LAGOS STATE
Diagnostic Survey Report
December 2009

Land-use/land-cover map of Lagos State
LAGOS STATE
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Lagos State Agricultural Development Authority mid-year activity report

Lagos State Agricultural Development Authority 2009 Fisheries production Survey

LSADA participatory rural appraisal for the implementation of 2010 on farm adaptive research and extension activities
1.0 INTRODUCTION

Farming activity is important to developing nations like Nigeria for the provision of food and as a source of income for farmers. Although farmers are many and diverse in their agricultural activities engaged in e.g. crop livestock and fish farming activities, forest, agro-processing, farm mechanism, commercial agricultural e.t.c. they seem not to be meeting the nations need in feeding the teeming population year in year out. Nigeria continue to import one agricultural item or the other, while Universities and Research Institute are also engaged in agricultural related research studies in one form or the other.

It however seems that most of the farmers are not benefitting enough from research studies carried out in such institutions. This may not be unconnected with the fact that the technology innovations developed by the researcher are beyond the income level of the peasant farmer who constitute the majority to adopt or the tech/innovations are not properly understood by the illiterate farmers or even still, the developed tech/innovation are not directly related to the farmers needs for improved performance in their farms.

This led the Research and Development centre of the University of Agriculture, Abeokuta to send a team of Lecturer to each of 8 states of the old western region of Nigeria (which is UNAAB catchment areas) on a Diagnostic survey to interact with farmers, ADPs, Agricultural related industries and establishments as well as individual concerned to assess the situation on ground and make recommendations that will re-orientate the research focus towards demand and/ farmer driven research studies.

1.1 Research objective

The general objective of the study is to determine the research gap(s) in agriculture in the mandate States of the University of Agriculture, Agriculture.

Specifically, the study will include the following objectives:

1. To identify basic social and economic characteristics of the farmers.
2. To identify the farm enterprises.
3. To identify the farm activities and existing technologies in farming in the States.
4. To identify the basic problems of farming in the State.
5. To describe the role of other Institutions in the area on agriculture.
6. To draw conclusions and action plans.
2.0 RESEARCH METHODOLOGY

2.1 Study area

Two zones in Lagos State which are western zone with the headquarter at Badagry and far east zone with its headquarter at Epe (Figures 1-3).

2.2 Sampling and Data Collection

Participatory Rural Appraisal approach was employed in conducting the survey. The Multi stage sampling technique was used to select the farm-stead or villages. The first stage was to randomly select 2 cells from every agricultural zone of the State. Five extension village groups were selected from each cell. The state was divided into 2 zones, each consisting of a number of cells. Information was elucidated from the Focus Group (FG) in the selected villages using an interview guide.

2.3 Diagnostic Survey trip to Lagos State

A team of lecturers from University of Agriculture, Abeokuta namely Prof. A. B. J. Aina, Dr. A. F. Adisa, Dr. O. F. Ashaolu and Dr. (Mrs.) I. K Oyewusi embarked on an official trip to carry out diagnostic survey on Agricultural ventures in Lagos State. The team took off with an official car of RESDEC from Somorin junction of Abeokuta by 9.00 a.m. on 7th December 2009.

Our first place of call at Lagos was Lagos State Agricultural development Authority, Oko Oba, Agege, Lagos.

Mr. Elias who is in charge of Extension service and Mrs. Raji who stood in for the project manager (Dr. Jide Basorun) who was away on outside official assignment received us with some other staff members.

The organization team members with our team from UNAAB had discussion, question and answer section in relation to the diagnostic survey guide formulated to them in advance. All the questions have been answered and necessary information was made available to us to photocopy.
There and then we were informed that there are three agricultural zones in the state comprising western, eastern and far east zones. We then agreed to cover two zones which are western zone with the headquarter at Badagry and far east zone with its headquarter at Epe. We were informed that Mr. Olubiyo Dayo (Zonal Executive Officer for Western Zone) will lead us and a team of three (3) field Extension staff including a lady. A video and a camera man and a driver to convey us in their official staff bus for two days.

Later on 7th December, 2009. We proceeded to Lagos State Ministry of Agriculture to meet the Permanent Secretary at Ikeja. We were informed that the Permanent Secretary had travelled with Lagos State Governor outside the State but he had referred our request to Lagos State Agricultural Development Authority (LSADA) to treat. There was no need to bother anybody on that since LSADA have acted appropriately.

Our last place of call on the first day of the trip was Federal Institute of Industrial Research, Oshodi (FIIRO), Lagos. We were told that the Director General was in a meeting and will not be able to attend to us. Mrs. Kupoluyi who is next to Director attended to us but informed us that she was not aware of our coming and had not sighted the letter forward to them from UNAAB. We were asked to come later to collect information related to our diagnostic survey while Engr. Adeyemi and Komolafe conducted us round the FIIRO workshop to see some Agricultural and Industrial processing machine produced by FIIRO. FIIRO is involving the ADPs to interact with the farmers an adaptive technology on monthly training on their developed technologies.

On 8th December 2009, both the UNAAB and LSADA team embarked on the field trip to western zone with the LSADA bus, 9 of us in total. We stopped at Lagos State University (LASU) campus, Ojo Local Government to interview the vegetable farmers along the campus frontage who were training Hausas men from Kano planting Soko, Tete, Onion, Okoro e.t.c. Inside the campus we met many women and some few men engaged in planting Ugwu and bitter leaf vegetables. They were mainly Ibos by tribe.
These groups of vegetable farmers are making use of surface irrigation with their water being supplied from wash bore and application of fertilizer and manure to the sandy soil.

We then drove to Ajara Farm Settlement in Ajara Badagry Local Government Area of the State. We met extension staffs who are in charge of this cell who introduced us to the farmers. Coincidentally, some group of farmers' representative were in a meeting with a female micro finance bank staff. We took over the discussion with group of both Male and Female Farmers of vegetable, poultry and crops.

We thereafter, proceeded to Itedo Alafia cell in Badagry Local Government area (LGA) visit to Gari processing factory. On ground we met Oluwasheyi women group of farmers frying gari in the factory. In the same community we were told that they have Sheneyan men group of farmer too. It is a Lagos State Modern Community based cassava processing centre, Itedo Alafia, Badagry Local Government Area. We went to Itoga Rice Farm, Olorunda Local Council under Badagry block.

The last place we visited on 8th December, 2009 was Lagos State Itoga Rice Farm, Apa Block in Olorunda Local Council. It is a 155ha lowland party developed for rice production in the raining season and supposed to be for water melon production in the dry season by surface irrigation. As of the time of our visit, about 5.00 p.m. there was nobody at the farm site and no recent farming activity was observed. Two metallic staff is on the site for storing farmers' implements and hand tools.

On 9th December 2009, LASADA and UNAAB teams left with the ADPs bus early in the morning to the authority office of Epe Local Government in the far Eastern zone. Our first point of call was Lagos State Government Rice for job programme project, Itokin block. We met about 6 staff who took us round the rice processing mill mini plant and showed us the Agricultural Equipment made available to farmers. Operations like rice, threshing, parboiling in the plant yard and rice harvesting by renpet on the field were going on at the time of our arrival there. We were able to collect relevant information from the people we met on ground.
From here we moved to Ilara cell, Eredo Block in Epe Local Govt,. Area to visit a family who is engaged in poultry, piggery And cassava production. It was the wife we met, the husband was not around. We were conducted round the 400 chickens layers housed in a thatched roof building with old battery cages. We also visited the piggery house that has capacity for 100 pigs at once. The family was into production of cassava to form part of the pig ration. She was interviewed and gave us useful information pertaining to our field trip.

Igbooye cell in Eredo block was our next place of call because we were informed at ADP’s office that it is a community where goat rearing is a taboo. We met the ruler with price of his chiefs and about 11 women who are in farming business in the community. They were all interviewed. Coincidently, that day was the first day they were able to sell their produce in the community market. Before then they have being taking their produce to a nearby town to sell while they have not being market in their own town. A collapsed bridge linking them to their main farm land was reported to be a great hindrance in accessing their farmland. This also was partly responsible for not having market in the community.

Also in Igbooye we met an integrated farmer who is into poutry, fish, cattle and crop production. We were able to interview him and got some facts related to our field trip. We eventually returned to ADPs office by 4.30p.m

On 10th December 2009 we proceeded to Nigeria Institute of Medical Research Centre, Yaba , Lagos. We met Dr. Adeiga who is the only veterinary Doctor on group because in this place their research is mainly related to human beings. We were however, informed of a more related research centre by name: Veterinary Diagnostic Centre, Keffi Street, Obalende, Lagos (A branch of VOM, Jos).

We got additional intervention and date from FIIRO, Oshodi. In afternoon time we met the LSADA. On a rapup to inform them of our experience with them and appreciated their establishment (ADP) for assisting us so far. We have earlier on been told by RESDEC that the Nigerian Institute for Oceanography and Marine Research, Victoria
Island, Lagos could not be available for our visit. The findings from each zone are as attached.
3.0 RESULTS AND DISCUSSIONS

3.1 Diagnostic Surveys: Lagos ADP Western Zone

3.1.1 Ajara Farm Settlement

Date of Interview: 8th December, 2009

Village - Ajara Farm Settlement
Local Government - Badagry
State - Lagos (Western Zone Badagry block)

A Farmer Characteristic
A1 Total number of FGD - 29 people (Female 8, Male 21)
A2 Major Tribe - Egun, Yoruba, Ibo and Edo
A3 Social Infrastructures - Schools, Churches, Mosques, Electricity, Borehole, Cement, Wetland, Houses and Petrol Station
A4 Coordinate - GPS instrument not available
A5 Means of transportation - Motor, Bike, Keke Napep, Cars, Trucks, Buses
A6 Age group - Male 16 (between 30 - 50 years) 5 males >50 year. Female 8 (between 25 40 years)
A7 Primary occupation - Crop and livestock farming
A8 Type of training - Traditional and formal training
A9 Average yield - Tomatoes, Ugwu, Ewedu, Tete, Cassava, Coconut, Banana, Pineapple, Pawpaw, Citrus, Mango, Maize, Pigs, Duck, Chicken, Goat, Sheep.
A10  Primary source of income - from sales of produce n the farm
    Secondary source - not indicated
A11  Credit source - from cooperatives and Microfinance banks.
    The bank staff come to address then on the day of our visitation to these farmers.

B  CROP/LIVESTOCK
B1  CROPS/LIVESTOCK

CROPS
Vegetable - Tete, Ugwu, Ewedu, Tomatoes
Fruits - Pineapple, Citrus
Arable crops - Cassava, maize Coconut

Livestock
Poultry - Chicken, Duck
Fish
Pigs
Sheep and Goat

B2  Farm Implements/Equipment - Tractors, Cutlass and Hoes
B3  Sources of farm inputs - Buy from Agricultural stores, ADP, Lagos State. Agricultural input supply authority (LAISA) and UNAAB leventis
B4  Soil mapping - Nil
B5  Forest and wildlife production - Nil
B6  Existing fishery practice - Earthen ponds,
    Species - Tilapia, cat fish
B7 Common Farm Management - Mixed farming

B8 Visit by Extension assets - done on regular basis

C Post Harvest Activities

C1 Common post production activity - Oil palm fruit processing, cassava Processing

C2 Channels of production marketing - Buyers at farm gate

C3 Value addition to crops, livestock and fishery - Fish smoking, oil palm processing and cassava processing

C4 Categories processing along sender: - 3 female in fish smoking. 5 males and 5 female in oil processing. 8 females in cassava processing

D CONSTRAINTS/PROBLEMS

D1 Major Constraints - soil degradation, access to land, urbanization, unavoidability of labour (labourers go for "Okada riding" now), Poor seeds, storage facilities, pests. (weaver birds affecting cocoanut plantation, Black spot disease on tomatoes., termites invasion, unpredictable weather/session, disease outbreaks (African swine fever, Avian flu), highest and scarcity of chemical fertilizer, No irrigation facilities, poor production chicken layer. (purchased from UNAAB Leventist), farmers demand for unrealistic bank interest from microfinance banks, lack of modern farm equipment, personality of some of the bankers in questionable by not been honest to the farmers too many dependents on farmers (leaving little or no produce for marketing), in most cases buyer dictate prices and fund.

E INTERVENTIONS

E1 Areas interventions are:

- Provision of irrigation facility
- Provision of good and affordable seeds
- Subsidized fertilizer price
- Processing and presentation of farm produce
- Pest control
- Soft and appreciable loans at reasonable interest rate
- Provision of mechanized tools and implements to replace traditional tools

3.1.2 Itedo Alafia Cassava Process Unit

Date: - 8th December, 2009
Village - Itedo Alafia (Cassava Processing Unit)
Local Govt. - Lagos (Western Zone, Aga Block)

A Farmers Characteristic
A1 Number of participant at FGD - 6 women
A2 Tribe - Egun, Yoruba, Awori, Ilaje
A3 Social Infrastructure - Churches, Mosques, Borehole, MTN and GLO network
A4 Coordinates - Not GSP instrument
A5 Means of transportation - Motor bike, keke Napep, Buses, Tribe
A6 Age of FG - 35 – 45 years female

No. and age of member of Oluwseun Women group -38, Age: 35 - 60 years
A7 Primary Occupation - Cassava farming and processing
Secondary occupation - petty trading
A8 Training - Traditional and formal (short)
A9 Average yield - Cassava, Maize, Palm trees
A10 Primary source of income - Sales of produces.
Secondary source of income - petty trading

A11 Credit sources - from cooperatives loan (men and women apart)

B Crop/Livestock
B1 List all crops/livestock in the community – cassava, coconut, oil palm tree, maize, vegetables

B2 Farm implements/Equipment - Hoes, cutlasses and wheel barrows
B3 Sources of Farm inputs - from LAISA and public market
B4 Mapping - Nil
B5 Forest and Wildlife products - Nil
B6 Exist Fishery practices & species - Nil
B7 Common farm management - Mixed cropping
B8 Extension agent visit - on regular

C Post - Harvest Activities
C1 Common post production activity - cassava processing and coconut processing
C2 Channels of produce marketing - At farm gate and suburb markets
C3 Value addition to crops - Nil
C4 Processors along gender - 6 women in attendance

D Constraints
- Capital
- Cassava processing house built by Government cannot accommodate all processor; there is no enough fire stands, the surface tanks are too deep
for its use, the fryer made of mild steal is in appropriate to produce quality Gari.

- No mechanized technology transfer to them e. g Cassava peelers

**E Interventions**

**E1**
- Provision of stainless fryers to replace the mild steel fryer installed
  - Need more frying point and extended shad
  - The height of surface tank need to be reduced
  - Provision of soft loans by government

**3.1.3 Lagos State University (LASU) Ojo**

Date of Interview: - 8th December, 2009

Name of Interview - Group 4 members

Village - Lagos State University (LASU)

Coordinators of Location - GPS instruments was not given to us

Local Govt. Area - Ojo local govt.

State - Lagos (westerner zone, Ojo Block)

**A Farmer characteristics**

A1 No at the focus group discussion (FGD) - 10
  Total male - 2, Total female - 10

A2 Tribe - Ibos, Calabar and Hausa

A3 Social infrastructures available in the community are: Primary, secondary and post secondary schools, churches, mosques, electrical, petrol stations, primary health centre, borehole, well, all net work and other modern infrastructures.

