7	1	1	2
108.	83	4000	179	7858	39	7	98	13	5	1	1	2
109.	82	9000	650	28535	42	8	78	11	6	1	1	2
110.	82	9000	647	28403	51	9	80	6	13	1	1	2
111.	82	8000	569	24979	46	8	30	8	9	1	1	2
112.	82	4000	141	6190	44	8	78	6	6	1	1	2
113.	81	9000	640	28096	46	8	77	8	10	1	1	2
114.	81	8000	560	24584	41	7	29	8	5	1	1	2
115.	81	4000	148	6497	41	8	117	6	5	1	1	2
116.	80	5000	214	9395	40	7	80	6	5	1	1	2
117.	80	4000	187	6014	30	6	117	13	4	1	1	2
118.	79	5000	201	8824	38	7	89	11	3	1	1	2
119.	79	8000	537	23574	37	7	30	11	5	1	1	2
120.	78	5000	200	8780	37	7	90	11	5	1	1	2

APPENDIX XVII (CONTD..)

121.	78	4000	199	8736	37	7	89	8	6	1	1	2
122.	78	9000	631	27701	47	8	80	8	10	1	1	2
123.	78	4000	133	5839	37	7	120	8	4	1	1	2
124.	76	9000	625	27438	50	9	84	8	12	1	1	2
125.	76	9000	637	27964	49	8	84	8	11	1	1	2
126.	76	4000	129	5663	30	5	120	13	4	1	1	2
127.	74	8000	540	23706	41	7	30	11	7	1	1	2
128.	74	8000	527	23135	43	8	30	6	6	1	1	2
129.	74	4000	129	5663	35	6	111	13	6	1	1	2
130.	73	4000	189	8297	35	6	91	11	5	1	1	2
131.	72	9000	626	27481	46	8	86	8	11	1	1	2
132.	72	7000	527	23135	48	8	28	6	10	1	1	2
133.	71	9000	627	27525	33	7	83	13	4	1	1	2
134.	65	9000	602	26428	38	7	88	13	5	1	1	2
135.	65	9000	600	26340	36	7	89	13	5	1	1	2
136.	65	8000	512	22477	40	7	31	11	7	1	1	2
137.	61	9000	600	26340	30	6	88	13	4	1	1	2
138.	61	8000	589	26252	39	8	89	13	7	1	1	2
139.	58	7000	496	21774	38	7	35	13	5	1	1	2
140.	58	7000	493	21643	38	7	33	11	6	1	1	2

APPENDIX XVII (CONTD..)

141.	57	8000	500	21950	39	8	36	11	6	1	1	2
142.	57	7000	499	21906	37	8	32	13	6	1	1	2
143.	56	7000	487	21379	38	7	35	11	5	1	1	2
144.	56	7000	490	21511	36	7	36	13	5	1	1	2
145.	54	8000	573	25155	35	6	89	13	5	1	1	2
146.	54	7000	486	21335	35	7	33	13	5	1	1	2
147.	47	7000	478	20984	33	6	34	13	4	0	1	2
148.	46	7000	477	20940	36	7	33	13	4	0	1	2
149.	42	8000	548	24057	37	7	90	13	5	1	0	2
150.	23	8000	507	22257	34	6	90	13	5	0	0	2

APPENDIX XVII

CANONICAL DISCRIMINANT FUNCTIONS EVALUATED AT GROUP

MEANS (Group Centroids) (THEORETICAL)

Group	Func 1
1	1.09846
2	-0.20923

Critical Region = 0.444615

S/No	Group	Actual Group	Discriminant Scores
1	1	1***	-0.4184
2	1	1	2.1503
3	1	1	1.8889
4	1	1***	0.0907
5	1	1	1.2261
6	1	1	1.6546
7	1	1	1.0313
8	1	1	1.6798
9	1	1	2.3416
10	1	1	1.6953
11	1	1	1.5509
12	1	1	0.6915
13	1	1	0.7578
14	1	1	1.1607
15	1	1	1.3792

