

## **MICROFINANCE INSTITUTIONS AS VEHICLES FOR SUSTAINABLE CREDIT ACCESS BY THE POOR IN KANO STATE, NIGERIA<sup>1</sup>**

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### **ABSTRACT**

Microfinance Institutions (MFIs) have evolved as a veritable strategy for alleviating poverty among the active poor in developing countries. This study aimed at measuring the performances and challenges posed to MFIs as financiers of poor entrepreneur farmers and other low resource-based individuals was conducted as a field survey, using multiphase sampling technique to select samples for detailed analysis. Two sets of questionnaires were administered on the eleven (11) MFI decision units in Kano State, Nigeria, to collect information on their characteristics, financial resources and mode of operations; sources and uses of funds, resource use efficiency as well as outreach. Levels of savings of members, microloans packaged and delivered, women participation, and profits generated as well as returns to investments and to assets were measured. The results showed that three categories of MFIs operate in the area of study namely: formal finance institutions (FFIs), semi-formal finance institutions (SFFIs), and informal finance institutions (IFFIs) each with its unique features and mode of operations. They share many common problems such as low level of member

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savings, low equity levels in all cases and high level of borrowed funds. Average returns on assets for IFFI and SFFI ranged from 4% to 6% over the period, and confirms efficient use of resources while high dependence on costly borrowed funds as against savings by members may delay achievement of sustainability going by their level of dependence on subsidy. As to the main activities financed by MFIs, petty trading ranks first followed by farming, equipment financing, livestock rearing, food and restaurant services, artisans and household wares trading respectively. With regards to problems and constraints to their growth, descending order of importance, they ranked the following factors: lack of qualified staff, inadequate working capital, board decision problems, fund recovery, government policy changes, and difficulty in sourcing additional funds, as the most crucial. Overall it is evident that MFIs in Kano are profitable, efficient and could be sustainable if the identified problems and constraints are addressed by stakeholders and suggested solutions like broadening the savings base and training for staff are adhered to.

**Key words:** Microfinance, performances, constraints, sustainability.

## **I. INTRODUCTION**

Provision of microcredit by financial institutions to small scale entrepreneurs is a major challenge to policy makers, private businesses and the small entrepreneurs in most developing economies. Sustainable access to credit is a critical factor in the development and growth of economies. In fact, credit supply largely determines credit availability so is among the components identified as critical to the success of any agricultural policy goals (Yaron, 1992; Von Pischke, 1996; World Bank, 2007).

This situation is more apt when viewed from the perspectives of supply led approaches that dominated the mode of credit delivery designed and adopted by formal financial institutions in the 50s and 60s in many developing countries (Von Pischke, 1999). Credits were extended to various categories of users in one off basis which led to lots of problems including lack of repayments, collapse of credit institutions, general apathy, and lack of participation or disdain by commercial banks toward smallholders. This contributed immensely towards review and replacement of the strategy of credit delivery in those countries.

The current microfinance packages designed by MFIs have in-built mechanisms to ensure broader participation among suppliers and users as well as enhance the flow of investment funds into the agricultural sector. It is claimed that commercial banks, community banks, non-governmental organizations (both local and international), self-help groups, credit unions have engage in the provision of micro-credit (Dichter,1999). However, in Nigeria, no serious documented research on their performances and/or the future sustainability of their operation was conducted. This is required

especially when cheap sources of subsidy fund are no longer available. Efficiency and profitability among MFIs largely depends partly on their ability to procure and effectively utilize cheap funds and channel them to users with minimal recovery risks, among others (Morduch, 1999, Alimi, 2000) and partly on the ability to identify and remove operational constraints. This paper aims to discover the main sources of fund for MFIs and how the funds are used and finally address constraints that limit their growth in Kano State.

## **II. LITERATURE REVIEW**

Literature Review especially on what is being done by other developing countries to alleviate poverty through MFI.