A4 Coordinates - GPS instrument not available
A5 Road transportation is available to the farmers (motor bike, buses, keke napep, cars, trucks e.t.c)

A6 Age of FGD - 31–50 years Female
                   31–50 years Male

A7 Primary Occupation of FG - Vegetable farming
Secondary occupation - some are civil servants

A8 Type of training - Traditional and formal (short)

A9 Average yield - Ugwu (Pumpkin) 6.04 MT/Hectare
                   Tete (Amaranthus) 5.30 MT/Hectare
                   Sokoyoto (celosia) 8.04MT/Hectare

A10 Primary source of Income - sales of produce (vegetable)
Secondary source - some are from spouse, civil service
                   work (salary and trading)

A11 Credit sources - They buy seeds or seedlings on credit
                   and pay back on harvesting

B Crop/Livestock

B1 Crops/Livestock in the community - Vegetables (Ugwu, Amaranthus,
                                      Ewedu, Sokoyokoto)

B2 Farm implements/Equipment - Cutlass and Hoes

B3 Sources of farm inputs - buy seeds from co-farmers and from
                            public markets

B4 Soil mapping - Nil

B5 Forest and Wildlife products - None was sighted

B6 Fishery practice - Nil

B7 Common farm management practice - Monocropping

B8 Frequency of visit by extension agents they visit on regular basis
C Post - Harvest Activities

C1 Common post production activity - Nil

C2 Channel of produce marketing - buyers from urban centres in Lagos State and in the University of Common levy at farm gate

C3 Value addition to crops, livestock and fishery Nil

C4 Categories processors - Nil

D Constraints/Problems in Agriculture

D1 Major constraints -

(a) Seeds - Port-Harcourt variety of Ugwu seeds is drought and disease resistant but with longer maturity period. Calabar variety matures earlier but with low resistance to draught and disease resistant

(b) Flood and funds

(c) Need for organic or farmyard manure

(d) Lack of appropriate insecticides for treatment of disease out break

(e) Water shortage during the dry season can increase cost on labour use and this may imply reduction in land cultivated

(f) Poor soil condition in the dry season

(g) Lack of storage facilities

E Interventions

E1 Seed multiplication of appropriate type that is high yielding and disease resistant
3.1.4 Itoga Rice Production

Date: 9th December 2009

Village: Itoga (Lagos State Government, Ministry of Agriculture and Cooperative "Rice for Job programme", Itoga Site)

Local Gov.: Badagry

State: Lagos (western zone, Apa Block)

At Itoga site, we did not meet any of the farmers because we got there in the afternoon (they must have finished their morning farm activities). They have harvested the rice on the farm. Since parts of the land acquired for the rice project have not been cleared at all for farmers’ use. There seems to be no current activities taken place on the farm. It is said to be 55 hectares of land need for "Rice for Job pressure".

3.2 Diagnostic Survey: Lagos ADP Far Eastern Zone

3.2.1 Idena – Itoikin (Rice for job programme)

Date of Interview: 9th December, 2009

Names of Interviewer: Dr. A. F. Adisa, Prof. A. B. J. Aina, Dr. O. F. Ashaolu and Dr. (Mrs) I. K. Oyewusi

Village: Idena—Itoikin (Rice for job programme)

Coordinates of Location: No GPS instrument to determine the coordinator

Local Govt. Area: Epe Local Govt., Lagos

State: Lagos

A FARMER CHARACTERISTICS

A1 Total Male – 6, (Lagos State Rice for Job Programme Staff) no female

A2 Yoruba
A3  Borehole, tarred road, schools, GSM facilities
A4  No GPS instrument to determine the coordinates
A5  Bicycle, motor bike, car and truck
A6  Male age 31-50 category, No female was met
A7  Civil Servant
A8  Formal training
A9  MERICA (Ofada) rice variety yield as 1 ton/ha and famo 44 variety yield is from 2-3 ton/ha
A10 From Lagos State University
A11 Credit source comes from Lagos State to the farmers

B  CROP/LIVESTOCK
B1  Rice, Water melon, Banana, Cassava, Vegetable, Maize, Palm Wine, Poultry and cattle
B2  Power tiller, tractor, seed planter, transplanter, knapsack, sprayer, rice reaper, thresher, rice milling machine and small capacity harvester
B3  From Lagos State Government, Ministry of Agriculture and Cooperative through Agricultural Development Project
B4  Soil map not made available by generally observer as heavy swampy lowland soil
B5  None
B6  Fish ponds, shrimps and fishing
B7  Mono cropping (rice) and fishery
B8  Regular visit of extension agents

C  POST HARVEST ACTIVITIES
C1 Mechanised rice processing/milling
C2 Through Lagos State Ministry of Agriculture, that buys the paddy rice back and further processed limited before selling to the public (Eko Rice)
C3 Rice processing and milling before being sold
C4 Processed by Lagos State Government Rice for Job programme staff.

A. CONSTRAINTS/PROBLEMS IN AGRICULTURE
   (a) Lack of electricity power supply from national grid to the processing plant.
       They rely solely on generator power supply
   (b) No mechanical drier for the parboiled rice, it is currently being sun dried
   (c) Shortage of rainfall resulted in drought problem that brought about blast on the crop and low yield
   (d) The small capacity combine harvester performance has reported not satisfactory.

E INTERVENTIONS
- Electricity power supply from natural grid to rice mill
- Provision of mechanical drier
- Functional combine harvester to be provided
3.2.2 Eredo Block, Ilara

Date of Interview - 9th December, 2009

Names of Interviewers: - Dr. A. F. Adisa, Prof. A B J Aina, Dr. O. F. Ashaolu, and Dr. (Mrs) I. K. Oyewusi

Village - Ilara

Coordinate of Location - No GPS Instrument

Local Govt. Area - Epe

State - Lagos

A FARMER CHARACTERISTICS

A1 A female poultry and Piggery farmer

A2 Yoruba

A3 All modern/Urban infrastructures

A4 No GPS instrument

A5 Bicycle, Motorcycle, Cars and Trucks

A6 31-50 year age category

A7 Poultry and piggery farming as primary and cassava production as secondary

A8 On the job training (traditional)

A9 Producing about 1000 pigs (average 80kg – selling for N250/kg life weight and 400 chicken layers at a time

A10 Income from sales of animal products and cassava

A11 Family enterprise

B CROP/LIVESTOCK
B1 Cassava, Maize, Plantain/Banana, Palm trees, poultry, piggery and fishery
B2 Wheel barrow, cutlass, hoes, battery cages
B3 Feed obtained from commercial producers, equipment from agriculture shops
B4 Not available
B5 Snails, Bushmeat, Mushrooms
B6 Not applicable
B7 Mixed farming
B8 Government and private veterinary personnel render services

C POST HARVEST ACTIVITIES
C1 None on poultry and piggery production—direct sales of poultry products
C2 Public purchase at farm gate
C3 Not applicable
C4 Not applicable

CONSTRAINTS/PROBLEMS IN AGRICULTURE
D1 (a) Poultry produce marketing problems during glut
(b) No proper storage facility for brewers waste for piggery
(c) Poultry house thatched roof not in good condition
(d) Poultry battery cages too old, require replacement
(e) No enough labour to support the family in clearing the poultry house which may result into poultry disease outbreak

E INTERVENTIONS
(a) Appropriate piggery brewer's wastes storage needed
(b) High cost brewer's waste and irregular availability of the wastes

3.2.3 Idena (Lagos State Govt. Ministry of Agric & Cooperative, Rice Processing Center, Idena-Itokin)

<table>
<thead>
<tr>
<th>Date of Interview</th>
<th>9th December, 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Interviewers</td>
<td>Dr. A. F. Ashaolu, Prof. ABJ Aina, Dr. O. F. Ashaolu and Dr I. K. Oyewusi</td>
</tr>
<tr>
<td>Village</td>
<td>Idena (Lagos State Govt. Ministry of Agric &amp; Cooperative, Rice Processing Center, Idena-Itokin)</td>
</tr>
<tr>
<td>Local Govt. Area</td>
<td>Epe</td>
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<tr>
<td>State</td>
<td>Lagos</td>
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<tr>
<td>Block</td>
<td>Itoikin</td>
</tr>
<tr>
<td>Cell</td>
<td>Idena</td>
</tr>
</tbody>
</table>

A FARMER CHARACTERISTICS

| A1 Total Male            | Six (6), who were the staff of the rice for job, Programme, Lagos State |
| A2 Major Tribe           | Yoruba |
| A3 Borehole, Schools, Roads, GSM, streams & rivers |
| A4 No GPS instrument     |
| A5 Bicycles, trucks and cars |
| A6 Age                  | 31 – 50 years for all |
| A7 Primary Occupation    | Civil Servant |
| A8 Training             | Format training |
A9 Yield - Ofada (NERICA): 1 ton/Ha
FARO 44; 2-3 ton/ha

A10 Source of Income - Salary earners

A11 Credit Source - Lagos State Govt

B CROP/LIVESTOCK
B1 Crops: Rice, Water melon, Banana, cassava, vegetables, maize and palm tree
Livestock: cattle, poultry

B2 Power tillers, Havesters, seed planters, Knapsack sprayer, rice reapers,
threshery rice miller, small capacity combine harvester.

B3 Source of Inputs: Lagos state ministry of Agric. And Coop, ADP

B4 Observed as heavy swampy lowland soil

B5 Nil

B6 Fish ponds, streams

B7 Monocropping (Rice) fishery

B8 Extension agents; Regular visit

C POST HARVEST ACTIVITIES
C1 Mechanized rice processing & milling

C2 The Lagos State Ministry of Agriculture that buys paddy rice, processed and
milled before selling to the public

C3 Rice processing and milling before being sold

C4 Processed by Lagos State Govt. Rice for Job programme staff
D CONSTRAINTS

Lack of electric power supply.
No mechanical dryer for parboiled rice

3.2.4 Eredo Block, Igbooye

Date of Interview - 9th December, 2009
Name of Interviewers - Dr. A. F. Adisa, Prof. A B J Aina,
Dr. O. F. Ashaolu, and Dr. (Mrs) I. K. Oyewusi
Village - Igbooye
Coordinates of location - No GPS instrument to determine this
Local Government - Epe
State - Lagos

A FARMER CHARACTERISTICS
A1 Two (2) Males and Eight (8) females
A2 Yoruba
A3 All modern infractures
A4 No GPS Instrument to determine coordinates
A5 Bicycles, Motor Bike, Cars and Trucks
A6 Male age category >50 and female category 31 – 50 and >/ 50
A7 Farming, Trading/retail and food processing
A8 On the job training (tradition)
A9 Cassava is 92 ton/ha, Yam 10.65ton/ha, Maize 2.57 ton/ha, rice 2.47 ton/ha,
Okro 4.34 ton/ha
A10 Primary source of 4 residents Income: farming
A11 None

B CROP/LIVESTOCK
B.1 Banana, Cassava, Palm Tree, Pineapples, Fishery and Maize
B2 Cutlass, Hoe and Wheel barrow
B3 from government through ADP I public markets
B4 Not available
B5 Palm tree
B6 -
B7 Monocropping, mixed farming, intensive farming
B8 Extension agent do pay occasional visit

C POST HARVEST ACTIVITIES
C1 Garri processing mainly
C2 Produce marketing through neighbouring town, market outlet
C3 Cassava processed to gari and smoked fish
C4 Cassava processing by female farmers

D CONSTRAINTS/PROBLEMS IN AGRICULTURE
(a) A community where goat rearing is a taboo
(b) No tractor equipment facility for farmers operation outside the farm Settlement
© No access bridge linking the community directly with major farm lands to
convey farm inputs and output resulting in high cost of transportation through routes to the farm

(a) Produce marketing problem due to lack of markets in the community. They were met on the day of their community first marked

E INTERVENTIONS

(a) They need Government intervention in providing tractor faculty for their farming in the community

(b) Government to repair/replace the collapsed bridge linking them to the major available farm land.

3.2.5 Eredo Block, Igboye

Date of Interview  - 9th December, 2009
Names of Interviewer - Dr. A. F. Ashaolu, Prof. ABJ Aina, Dr. O. F. Ashaolu and Dr (Mrs) I. K. Oyewusi
Village  - Igboye
Coordinates of Location - No GPS Instrument to determine this
Local Govt. Area  - Epe
State  - Lagos

A  - FARMER CHARACTERISTIC
A1  - A male – family integrated farm
A2  - Yoruba
A3 - All modern infrustrurers types
A4 - No GPS instrument to determine coordinates
A5 - Bicycles, Motor bike, cars & trucks
A6 - Male age category - 50
A7 - Poultry, fishery, cattle and crop production
A8 - On the job training (tradition) & Formal training (Short)
A9 - 8 cows, not easy to estimate dusts high mortality rate
A10 - Primary occupation
A11 - Personal savings, cooperative

B - CROP/LIVESTOCK
B1 - Cassava, Maize, Fishery, poultry and Cattle production
B2 - Cutlass, Hoe, wheel barrow
B3 - from public enterprise, government agricultural commercial ventures
B4 - Not available
B5 - Bush meats, snails and mushroom
B6 - -
B7 - Intensive/the stock farming
B8 - Extension agent do visit regularly

C - POST HARVEST ACTIVITIES
C1 - No post production done by the farmers on the fishery, poultry and cattle production. Direct sales of produce
C2  - Produce Marketing publicity in towns around Lagos State.
C3  - No value addition to farm produce except processing into garri
C4  - Cassava processing into gari by females

D  - CONSTRAINTS/PROBLEMS IN AGRICULTURE
(a) Had high mortality problem with the day old chicks he got through an
agent who claimed and brought the chicks to him from UNAAB farms

(b) Experienced serious cattle abortion which was claimed to be as a result of
the source of the calf purchased

D. INTERVENTIONS
(i) The farmer requested for assistance in getting UNAAB day old chicks that
he will be sure of

(ii) Need for good marketing network
3.3 Diagnostic Survey: Interview Guide for key Organisation

Date of Interview: 7th December, 2009

Name of Interviews: Dr. A. A. Adisa
Prof. A. B. J. Aina
Dr. O. F. Ashaolu
Dr. (Mrs) I. K. Oyewusi

Name of Institution/Organisation - Federal Institute of Industrial Research, Oshodi (FIIRO)

Address - FIIRO, P. M. B. 21023, Ikeja
Tel: 08023414996 and 08023164201
Fax: 01 4525880
E-mail: info@fiiro-ng.org
Website: www.fiiro-ng.org

Coordinates of Location: No GPs Investment
Local Government Area: Oshodi Local Government Area
State: Lagos.

B. GENERAL INFORMATION

A.1 The broad mandate is to conduct research and development on our local raw materials for industrial utilization and upgrading of indigenous production techniques.

A.2 was established in 1956

A3 Research, Development of technologies and training

A4 Meat processing technology under livestock, Fish processing technology under livestock, Fish processing technology under fishery.

Mechanised cassava processing technologies, Cereals and legume processing technologies.

Bread and confectionary baking technology fruit processing technologies.

Root and Tube processing technologies

Groundnut processing technology
Beverage drinks production and presentation technologies

Oil seeds processing technologies

Edible mushroom production technology

Pulp and paper production technology

Engineering services technologies

C. INTERVENTIONS

B.1 They are not into farming and do not deal with the farmers directly but with their produce.

B.2 (a) Cassava and legumes machines
(b) Cereals and legumes machines
© Fish and meat processing machines
(d) Bread and confectionary baking machine
(e) Fruit processing machines
(f) Roots processing Machine
(g) Tubers processing machine
(i) Beverage drinks and preservation machine
(j) Oil seeds processing machines

B.3 They don't deal with farmers directly; they have contact with the farmers through the ADP staff. The technology transfer of the Institute is also done through the ADP and organizing training workshops on list of developed machine technologies mentioned in B2 above

B4 (a) Plaintain Slicer
(b) Palm wine bottling and preservation
B5. The whole Federation of Nigeria deals with organized private sectors.

B6. (a) Nutritional centre for Agricultural Mechanization (NCAM) Ilorin.
(b) Agricultural and Rural Management training Institute, Ilorin
(c) State Agricultural Development projects
(d) IARLT, Ibadan
(e) Raw materials research and Development centre, Abuja
(f) World Association of International Research Organisation (WAITRO)

B7. Not applicable

B8. Publications are attached (Appendices 1-18)

B.9 Not applicable

C. CONSTRAINTS/PROBLEMS IN AGRICULTURE

C.1 (a) Major constraint is unavailability of fund to execute approved research proposals
(b) Fund not available to promote research results particularly FIIRO reports
(c) Inability to attend Local and International Conferences due to fund constraints
(d) Inability to organize training workshops for prospective users of developed technologies
(e) Inability to maintain the developed technologies
(f) Industries that are being served are not supporting research projects.

(g) No more foreign aid to support research project

C.2 Constraints as highlighted by ADP’s report

- Farmers inability to adopt the finished technologies due to lack of funds
- Low educational background of farmers hinders undertaking and operation of the developed technologies.

E. RECOMMENDATIONS/SUGGESTIONS

- From the constraint highlighted above, fund seems to be the main limitation both for the developer and adopter of technologist

(a) Enough fund should be made available at appropriate time for approved projects development, monitoring and maintenance

(b) They should develop machine that are small enough for the peasant farmers and at affordable cost.