S/No.	Group	Actual Group	Discriminant Scores
16	1	1	•0.5671
17	1	1	1.7913
18	1	1	0.7430
19	1	1	0.6411
20	1	1	0.6182
21	1	1***	0.0625
22	1	1	1.9133
23	1	1***	-0.3498
24	1	1	1.4959
1	2	2***	0.8819
2	2	2	-0.0927
3	2	2	-0.0123
4	2	2	-0.9005
5	2	2***	0.7520
6	2	2***	0.6509
7	2	2	-0.5836
8	2	2***	1.4137
9	2	2***	1.1319
10	2	2	-0.2736
11	2	2***	0.9980
12	2	2***	1.2868

APPENDIX XVII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
13	2	2***	0.8295
14	2	2***	0.7986
15	2	2***	1.0770
16	2	2***	0.6147
17	2	2***	1.6736
18	2	2	-1.6103
19	2	2	0.3851
20	2	2***	0.8543
21	2	2	0.1584
22	2	2	-1.0562
23	2	2***	1.7599
24	2	2***	2.0240
25	2	2	-0.8506
26	2	2	-1.1595
27	2	2***	1.0136
28	2	2***	0.4819
29	2	2***	0.5845
30	2	2***	1.1404
31	2	2***	1.0410
32	2	2	0.3641
33	2	2***	1.6234
34	2	2***	0.6645

APPENDIX XVII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
35	2	2	-0.2152
36	2	2	-0.5128
37	2	2	-0.4374
38	2	2	-0.0913
39	2	2	-0.2174
40	2	2	-0.4906
41	2	2***	1.5134
42	2	2***	0.9908
43	2	2***	1.3681
44	2	2	0.3819
45	2	2	-0.3609
46	2	2***	1.2861
47	2	2	-0.3589
48	2	2***	0.5139
49	2	2	-0.5650
50	2	2	-0.8209
51	2	2***	0.4698
52	2	2	-0.5154
53	2	2	-0.9456
54	2	2	-1.1869
55	2	2***	0.4567

APPENDIX XVII (CONTD.)

S/No.	Group	Actual Group	Dsicriminant Scores
56	2	2***	0.6925
57	2	2	-0.8047
58	2	2	-0.3301
59	2	2	-0.9109
60	2	2	-0.1808
61	2	2	-1.2832
62	2	2	-0.0699
63	2	2***	1.0208
64	2	2	-0.8076
65	2	2	-0.0338
66	2	2	-1.1827
67	2	2	-0.0955
68	2	2***	0.7809
69	2	2	-1.0827
70	2	2	-1.2182
71	2	2	-0.8575
72	2	2	-1.1705
73	2	2	-1.3544
74	2	2	-1.3416
75	2	2	-0.2078
76	2	2	-1.2341

APPENDIX XVII (CONTD.)

S/No.	Group	Actual Group	Dicscriminant Scores
77	2	2	0.3177
78	2	2	0.4011
79	2	2	-0.7678
80	2	2***	1.1715
81	2	2	-0.1224
82	2	2***	0.7479
83	2	2	0.3105
84	2	2	-0.9900
85	2	2	-0.4928
86	2	2***	1.7586
87	2	2***	0.4898
88	2	2	0.0182
89	2	2***	0.8026
90	2	2	-0.3896
91	2	2	-0.4397
92	2	2	-0.3867
93	2	2	-2.3248
94	2	2	-1.2831
95	2	2	-1.3965
96	2	2	-1.3037
97	2	2	-0.9221

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APPENDIX XVII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
98	2	2	-0.8220
99	2	2	-1.0241
100	2	2***	1.3268
101	2	2***	1.4801
102	2	2	-1.9113
103	2	2	-0.4731
104	2	2	-0.2235
105	2	2	-1.2544
106	2	2	-1.2036
107	2	2***	0.9096
108	2	2***	1.1172
109	2	2	-2.1038
110	2	2	-1.0855
111	2	2	-1.4608
112	2	2	-0.6919
113	2	2	-2.2706
114	2	2	-1.0760
115	2	2	-1.3103
116	2	2	-1.0890
117	2	2	-1.3640
118	2	2	-1.8364
119	2	2	-1.1694