Perhaps micro finance as conceived and packaged by its promoters especially among NGOs and other financial intermediaries has had the most successful attempt at improving credit access to the poor since the last two decades. According to Dichter (1999) who reviewed applied literature on microfinance programs across the World observed that the programs are judged by the extent of their financial service outreach to the poor and their financial sustainability. Since the birth of the Grameen Bank in the early eighties several countries in Africa, South America, the Pacific and the root continent Asia have followed up with one form or another of the Grameen bank model. The transformation that is taking place in the life of the poor as a result of the strategies adopted by microfinance institutions is on the increase in many countries. Bangladesh, India, South Pacific and Brazil, Mexico in Asia and South America; Mali, Burkina Faso, Benin, South Africa, Egypt, and others in Africa have all reported significant achievements to reducing poverty as a result of interventions by microfinance programs ( Yaron, 1992; Von Pischke, 1996; World Bank, 2007).

## **III. DATA AND METHODOLOGY**

### ***Sampling Technique/Data Collection and Analysis***

The study was carried out principally in Kano financial market, in the Northern part of Nigeria. The sample was purposefully drawn from operators who employed the provision of microcredit services in the market. The sampling frame was made up of all financial, non financial; formal and informal microcredit institutions in the area. These are of various types including Commercial Banks, Development Banks, Cooperative Societies, and Savings and Loans Associations. Self-help Groups, Credit Unions and informal lenders played a role. Each type of financial institution involved in service delivery is represented after the actual number of operators was first determined from a pre survey. The following were the main category of operators in the Kano financial market:

1. **Commercial Banks:** After the Central Bank of Nigeria (CBN) consolidation exercise, 25 Banks emerged as the approved commercial banks in the country. Each of these maintains presence in Kano with most of them having at least one Branch in the metropolis. From information obtained from the Kano Branch of Central Bank of Nigeria, all the 25 banks operate in Kano. Further inquiry on those offering microfinance services revealed that only two were active while most of them are yet to commence the provision of such services particularly as wholesale providers of microfinance services. Specifically, First Bank PLC and Union Bank have been identified, by the Apex Bank, as providers of microloans to farmers in the area. Those planning to start providing microfinance services in the area include Zenith Bank, Unity Bank, United Bank for Africa (UBA), First Inland Bank among others. This limited our sampling frame among commercial banks to selection of only those who provide microcredit services as at the time of the study.
2. **Development Banks:** Only two development banks operate in the Kano market namely Nigeria Agricultural Cooperative and Rural Development Bank (NACRBD) and Federal Mortgage Bank of Nigeria (FMBN). The latter however does not offer microcredit services either both by its objectives nor through its actual operations leaving the NACRDB as the only development bank performing this role in the market. Of course, primary mortgage institutions have taken up the challenge of engaging in providing similar services since the liberalization, consolidation and introduction of the universal banking services in the country.
3. **Microfinance Banks:** These are recently licensed banks which pioneered the provision of microfinance services in the country. Some were NGO based service providers while others converted from community banks or rural banking services MFI as required by CBN. Specifically Madobi Community Bank converted to Freedom microfinance bank; Women Development Initiative which converted into WDI MFI; and Grassroots Health Organization of Nigeria (GHON) which was seeking registration and licensing as GHON MFI and seeking affiliation to an older MFI called Lift Above Poverty Organization (LAPO) based in Edo State.
4. **Non Financial Institutions:** This category of microfinance service providers operate strictly to serve their members with or without profit

motive. In this category are Cooperative Societies, Self Help Groups, Savings and Loans Associations, and Rotating Savings and Credit Associations. But because none of them registered its intention to provide such services so far, they were excluded from the sampling for this study.

5. **Primary Mortgage Institutions:** These are primarily financial institutions registered and licensed to provide banking services for the purpose of developing the mortgage subsector. Given the development in the nation's financial landscape which advanced towards Universal banking, they ventured into the provision of other banking services including microcredit. Two banks were identified in this category namely Eurobanc Savings and Loans and Dala Building society.