4.0 Effect of other Institutions in the area of agriculture

4.1 Effect of Federal Institute of Industrial Research, Oshodi

4.2 Effect of Lagos State Agricultural Development Authority (Appendices 20-30)

4.2.1 Socio-Economic characteristics of the farmers in Lagos State (Appendix 19)

4.2.2 Lagos State showing authority’s zonal offices, block offices and farm services centres (Figure 4)

4.2.3 2008 Rainfall Records in the State (Table 1)

4.2.3 Details of the rainfall data for the mid-year 2009 (Table 2)
### Table 1

<table>
<thead>
<tr>
<th>MONTH</th>
<th>EAST ZONE</th>
<th>WEST ZONE</th>
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<th>STATE</th>
</tr>
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<tbody>
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<td></td>
<td>MM</td>
<td>NOS</td>
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<td>JULY</td>
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<td>2007</td>
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<td>48</td>
<td>1346.7</td>
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</table>

There was a remarkable increase in the number and volume of rainfall incidence in 2007 observed even at the zonal basis across the state as compared to what was obtained at the state level in the state for the year 2007. However, there was no report of flood in any part of the state and as such, agricultural activities went on without any serious or critical weather disturbances.

### 3.0 CONSTRAINTS

3.1 The following constraints were faced by the Component during the period under review:

1. Inadequate field equipment for enumerators.
2. Inadequate chairs and textbook in the library.
3. Non-maintenance of all the computer systems in the component.
4. Inadequate supply of stationery especially printing paper for report condition.
5. A functional photocopying machine is required in the library.
6. A standby generator is urgently required for the preparation of reports.
Table 2

A view of the rainfall records were obtained in six locations across the zones. These locations
are the Head quarters, Ogbe, Idogo, Ikogosi, Ikpona, Arage and Odunde. Analysed reports were
submitted to relevant institutions and government Agencies.

Details of the rainfall data for the mid year 2009 are shown below.

<table>
<thead>
<tr>
<th>MONTH</th>
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<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
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<td>0.05</td>
</tr>
</tbody>
</table>

In the mid year 2009, the far eastern zone had a total rainfall amount of 1241.7mm with total
rainy days of 38. Western zone had a total rainfall amount 940.89 mm and a total of 31 raining
days. The far Eastern zone recorded 874.4 mm and 33 raining days.

At the state level, total rainfall records were less in the mid year 2009 compared to mid year
2008. At the state level, the total amount of rainfall recorded in the mid year 2008 was 817.7
with a total of 29 raining days as against 792.0mm and 25 raining days in the corresponding mid
year 2009.

The state varied between 34 degrees and 30 degrees between January and June while
the variation for same period 745 and 74%.

There is a remarkable difference in rainfall recorded between mid year 2008 and mid year
2009. Agricultural activities commenced in earnest this year and so far there had not been any
major weather hazards recorded. Although the higher rainfall records affect production
negatively, however, there was no reported case of flood in any part of the state and as such,
agricultural activities went on without any serious or critical weather disturbances.

Challenges:

The following constraints were faced by the Component during the period under review:

- Inadequate cashflow and lack of credit in the library.
5.0 CONCLUSIONS

5.1 Implications of Findings

The major limitation factors to agricultural development in the state are

(a) Funds to farmers

(b) Storage facility for perishable agricultural goods

Found as a limiting factor

- Worthwhile agricultural proposal could not be executed
- Agricultural research results could not be promoted
- The Institutes that develop new technology or innovation could not be promoted. As such farmers are not aware of such development technology innovation.
- Researchers could not able to attendance local and international conferences to promote the technology developed
- Regular organized training for prospective users could not be arranged
- The developed technology/innovation caused not be maintained, hence some of them will get rottenning as decayed as a result of long stay without use or maintenance
- The industries which make use the developed technology/innovation are not supporting the Research Institution or University financially.

Financial

- Foreign aids had become herculean task
- Transportation of produce and road condition are better appreciated than talking about arising from lack of funds to do the roads.
- Farmers are unable to adopt the developed technology innovation for lack of funds
Storage Facility as a Limiting Factor

Most of the agricultural products are perishable good crop, livestock, fishery e.t.c. when they are produced in excess of demand in the community in which they are produced, the surpluses rotten and perish, resulting in heavy profit in a heavy profit loss.

Where agricultural machines are produced because of limiting funds appropriate storage warehouse could not be built. As such warehouse could not be built. As such the developed machines are exposed to constraints weather condition (sunshine, rainfall, dews e.t.c.) thereby getting rust.

Other factors that have implication are:

- Unavailability of labour. People are no more interested in the old technology of farming – hoes and cutlasses while the farmers cannot afford learning modern implements. This significantly reduce the form size the farmer would have wanted to work with

- High cost/untimely supply of impute to farmers e.g. loans and other implements. Loans at time are not released as at the time of farming activities. As such, the loans are spend on other things that are not farming activities. When the loans are given. The interest rates are too high for farmers to meet the repayment as at when due.

Marketing

- During the period of excess production and fewer buyers, it is the buyers that dictate the price. At times such price could be at a loss to the farmers, because there are mainly farmers producing the same commodity.

- This is because in case of crop production the production activity is usually in the wet season not many farmers is usually in the wet season not many farmers can afford the lost or irrigation during the dry season which still boils down to fund limitation

Irregular power supply
This has ruined almost all industries in the nation. Even some artisans that could have been engaged in productive activities are now engaged in activities that does not require electricity supply as Okada business. It significantly agricultural mechanization industries and restorage facilities where available.

Low yield crop seeds varieties and lack of resistance to draught and disease. This has limited the yield of farmers. The input/output ratio is almost 1:1. This is not encouraging the farmers.

Taboo against good rearing – This will limit, the source of animal protein accessible to the community useless other livestock species are reared in sufficient numbers to meet animal protein requirement of the community members.

Outbreak of disease – This can result in heavy losses to the farmer or even lead to folding up of some farms unless adequate fund and veterinary drugs are available as at when due and of appropriate places.

Some of the publication collected is hereby attached, and also video CD and field photographs are submitted.
Appendix 1

Investment opportunities @ FIERO
MECHANIZED CASSAVA PROCESSING TECHNOLOGIES
PRODUCTS: Cass, Garri, Fufu, Cassava Flour, Cassava Pulp, Cassava Starch, Dextrose Cassava Flour, Fufu flour, Cassava Starch, Deminilated Cassava Starch, Soy-spra, Cassava Chips and Pellets, and Noodles from Cassava.

MAJOR RAW MATERIALS:
Cassava tubers, Soy-beans, Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

CEREALS AND LEGUMES PROCESSING TECHNOLOGIES
PRODUCTS: Soy-oil, maize flour, maize grits, Beans flour, Detergent fibs, Detergent cereals and legumes, Soy-beans, Pulses, Legumes, Fabrices, Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

TECHNOLOGY TRANSFER:
Technical Agreement (Soy-oil).

FISH AND MEAT PROCESSING TECHNOLOGY
PRODUCTS: Soy-oil, maize flour, smoked meat.

MAJOR RAW MATERIALS:
Flesh, Fish, Maize flour, Salt.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

BREAD AND CALLIONERY BAKING TECHNOLOGY
PRODUCTS: Bread, Meat pie, Hoeggbota, Chichinoro, Soy-beans, cereals.

MAJOR RAW MATERIALS:
Wheat, maize, cobs, flour, Fb. Sugar, Fats etc.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

FRUIT PROCESSING TECHNOLOGIES
PRODUCTS: Fruit (pulp, Fruits, Apple extract, jams and marmalades), Table wine, Zobo, and fruit-

MAJOR RAW MATERIALS:
Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

ROOTS PROCESSING TECHNOLOGIES
PRODUCTS: Dried ginger roots, Ginger powder.

MAJOR RAW MATERIALS:
Dried ginger roots, Sources of M.E. F.I.R.O.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

COCONUTS PRODUCTION TECHNOLOGY
PRODUCTS: Tapioca, Cassava, Soy-bean, Maize, and Biscuit feeds.

MAJOR RAW MATERIALS:
Tapioca, Soy-bean, Maize, and Cattle feed.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

BEVERAGE DRINKS PRODUCTION AND PRESERVATION TECHNOLOGIES
PRODUCTS: Bottled, Chilled, Potable, Alcoholic Beverages, Beer.

MAJOR RAW MATERIALS:
Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

OIL SEEDS PROCESSING TECHNOLOGIES
PRODUCTS: Groundnut oil, Maize oil, Palm oil, and Groundnut oil.

MAJOR RAW MATERIALS:
Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

INTERMEDIATE INDUSTRIAL RAW MATERIALS PRODUCTION TECHNOLOGIES
PRODUCTS: Sorghum, Maho, Potable Alcohol.

MAJOR RAW MATERIALS:
Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.

ENGINEERING SERVICES TECHNOLOGIES
PRODUCTS: Electrical services, Mechanical services, Industrial services.

MAJOR RAW MATERIALS:
Sources of M.E. F.I.R.O., Local Fabrices.

TECHNOLOGY TRANSFER:
Through *TAS and Training at F.I.R.O.
Appendix 2

FIIRO Industrial Profile on Cassava Chips and Pellets Production
FIIRO
Industrial Profile
On
Cassava Chips and Pellets Production

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction

A. Cassava Chips
Cassava root is a highly perishable commodity with a post harvest life of less than 72 hours. Consequently, it has been observed that cassava processing firms do not engage in continuous production because cassava roots are highly perishable. In order to reduce post-harvest losses, an appropriate method of processing freshly harvested cassava into chips has been developed. This ensures steady production and availability of dried cassava chips throughout the year. Generally, cassava chips are either circular, cylindrical or strand/rod in shape, of uniform thickness, cut into various size to suit the market.

B. Cassava Pellets
Cassava pellets production is another method of cassava preservation. Pellets are produced from chips which are milled into powder, hardened and molded into cylindrical shapes of about 2-3 cm long and 0.4-0.8 cm in diameter. They should be uniform in appearance and texture.

Production Process
The process technology for production of the two products is simple. Freshly harvested cassava roots (high cyanide variety) are subjected to the following unit operations:

Chips Production
Weighing: the cassava roots are weighed.
Peeling: the weighed cassava roots are manually peeled with knives.
Washing: the peeled roots are thoroughly washed in potable water to remove sand and other extraneous materials.
Chipping: the roots are chipped transversely into between 3mm and 5mm thickness in size, using a chipping machine. This is to increase the surface area of the root, which will be subsequently exposed to drying.
Drying: the wet chips are dried using a cabinet tray dryer at a predetermined temperature, however, other dryers such as solar dryer could be used. The dried chips should be cream-white in colour and crisp in texture.
Packaging: the dried chips are packaged in high density polypropylene bags lined with high density polyethylene sheets of 50g/pair.

Pellets Production
Pellets are essentially produced from dried chips as follows:
Milling: Dried chips are milled into powder.
Pelletizing: The powder is converted into pellets of 2cm-3cm length and diameter of 0.8cm.
Drying: The pellets are subjected to further drying before packaging.
Packaging
The pellets are packaged for exporting in the same type of packaging materials for chips.

Flow Chart

1. Cassava root
2. Weighing
3. Peeling
4. Chopping
5. Drying
6. Packaging
7. As Chips
8. Milling
9. Pelletizing
10. Drying
11. Packaging as pellets

Labour Requirement
The manpower required are: production supervisor, machine operators, factory and casual workers (peelers). Others are general manager, administrative officer, purchasing officer, storekeeper, sales clerk, account clerk, driver and security guard.

Machinery and Equipment
- Chipping machine
- Cabinet dryer
- Hammer mill
- Pelletizer
- Cabinet dryer for pellets (1 tot/4 hr)
- Knives (20)
- Wheetharrows (5)
- Plastic washing troughs (5)
Space Requirement
A standard plot is adequate for factory building and offloading space for cassava roots.

Proposed Production Capacity
1 ton of chips and 1 ton of pellets,
Input: output ratio 3:1 for chips
Input: output ratio 100:98 for pellets
Maximum installed output capacity is 2 tons/day
Maximum efficiency level in the 1st year is 80%
Maximum efficiency level in subsequent years is 70%

Estimated Capital Requirement

|                           | Naira
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The total equipment cost</td>
<td>3,108.00</td>
</tr>
<tr>
<td>Estimated fixed capital</td>
<td>6,144.88</td>
</tr>
<tr>
<td>Estimated working capital</td>
<td>1,334.57</td>
</tr>
<tr>
<td>Total capital requirement</td>
<td>7,279.43</td>
</tr>
</tbody>
</table>

Profitability

<table>
<thead>
<tr>
<th></th>
<th>Naira</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue @ 2500/50kg bag of chips</td>
<td>20,584,000.00</td>
</tr>
<tr>
<td>and 2700 kg bag of pellets</td>
<td>3,815,000.00</td>
</tr>
<tr>
<td>Total production cost</td>
<td>6,185,000.00</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>1,855,500.00</td>
</tr>
<tr>
<td>Tax @ 30%</td>
<td>556,650.00</td>
</tr>
<tr>
<td>Net profit</td>
<td>1,298,850.00</td>
</tr>
<tr>
<td>Rate of return on investment</td>
<td>&gt;30%</td>
</tr>
<tr>
<td>Internal rate of return</td>
<td>6%</td>
</tr>
<tr>
<td>Pay back period</td>
<td>2 years</td>
</tr>
<tr>
<td>Net present value</td>
<td>3,542,100.00</td>
</tr>
<tr>
<td>Gross profit: sales</td>
<td>10%</td>
</tr>
</tbody>
</table>

Services Available at FIRO
1. Training in chips and pellets production
2. Supply of equipment
3. Preparation of feasibility report
4. Quality control analysis
5. Technical assistance and consultancy services
These services are available at moderate fees.

For further details, please contact,

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Web-site: www.firo-ng.org
Appendix 3

FIIRO Industrial Profile on 10% Cassava-Wheat composite bread
FiIRO Industrial Profile

On

10% Cassava-Wheat Composite Bread Production

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction

Bread is an age-long product made principally from wheat flour. It is a staple food, and several thousand tons of baked products are consumed per day in Nigeria. Wheat is not produced in Nigeria; hence a huge amount of foreign exchange is used annually for its importation. Research evidence at FRO has shown that cassava flour can be incorporated into wheat flour for bread making at different levels of substitution, 10–15% being most acceptable, while higher levels are acceptable for confectionaries and other baked products.

Materials for Cassava Bread
- Cassava flour
- Wheat flour
- Sugar
- Baking powder
- Yeast
- Improver
- Salt
- Water

Production Process

Weighing
- The raw materials are weighed based on the recipe.

Mixing
- The flour and other ingredients are mixed in the mixing tank to obtain a homogeneous mixture.

Milling
- The dough is milled in a dough milling machine.

Cutting
- The dough is cut into required sizes.

Proothing
- The cut dough is transferred into the bread pan and allowed to proof for a period of time.

Baking
- The proofed dough is transferred into the oven to bake.

Packaging
- The baked bread is removed from the pan, cooled and packaged.
Flow Chart

Weighing
↓
Mixing cassava flour and wheat flour
↓
Dividing
↓
Moulding
↓
Panning
↓
Proofing
↓
Baking
↓
Cooling
↓
Slicing
↓
Packaging

Labour Requirement
2 bakers and 2 assistants.