APPENDIX XVII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
120	2	2	-1.6905
121	2	2	-1.1965
122	2	2	-1.8982
123	2	2	-1.2268
124	2	2	-1.0760
125	2	2	-1.8561
126	2	2	-1.3366

*** = Not Correctly Classified

The Percentage of "Grouped" Cases Correctly Classified = 70%.

APPENDIX XVIII

CANONICAL DISCRIMINANT FUNCTION EVALUATED AT
GROUP MEANS (Group Centroids) (PRACTICAL)

Group	Func 1
1	1.03765
2	-0.19765
Critical Region =	0.4200

S/No.	Group	Actual Group	Discriminant Score
1	1	1***	-0.4091
2	1	1	1.4730
3	1	1	1.4838
4	1	1***	0.3258
5	1	1	1.1354
6	1	1	1.2867
7	1	1	0.7673
8	1	1	1.4065
9	1	1	1.6593
10	1	1	1.1645
11	1	1	2.4002
12	1	1	2.1104
13	1	1	1.9209
14	1	1	2.5761
15	1	1	1.2699

APPENDIX XVIII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
16	1	1	0.6585
17	1	1	1.6578
18	1	1***	0.3002
19	1	1***	0.2887
20	1	1	0.4249
21	1	1***	-0.3896
22	1	1	1.2830
23	1	1***	-1.0200
24	1	1	1.1494
1	2	2***	1.2677
2	2	2	-0.2935
3	2	2	-0.2970
4	2	2	-0.8308
5	2	2	0.2885
6	2	2	0.0875
7	2	2	0.0094
8	2	2***	0.9686
9	2	2***	1.6785
10	2	2	0.1018
11	2	2***	1.3524
12	2	2***	0.7428

APPENDIX XVIII (CONTD.)

S/No	Group	Actual Group	Discriminant Scores
13	2	2***	0.4907
14	2	2***	0.4624
15	2	2***	1.4227
16	2	2***	1.1585
17	2	2***	1.4327
18	2	2	-1.8718
19	2	2	0.0122
20	2	2***	0.8203
21	2	2	-0.0824
22	2	2	-1.3471
23	2	2***	1.2253
24	2	2	1.4730
25	2	2	-0.0963
26	2	2	-1.2754
27	2	2***	0.7381
28	2	2***	0.9821
29	2	2***	0.7353
30	2	2***	0.8003
31	2	2***	0.4538
32	2	2***	0.4331
33	2	2***	1.3349
34	2	2***	0.5997

APPENDIX XVIII (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
35	2	2	0.3149
36	2	2	0.2469
37	2	2	-0.1348
38	2	2	0.1629
39	2	2	-0.4377
40	2	2	-1.8380
41	2	2***	1.2151
42	2	2***	0.6856
43	2	2***	0.8573
44	2	2***	1.2523
45	2	2	-0.3235
46	2	2***	0.6626
47	2	2	-0.6024
48	2	2***	0.7201
49	2	2	-0.5073
50	2	2	-1.5782
51	2	2***	0.5534
52	2	2	-0.0969
53	2	2	-0.9192
54	2	2	-0.8771
55	2	2	0.2532

APPENDIX XVIII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
56	2	2	0.4043
57	2	2	-0.9531
58	2	2	0.1502
59	2	2	-1.1011
60	2	2	0.3180
61	2	2	-1.1973
62	2	2	0.1217
63	2	2***	0.5682
64	2	2	-0.2772
65	2	2	0.1742
66	2	2	-1.2714
67	2	2	-0.2957
68	2	2***	1.0584
69	2	2	-0.7191
70	2	2	-1.2282
71	2	2	-1.4403
72	2	2	-0.5292
73	2	2	-1.2581
74	2	2	-1.1908
75	2	2	-0.3382