Given the above scenario our sampling frame was made up of all the active participants in the provision of microcredit services in the financial market. The multiphase sampling technique was adopted to determine our sample. It was adopted for the purpose of this study since more than one phase of sampling was involved: to first identify and select all the institutional lenders that supply micro-finance services and second to proceed to select those financial institutions involved in providing micro credit products to targeted clients. All forms of credit and/or savings institutions were first identified and constituted into the sampling frame. Consequently, samples were purposefully drawn from the formal finance institutions made up of the five commercial banks reported to be active participants in microfinance activities by the development office of the Central Bank of Nigeria, Kano branch. Three most active in the running of microfinance programme were selected from the 25 commercial banks that emerged after banks' restructuring and the five found to be active in microcredit services. All informal and semi formal MFIs categories identified, totalling four each which were included in the survey. The features of the participating institutions/programmes were further studied with respect to additional characteristics. In the second or main phase of the inquiry selected MFIs were categorized into three main groupings to ease collection of information. These were Formal, Semi Formal and Informal MFIs.

Both primary and secondary data were collected for this survey. Relevant primary information was collected through interviews with the executive officers of the financial institutions included in the survey as well with officials Central Bank of Nigeria, Kano Branch using structured questionnaires. Further, data was also collected from the published financial

reports of formal institutions including various CBN Annual reports over the preceding three years (2004-2006). In the interviews detailed information on the specific aspects of the microfinance window operated by the MFIs were collected from the Chief Executives of the MFIs or their representatives.

Analytical/measurement tools used are.

i) Descriptive statistics

ii) Efficiency and Subsidy Intensity Index (ESII) technique.

**i)** Descriptive Statistics such as mean, range, percentage, frequency distribution, standard deviations, variance, charts and others, were used to attain objectives relating to the characteristics/behaviour of the main decision unit, the MFIs, identified their mode of operations and main sources of funding. In addition for the NGOs their purpose, mode of operations, outreach in terms of target populace, nature of supports provided, terms of repayment and as well as other peculiarities were analyzed using similar tools of analysis.

The Student's t-test was used to determine whether or not SFFI and IFFI are the same with respect to level of savings and micro loans produced. The Student's t-test was conducted using data generated from the savings records of the members of the 2 groups (SFFIs and IFFIs) over the last three years. Similarly, for the micro loans data collected was used to compare the two categories.

**ii) Efficiency and Subsidy Intensity Index (ESII) technique.**

ESII was used to measure the efficiency and sustainability of the microfinance programs. It has been found to be a useful tool for the measurement of efficiency as well as determination of subsidy dependency of microfinance programs (Khalil, et al. (2000). They first used it to determine the efficiency and sustainability of microcredit programs in Bangladesh.

ESII was adopted for use in this study since it consists of ratios that related loan portfolio to revenue and cost generated by the program as well subsidy employed by each program. These parameters could afford policy makers an opportunity to develop broad-based index for determination of subsidy dependency and social cost of MFP. This dream is fulfilled by the development of ESII technique presented below:

ESII is given by equation 1:

**Equation I**

ESII

$$= \frac{S}{(r_1 * L)} + \frac{1}{r_1} \left[ \frac{(W * Emp) + (bi * B) + (di * MS) + \theta L + OPE}{L} \right] - \frac{(ri * I)}{(r_1 * L)} - \frac{IG}{(r_1 * L)} - 1$$

$$\frac{1}{(1 + \frac{(ri * I)}{(r_1 * L)})}$$

Where ESII = Efficiency and Subsidy Intensity Index

S = Gross subsidy

$r_{1=}$  is the average lending interest rate on micro loans (%)

$(r_1 * L)$  = is average income from microloans (Naira)

$r_{i=}$  is the average interest rate on MFIs' Investment (%)

$(r_i * I)$  = is average income from MFIs' Investment (Naira)

$bi$  = average borrowing interest rate by MFI (%)

$B$  = average borrowing by MFI (Naira)

$(bi * B)$  = is the average expense on borrowed fund (Naira).