Machinery and Equipment
The necessary machinery and equipment are all locally available. The equipment list is as follows:
1. Baking oven
2. Milling machine (optional)
3. Mixer
4. Slicing machine (optional)
5. Weighing scale
6. Baking pans
7. Dough cutter (optional)

Space Requirement
The space required for the project is about 15m x 10m. This will house all the machinery and equipment. Additional space would be required for raw material storage and cooling of prepared loaves and packaging.
## Proposed Production Programme

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Production days / week</td>
<td>6</td>
</tr>
<tr>
<td>Production weeks / annum</td>
<td>50</td>
</tr>
<tr>
<td>Production days / annum</td>
<td>300</td>
</tr>
<tr>
<td>No. of shifts / day</td>
<td>2</td>
</tr>
<tr>
<td>Output / annum</td>
<td>240 leaves</td>
</tr>
<tr>
<td>50kg bag of composite flour</td>
<td>N3,200</td>
</tr>
</tbody>
</table>

## Estimated Capital Requirement

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total equipment cost</td>
<td>1,955,000.00</td>
</tr>
<tr>
<td>Estimated fixed capital including pre-production cost</td>
<td>7,323,755.00</td>
</tr>
<tr>
<td>Estimated working capital</td>
<td>2,282,000.00</td>
</tr>
<tr>
<td>Total capital requirement</td>
<td>9,605,755.00</td>
</tr>
</tbody>
</table>

## Profitability

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue</td>
<td>24,000,000.00</td>
</tr>
<tr>
<td>Size: large bread</td>
<td>120.00</td>
</tr>
<tr>
<td>Total production cost</td>
<td>20,534,430.00</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>3,465,570.00</td>
</tr>
<tr>
<td>Tax @ 30%</td>
<td>1,039,671.00</td>
</tr>
<tr>
<td>Net profit</td>
<td>2,425,899.00</td>
</tr>
</tbody>
</table>

## Services Available at FIRO

- Training in baking and confectioneries with cassava wheat composite flour
- Supply of equipment
- Preparation of feasibility report.
- Quality control analysis.
- Technical assistance and consultancy services

All the services are available at moderate fees.

For further details, please contact

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Appendix 4

FIRO Industrial Profile on mechanized production of Fufu
On Mechanized Production of Fufu

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSNODI
Federal Ministry of Science & Technology
INTRODUCTION

Cassava has been processed in Nigeria to obtain four different products, namely: garri, lafun, fufu and starch. Garri is by far the most popular. Although the first three food products are obtained by way of fermentation, each possesses its own characteristic quality attributes. Fermentation may not be involved in starch production.

Traditionally, fufu is produced in the wet form with moisture content of 40-50%. This makes the product highly perishable compared with garri and lafun, which are in granular form with moisture content below 10%. This has necessitated the Institute to mechanize and upgrade the traditional method of its production.

The Product

Fufu is a fermented cassava root product. Unlike the traditional product, the mechanized product is presented in granular flour form.

Production Process

Sorting and Weighing

Finely harvested cassava roots are sorted manually to separate twigs, leaves and rotten parts. The suitable roots are weighed.

Peeling and Washing

The roots are manually peeled since the available mechanical cassava peeler currently available is inefficient. This hand peeling of the cassava roots is recommended. The peeled roots are thoroughly washed.

Fermentation (Steeping)

The clean roots are loaded into fermentation tanks which may be of plastic, stainless steel, aluminum or fibre glass materials and fitted with lids. The roots are cut into pieces to obtain fairly uniform sizes. This is to ensure uniform fermentation of all the roots in the same time. The roots are covered up completely with clean water and the lids fitted on tightly to ensure an anaerobic condition in the medium.

Pulping and Screening

The fermented root mass is transferred into clean water in which they are pulped to obtain slurry. A pulper is suitable for this purpose. The slurry is screened using a sifter to separate the fibre from the fufu.

Sedimentation and Dewatering

The fufu is allowed to sediment. The sediment is collected and dewatered using hydraulic or screw press.

Granulating

The wet cake is broken into smaller pieces for easy and efficient drying.

Drying

The fufu granules are fed into a dryer to reduce the moisture content.
Screening
The dried granules are screened into different particle sizes. The over-size particle from the screens is passed on to a mill, which reduces the particle size.

Blending, Weighing and Packaging
The milled granules are blended with the granules from the screening process. The dried is left to cool, weighed and packaged.

Flow Chart
- Cassava Roots
- Drying
- Peeling
- Jerrycan Weighing
- Washing and Screening (Fermentation)
- Drying
- Cooling
- Screening
- Blending/Weighing
- Packaging

Labour Requirement
Eight factory workers will be needed; four will serve as operators while one will be the supervisor. Also, casual labourers will be needed to peel the cassava.

Machinery and Equipment
- Vibro-screen
- Sifters
- Hydraulic Press
- Pulper
- Dryer
- Sedimentation tanks
- Cone blenders
- Granulator

The plant capacity is 1 ton/hour.

Space Requirement
The space required for the project is 10m x 20m. This will house all the machinery and equipment. Additional space will be required for raw material storage.

Proposed Production Programme
- No. of hours/day: 8 hours
- No. of days/year: 250 days
- No. of tonnes/day: 1 ton
- The input/output ratio: 3:1
- Fresh cassava roots cost: R7.00 per kg
Estimated Capital Requirement

Total equipment cost: N5,310,000.00
Fixed capital cost: N10,827,000.00
Estimated working capital: N2,164,740.00
Estimated total investment: N12,991,740.00

Profitability

Total production cost: N18,515,700.00
Gross profit: N6,480,300.00
Tax at 30%: N1,944,090.00
Net profit: N4,536,210.00

Services Available at FIRO
- Training in fufu production
- List of equipment vendors
- Preparation of feasibility report
- Quality control analysis
- Technical assistance and consultancy services

These services are available at moderate fees.

For further details, please contact
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Appendix 5

FIIRO Industrial Profile on Cassava-based noodles
Introduction

Noodles are cereal-based pasta products marketed under different trade names according to shape and size, such as macaroni, spaghetti, spaghettifili and fusilli.

They are commonly prepared from durum wheat semolina, but with recent advances in technology and product development, noodles have been successfully produced from cornmeal.

The Federal Ministry of Industry and Research. OIC has explored into the use of millet and others as partial substitute for wheat semolina in noodle production. This product technology developed has been perfected and is available for transfer to entrepreneurs.

Production Process

Pre-gelling

Cassava flour is pre-gelled.

Mixing

The pre-gelled flour is mixed with other ingredients.

Dough Extrusion

The dough is extruded into desired shapes.

Resting and Conditioning

The noodles are conditioned.

Drying

The conditioned noodles are dried.

Cooling and Packaging

The dried noodles are cooled and packaged in biaxial oriented polypropylene film (BOPP).

Flow Chart

Pre-gelling

Mixing

Dough extrusion

Resting and conditioning

Drying

Cooling
Raw Materials, Supplies and Utilities
The major raw materials for cassava-based noodle are cassava flour, wheat flour, salt, vegetable oil and noodle improper. The main items of supplies are packaging materials and factory wears such as boots, overall, gloves etc. The major utilities are electricity, diesel and water. A 40KW VA generator is needed as back-up for power supply.

Labour Requirement
Labour requirement consists of both skilled and unskilled. The manpower is made up of production, marketing, administrative and accounting personnel. About twenty (20) personnel are required.

Machinery and Equipment
The machinery and equipment for cassava noodle can be fabricated locally. The equipment list is as follows:
1. Gelatimiser
2. Extruder
3. Tray dryer
4. Packaging machine
5. Weighing scale and other accessories
The total cost of machinery and equipment is N5, 650, 000.00, including 10% installation.

Capitalization
The estimated total initial investment is N13, 600, 720.00 (This is made up of N10, 365, 750.00 initial fixed capital, N2, 750, 000.00 initial working capital and N552, 965.00 pre-production expenses).

Space Requirement
One plot of land is required for this project. The actual space required for factory construction is about 15m x 20m.

Production Programme
Production days/week
Production weeks/annum
Production days/annum
Production volume/day
Production volume/annum

### Profitability

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue from 325T (team)</td>
<td>₦60,937,500.00</td>
</tr>
<tr>
<td>Total production cost</td>
<td>₦51,097,860.00</td>
</tr>
<tr>
<td>Profit before Tax</td>
<td>₦9,839,640.00</td>
</tr>
<tr>
<td>Tax @ 30%</td>
<td>₦2,951,892.00</td>
</tr>
<tr>
<td>Net profit</td>
<td>₦6,887,748.00</td>
</tr>
<tr>
<td>Gross profit (Net profit to sales)</td>
<td>11.3%</td>
</tr>
<tr>
<td>Return on investment</td>
<td>50.4%</td>
</tr>
<tr>
<td>Return on equity</td>
<td>126%</td>
</tr>
<tr>
<td>NPV @ 25%</td>
<td>₦6,945,318.00</td>
</tr>
<tr>
<td>Break-even point (years)</td>
<td>3.9 years</td>
</tr>
<tr>
<td>Payback period</td>
<td>1.4 years</td>
</tr>
<tr>
<td>Profitability index</td>
<td>2.1</td>
</tr>
</tbody>
</table>

### Services Available at FIRO

1. Training on cassava based noodles
2. Machinery and equipment fabrication and installation
3. Preparation of bankable feasibility reports/business plan
4. Quality control service
5. Technical assistance and consulting services at moderate fees

For further details, please contact:

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Appendix 6

FIRO Industrial Profile on instant Pounded Yam Flour production
Introduction

Pounded yam is a staple food which is consumed by almost every tribe in Nigeria. The indigenous process of production is very laborious. It requires physical pounding by two or more people, depending on the quantity, with mortar and pestle. Instant Pounded Yam Flour (IPYF) brings succor to pounded yam lovers as the drudgery of pounding yam is eliminated.

Production Process

The production process consists of simple unit operations which have been mechanized.

Yam selection and weighing

Wholesome suitable varieties are selected and weighed.

Washing

The selected tubers are washed to remove adhering sand.

Peeling and slicing

The washed tubers are carefully peeled manually with stainless steel knives. The peeled tubers are sliced mechanically to desirable thickness in a slicing machine made of stainless steel blades.

Parboiling

The yam slices are blanched in boiling water (parboiled) for some minutes depending on the thickness of the slices.

Drying

The blanched yam slices are dried in a dryer at specified drying temperature for few hours. The dried yam chips are stored in airtight containers.

Milling

The dried yam chips are milled directly into flour of uniform particle size distribution.

Packaging

The yam flour is packaged into airtight moisture-proof packaging materials.
Flow Chart
Yam selection and weighing
↓
Washing
↓
Peeling
↓
Slicing
↓
Parboiling
↓
Drying
↓
Milling
↓
Packaging

Labour Requirement
Six workers, that is, five operators, and a supervisor are required for the factory operations. Casual labourers will also be needed for peeling the yam tubers.

Machinery and Equipment
These can be fabricated locally at FIDRO. The equipment list is as follows:
i. Slicer
ii. Parboiler
iii. Dryer
iv. Hammer-mill
v. Sealing machine
vi. Weighing scale
Other accessories include: knives, plastic containers, scoops, wood paddles.

Space Requirement
The space required is about 15m x 12m. This will house all the machineries and equipment. Additional space needs to be provided for storage of raw materials and end products.

Proposed Production Programme
<p>| No. of hours/days | 16hrs |
| No. of days/week | 7 days |
| No. of shifts/day | 2 shifts |
| No. of hours/shift | 8 hr |
| The input/output ratio | 3:1 |
| Cost of yam tuber/ton | N$35,000.00 |</p>
<table>
<thead>
<tr>
<th>Volume of production</th>
<th>400kg/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Estimated Capital Requirement</strong></td>
<td>N</td>
</tr>
<tr>
<td>Total equipment cost</td>
<td>3,128,950.00</td>
</tr>
<tr>
<td>Estimated fixed capital cost</td>
<td>5,410,820.00</td>
</tr>
<tr>
<td>Working capital cost</td>
<td>475,050.00</td>
</tr>
<tr>
<td>Total capital requirement</td>
<td>5,885,870.00</td>
</tr>
<tr>
<td><strong>Profitability</strong></td>
<td>N</td>
</tr>
<tr>
<td>Sales revenue from 100 tons @ $5290/ton</td>
<td>55,200,000.00</td>
</tr>
<tr>
<td>Total production cost</td>
<td>21,520,420.00</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>3,479,580.00</td>
</tr>
<tr>
<td>Tax @ 30%</td>
<td>1,043,870.00</td>
</tr>
<tr>
<td>Net Profit</td>
<td>2,435,710.00</td>
</tr>
<tr>
<td>Net present value @ 30%</td>
<td>1,783,127.00</td>
</tr>
<tr>
<td>Rate of return on investment</td>
<td>34.2%</td>
</tr>
<tr>
<td>Rate of return on equity</td>
<td>52.8%</td>
</tr>
<tr>
<td>Pay-back period</td>
<td>2 years</td>
</tr>
<tr>
<td>Internal rate of return</td>
<td>&gt;30%</td>
</tr>
<tr>
<td>Break even point - @ 51.57% capacity utilization</td>
<td></td>
</tr>
</tbody>
</table>

**Services Available at FIRO**

- Training in IPYF production
- Supply of equipment
- Preparation of feasibility report
- Quality control analysis
- Technical assistance and consultancy services

These services are available at moderate fees.

For further details, please contact:

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Website: www.firom-ng.org
Appendix 7

FIIRO Industrial Profile on Fish smoking
FIIRO
Industrial Profile
On
Fish Smoking

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction
The demand for fish and fish products has resulted in increasing fish processing activities in Nigeria. Masses' impression of various types of fish is also complementing domestic production. As a result of this increase, the aquaculture sector of the economy is fast evolving. A good percentage of the fishes caught in the rivers are preserved through the traditional method of smoking by spreading the fish in an open area to dry under the sun. This method is laborious and time-consuming.

The Process of Smoked Fish

This technology of the smoking kiln is the capacity of smoking fresh fish. This means that the fish is evenly smoked under hygienic conditions, and lasts a longer shelf life.

Production Process

The basic steps involved in fish smoking are:

Cleaning: The fish is blanched, gutted and filleted to remove the aspect of deterioration by using clean tools.

Brining: The cleaned fish is soaked in salt solution.

Smoking: The cleaned or brined fish is placed into the trays and fed into the kiln.

Packaging: The smoked fish is packaged appropriately.

Flow Chart

Cleaning → Brining → Smoking → Packaging
Raw Materials, Suppliers and Utilities

Fresh fish is the only raw material for fish smoking. The main items of supplies are packaging materials and preservatives. The packaging materials include styrofoam and siliconized cotton. Table salt is used as preservative. The main source of utilities is channel.

Labour Requirement

Labour requirement for the project components is estimated as follows: About nine (9) personnel are required.

Machinery and Equipment

Two types of fish smoking kilns are used in the fish smoking kilns. There are two types of the smoking kilns designed and fabricated at Harbour. They are: metallic and brick type. The total 20% two types smoking kiln is N57,500.00, including 10% installation.

Capitalization

The estimated total initial investment is N4,993,670.00. This consists of the main Fixed capital N2, 534,210.00, pre-production expenses N238, 675.00 and N1, 386,400.00 being the initial fixed capital.

Space Requirement

A total plot of land is required for this project. The space required for construction of the brick type smoking kilns is about 0.2 ha.

Production Programme

The following assumptions are made in arriving at the proposed production programme:

- Production days/week: 6
- Production weeks/year: 50
- Production days/month: 10
- Maximum production volume/day: 100 kg
- Maximum production volume/month: 100 kg
- Average weight: 125 kg
- No. of smoked fish/month: 800,000 pieces
Profitability

Sales revenue from 65,000 pieces of smoked fish (year 1) N32,760,000.00
Total production cost N28,338,030.00
Profit before tax N3,921,970.00
Tax @ 30% N1,176,591.00
Net profit N2,745,380.00
Gross profit: sales 11.9%
Return on investment 66.1%
Return on equity 110.2%
NPV @ 25% N2,651,081.00
Break even point (year 1) 32.1%
Payback period 1.4 years
Profitability index 2.1

Services Available at FIRO

1. Training on smoked fish production
2. Machinery and equipment fabrication and installation
3. Preparation of bankable feasibility report/business plan
4. Quality control services.
5. Technical assistance and consultancy services at moderate fees.

For further details, please contact:

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Designed and Printed by FIRO Printing Unit
Appendix 8

FIIRO Industrial Profile on Zobo drink production and preservation
FIRO
Industrial Profile
On
Zobo Drink
Production and Preservation

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction

Traditionally, flowers, leaves and fruits, such as lemon grass, rosehip, nut leaves, ginger, garlic etc, have been used for the preparation of drinks and beverages all over the world. Roselle calyx is a tropical plant which has been utilized in northern Nigerian villages to make a drink known as zobo. In the last decade, zobo has grown in popularity throughout the country by virtue of its low price, refreshing taste, attractive red colour, medicinal and nutritional attributes.