APPENDIX XVIII (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
76	2	2	-1.0724
77	2	2	-0.0015
78	2	2	-0.0065
79	2	2	-0.5400
80	2	2***	1.2151
81	2	2	0.1039
82	2	2***	0.9710
83	2	2***	0.8271
84	2	2	-1.1103
85	2	2	-0.4139
86	2	2***	1.3249
87	2	2***	0.8138
88	2	2***	0.4416
89	2	2***	0.4432
90	2	2	0.1309
91	2	2	-0.1450
92	2	2	-0.1449
93	2	2	-2.7673
94	2	2	-1.0713
95	2	2	-0.8051
96	2	2	-1.2371

APPENDIX XVIII (CONTD.)

S/No.	Group	Actual Group	Discriminant Score
97	2	2	-0.9310
98	2	2	-0.1181
99	2	2	-1.0485
100	2	2***	0.9134
101	2	2***	0.7912
102	2	2	-2.7772
103	2	2	-0.1840
104	2	2***	0.6782
105	2	2	-1.8140
106	2	2	-1.5776
107	2	2	0.3997
108	2	2***	1.3709
109	2	2	-2.0557
110	2	2	-1.2251
111	2	2	-1.5567
112	2	2	-0.3463
113	2	2	-2.6553
114	2	2	-1.0724
115	2	2	-0.8626
116	2	2	-0.6812
117	2	2	-0.5583

APPENDIX XVIII (CONTD.)

S/No.	Group	Actual Group	Discriminant Scores
118	2	2	-0.9887
119	2	2	-0.7044
120	2	2	-1.2008
121	2	2	-1.7271
122	2	2	-1.3370
123	2	2	-1.7048
124	2	2	-1.1666
125	2	2	-1.3953
126	2	2	-1.9069

*** = Not Correctly Classifed

The Percentage of "Grouped" Cases Correctly Classified = 68.67%

APPENDIX XIX

STATISTICAL TEST OF SIGNIFICANCE FOR POULTRY

DISCRIMINANT FUNCTION

THEORETICAL	
Canonical Correlation	0.4346594
Wilks' Lambda	0.8110712
Chi-Squared	30.049
D.F.	9

PRACTICAL	
Canonical Correlation	0.4148386
Wilks' Lambda	0.8279090
Chi-Squared	27.667
D.F.	3

'onfidential

FUSACS 1A

FUND FOR SUPERVISED AGRICULTURAL CREDIT SCHEME

APPLICATION FOR LOAN

PART I

(To be completed by all applicants)

A.—Name and Address of Applicant

Surname

Forenames

(a) Age _____ (b) Sex

Residential address

Business address (*No Box Number*)

Home town

(a) Village

(b) Kindred

(c) Quarter

Local Government Area

B.—Occupations

Year		Occupation	Name of Employer (if any)
From	To		

C.—Training and Qualifications

Year		School, College, etc.	Qualifications obtained
From	To		

D.—Family Particulars

Married

Number of dependent children

Next of Kin: Name

Relationship

Address

PART II

(To be completed if application is on behalf of a Limited Liability Company, Registered Co-operative Society or other form of Business Association).

A. Name of Business _____

B. Address of Business _____

_____

E.—Name and Addresses of Directors, Partners, etc.