$d_i$  = average interest rate on member savings (%)

$MS$  = is the average member savings generated by MFI (Naira).

$(d_i * MS)$  = the average expense on members savings deposit (Naira)

$\emptyset$  = ratio of loan loss to total loan

$\theta L$  = is the amount of loan loss (Naira).

$w$  = average wage rate (Naira)

$Emp.$  = employment numbers of personnel

$(w * Emp)$  is expenditure on staff (Naira).

$OPE$  = other operating expenses (Naira)

$MS$  = is the average member savings generated by MFI (Naira).

Gross subsidy (S) is the opportunity cost of funds from Owners (equity),

Low computed values of the index (ESII) mean more efficient and more sustainable MFI operations. Zero or negative values indicate that MFP fully pays for all expenses from its stream of revenues and income grant so no

subsidy dependency. It can secure funds from the market and efficiently generate profits on a continuous basis hence its assured sustainability.

### Efficiency and Productivity

Cost efficiency is determined from the ratio of expenses incurred to perform key activity relative to total revenue functions of the MFI and relative to the loan output and the overall profitability. Cost per borrower and cost per saver are two most commonly used parameters to determine efficiency of an MFP. Cost per borrower is simply the ratio of total expenses to total number of borrowers while total expenses divided by total number of savers give the cost per saver.

Productivity is determined from a combination of two parameters namely outreach and efficiency. It is measured in terms of borrowers per staff and or savers per staff. The MFP which uses fewer resources to deliver services to a large number of users or beneficiaries is more productive than the reverse situation.

Profit P on the other hand, is determined from the difference between total revenue and total cost of the MFI realized in the course of its business for the period considered. It is computed as follows:

$$P = \text{total revenue (TR)} - \text{total expenses (TE)}$$

$$P = (r_1 * L) + (r_i * I) + IG - [(w.emp) + (b_i * B) + (d_i * MS) + (\emptyset * L) + OPE] \quad \text{Equation V}$$

where  $\emptyset$  L,  $r_1$ ,  $r_i$ , IG, w, emp.,  $b_i$ , B,  $d_i$ , OPE and MS are as defined above.

The gross profit from the operations of an MFI fully covers all expenses as well the cost of subsidized funds then the program is profitable and financially sustainable.

## VI. EMPIRICAL RESULTS

### Types or Microfinance Institutions/Programs (MFI)

Microfinance institutions/programs (MFI) engage in a wide range of practices across the state. Prominent operators in the area of study include Development Banks (DB), Commercial Banks (CMB), Primary Mortgage Banks (MB), Microfinance Banks (MFBs) and non-governmental organizations (NGOs). Saving and loans associations, cooperatives of whatever type, and rotating savings and credit association (ROSCA) did not



participate in this survey even though records from state ministry of commerce suggest the existence of such associations.

The financial Structure among MFI reveals that they relied mostly on borrowed funds, leverage, followed by equity funds and least on member savings.

**Table A: Proportion of equity and reserves, borrowed fund and members' savings among categories of MFIs (2004-2006)**

Types of Microfinance Institutions (MFIs) Range in % and averages									
Source of fund	FFI	Mean %	SFFI	Mean %	IFFI	Mean %	Ave.	Mean %	
Equity & Reserves	38-40	39	22-52	36	9-15	12	9-52	30	
Borrowed Funds	44-50	47	41-75	57	62-81	71	41-81	60	
Members' savings	13-16	14	3-11	7	11-23	17	3-23	12	
Total		100		100		100		100	

Source: Survey Data, 2007.