Unfortunately, drinks made from roselle are beset with the problem of rapid deterioration and spoilage due to fermentation. The Federal Institute of Industrial Research Oshodi therefore has developed and perfected the process technology for the production and preservation of roselle in order to upgrade its shelf life and enhance its quality.

Production Process:

Product handling and preservation of zobo drink includes the following processing steps:

- **Cleaning**: The roselle calyxes are thoroughly cleaned to remove dirt.
- **Weighing**: The raw materials, that is, the leaves and the preservatives are weighed appropriately.
- **Washing and Draining**: The weighed calyxes are washed and allowed to drain.
- **Boiling/Extraction**: The washed calyxes are blanched in boiling water for extraction.
- **Straining**: The blanched calyxes are strained after extraction using muslin cloth.
- **Formulating**: The additives are added appropriately.
- **Mixing**: The additives are properly mixed.
- **Filtering**: The roselle drink is filtered and transferred to holding tank.
- **Pasteurization**: The drink is pasteurized at appropriate temperature over a period of time.
- **Cooling and Labeling**: The drink is cooled after which the bottle is labeled.
- **Packaging**: The bottles are packaged in cartons.

Flow Chart:

1. Cleaning
2. Weighing
3. Washing and Draining
4. Boiling/Extraction
5. Straining
6. Formulating
7. Mixing
8. Filtering
9. Pasteurization
10. Cooling and Labeling
11. Packaging
Raw Materials, Supplies and Utilities

The major raw material for soft drink production is the condensed syrup from the molasses plant. Molasses is grown in large quantities especially in northern Nigeria. The commonly used preservatives are citric acid, sodium benzoate and meta-sulphite. Sugar could be used as sweetener. The main items of supplies are packaging materials including plastic bottles, corks, and labels. Others are factory wear (factory overall, hand gloves, factory shoes etc), cleaning agents, disinfectant, etc. Electricity, about (five project vehicle and generator) and water constitute the utilities required. A 12.5KVA generator is needed as back up for power supply.

Labour Requirement

Labour requirement for the project consists of both skilled and unskilled. The manpower is made up of production, marketing, administrative and account personnel. About twenty three (23) personnel are required.

Machinery and Equipment

The machinery and equipment needed can be fabricated locally. The equipment list is as follows:

- Extracter
- Sterilizer/homogeniser
- Pasteurizer
- Holding tank (stainless steel)
- Filling machine (liquid)

The local cost of machinery and equipment is N4, 450,000.00; including 10% installation. The estimated total initial investment is N7, 341,000.00. This consists of initial fixed capital of N4, 797, 600.00; initial working capital of N2, 545, 400.00 and pre-shipment expenses of N50, 300.00.

Space Requirement

One plot of land is required for the project. The initial space required for factory construction is about 35m X 35m.
### Profitability

Sales revenue from 63,000 pieces of smoked fish (year 1) | N32,760,000.00
---|---
Total production cost | N28,838,030.00
Profit before tax | N3,921,970.00
Tax @ 30% | N1,176,591.00
Net profit | N2,745,380.00
Gross profit: sales | 11.9%
Return on investment | 66.1%
Return on equity | 110.2%
NVP @ 25% | N2,651,080.00
Break even point (year 1) | 32.1%
Payback period | 1.4 years
Profitability index | 2.1

### Services Available at FIRO

1. Training on smoked fish production
2. Machinery and equipment fabrication and installation
3. Preparation of bankable feasibility report/business plan
4. Quality control services.
5. Technical assistance and consultancy services at moderate fees.

For further details, please contact:

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**Designed and Printed by: FIRO-Publishing Unit**
Appendix 9

FIIRO Industrial Profile on Kunu drink production and preservation
Industrial Profile

On

Kunu Drink
Production & Preservation

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction

Kunu is a fermented cereal-based food drink. It is rich in vitamins, especially B1 and B2 and essential mineral elements. Kunu drink is very refreshing and filling. Kunu prepared by traditional method has short shelf-life and therefore requires adequate preservation to improve its shelf-life and quality. It spoils within 24-36 hours and cannot be stored, preserved or transported over long distance. The main raw materials are sorghum or millet or a combination of both. They are readily available in commercial quantities in Northern Nigeria.

To empower the small scale and make it viable to efficiently, the Federal Institute of Industrial Research, Oshodi has developed and perfected a process technology for the production and preservation of kunu. The technology is available for transfer to entrepreneurs.

Production Process

Production and preservation of kunu include the following steps:

1. Sorting: The grains are sorted to obtain wholesome grains for processing.
2. Weighing: Sorted grains are weighed accurately.
3. Washing and Soaking: The weighed grains are washed thoroughly and soaked for about 34 hours.
4. Draining: The soaked grains are drained again and allowed to drain.
5. Wet milling: The grains are wet milled with hammer mill.
6. Heating: The wet milled grains are mixed with adequate quantity of water.
7. Fermentation: The mixture after heating is heated over a period of time.
8. Addition of Preservatives: Adequate quantities of preservatives and flavors are added.
9. Filtration: The mixture is filtered to remove suspended particles.
10. Pasteurization: The mixture is subjected to heat treatment to destroy micro-organisms, prevent fermentation and multi-ensurable enzyme activity.

Flow Chart

1. Sorting
2. Weighing
3. Washing and soaking
4. Draining
5. Wet milling
6. Heating
7. Fermentation
8. Pasteurization
9. Cooling
10. Packaging

- Toping
- Addition of preservatives
Raw Materials, Supplies and Utilities
The major raw material for kunu is wheat. Sodium Bisulphate is used as preservative. Sugar could be used as sweetener. The required utilities are electricity, diesel and water. A 25KVA generator could be needed as back-up for power supply. The main items of supplies are packaging materials: this includes plastic bottles, cartons and labels. Others include factory tools (factory scissor, hand gloves, factory shoe, etc) cleaning agents and disinfectants.

Labour Requirement
Labour requirement consists of both skilled and unskilled. The company is made up of production, marketing and administrative personnel. About forty-seven (47) personnel are required.

Machinery and Equipment
The machinery and equipment for kunu production and preservation can be fabricated locally. The equipment list is as follows:
1. Soaking tank
2. Hammermill
3. Pasteurizer
4. Kneading machine
5. Filling machine
6. Vibro sifter
7. Sedimentation tank
8. Shrink wrapper for carton
9. Weighing scale and other accessories.
The total cost of machinery and equipment is N3, 342, 180, including the cost of fabrication.

Capitalization
The estimated total initial investment is N17, 084, 860.85. It comprises of the social fixed capital N8, 852, 791.40, working capital N7, 734, 080.85 and pre-production expenses N170, 000.00.

Space Requirement
One plot of land is required for the process. The actual space requirement is about 20m x 30m.
### Production Programme

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production days/week</td>
<td>6</td>
</tr>
<tr>
<td>Production week/annum</td>
<td>50</td>
</tr>
<tr>
<td>Production volume/annum</td>
<td>300</td>
</tr>
<tr>
<td>Production volume/day</td>
<td>2,500 litres or 5,000 bottles (50cl)</td>
</tr>
<tr>
<td>Production volume/annum</td>
<td>750,000 litres or 1,500,000 bottles</td>
</tr>
<tr>
<td>Input-output</td>
<td>1kg (sorghum) gives 8 litres of kaju</td>
</tr>
</tbody>
</table>

### Profitability

<table>
<thead>
<tr>
<th>Source revenue from 900,000 bottles (Year 1)</th>
<th>N67,500,000.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total production cost</td>
<td>N55,042,840.00</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>N11,958,160.00</td>
</tr>
<tr>
<td>Tax @ 30%</td>
<td>N3,587,450.00</td>
</tr>
<tr>
<td>Net profit</td>
<td>N8,370,710.00</td>
</tr>
<tr>
<td>Gross profit: sales</td>
<td>14.1%</td>
</tr>
<tr>
<td>Net profit: sales</td>
<td>12.4%</td>
</tr>
<tr>
<td>Return on investment</td>
<td>48.9%</td>
</tr>
<tr>
<td>Return on equity</td>
<td>122.3%</td>
</tr>
<tr>
<td>NPV @ 25%</td>
<td>N8,131,080.00</td>
</tr>
<tr>
<td>Break-even point (year 1)</td>
<td>49.6%</td>
</tr>
<tr>
<td>Payback period</td>
<td>1.4 years</td>
</tr>
<tr>
<td>Profitability index</td>
<td>2.2</td>
</tr>
</tbody>
</table>

### Services Available at FIBRO

1. Training on kaju production and preservation
2. Machinery and equipment fabrication and installation
3. Preparation of bankable feasibility report business plan
4. Quality control services
5. Technical assistance and consultancy services at moderate fees.

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*Designed and Printed by FIBRO Printing Unit*
Appendix 10

FIIRO Industrial Profile on Fruit juice production (Natural & Clarified)
FIIRO
Industrial Profile
On
Fruit Juice
Production
(Natural & Clarified)

50th Anniversary 1957 - 2007

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction

Fruit juices are products extracted from fresh fruits such as orange, mango, pineapple, grapes, etc. Fruit juices after extraction are generally preserved in different forms such as single strength pure juice, squishes, cordials and concentrate. Fruit juices serve as non-alcoholic drinks and as sources of vitamin C.

Production Process

Sources

The process for natural fruit juice involves the following:

Selection and Weighing of Fresh Fruits

The required wholesome and fresh fruits are selected and weighed. The selected fruits are washed in a trough using water jacket.

Peeling

The fruits are peeled by hand.

Juice Extraction

The juice is extracted using an extractor. Pulper is used for pineapples and other fleshy fruits.

Formulation

Additives of other ingredients, e.g. preservatives, sweetener and water to obtain the right formulation.

Mixing

The juice is mixed in a tank using a homogenizer.

Labetting

The mixed juice is bottled and corked either manually or with automatic bottle filling machine depending on the scale of operation.

Pasteurising

The bottled juice is pasteurized at 80°C for one hour.

Cooling and Packaging

The pasteurised juice is allowed to cool and then packaged into corrugated cartons and sealed.

Clarified

The production of clarified fruit juice is by using pressure.
Flow Chart

**Natural**
- Selection and weighing of fresh fruits
- Washing
- Peeling
- Juice extraction
- Formulation
- Mixing
- Boiling
- Curing
- Pasteurizing
- Cooling/Packaging

**Clarified**
- Selection and weighing of fruits
- Washing
- Peeling
- Pulping of fruits e.g. guava, bananas
- Addition of enzymes to extract juice
- Filtration
- Formulation
- Mixing
- Boiling
- Curing
- Pasteurizing
- Cooling/Packaging

**Labour Requirements**
Seven workers are required for the factory operations. Six as operatives, and one as a supervisor.

**Machinery and Equipment**
The processing machinery and equipment can be fabricated locally. These include:
- Citrus extractor
- Pulper
- Mixer
- Holding tank
- Liquid fillers (autmatic)
Steam jacket vessel

**Space Requirement**
A standard plot will be adequate for the project.

**Proposed Production Capacity**
2400 litres of juice/6 hour day
Input: output ratio 100:80
Maximum installed output is 2400 litres.
Maximum efficiency level is 80%.

**Estimated Capital Requirement**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>The total equipment cost</td>
<td>4,580,000.00</td>
</tr>
<tr>
<td>Estimated fixed capital</td>
<td>8,080,000.00</td>
</tr>
<tr>
<td>Estimated working capital</td>
<td>5,120,000.00</td>
</tr>
<tr>
<td>Total capital requirement</td>
<td>14,100,000.00</td>
</tr>
</tbody>
</table>

**Profitability**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue from 500,000 bottles</td>
<td>25,000,000.00</td>
</tr>
<tr>
<td>@ N50.561 bottles</td>
<td></td>
</tr>
<tr>
<td>Total production cost</td>
<td>18,500,000.00</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>6,500,000.00</td>
</tr>
<tr>
<td>Tax, @ 30%</td>
<td>1,950,000.00</td>
</tr>
<tr>
<td>Net profit</td>
<td>4,550,000.00</td>
</tr>
</tbody>
</table>

**Services Available at FIRO**
Training in fruit juice production
Supply of equipment
Preparation of feasibility reports
Quality control analysis
Technical assistance and consultancy services

These services are available at moderate fees.

For further details, please contact

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Appendix 11

FIIRO Industrial Profile on Palm Wine preservation and bottling
FiiRO Industrial Profile

On Palm Wine Preservation and Bottling

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI.
Federal Ministry of Science & Technology
Introduction

The preservation and bottling of palm wine is achieved by arresting the activities of yeast and bacteria, thus stopping the fermentation and bio-deterioration of the product. The preserved and bottled palm wine, so obtained, becomes considerably stable with a maximum alcohol content of 4% v/v, and can be cheaply bottled and corked.

Bottling increases the shelf life of palm wine to 12 months; it is also more hygienic and consequently more attractive to consumers. The preservation of palm wine enhances its prospects for exportation. The product is best served chilled.

Production Process

FIBRO has developed the technology of preservation and bottling of palm wine. The unit operations are described below.

Raw Palm Wine Assessment

The raw palm wine is assessed organoleptically based on the following parameters: taste, odour, and mouthfeel. Chemical and microbiological analyses are also done in the laboratory to ascertain the wholesomeness of the fresh palm wine.

Bottle Cleaning

The bottles should be thoroughly cleaned.

Mixing

The raw palm wine is mixed with recommended quantity of preservative.

Filling

The treated palm wine is filled into previously washed bottles.

Corking

The filled bottles are corked with corkscrewing machine.

Pasteurizing

The corked bottles are loaded into a pasteurizer containing hot water and pasteurized at a predetermined temperature for about one hour.

Cooling

The pasteurized bottled palm wine is allowed to cool at room temperature.

Labeling

The corked bottled palm wine is labeled. The label should read the treated name, content, manufacturing date and expiry date.
Packaging
The labelled palm wine bottles are packaged in paper board cartons or plastic crates for marketing.

Flow Chart
- Fresh Palm Wine →
- Raw Material Assessment →
  - Mixing →
  - Filling →
  - Corking →
  - Pasteurizing →
  - Labelling →
  - Packaging →

Labour Requirement
The project requires the services of both skilled and unskilled labour force. For the capacity recommended for this project, four administrative personnel are required—sales clerk, accounts clerk, purchasing clerk, and security. Five factory workers are also required—supervisor, two machine operators, and two factory hands.

Machinery and Equipment
They are simple and can be fabricated locally at FIU RO. The list is as follows:
1. Pasteurizer
2. Homogenizer/filler with stainless screen
3. Corking machine
4. Other accessories are worktables, string rolls, washing troughs (galvanized)

Space Requirement
10m X 20m is required for the project. This will accommodate production and storage of materials and finished product for effective marketing.

Proposed Production Programme
No of hours per day
No of days per week: 5 days
No of batches per day: 2 batches
Volume of production: 800 bottles/day
Maximum installed output capacity: 1000 bottles/day
Maximum efficiency level: 80%
Recommended capacity utilization: 80%

Estimated Capital Requirement

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total equipment cost</td>
<td>N 790,000.00</td>
</tr>
<tr>
<td>Estimated fixed capital</td>
<td>N 2,630,000.00</td>
</tr>
<tr>
<td>Engineering &amp; working capital</td>
<td>N 30,000.00</td>
</tr>
<tr>
<td>Pre-production expenses</td>
<td>N 419,000.00</td>
</tr>
<tr>
<td>Total capital requirement</td>
<td>N 3,549,372.00</td>
</tr>
</tbody>
</table>

Profitability

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sales from 200,000 bottles at N55/bottle</td>
<td>N 11,000,000.00</td>
</tr>
<tr>
<td>Total production cost</td>
<td>N 8,951,340.00</td>
</tr>
<tr>
<td>Gross profit</td>
<td>N 2,048,460.00</td>
</tr>
<tr>
<td>Corporate tax at 30%</td>
<td>N 614,538.00</td>
</tr>
<tr>
<td>Net profit</td>
<td>N 1,433,922.00</td>
</tr>
<tr>
<td>Net profit @ 30% after 5 years</td>
<td>N 2,245,180.00</td>
</tr>
<tr>
<td>Rate of investment for 1st year</td>
<td>40%</td>
</tr>
<tr>
<td>Gross margin for 1st year</td>
<td>12%</td>
</tr>
<tr>
<td>Rate of return on investment</td>
<td>&gt;30%</td>
</tr>
<tr>
<td>Pay back period</td>
<td>3 years</td>
</tr>
</tbody>
</table>

Services Available at FIRO

- Training on palm wine bottling and preservation
- List of equipment vendors
- Preparation of feasibility report
- Quality control analysis
- Technical assistance and consultancy services

These services are available at moderate fees.