Name	Status	Address

F.—Other Business Particulars

1. Status of Business _____
2. Date first formed _____
3. Date of registration _____
4. Registration number _____

PART III

(To be completed by all applicants)

A. Present Activities _____

_____

B. Other loans, if you have ever applied elsewhere for a loan

Name of Bank	Address	Amount of loan	Date of Issue	Period of refund	Amount outstanding

PART IV

(To be completed by all applicants)

A.—Purpose and amount of Loan (State type of farming and amount of loan required)

_____

_____

B.—Proposed Security for Loan

1. Name and addresses of two persons of substance who are willing and able to guarantee repayment of the loan.

   (a) Full Name _____

   Address: Street or Road _____ No _____
   (No school address allowed)

   Town, Village and Quarter _____

   Local Government Area _____

   Occupation _____ Age _____

   Amount of Guarantee: N _____

   (b) Full name _____

   Address: Street or Road _____ No _____

   Town, Village and quarter _____

   Local Government Area _____

   Occupation _____ Age _____

   Amount of Guarantee: N _____

2. Property or assets offered as security:

Description	Location	Value N

PART V

(To be completed by all applicants)

A.—Location of land to be used for the Project

1. Local Government Area _____

2. Village/town _____

3. Local Name of land _____

B.—Description of Land

1. Present use of land _____

2. Area of land _____

3. Present value _____

C.—Title of Land

1.   Freehold   Leasehold

Other tenancy
(e.g., rented)

2. If leasehold or other tenancy, give name and address of original owner. (Also attach a copy of lease certificate of occupancy).

Name _____

Address _____

3. Yearly Rent N _____

4. If the land or part of it (including building on it) is at present mortgaged, pledged or subleased give details.

_____

_____

_____

_____

_____

_____

DECLARATION

1.—*Literate applicants should use this declaration.*

I/We _____ hereby declare that the information given in this Application Form was given after due consideration and is correct to the best of my/our knowledge and belief.

DATED this _____ day of _____, 19_____

Signature (s)

(1) _____

(2) _____

(3) _____

2. Other applicants unable to read and write should use this declaration.

I/We _____ hereby declare that this Application Form was read over and interpreted to my/our understanding and satisfaction and that the information was given after due consideration and is correct to the best of my/our knowledge and belief.

DATED this _____ day of _____, 19_____ at _____

Signature mark or right thumb-print of applicant:—

_____

(This signature mark or right thumb-print should be made in the presence of a person completing the application form who should also sign the certificate beneath).

CERTIFICATE

I hereby declare that the foregoing has been completed, read over and/or translated to the illiterate declarant into

_____ language which he/she/they appeared to have perfectly understood before affixing his/her/their signature(s) marks(s).

Name _____

Address _____

Qualification _____

GPE 194/186/20,000

APPENDIX XXI

<u>QUESTIONNAIRE ONE</u> •

DEPARTMENT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF NIGERIA, NSUKKA

THESIS TOPIC: EVALUATION OF THE PERFORMANCE OF SUPERVISED

AGRICULTURAL CREDIT SCHEME OF ANAMBRA STATE,

NIGERIA.

Mr C.J. Arene of the Department of Agricultural Economics,
University of Nigeria, Nsukka is carrying out a research study
on "EVALUATION OF THE PERFORMANCE OF SUPERVISED AGRICULTURAL
CREDIT SCHEME OF ANAMBRA STATE, NIGERIA". Based on the findings,
he is expected to make useful policy recommendations to scheme
management. Please could you answer the questions below.
Your co-operation and help are highly solicited and appreciated.
All information supplied will be treated as confidential. Thanks.

INTERVIEW SCHEDULE FOR THE CROP FARMERS IN SUPERVISED AGRICULTURAL
CREDIT SCHEME IN THE STATE.

Please tick ( ) for the correct answer or fill in details as
appropriate.

(1) Zone _____

(2)   Age of Farmer _____

(3)   Level of Formal Education _____

(4)   Number of Years of Farming Experience _____

(5)   Number of Dependants _____

(6)   What is the size of your Farm?_____

(7)   What is the distance from your home to the source of

     loan? _____

(8)   What type of crops do you grow? _____

     _____

(9)   Which of these methods do you employ in crop production?

     (a)   _____   Better farming implements (tractors)

     (b)   _____   Improved seeds and seedlings

     (c)   _____   Fertilizer application

     (d)   _____   Pesticides application

     (e)   _____   Minimum tillage

     (f)   _____   Irrigation practice

     (g)   _____   Others (specify)_____

     _____

(10) What are your objectives in borrowing?