### Size of microloans and mode of disbursement

There is a wide gap among MFIs and even within each category of FFIs regarding the size of microloans extended whether lending to individuals or group on the size. It ranged from ₦ 0 000 to ₦ 50 000 naira per loan beneficiary. SFFI generally provide from ₦ 15,000 - 50,000 which is renewed upwards up to ₦150, 000 per active and performing client. IFFI generally start at ₦5, 000 - N10, 000 but can grow to ₦ 5,000 - ₦ 5, 000 per beneficiary in group. The type of activity financed often dictates the size of microloan with asset acquisition attracting the highest and longer gestation period of repayment.

### Women Participation in MFI activities

Over 80% of funds disbursed were made to women beneficiaries for a wide range of activities including petty trade, food and restaurant services, financing for the acquisition of capital assets among others as seen in the Table on activities

Information regarding the various parameters on cost efficiency, financial ratios and other performance indices can be seen in Table B.

**Table B ESII Computations for FMFI, SFFI and IFFIs in Kano, 2007**

		FORMAL MF			SMFI			IMFI		
		2004	2005	2006	2004	2005	2006	2004	2005	2006
G	Grants (G)	201,221,720	215,377,720	216,352,325	10,000,000	5,000,000	5,000,000	3,000,000	5,000,000	6,000,000
EQF	Equity Fund	12,933,581,047	16,815,833,627	21,229,306,503	15,000,000	20,000,000	45,000,000	2,000,000	4,000,000	5,000,000
(G+EQF)	tot E&G	13,134,802,767	17,031,211,347	21,445,658,828	25,000,000	25,000,000	50,000,000	5,000,000	9,000,000	11,000,000
rm	Markt int. rate (rm)%	0	0	0	0	0	0	0	0	0
bi	Ave. Bor. Rate%	0	0	0	0	0	0	0	0	0
B	Borrowing Amt.	14,424,986,367	17,975,115,563	29,190,670,348	12,000,000	20,000,000	150,000,000	8,000,000	36,300,000	42,000,000
IG	income grant rec.	-	-	-	-	-	-	-	-	-
rm-bi	Net rate%	0.07	0.08	0.08	0.14	0.15	0.15	0.12	0.11	0.11
B*(rm-bi)	Subsdy frm borr.B*(rm-bi)	1,024,174,032	1,438,009,245	2,346,929,896	1,656,000	2,960,000	22,200,000	960,000	3,993,000	4,620,000
(G+EQF)*rm	Subs. From Grts & Eq.	1,970,220,415	2,724,993,816	3,431,305,412	3,750,000	4,000,000	8,000,000	750,000	1,440,000	1,760,000
Gross S	Subs frm Borr, Eq & Inc, G (S)	2,994,394,447	4,673,939,401	6,421,605,073	6,406,000	7,710,000	31,700,000	1,910,000	5,703,000	6,710,000
r1	Int. on Loan%(r1)	0.12	0.12	0.12	0.48	0.48	0.48	0.34	0.34	0.34
L	Ave. Loan(L)	7,940,000,000	8,499,288,130	11,723,876,060	29,000,000	85,000,000	302,000,000	15,000,000	48,273,120	51,474,733
ri	Int on Invt(ri)	0.05	0.11	0.11	0.12	0.12	0.12	0.25	0.25	0.25
I	Ave. Invt(I)	13,012,000	13,012,000	580,969,000	3,000,000	5,000,000	6,000,000	3,000,000	3,500,000	5,000,000
W. Exp	Wages (W. Exp)	1,360,115,235	1,379,946,952	1,360,115,235	1,186,000	1,500,000	2,376,000	588,000	588,000	646,000
s	Saving Amt	5,041,607,299	5,441,607,399	7,446,377,289	2,000,000	5,000,000	6,500,000	3,125,000	4,810,000	6,500,000
d1*MS	Int paid on savs.(d1MS)	148,482,817	158,482,817	144,191,299	50,000	125,000	162,500	93,750	144,300	195,000
d,	Saving Int%(d1)	0.035	0.035	0.035	0.025	0.025	0.025	0.03	0.03	0.03
r, L	Income frm loan(r1L)	597,000,000	619,277,782	622,631,880	13,920,000	40,800,000	144,960,000	5,100,000	16,412,861	17,501,409
r, I	Income frm Invt(ri I)	620,000,000	349,439,639	117,945,998	360,000	600,000	720,000	750,000	875,000	1,250,000
B*bi	Borr exps(B*bi)	225,377,720	244,036,817	244,036,817	144,000	240,000	1,800,000	240,000	1,815,000	2,100,000
OL	Loan Loss prov.	629,012,643	665,168,806	1,003,525,507	580,000	1,700,000	6,040,000	300,000	965,462	1,029,495
OPE	Operation Exp	2,338,435,776	2,638,435,776	2,481,580,314	3,480,000	10,200,000	36,240,000	1,275,000	4,103,215	4,375,352
S/r1*L	Ratio Subs/loan Inc	5.02	7.55	10.31	0.46	0.19	0.22	0.37	0.35	0.38
1/r1	recpcal of int. on L	8.33	8.33	8.33	2.08	2.08	2.08	2.94	2.94	2.94
Exps/L	Ratio Exps/loan	0.59	0.60	0.45	0.19	0.16	0.15	0.17	0.16	0.16
ri*/r1L	portfolio mix	1.04	0.56	0.19	0.03	0.01	0.00	0.15	0.05	0.07
1/r*E/r1L	cost efficiency	4.93	4.99	3.72	0.39	0.34	0.32	0.49	0.46	0.48
IG/r1*L	Ratio Inc G/ Loan	-	-	-	-	-	-	-	-	-
ESII	Efficiency & Subsidy Intensity Index	3.88	7.01	10.80	(0.17)	(0.48)	(0.46)	(0.25)	(0.23)	(0.20)