For further details, please contact,

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Appendix 12

FIRO Industrial Profile on Edible Mushroom production
FIRO
Industrial Profile
On
Edible Mushroom
Production

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI
Federal Ministry of Science & Technology
Introduction

Mushrooms is the fleshy body of a fungus, the main or central body which is often unnoticed in the soil or in the developing mycelium such as leaves, or woods and compost from which the fungus obtains its nutrients.

There are edible and poisonous species of mushrooms. In Nigeria, tropical edible mushrooms such as Gymno mushrooms (P. aureo and straw mushrooms) are the Edible mushrooms common.

Mushrooms are rich in amino acids and minerals which are good for people with heart and related ailments. Some species of mushrooms have medicinal properties.

IFRD has been able to demonstrate the possibility of producing edible mushrooms commercially. Fresh mushrooms are preserved by dehydration which enhances its shelf-life and widens market penetration.

Process Technology

The main operations involved in mushroom production are:

Composting: mixing of suitable substrates with lime and water. The substrate is mixed up with the aid of a wooden turner and allowed to undergo natural fermentation.

Turnage: Mixing of the composted waste to allow even distribution of nutrients.

Filling: process of removing or dispensing compost waste to appropriate containers.

Pasteurization: The compost is pasteurized using moist heat to destroy undesirable contaminants, e.g., heat and bacterial spores.

Spawning: The mushroom spores are planted in the compost.

Harvesting: the harvesting bodies of the mushrooms are picked carefully.

Drying: The harvested mushrooms are dried in an air dryer at appropriate temperature.

Packaging: Freshly dried mushrooms are packaged in polythene sachets and sealed ready for marketing.
Production and Drying Flowcharts

Production
- Composting
  - Turning
  - Filling
- Pasteurization
- Spraying
- Harvesting

Dehydration
- Fresh mushrooms
  - Grading / sorting
  - Cutting
  - Dehydration
  - Packaging
  - Storing

Labour Requirement
The labour required is both skilled and unskilled.
The manager could be a trained food technology engineer. He is assisted by factory operators for both the production and the dehydration lines. A total of about 12 people (depending on the manager, laboratory assistant, factory hands and security guard) will be required.

Machinery and Equipment
The necessary processing machinery and equipment can be fabricated locally.
The equipment list is as follows:
1. Washing machine
2. Grader (for grading mushrooms)
3. Dryer
4. Packages

Other accessories
These include: washing troughs, wheelbarrows, processing platforms, all of which can be obtained locally.

Space Requirement
This is a non-negotiable for the project. This space is adequate for production and maintenance of all the machinery and equipment required for mushroom cultivation.

Production Programme
Mushroom houses will be constructed with 2 chambers of 4 tiers each. 24 weeks of production per year is proposed with harvesting between Oct and April. A round of harvesting is expected to produce 2500kg of fresh mushrooms weekly. Annual production of 15,000kg. The final dried product will be packed in polyethylene wrapping in varieties of 24 pieces each. Flight, mushroom may be exported. Marketing constraints (organisations, superstores, retailers).
Capitalization

A total investment cost of about N3,435,000 is estimated for the project. Out of this, N2,355,000 is estimated for the fixed capital items, while N321,000 is estimated for the initial working capital. The pre-production estimate is N159,000. The equipment and accessories being part of the fixed capital items is estimated at N580,000.00

Profitability:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sales revenue @ N380 satchet of 300gms</td>
<td>3,648,000.00</td>
</tr>
<tr>
<td>2.</td>
<td>Total manufacturing cost</td>
<td>2,244,930.00</td>
</tr>
<tr>
<td>3.</td>
<td>Gross profit</td>
<td>1,403,365.00</td>
</tr>
<tr>
<td>4.</td>
<td>Net profit</td>
<td>982,035.00</td>
</tr>
<tr>
<td>5.</td>
<td>Gross profit : Sales</td>
<td>9:2</td>
</tr>
<tr>
<td>6.</td>
<td>Net profit : Sales</td>
<td>7:3</td>
</tr>
<tr>
<td>7.</td>
<td>Rate of return on investment (RRI)</td>
<td>26.14%</td>
</tr>
<tr>
<td>8.</td>
<td>Rate of return on equity (RRE)</td>
<td>65.35%</td>
</tr>
<tr>
<td>9.</td>
<td>Internal rate of return</td>
<td>30%</td>
</tr>
</tbody>
</table>

Services Available at FIRO

1) Training in edible mushrooms production
2) Preparation of feasibility reports
3) Quality control analysis
4) Technical assistance and consultancy services
All the services are available at moderate fees.

For further details, please contact
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Appendix 13

FIIRO Industrial Profile on Pharmaceutical grade Corn Starch
FiRO Industrial Profile

On

Pharmaceutical Grade
Corn Starch
Introduction
Starch is an industrial raw material with useful applications in industries such as pharmaceutical, textile, adhesive, paper, food, etc. It is a major component of many major staple food crops such as rice, corn, wheat, potatoes, etc. The standards for starch vary with the end industry. The food, pharmaceutical and the food industries in particular, require a high grade starch for their production. However, high-quality starch is extracted from maize, which is preferable in the pharmaceutical industry. The Federal Institute of Industrial Research Oshodi has developed and perfected process technology for extraction of high-quality starch from maize.

Process Flow:
The main operations involved are:

Cleaning
The mixture is cleaned to remove foreign materials.

Milling
The cleaned grain is steeped in water-acidic water.

Wet Milling
The steeped grain is fed into attrition mills to reduce its size.

Determining
The starch is allowed to stand, the germ is decanted.

Extracting
The starch is extracted from the stand.

Drying
The extracted starch is dried in a flash dryer.

Packaging
The starch is packaged.

Flow Chart:
Cleaning → Milling → Wet Milling → Determining → Extracting → Drying → Packaging
Raw Materials, Supplies and Utilities

The only raw material for production of pharmaceutical grade starch is maize. The main items of supplies are packaging material and factory ware such as tins, screw caps, glassware, etc. Items of utilities include electricity, diesel and water. A 75KVA generator is needed as backup for power supply.

Labour Requirement

Labour requirement for the project consists of both skilled and unskilled labour. The workforce is made up of production, marketing, administrative and accounting personnel. About forty six (46) personnel are required.

Machinery and Equipment

The machinery and equipment required can be fabricated locally. The equipment list is as follows:

1. maize milling machine
2. hammer mill
3. hydraulic press
4. sedimentary tank
5. grader
6. sieve
7. packaging machine
8. weighing scale
9. Hot water generator
10. new stainless steel tanks (500L)
11. accessories

The total cost of machinery and equipment is N1,400,000.00 including 10% installation.

Capitalisation

The estimated total initial investment is N482,081,400.00. This is made up of N333,977,950.00 (material capital), N7,962,810.00 (sales and marketing capital) and N140,140.00 pre-production expenses.

Space Requirement

One plot of land is required for the project. The actual space requirement for factory construction is 900 x 400.

Production Programming

Production weekly

<table>
<thead>
<tr>
<th>Period</th>
<th>Production (Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>50</td>
</tr>
<tr>
<td>3-4</td>
<td>280</td>
</tr>
<tr>
<td>5-6</td>
<td>1,200 (capacity)</td>
</tr>
<tr>
<td>7-8</td>
<td>1,200 (capacity)</td>
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<tr>
<td>9-10</td>
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Annual production: 1,200 Tonnes
### Profitability

<table>
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<tr>
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<tr>
<td>Sales revenue from 900 tonnes of corn starch (year 1)</td>
<td>N121,500,000.00</td>
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<tr>
<td>Total production cost</td>
<td>N109,242,000.00</td>
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<td>Profit before tax</td>
<td>N12,258,000.00</td>
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<td>Tax of 30%</td>
<td>N3,677,400.00</td>
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<tr>
<td>Net profit</td>
<td>N8,580,600.00</td>
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<tr>
<td>Gross profit to sales</td>
<td>10.1%</td>
</tr>
<tr>
<td>Net profit to sales</td>
<td>7.0%</td>
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<tr>
<td>Return on investment</td>
<td>20%</td>
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<tr>
<td>Return on equity</td>
<td>55.5%</td>
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<tr>
<td>Break-even point (year 1)</td>
<td>N4,214,640.00</td>
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<td>Payback period</td>
<td>2.5 years</td>
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</table>

### Services Available at FIIRO

1. Training on pharmaceutical grade corn starch
2. Machinery and equipment fabrication and installation.
3. Preparation of bankable feasibility report/business plan
4. Quality control services.
5. Technical assistance and consultancy services at moderate fees.

For further details please contact:

**The Director General,**

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Appendix 14

Cultivation of tropical edible mushroom
CULTIVATION OF TROPICAL EDIBLE MUSHROOM

Pleurotus sajor-caju

Introduction

Mushroom is a fungus which grows from dead woods and other dead materials in the rural areas. Work on the cultivation of Pleurotus sajor-caju and other tropical edible mushrooms has been motivated by the concern about the high levels of malnutrition and undernutrition among the low income group in Nigeria who cannot afford protein rich fish or meat.

By developing a simple cultivation process, FIIRO has made it possible for tropical edible mushrooms to be cultivated profitably by local farmers in the rural areas.

This training material will be useful to trainers, farmers, investors, restaurateurs, hoteliers and interested layman who would want to go into mushroom cultivation.

Funding of the research was provided by National Agricultural Research Project.

BENEFITS OF EDIBLE MUSHROOM CULTIVATION

- Add flavour and provide a variety in taste and texture to food
- Constitute important source of proteins of up to 27% (dry wt) a good substitute for meat and fish.
- A good source of carbohydrates, minerals salts and vitamins.
- Can be cultivated throughout the year without sophisticated equipment both commercially or as a small/cottage industry.
- Valuable for medical purposes. (good for diabetic and high blood pressure patients because it contains low carbohydrate and no cholesterol respectively.

*Carbohydrates produce energy for basic body functions and steady weight.
**Proteins are body-building nutrients needed for maintenance and growth of body tissues.
***Vitamins and minerals are essential for normal growth and good health.

MUSHROOM CULTIVATION

The indoor cultivation technique is practiced at the Federal Institute of Industrial Research, Oshodi. FIIRO mushroom house differs from a conventional type for the following reasons:

- Only one type of mushroom can be grown at a time
- It has wooden windows and door, rather than the typical steel structure.
- There is no controllable ventilation system as in standard mushroom house.
- Moist heat is generated from a drum of boiling water,
for the pasteurization of compost (Boiler is used to generate steam in conventional mushroom houses).

Temperature in the mushroom house is monitored with a thermometer. Humidity is monitored with a hygrometer. Both temperature and humidity are controlled by opening and closing the windows as necessary. The optimal temperature and humidity depends on the variety of mushroom being cultivated but for *Phyrotus sinensis* temperature of about 28-32°C and humidity of between 80-100% are required.

**EQUIPMENT AND MATERIALS**

Cultivation of edible mushroom may not require sophisticated equipment and materials. For cottage level production the major equipment and materials required are:

- Mushroom shed or house: an enclosure for growing mushroom.
- Polythene (preferably PVC) bags for growing the mushroom.
- Water tank or pot: to store pure water for watering mushroom.
- Drum, firewood, chemical and steam pipe: for pasteurizing substrate (compost) used for growth.
- Water sprayer: to spray water on growing mushroom.
- Buckets and basins: for transferring substrate from composting ground to mushroom shed.

- Consumable materials such as rice straw or cotton waste: as composts.
- Lime: added to substrate during composting to suppress bacteria growth.

**PROCESS TECHNOLOGY FOR EDIBLE MUSHROOM CULTIVATION**

The process technology for edible mushroom cultivation involves combination of activities such as composting, turning, filling, pasteurization, spawning, harvesting and packaging.

**Composting:**
32% waste is mixed with 66%
Water and 2% lime

**Turning:**
Composted waste turned to allow adequate mixing of nutrients and air penetration

**Filling:**
Compost is filled into buckets or basins and transferred into the mushroom house or shed.
Appendix 15

Mechanized processing of Groundnut
ABOUT FIRO

The Federal Institute of Industrial Research Oshodi (FIRO) is a Federal Government of Nigeria (FGN) permanent institution, set up by the Federal Ministry of Science, Technology and Innovation (FMSTI) as a Federal University of Technology (FUT). FIRO was founded in 1966, and is managed by the Federal Ministry of Science, Technology and Innovation (FMSTI). The institute is organized into various faculties, including agricultural and industrial sciences, mechanical engineering, electrical and computer engineering, and management sciences. The institute also conducts research and development in various fields, including food technology, agriculture, and industrial management. FIRO's mission is to train professionals in the fields of science and technology, and to contribute to the economic development of Nigeria.
MECHANIZED PROCESSING OF GROUNDNUT

Introduction

Groundnut (peanut), an oil seed is a valuable source of nutrients in our daily food consumption. It provides energy (calories), vitamins, minerals and proteins.

In spite of this nutritional value, little or no attention is paid to it's mode of processing and today, the processing of groundnut is still in it's laborious traditional method.

Research and development in groundnut processing was therefore carried out by FIRO so as to simplify and modernise it, using plant consisting of sheller, roaster and huller.

This booklet describes the mechanised method of processing groundnut oil will be found useful by trainers, food processors, oil miller, farmers and interested entrepreneur.

Funding for the research was sponsored by National Agricultural Research project (NARP), Moor Plantation, Ibadan, Nigeria.
COMPONENT UNITS OF THE PROCESSING PLANT.

The groundnut processing plant comprises three component units (machines):

- Sheller
- Roaster
- Huller

SHELLER is the machine to remove the pods which encase the seeds. The operating capacity is 100kg/hour. The use of the sheller alleviates the problems encountered by farmers (mullers) who shell groundnuts by hand.

ROASTER is designed to roast shelled groundnut uniformly. The essence of roasting is to remove the moisture content on every groundnut. Roasting time is 25 minutes per batch, of 25kg. The working capacity is 60kg/hour.

HULLER is designed to remove the skin (pinta or seed coat) of the roasted groundnut. It has the capacity of 60kg/hour.

ADVANTAGES OF THE EQUIPMENT

The plant is unique with the following features:

- Produces clean and more hygienic products
- Use various sources of energy such as electricity, gas, charcoal, diesel etc.
- It can be produced in various capacity (sizes) to meet the needs of users (investors).
- The independent nature of the units make it affordable for interested investors to go into cottage and small scale business of their choice.
- Versatility of the equipment for other product processing is guaranteed.
HOW TO OPERATE THE PLANT

Shelling

1. Fill the hopper with unhulled groundnuts.
2. Adjust the chaff gate taking groundnut shells into the sheller.
3. Place a drum containing the shelled nut and seeds at the collecting end.
4. Feed the nuts of kernels into the drum.
5. The husks separate and are collected for hatching.

Roasting

1. Close the inlet and outlet ends.
2. Heat the whole groundnut kernels in the drum for about 10 minutes.
3. Spread the hot groundnuts with the drum in a tray and remove the skins.
Appendix 16

Home made weaning foods
HOME MADE WEANING FOODS

Federal Institute of Industrial Research Oshodi, Lagos.
NARP EXTENSION PUBLICATION
HOME MADE WEANING FOODS

How to make nutritious powder weaning foods at home from a combination of either corn, millet, or sorghum with soybean, groundnut, or crayfish.

Federal Institute of Industrial Research Oshodi, Lagos.
NARP EXTENSION PUBLICATION
NARP EXTENSION PUBLICATIONS

FIIRO provides information and guidance to extension specialists, educators, health workers, entrepreneurs, cooperatives and interested individuals in the NARP extension publications based on advances in proven research and development projects of socio-economic relevance to the nation.

The NARP extension publications will be periodically updated to meet advances in research and development works.