     (a)   _____   to increase hectares under cultivation

     (b)   _____   to buy seeds/seedlings/cuttings

     (c)   _____   to buy fertilizers/chemicals

     (d)   _____   Others (specify) _____

(11) Was the amount lent to you sufficient for your objectives? _____ Yes; _____ No.

(12) What was the size of loan given to you in the last farming season? _____

(13) What is your income level? _____

(14) How much of the loan did you repay? _____

(15) How do you find the lending exercise?

    (a) _____ Time consuming

    (b) _____ Unnecessary

    (c) _____ Cumbersome

    (d) _____ No problems at all

(16) When do the actual handing-over of the approved loan fund come up?

    (a) _____ Before planting

    (b) _____ During planting

    (c) _____ After planting

    (d) _____ Before harvesting

    (e) _____ During harvesting

    (f) _____ After harvesting

(17) How was the loan given to you?

    (a) _____ in cash

    (b) _____ in kind

    (c) _____ in both cash and kind

(18) How would you have preferred the loan?

    (a) _____ in cash

    (b) _____ in kind

    (c) _____ or both cash and kind?

(19) If in both cash and kind, in what proportions?

    (a) _____ more cash than kind

    (b) _____ more kind than cash

    (c) _____ equal cash and kind

(20) How do you find the present rate of interest?

    (a) _____ too high

    (b) _____ too low

    (c) _____ moderate

(21) If your answer to the above is (a), what would

you prefer? _____

(22) What do you offer as security for the loan(s)?

    (a) _____ land

    (b) _____ house(s)/property

    (c) _____ guarantors

    (d) _____ good character

    (e) _____ Others (specify) _____

_____

(23) How many times do the supervisors of the scheme visit

you in a year? _____

(24) How do they supervise your farm? _____

_____

(25) Are you satisfied with the method of supervision?

(a) _____ yes; (b) _____ No.

(26) If no, what are your suggestions?_____

_____

(27) How do you repay your loans?

(a) _____ in bulk; (b) _____ instalmentally

(28) If your answer is (b), why?

(a) _____ lack of profit

(b) _____ crop failure

(c) _____ adverse natural condition (specify) _____

_____

(29) What benefits do you think you have derived from the

loan?

(a) _____

(b) _____

(c) _____

(d) _____

(30) What problems do you encounter in securing the loans?

(a) _____

(b) _____

(c) _____

(d) _____

(31). What problems do you encounter in repaying the loans?

(a) _____

(b) _____

(c) _____

(d) _____

(32) How do you think the scheme could be improved to serve more farmers?

(a) _____ increase amount of money disbursed

(b) _____ reduce interest rates

(c) _____ give money to practising farmers only

(d) _____ scrape collaterals

(e) _____ speedy processing of applications

(f) _____ establish more offices

(g) _____ Others (specify) _____

_____

APPENDIX XXII

<u>QUESTIONNAIRE TWO</u>

DEPARTMENT OF AGRICULTURAL ECONOMICS

UNIVERSITY OF NIGERIA, NSUKKA

THESIS TOPIC: EVALUATION OF THE PERFORMANCE OF SUPERVISED

AGRICULTURAL CREDIT SCHEME IN ANAMBRA STATE,

NIGERIA.

Mr. C.J. Arene of the Department of Agricultural Economics,
University of Nigeria, Nsukka is carrying out a research study
on "EVALUATION OF THE PERFORMANCE OF SUPERVISED AGRICULTURAL
CREDIT SCHEME IN ANAMBRA STATE, NIGERIA." Based on the findings,
he is expected to make useful policy recommendations to the scheme
management. Please could you answer the questions below. Your
co-operation and help are highly solicited and appreciated. All
information supplied will be treated as confidential. Thanks.