From the computed values of the ESII it is clear that in the case of FFI, survival depends on subsidized fund increasingly over the three year period. With SFFI and IFFI they continue to reduce their dependency on subsidy over

the period. Clearly the later are on the path to sustainability and efficiency while the former is not sustainable as presently operated.

## **V. CONCLUSION& RECOMMENDATIONS**

The highlights of our findings discussed alongside the key performance indices enumerated in Table B lead to the following recommendations, among others:

1. MFIs are cost efficient among SFFI and IFFI categories as demonstrated by the results of analysis of Hududullah and WDI but inefficient with formal MFP. In both cases opportunities for improvement exist. Returns to equity and assets are comparable to any other business in the economy. However, further examination needs to be carried out in areas where transaction costs could be minimized while review of lending rates to market rates of interest should be is adopted to improve profitability.
2. MFIs can be sustainable if information flow is better managed particularly for markets rates on deposits and microfinance products. A situation where the savings component is the lowest in the financial structure suggests a faulty strategy for a sustainable program.
3. The use of ESII to measure the extent of subsidy dependence of MFI and their sustainability has shown that semi formal as well as informal MFI have come a long way in achieving independence from subsidy and are on the path to sustainable operations. With FFI a lot has to be done to reduce subsidy dependence and improve on efficient operations going forward.
4. It is recommended that the mode of operation of microfinance institutions needs to be reinforced and more business-like approach should be encouraged to maximize their potentials. FFI must review their approach to the program. A better strategy to improve savings deposit is necessary for sustainable operations.
5. Further research needs to be carried out to build up accurate data covering longer period to support the restructuring process suggested in 5 above. The nature and, timing of the investment and risk return trade off for best practices need to be determined for the emerging MFIs.

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Notes

All the parameter cited in the formula above have been defined earlier when presenting the formula of net subsidy (NS). Similarly, sources of information on the key variables as well as the units of measurement were also indicated.