Editor: Segun Fawu
Text Processing: Taiwo Akimati
Art Work: Deda Adeyemo
Coordination: Woman Nature
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<td>- Soybean, groundnut and crayfish cooking or toasting</td>
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<td>- Making the flour - grinding, sieving and packaging</td>
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HOME MADE WEANING FOODS

Research into the use of locally grown crops such as corn, millet, sorghum, soybean and prunusn in home made weaning foods production has been motivated by the high incidence of malnutrition and other protein deficiency illnesses among infants from low income families who are fed mainly on watery traditional weaning foods made from gruels of tubers or cereals.

A study carried out on the nutritional status of infants within the age group of 5-15 months has revealed that, during the gradual change from milk only diet to family diet, the deficiency in infants diet is protein and the inadequate use of high energy giving food components by nursing mothers.

The Federal Institute of Industrial Research Oshodi (FIRO) has consequently developed simple and inexpensive method for producing powder weaning foods of appropriate protein and energy in composition which could particularly be within the reach of the less privileged families.

This booklet is a guide to trainers, extension workers, mothers, health workers, women cooperatives and interested individuals who are involved with infant care and welfare, on how to process high protein-energy weaning foods using familiar simple kitchen appliances at home level.

The technical content was developed by Mrs Augusta Onunna of the Food and Biotechnology Division. The Publication Section edited and designed the booklet. The contributions of Dr. Otunwode O. Olatunji who supervised, and Prof. Sunday A. Oluja who directed the research work in this publication are gratefully acknowledged.

Funding for the research was provided by the National Agricultural Research Project (N.A.R.P) Moir-Plantation, Ibadan.

FIRO, LAGOS
ADVANTAGES OF HOME MADE WEANING FOODS

1. Simple Methodology
   Simple and familiar traditional food processing methods have been adapted and upgraded for home use. Common kitchen appliances are utilized in the processing of homemade weaning foods to make the production very easy for both rural and urban housewives.

2. Availability of Raw Materials
   Availability of raw materials for use is assured throughout the year. The food crops adopted are cultivated locally and can be obtained readily even by low income mothers in all the localities of the country. Corn, millet, sorghum, soybeans, crayfish, and groundnuts are familiar food raw materials to Nigerian housewives.

3. Low Production Cost
   Home-made weaning foods are cheaper than the industrially processed ones. Its production does not require expensive equipment with sophisticated appliances other than the familiar kitchen utensils like bowls, knives, baskets, mortar, pestle and sieves.
   Cooking is done with firewood or kerosene stove. The average cost of home-made weaning food is about half the price per kilogram of the industrially processed commercial weaning foods.
   Packaging is in simple cellulose bags instead of the expensive and sophisticated containers for storage.

4. Safe and Hygienic Mode of Preparation
   The steps adopted in the processing such as roasting/toasting, drying, grinding, and sieving provides an hygienic mode of producing powder/four home weaning foods fit for infants consumption. Mothers are also directly involved in the production of foods for their infants and will necessarily ensure that clean appliances and wholesome materials are used in their food composition.
5. **Better Nutrition**

For the growing infants to stay healthy, they need the following nutrients which are found in the home-made weaning food compositions described in this booklet.

- **Carbohydrates** - Carbohydrates produce energy for basic body functions. The starch and sugar in the corn, millet and sorghum including soybean provide infants 64 - 71% carbohydrate.

- **Proteins** - Proteins are body building nutrients needed for maintenance and growth of body tissues of the infants. Soybean, groundnut and crayfish added in the formulation composition provides 15-20% protein in the home-made weaning foods.

- **Fats** - Fats are energy providers and produce twice as much energy per gram as carbohydrate and proteins. 9 - 14% fats are available in the weaning foods.

- **Vitamins and Minerals** - Vitamins and minerals are essential for normal growth and good health. Cereals, salt, maize grains, crayfish, nuts and beans provide some of the needed vitamins and minerals.

- **Water** - Water controls body processes and helps in transporting materials throughout the body. The powdered products when dissolved thoroughly in water, cooked in low heat and cooled to spoon feed the baby contains adequate amount of water the infants need.

The malted grain utilized in the formula reduces the quantity of water used in the cooking. This increases the energy density, so the child eats little and gets more nutrients than the one produced without the malted grain.
HOW TO PREPARE THE HOME MADE WEANING FOODS

Preparation is in four steps. The procedure is simple and can be carried out at home by nursing mothers in both rural and urban environment. It requires no elaborate operational space and sophisticated equipment.

STEP ONE

The first step is the picking/selecion, cleaning and soaking of millet/maize/sorghum whichever is used in pots or containers to ferment and to germinate before drying or frying.

Grain Fermentation

1. Pick out waste, diseased and insect infested grains from the millet, corn and sorghum.
2. Measure the desired quantity of grains.
3. Soak the grains in non-leaking containers for a period of about two days (38 hrs).
5. Drain off the water in containers after 2 days of soaking.
6. Wash the grains once to remove any sandy particles and musty odour.
7. Spread drained fermented grains on clean trays or mats to air dry.
Spread in the sun or pan toast at low heat to low moisture level.
Store the fermented dry grains in nylon bag and tie the mouth until time to use.

**NOTE:**
To save time, housewives with kitchen oven can oven dry the grains at low heat. Do not burn.

**Grain Germination/Maing**
1. Pick and wash the selected grains.
2. Soak the grains for about 24 hours.
3. Wash and drain off water.
4. Spread on thoroughly washed pan, bag on a flat surface or in a flat basket. Do not overpile the grains.
5. Allow to germinate for 48 hours.
6. Sprinkle water once a day to enable the grains to germinate.
7. After two days, spread the germinated grains in open air to dry or oven dry.
Remove sprouted roots from the germinated grains.
Store dried malted grains in cellophane bag until time to use.

**STEP TWO**

**Soya Beans Preparation**
- Pick out unwholesome seeds and wash the desired quantity of soya beans with water.
- Boil for 30-40 minutes and drain the water.
- Wash off the skin and spread on clean trays or a flat clean material to air dry for one day.
- Par toast at low heat in batches until they turn light brown.
- Or dry cooked beans when it becomes good with a kitchen oven at medium heat setting until very dry.
- Store the cooked toasted/dried soybeans in cellophane bag until time to use.
Ground Nut Preparation:

- Pick and clean the nuts to remove sand/stones, dirt and diseased seeds.
- Sand roast nuts in a frying pan over fire and remove the hulls or toast dehulled nuts lightly in a kitchen oven to light brown colour.
- Toast just enough to remove the skin and the germ and store in a dry closed container/cellophane bag until time to use.

Crayfish Preparation:

- Clean and remove unwholesome crayfish and sand.
- Toast in frying pan at low heat or even dry, do not burn.
- Store dried or toasted crayfish in a container until time to use.
**STEP THREE**

**HOME WEANING FOOD RECIPES/FORMULAS**

The following are the recipes for making home weaning foods from a combination of either fermented and malted (germinated) corn, millet or sorghum with soybean, crayfish or groundnut.

**FORMULA/RECIPE 1**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Proportion</th>
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<tbody>
<tr>
<td>Fermented millet</td>
<td>4 leveled cups</td>
</tr>
<tr>
<td>Malted millet</td>
<td>2 cup</td>
</tr>
<tr>
<td>Processed soybeans</td>
<td>3 cup</td>
</tr>
<tr>
<td>Sugar granulated</td>
<td>1 cup</td>
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</table>

**FORMULA/RECIPE 2**

<table>
<thead>
<tr>
<th>Ingredients</th>
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</tr>
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<tbody>
<tr>
<td>Fermented corn (maize)</td>
<td>4 leveled cups</td>
</tr>
<tr>
<td>Malted corn (maize)</td>
<td>2 cup</td>
</tr>
<tr>
<td>Processed soybeans</td>
<td>3 cup</td>
</tr>
<tr>
<td>Sugar granulated</td>
<td>1 cup</td>
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**FORMULA/RECIPE 3**

<table>
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<tr>
<td>Fermented millet</td>
<td>2 leveled cups</td>
</tr>
<tr>
<td>Malted millet</td>
<td>1 cup</td>
</tr>
<tr>
<td>Fermented corn (maize)</td>
<td>2 cups</td>
</tr>
<tr>
<td>Malted corn (maize)</td>
<td>1 cup</td>
</tr>
<tr>
<td>Processed soybeans</td>
<td>2 1/2 cup</td>
</tr>
<tr>
<td>Roasted groundnut</td>
<td>1/2 cup</td>
</tr>
<tr>
<td>Sugar granulated</td>
<td>1 cup</td>
</tr>
</tbody>
</table>
### Formula/Recipe 4

**Ingredients**
- Fermented millet
- Malted millet
- Fermented corn (maize)
- Malted corn (maize)
- Processed soybeans
- Clay fish
- Sugar granulated

**Proportion**
- 2 leveled cups
- 1 cup
- 3/4 cup
- 1/4 cup
- 1 cup

### Formula/Recipe 5

**Ingredients**
- Fermented sorghum
- Malted sorghum
- Processed soybeans
- Sugar granulated

**Proportion**
- 4 leveled cups
- 1 cup

---

**Note:** Storage must be in cool, dry place.
STEP FOUR

MAKING THE HOME WEANING FOODS FLOUR

INGREDIENTS
- The fermented grain, from either corn, sorghum or millet.
- Malted grains
- Processed soybean
- Toasted crayfish
- Roasted groundnuts
- Sweetener (Granulated sugar)

PROCESSING PROCEDURE
- Grading
- Steaming
- Drying (Pan-toasting, oven drying)
- Cooling and packaging

Grinding:
- Grind together the recommended proportions according to the formula stated in step 3. The nursing mother can adopt any of the stated five recipes composition as desired.
- Grinding can be done either with a grinding machine or using clean and dry pestle and mortar. For example, grind into flour.
4 measured cups of fermented millet with 2 measured cups of malted millet and 3 measured cups of processed soya beans and add 1 measured cup of granulated sugar. Grind together these materials or pound by hand with mortar and pestle.

Sieving: Sift the composite flour through clean fine sieve.

Drying: Pan toast the pounded, sieved flour in an earthen ware pot or in a frying pan until it turns medium brown at low heat for about 10 minutes. Drying with a kitchen oven takes 15-20 minutes at medium setting. Turn frequently to prevent burning.

Packaging: Cool and package in cellophane bags. Store in plastic container with cover until time to use.
COOKING PROCEDURE

Dissolve thoroughly the desired quantity of the processed weaning foods, composite flour, by mixing 4 tablespoons in 380-200ml (1 medium margarine cup) of tap water inside a small cooking pot.

Cook in low heat and stir continuously until the mixture thickens.

Add more water if mixture is too thick.

Continue cooking for one more minute.

Add more sugar if desired.

Cool slightly and spoon-feed the baby.
FLOW PROCESS

Corns, millet and sorghum
Pick
Wash
Soak for 24-48hrs
Change water daily
Drain
Sprout to air or oven dry
Fermented grain

Seeds
Pick
Wash
Boil for 26-40 minutes
Drain
Germinate for 14-48hrs, remove water 1-2
Air dry or
Over dry
Remove seeds
Processed seed coat
Roasted seed coat
Blend cereal

Mix to recommended proportions
According to formulation
Grind together
Shake
Pan roast (millet and sorghum) until it turns brown at low heat for 10 minutes
Or
Over dry - 15 to 20 mins in batches at medium setting
Cool and package in cellophane and store in scoop
Store in plastic bucket with cover
About FIRO

The Federal Institute of Industrial Research Oshodi (FIRO) is a Federal Government parastatal institution, under the supervision of the Federal Ministry of Science and Technology (FMST).

FIRO was founded in 1956 and is presently on a five hectare land area at Oshodi, an industrial hub of Lagos State with staff complement upwards of 400 made up of research scientists and professionals such as chemists, microbiologists, food scientists/technologists, polymer chemists, fibre technologists, metallurgists, ceramic, mechanical, electrical and chemical engineers supported by administrative and support staff including information and computer scientists.

FIRO is mandated to carry out research and development functions relevant to industrial applications up to pilot-plant stage in the areas of food, other agro-allied products and in various non food areas. FIRO has identified four major activity areas as follows in terms of the nation’s needs and economic objectives:

- Upgrading indigenous technologies and adaptations of imported technologies.
- Improvement of Nigerian staple diets, that are deficient in the essential bodybuilding nutrients.
- Industrial utilization of Nigerian raw materials exported at prices which are unprofitable in comparison with what it costs to import the same materials to the country in processed forms.
- Design and development of production processes and the fabrication of equipment for mechanizing traditional production techniques.

FIRO laboratory research is supported by engineering design and fabrication of equipment and machine prototypes for actualization of its various research findings and pilot plant demonstrations to entrepreneurs.

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Appendix 17

Selected FIIRO technologies for industrial development
The Federal Institute of Industrial Research (FIIRO), Oshodi, Nigeria, is a multi-disciplinary institution established in 1980 by the Federal Government of Nigeria to promote industrial research, development, and technology transfer. The institute is known for its contributions to various sectors of the economy, including agriculture, mining, energy, and manufacturing. This page from the institute's publication, "Selected Technologies for Industrial Development," highlights the focus on technological innovations and their applications in various industries. The text provides insights into the institute's work in developing and promoting technologies that can be applied to improve industrial processes and enhance productivity in the Nigerian economy.
SELECTED FIIRO TECHNOLOGIES FOR INDUSTRIAL DEVELOPMENT

Mission Statement
To promote technological activities and industrialization of the national economy through research and development

FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH, OSHODI
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FOREWORD

Selected PIRO Technologies for Industrial Development is a useful guide to over 60 technologies developed at the Institute specifically to utilize raw materials available in Nigeria. The prototype equipment described in this book were developed, fabricated and tested in the Institute; they are intended for small- to medium-scale industries.

As Nigeria is still largely an agrarian economy, PIRO has concentrated primarily on providing information on innovations for improved food processing. Indeed, many PIRO technologies are already in use in cassava processing centres, groundnut and cashew production industries and fruit juice and beverage manufacturing industries, to mention a few. Such industries are important engines of economic growth and development, providing a wide range of employment opportunities, as well as stimulating agricultural production and the creation of wealth.

In addition to innovations in the area of food processing, PIRO has developed a number of machines for the production of industrial raw materials. These include, a biogas digester and fertilizer machine, an essential oil distillation unit, an adhesive reactor for making adhesives and adhesives from cassava starch and a soap reactor, for the manufacture of laundry and toilet soaps.

There is a wealth of information in this book which could be useful to community-based NGOs, individual entrepreneurs, and cooperative associations who want to set up small- to medium-scale enterprises. We hope the information in this book will encourage you to take advantage of PIRO’s expertise in setting up and using these technologies which have been specifically developed for Nigeria.

Dr. O Olusoji
Director-General, PIRO
FOOD PRODUCTS

Processing Cassava Roots

Cassava is a major staple grown in many areas of southern Nigeria. Its roots are processed into a variety of food products, such as, gari, fufu, latan, and tapioca. Cassava roots are also a good source of starch, which is utilized in food, pharmaceutical, and textile industries.

The processing of cassava roots is tedious and mainly carried out by women using traditional manual methods. Cassava processing usually starts with peeling of the roots by hand, after which they are grated or soaked. For gari production, the grated cassava is left to ferment for three to five days, after which the fermented mash is pressed to remove the water content. The pressed mash is then fried and dried until the moisture content is reduced. For fufu production, cassava roots are usually peeled, washed, and soaked in clean water (unsaturated fermentation) for about four days. The roots are allowed to soften by natural fermentation in water, and suffused with running water to obtain fufu flour. The flour is de-washed and the resulting cake is dried and milled to the desired particle size.

For traditional fufu production, cassava roots are usually washed, peeled, cut into uniform pieces and soaked in water for twenty-four hours. The soaked pieces are dried to the required moisture content and milled into flour of desired particle size. A new method of production that can be readily adopted is available in the Institute.
Dried Cassava Chips
Fresh cassava roots are processed into a more stable form as dried chips. The roots are peeled, washed and chipped to the desired size. These are dried, cooled and packaged as stable cassava chips. Dried cassava chips have a high export potential, being a major ingredient in animal feed production in Eastern European countries, either as chips or as pellets.

Gari from Dried Cassava Chips
The Institute has developed new methods of producing good quality gari from dried cassava chips. The chips are milled into grits and seeded with fresh cassava mash. This is fermented, dewatered and sifted to remove fibres. The resulting cake is broken, toasted, cooled and packaged. This technique will reduce the long and tedious processing methods associated with gari production from fresh cassava roots, and should ultimately reduce postharvest losses of fresh cassava.