INTERVIEW SCHEDULE FOR THE LIVESTOCK FARMERS IN SUPERVISED
AGRICULTURAL CREDIT SCHEME IN THE STATE.
Please tick ( ) for the correct answer or fill in details as
appropriate.

(1) Zone _____

(2) Age of farmer _____

(3) Level of formal education _____

(4) Number of years of farming experience _____

(5) Number of dependants _____

(6) What was the size of your farm? _____

(7) What was the distance from your home to the source

of loan? _____

(8) What type of animals did you rare? _____

_____

(9) Which of these methods did you employ in livestock

production?

(a) _____ Restricted movement of livestock

(b) _____ Veterinary care

(c) _____ Controlled breeding

(d) _____ Improved strains or breed

(e) _____ Better hygiene and management

(f) _____ Others (specify) _____

_____

(10) What were your objectives in borrowing?

(a) _____ to increase your stock of livestock

(b) _____ to buy more feeds

(c) _____ to buy more drugs

(d) _____ Others (Specify) _____

_____

(18) How would you have preferred the loan?

    (a) _____ in cash

    (b) _____ in kind

    (c) _____ or both cash and kind?

(19) If in both cash and kind, in what proportion?

    (a) _____ more cash than kind

    (b) _____ more kind than cash

    (c) _____ equal cash and kind

(20) How did you find the interest rate?

    (a) _____ too high

    (b) _____ too low

    (c) _____ moderate

(21) If your answer to the above question is (a), what would you prefer? _____

(22) What did you offer as security for the loan(s)?

    (a) _____ land

    (b) _____ house(s)/property

    (c) _____ guarantors

    (d) _____ good character

    (e) _____ others (specify)_____

(23) How many times did the supervisors of the scheme visit in a year?_____

(24) How did they supervise your farm?_____

_____

(25) Were you satisfied with the method of supervision?

(a) _____ yes; (b) _____ No.

(26) If no, what were your suggestions?_____

_____

(27) How did you repay your loans?

(a) _____ in bulk, (b) _____ instalmentally

(28) If your answer is (b), why?

(a) _____ lack of profit

(b) _____ livestock failure

(c) _____ adverse natural condition (specify)

(29) What benefits do you think you have derived from the loan?

(a) _____

(b) _____

(c) _____

(d) _____

(30) What problems did you encounter in securing the loans?

(a) _____

(b) _____

(c) _____

(d) _____

(31)   What problems did you encounter in repaying the loans?

(a) _____

(b) _____

(c) _____

(d) _____

(32)   How do you think the scheme could be improved to

serve more farmers?

(a) _____ increase amount of money disbursed

(b) _____ reduce interest rates

(c) _____ give money to practising farmers only

(d) _____ scrape collaterals

(e) _____ speedy processing of applications

(f) _____ establish more offices

(g) _____ Others (specify)_____

_____

APPENDIX XXIII

QUESTIONNAIRE THREE

Department of Agricultural Economics
University of Nigeria,
Nsukka,
Anambra State

4th April, 1989.

Dear Sir/Madam,

I am a postgraduate student in the Department of Agricultural Economics, University of Nigeria, Nsukka. I am currently carrying out a research study on "EVALUATION OF THE PERFORMANCE OF SUPERVISED AGRICULTURAL CREDIT SCHEME OF ANAMBRA STATE, NIGERIA AND ITS IMPLICATIONS FOR CREDIT EXTENSION DECISIONS.

I will be grateful if you will supply me with the information contained in the questionnaire attached. This will help me to complete the research study. All the information supplied by you will be strictly confidential.

I need your co-operation. Thank you and best wishes.

Yours sincerely,

Mr C. J. Arene.

QUESTIONNAIRE THREE

EVALUATION OF THE PERFORMANCE OF SUPERVISED AGRICULTURAL CREDIT SCHEME IN THE STATE.

Please tick (   ) for the correct answer or fill in details as appropriate.

(1) Have you ever lent money to farmers?