To summarize quantities like average micro loan amount,  $L$ ; Average Investment by MFI,  $I$ ; average number of employees  $Emp$ , their average wages and salaries,  $w$ ; average income from micro loans,  $(r_l * L)$ ; average income from investment,  $(r_i * I)$ ; Income grant,  $IG$ ; operational expenses,  $OPE$ ; expenses on borrowed funds,  $(b_i * B)$ ; expenses on members savings,  $(d_i * MS)$ ; loan loss provisions,  $\emptyset$  were all picked from their financial statements or management account reports or extracted from submissions sent to regulatory authorities. The micro lending interest rates  $r_l$ , borrowing rates by MFI  $b_i$ , rates on investments  $r_i$ , were all collected from the money market or CBN sources as reported in their Annual Reports. For SFMFI and informal MFIs information obtained using questionnaire administered were used to compute the various income from loans, investments and expenses on staff.

The ESII essentially comprises several ratios, including:

- Gross subsidy intensity in relation to income from loans
- Cost and financial efficiency
- Portfolio mix in relation to output price ratio.
- Income grant intensity
- Role of revenue from loans in relation to total income and its impact on subsidy intensity and efficiency
- Total expenses by the MFI program relative to total income from loan assets

Gross subsidy  $S$  is determined from the opportunity cost of subsidized funds and the financial structure of the MFP as in equation II

$$S = (G + EQF) * r_m + (r_m - b_i) * B + IG \text{ ----- Equation II}$$

Where  $S$  is the gross subsidy,

$G =$  is the Grant received by MFI in Naira

$B =$  is the total borrowing by MFI in Naira

$IG =$  is the income grant received as expense re-imburement to MFI in Naira

$EQF =$  is the equity and reserve fund of the MFI in Naira

$b_i =$  Average borrowing interest rate (%) and

$r_m =$  is the average market rate of interest in (%)

$r_m$  is defined as the past 36+ month deposit interest rate often used by researchers to evaluate the sustainability of MFPs as MFIs are expected to finance their operations from mobilized deposits. It captures the difference between market rates of interest on the one hand, and the respective costs of equity funds, grants, and borrowed funds accordingly. Subsidized funds have social costs associated with them as they have alternative investment options if they are not employed in the business of microfinance.

Total funds (TF), flowing into microfinance institution is made up of the owner capital contribution,  $EQF$ , earlier defined and measured in naira amount; grants received from

donors  $G$ , in Naira amount; borrowed funds  $B$ , from different sources (personal or impersonal) and measured in naira, members savings,  $MS$ , from deposits made by members and or potential beneficiaries and income grants received from donors as reimbursable  $IG$  and measured in naira amount.

The total revenue generated by an MFI in any given period is determined by income from loans, income from investment and income grant received from donors for reimbursable as seen in equation III:

$$TR = (r_1 * L) + (ri * I) + IG \text{ -----Equation III}$$

Where TR= Total revenue in Naira

$r_1 * L$  = Average income from loans which is a product of average loan and average weighted interest rate on MFPS' loan asset.

$r_i * I$  = Average income from investment which is a product of average investment and average weighted interest rate on MFPS' investments portfolio and

$IG$  = is the income grant received as expense reimbursable in Naira.

When an MFI is able to pay for gross subsidy and total operating expenses from its total revenue it is financially sustainable. The total expenses of the programme include payments for wages, interest on borrowed funds, loan losses, operational expenses and interest paid on member savings as presented in equation IV

$$TE = (w.emp) + (bi * B) + (di * MS) + (\theta * L) + OPE \text{ Equation IV}$$

Where

$(w.emp)$  = total expenses on wages and salaries of personnel (all categories of staff);  $B$  = expenses on borrowed funds (Naira);

$MS$  = expenses on members' savings (Naira);

$L$ ) = loan loss provision expense (Naira);

$(OPE)$  =operational expenses (Naira).

All other parameters are same as symbolized and defined earlier.