_____ Yes; _____ No.

(2) If yes, what type of farmers do you lend to?

(a) _____ Group farmers.

(b) _____ Individual farmers

(c) _____ Agricultural Commercial Concerns (companies)

(d) _____ Others (Specify)_____

_____

(3) Please complete the table below:

Type of farm Enterprise	No. of farmers given loan							
	1980	1981	1982	1983	1984	1985	1986	1987
Crop								
Livestock								

Type of farm Enterprise	Amount of loan given							
	1980	1981	1982	1983	1984	1985	1986	1987
Crop								
Livestock								

(4) What months do you receive the greatest request for loans?

(a) February - April

(b) May - July

(c) August - October

(d) November - December

(e) January

(5) What types of farm enterprise are most of your loan

applicants engaged in?

    (a) FOOD CROPS

        (i) Rice (ii) Maize (iii) Cassava (iv) Others (specify)

        _____

    (b) TREE (Permanent) CROPS

        (i) Oil Palm (ii) Citrus (iii) Plantain (iv) Others (specify)

        _____

    (c) VEGETABLE CROPS

        (i) Tomato (ii) Onions (iii) Melon (iv) Others (specify)

        _____

    (d) LIVESTOCK

        (i) Poultry (ii) Dairy (iii) Piggery (iv) Fishery

        (v) Others (specify) _____

(6) How many farmers do you supervise?

    (a) Maize farmers _____ (b) Rice farmers _____ (c) Poultry

    farmers _____

(7) What is your length of service as a supervisor in

    (a) Maize farming _____ (b) Rice farming _____ (c) Poultry

        farming _____

(8) How long did it take you to train in agriculture?_____

(9)   What is the duration of time (i.e. grace period) before

repayments become due

(a) _____ After 3 months

(b) _____ After 6 months

(c) _____ After 1 year

(d) _____ Greater than 2 years

(10) Are repayments made in one bulk?

_____ Yes, _____ No.

(11) If no, then for how long do they continue? _____

(12) Do you requre collateral security for your loans?

_____ Yes; _____ No.

(13) If yes, please list them

(a) _____

(b) _____

(c) _____

(14) How long does it take to process and approve/reject a loan

request from the date of application? _____

(15) Where loans have been approved, are there provisions for

appraisals, follow up evaluation and supervision

of projects? _____ Yes; _____ No.

(16) If answer to question (15) is "No", what are the reasons?

(a) _____ few staff available

(b) _____ farmers are too many and scattered

(c) _____ there is no need for it.

(d) _____ Others (specify)

(17) If answer to question (10) is "Yes", how often is this

carried out in one year _____

(18) What problems do you encounter in dispensing loans?

(a) _____ Supervisory field staff not enough

(b) _____ Money usually spent on unapproved projects

(c) _____ So many defaults on the part of farmers

(d) _____ Others (specify) _____

_____

(19) Please complete this table below:

Loan default measure (Crops)	1980	1981	1982	1983	1984	1985	1986	1987
Total loans issued to farmers								
Total due for repayment								
Actual repayment								

Loan default measure (Livestock)	1980	1981	1982	1983	1984	1985	1986	1987
Total loans issued to farmers								
Total due for repayment								
Actual repayment								

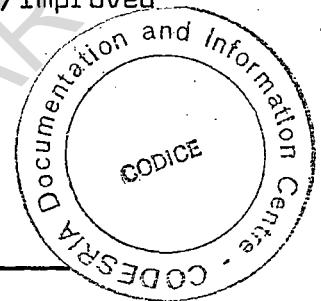(20) What ways do you think your services could improve
to serve the farmers better?

(a) _____

(b) _____

(c) _____

(21) Do you think your operations could be changed/improved
to increase the effectiveness of your board?

_____ Yes; _____ No.

If yes, please specify things to be done

(a) _____

(b) _____

(c) _____

(22) Please make any other comments that you feel are
important to this study.

_____

_____

_____

_____