Noodles from Cassava
Noodles are cereal-based pasta products marketed under different trade names according to shape and size such as macaroni, spaghetti, vermicelli and rotoli. They are commonly prepared from durum wheat semolina, but with recent advances in technology and product development, noodles have been successfully developed in FIRO from cassava roots.

Cassava roots are washed, peeled, grated and mixed with potato water. An emulsion of cassava slurry is pre-geled and added with other noodle making ingredients such as soy flour, alkali, strengthening agent and others. Noodle dough is extruded at room temperature into macaroni and spaghetti shapes, dried and packaged in bi-axial oriented polypropylene films.

Soy-gari from Cassava and Soybean
Cassava—Manihot esculenta Crantz—is one of the most important carbohydrates in the diet of several million African people everyday. The roots of the cassava plant can be processed into a number of different local foodstuffs, such as tapioca, gari, faru and lafun. Beyond their high caloric value, however, cassava roots have very little food value. The high proportion of cassava and similar high carbohydrate staple foods in the basic diet of the African has contributed to the poor nutrition status of many people living south of the Sahara. It would be immensely beneficial, therefore, to millions of people, if cassava could be fortified with an inexpensive protein, using a simple technology that can be reproduced in the home.

In the past, attempts were made by FIRO to fortify cassava with micro-organisms like Geotrichum candidum, Candida utilis and Candida tropicalis, known as single cell proteins. Even though there were marked differences in terms of improvement in the nutrient composition of microbially-fermented cassava over the unfortified sample, the product was rejected by the consumers. In addition, the transfer of this technology to local producers of gari or other processors of cassava products would have been difficult because the production of single cell protein requires very strict aseptic conditions which may be difficult to maintain in most processing sites.

More recently, FIRO successfully carried out research into the production of a high protein gari using a number of legumes—soybean, pigeon pea, groundnut and beans. Soybean, known as the wonder crop, was found the most suitable among the legumes under examination. Soybean is rich in protein, fat, minerals and vitamins. It also has some medicinal uses.

The end product, a mixture of cassava and soybean was termed soy-gari. The processing of soy-gari does not require strict aseptic conditions and can be easily accomplished using simple techniques.
Soy-gari contains over 10% protein. This is much more than the 1% protein found in unfortified gari. The minimum recommended intake of protein is 70 g/day for a normal adult. It has been observed that an average Nigerian adult consumes about 300g of gari/meal, which implies that only about 3g of protein is consumed during such a meal, especially if the accompanying soup or stew is poor in protein. On the contrary, the consumption of soy-gari will satisfy the daily body requirement of protein, even if consumed three times a day. The introduction of soy-gari into the diet of the population in the developing world may help solve the problem of protein malnutrition.

Soy-Ogi Production
The problem of protein deficiency among newly-weaned children is common in Nigeria, especially where breast-feeding has been discontinued and corn porridge (ogi or akamu) is used exclusively as a weaning food. In the early seventies, FIBO succeeded in enriching ogi by the incorporation of soybean, which is well known for the high quality of its protein, and produced a new product known as soy-ogi. The protein content of ogi was increased from 3% to 15%. The equipment for the processing of soy-ogi can be built locally. The product has been widely tested in clinics throughout Nigeria and shown to be efficacious in preventing and treating kwashiorkor.

The production process of soy-ogi basically follows the traditional method of ogi preparation which consists of soaking, fermenting and milling the maize. The only difference is the addition of a certain ratio of boiled soybeans to increase the protein content of the ogi to about 12%. After this, the washed soybeans and maize mixture is dried in a machine that reduces the water level to 7%. The final product is vitamin enriched, flavoured and packaged in a waterproof container.

The technology to produce hygienic soy-ogi using the Hazard Analysis Critical Control Point (HACCP) system can be acquired from FIBO, and its commercialisation can be undertaken through a licence agreement between the institute and the prospective investor.

Iru (Soy Dawadawa) from Soybean
Soy dawadawa traditionally constitutes a significant dietary component for people living in the rural areas of Benue, Kwa and Oyo states of Nigeria, as well as other countries like The Gambia, Ghana and some French-speaking countries of West Africa. It is produced from soybeans, acknowledged to be the richest source of vegetable protein. Soybeans grow abundantly in almost all the states of Nigeria, with the southern Girass zone being the main producing area.

The traditional method of producing soy dawadawa involves boiling the beans to remove stones and dirt, and toasting until light brown in colour using a frying pan. The roasted seeds are dehulled using a grinding stone, after which they are put in a clay and blown to remove the hull. The dehulled beans (coyble), are then soaked in water and boiled. After draining the water off, the beans are emptied into a perforated bowl which has been lined with leaves, e.g. pawpaw or bafjuba leaves. The preparation is covered with leaves and left to ferment for 3-48 hours at an ambient temperature. The fermented beans are dried and sun dried to improve preservation.

FIBO has developed a new technology for the production of soy dawadawa. The new technology involves roasting of soybeans in a hot air oven at a predetermined temperature, while the shelling, splitting and dehulling of the beans are done by a milling machine (hammer mill) and an aspirator. The beans are then cooked in a pressure cooker at a certain temperature and for a predetermined period.

The fermentation is done in a solar steam fermentor designed in such a way as to reduce, but not exclude completely, the entry
of air, and at the same time maintain a suitable humidity. This ensures good and consistent quality.

PIDRO has also developed a method of preservation through the addition of a specific predetermined concentration of salt and drying the beans at a specific temperature in a hot air dryer. Dried soy beans in powdered form has a shelf life of over 12 months.

Soy-enriched Snacks

Soy protein products can play an important role in providing the nutritious foods consumers demand. Soy protein can be added to a variety of foods to improve their nutritional value. It can be used as a partial or complete replacement for meat, eggs and dairy products. Research studies have shown that soybean is an excellent source of protein for infants, children and adults. It also has other beneficial health implications upon continuous consumption. These include, the lowering of plasma cholesterol and the prevention of osteoporosis in women after menopause.

PIDRO full-fat extruded and non-extruded soy flour has been successfully utilized in the enrichment of snacks and other products. The protein content of commonly consumed snacks, such as chin-chin and puff-puff, was increased by 27% to 30% when soy flour was added. A noticeable improvement in shelf-life, texture, color and overall acceptability was also observed. The cost of production was also reduced by 6%.

Soybean grows readily in Nigeria and the processed products are available. Its utilization and consumption should be encouraged.

Soybean Extrusion Cooker

Millions of people in Nigeria suffer from chronic protein and caloric deficiencies. One of the best solutions to this problem is to supplement cereal-based diets with whole soybeans.

The relatively balanced amino acid pattern and the high quality protein content of soybeans make it ideal as a supplement to cereal grains or maize. Furthermore, soybeans are an excellent source of feed for livestock and poultry industries, which have large potential for expansion in Nigeria.

Dry extrusion cookers are employed for processing soybeans into a product which can be added to cereals and grains. However, dry extrusion cookers are not manufactured locally and as a result they are very expensive and beyond the reach of the local processors. This has, in a great extent, affected the feed formulation in the livestock and poultry industries. The PIDRO low-cost soybean extrusion cooker was conceived and developed to solve the above problems with low technical and operational requirements.
Process/technology: To produce full-fat soy meal, the seed is first cleaned to remove foreign matter and introduced into the machine through the hopper. The equipment, which is powered by an electric motor, grinds, steams and cooks the soybean at a temperature not exceeding 180°C. In the process, all the raw food enzymes contained in soybean which can cause deterioration while in storage are inactivated, and the toxic substances which hinder digestion and other unwanted factors in soybean are destroyed by heat. This enhances the digestibility and palatability of the full-fat meal. The final product is discharged from the machine through the die under pressure.

Fish-Smoking Kiln
A good percentage of the fish caught in the riverine areas is preserved through the traditional method of smoking. The traditional fish-smoking method is carried out by spreading the fish on an open wire grate tray placed over an open hearth. In order to ensure that all the fish smoke evenly, the fish are continually turned manually (usually by women and children). This method of fish smoking is laborious and often unhygienic.

PHRO has developed a 150 kg capacity, closed-chamber fish-smoking kiln (see figure 2) which is completely free from the above-mentioned disadvantages. The design of the kiln ensures that the fish come out with a very low moisture content and, therefore, have a long shelf-life. The kiln can either be fixed or movable. Operating the kiln is very simple and can be learnt easily by anyone.

The fish-smoking kiln is operated by first loading charcoal into the heat chamber, preheating for some minutes, then loading the salted pieces of fish onto the trays in its central chamber. The kiln is closed for some time to allow smoking to take place: the length of smoking depends on the type and size of fish.

Mushroom Production
Mushrooms belong to the family of fungi and are generally found growing on dead wood and other decaying organic matter. The majority have an umbrella-like fruting body. Mushrooms are widely distributed in nature.

Mushrooms are rich in proteins, vitamins and mineral salts, and may serve as a substitute for fish or meat. The exploitation of tropical, edible mushrooms in underdeveloped parts of the world could be a potentially lucrative business.

Mushrooms are of two types: edible and the poisonous. The problem with harvesting wild mushrooms is the difficulty in differentiating the poisonous from the non-poisonous. There have been cases of mistaken consumption of poisonous mushrooms, resulting in sudden death. It is therefore reasonable to encourage
the cultivation of edible mushrooms. Many Nigerians are unaware that there is a commercial market for edible mushrooms.

FIBRO has developed a simple technology for the cultivation of tropical, edible mushrooms that can be adopted easily throughout Nigeria. First, the prospective mushroom farmer should prepare a compost bed from one or more mixtures of the following: cotton waste, sawdust, rice straw, tobacco stalk, etc. Then the compost beds or bags are inoculated with mushroom spawn or seeds (which are produced in FIBRO) and left to spawn. Finally, the beds or bags are left in the dark for mycelial ramification, after which they are exposed for watering. Mushrooms appear within 2-3 days of watering.

Training on the full cultivation technique can be obtained from FIBRO at a modest cost.

Figure 3. Mushroom production

Beniseed Oil Extraction

Beniseed is widely grown in Benue State and its environs. It contains a high level of oil, the extraction of which has not been exploited on a commercial scale. Beniseed oil is edible and is used for various culinary purposes. It also has industrial uses such as the manufacture of pharmaceutically, cosmetics, and petry.

FIBRO recognizes the economic importance of beniseed oil and has designed and fabricated a simple mechanical process for extracting it. There is, therefore, no reason why beniseed cultivation and commercial processing should not be undertaken on a large scale in those areas where the climate is favourable to its growth. To produce beniseed oil, the seed is first cleaned to remove foreign matter, after which the outer shell is removed through a dehulling process. The shell is then separated from the

Figure 4. FIBRO oil expeller
Production of Maize Flour and Maize Grits

Maize, properly milled, can be used solely or partly as flour for baking and also to produce corn flakes. Milling is achieved by the use of a milling machine, in which the endosperm is ground into flour and the germ is separated. The flour can be used in various culinary preparations or for industrial purposes. The remaining product, called maize grits, is produced by further grinding and sieving of the endosperm. This process is carried out in a series of stages, each of which requires specific equipment and conditions. The end result is a finely ground flour and a coarse maize grits, which can be used for different applications.

Grain Dehulling and Degermination

The process of dehulling and degermination of maize is carried out to remove the bran and germ from the endosperm. The bran is removed to improve the digestibility of the flour, while the germ is removed to reduce the levels of phytate, which can affect the nutritional value of the product. The dehulling and degermination process is carried out in a series of stages, each of which requires specific equipment and conditions. The end result is a dehulled and degeminated maize, which can be used for different applications.

Vegetable oil from maize

Vegetable oil from maize can be obtained from FIBCO. This process involves the extraction of the oil from the endosperm, which is the oil-rich part of the maize. The oil is extracted using a variety of methods, including mechanical pressing, solvent extraction, and chemical extraction. The end result is a high-quality vegetable oil, which can be used for various applications, such as cooking, baking, and the production of margarine.
an electric motor or diesel engine. The operating capacity is one tonne/8-hour day.

The equipment has been developed as a package with accessories for separating the hull and gata from the processed grains. This makes it possible for the processor to obtain the grain, gata, gina and hull for various industrial uses.

Instant Pounded Yam Flour

The popularity of pounded yam as a special dish among Nigerians is well known. However, its traditional preparation is laborious, tedious and impractical for many people. The development of instant pounded yam flour is intended to solve these problems.

FIBRO has developed instant pounded yam flour in order to reduce preparation losses, and also to remove the drudgery involved in the traditional method of preparing pounded yam.

Figure 7. Paccording to instant pounded yam.

The raw materials needed for the production of pounded yam flour are whole yam, dehydrated yam, dehulled yam, preservatives and water.

Equipment: Equipment required for production: a slicer, parboiler, dryer, hammer mill, weighing machine and sealing machine. FIBRO has identified and standardized the production equipment to make it easy to transfer the technology to farmers and other producers.

Process / technology: The production process includes: slicing, peeling, washing, and slicing; parboiling, drying, milling, weighing, packaging, and sealing. Instant pounded yam flour has a shelf-life of one year in air-tight packaging.

Pounded Yam Substitute

FIBRO has succeeded in formulating substitute for pounded yam using local cereals, roots and root vegetables. This product is produced in areas where yam cannot be readily grown.

The substitute contains processed flour, rice flour, yam flour and food-grade binder. It is highly palatable and it resembles pounded yam made from pure yam tubers organoleptically. It swells to about three times its original volume after cooking. The technology for the production of pounded yam substitute can be obtained from FIBRO at a reasonable cost.

Equipment: A parboiling tank (parboiler), potato slicer, a dryer, a hammer mill, sifter, weighing scales and a heat-sealing machine. All of the equipment is fabricated by the institute and is thus readily available. The shelf-life of the product is over one year when packed in air-tight and moisture-proof packaging.
Mechanized Production of Enriched
Yam Flour (Ehuho)
Yam is a high fibre carbohydrate with good economic value. Nigerian dishes made from yam include pounded yam, yam porridge, as well as boiled, fried and roasted yam. The percentage of the yam harvest that undergoes processing into yam flour (ehuho) is insignificant.

The processing of yam tubers into ehuho is tedious and mainly carried out by rural women using manual methods. Yam processing starts with the peeling of the tubers by hand, after which they are washed, sliced and parboiled. For yam flour (ehuho) production, these parboiled yam pieces are dried and milled into flour of desired particle size.

To enrich the yam flour (ehuho), soybean flour is incorporated into the yam flour without affecting the characteristic flavour which makes the product acceptable. Soybean flour is produced by parboiling whole soybeans in boiling water after which they are dehulled, dried and milled to the desired particle size. The addition of soybean flour will increase the nutritional value of ehuho as a staple food both in the quality and quantity of protein. The protein content of enriched soy-ehuho is 8.4% compared to 4% protein in the ordinary yam flour.

This mechanized method will not only effectively preserve the soybean, but also add value to the yam. It will also reduce the cost of transporting bulky yam tubers from the rural to urban areas, and reduce the time spent processing ehuho from yam tubers.

Cowpea Flour for Akara and Moi-moi
The cowpea is indigenous to Africa, but also widely grown in other continents. It is an important source of protein in the developing world, especially West Africa. In Africa, cowpeas (beans) are consumed in a variety of ways. They are consumed as a boiled legume, alone or mixed with other foods such as rice, maize, plantain, yam, cassava and vegetables. In Nigeria, a large portion of cowpeas is consumed as a deep fried product (akara) or a steamed product (moi-moi). The preparation of these products is often based on traditional methods, which involves making fresh paste from cowpeas. This is often accomplished by soaking the dry beans in excess water, then manually rubbing the seeds to loosen the seed coat. The seed coat is separated from the cotyledon, using excess water, followed by grinding the seeds into a smooth paste. The laborious and time-consuming nature of this traditional method calls for upgraded techniques that will remove the drudgery associated with the process.

It is our belief that the availability of intermediate products, such as bean flour, that can be conveniently rehydrated to form a paste, and whose end products (akara or moi moi) are as palatable to consumers as those made using traditional methods, would be a welcome innovation. The initial trials in the production of bean flour were not successful, probably due to inappropriate technology for their production.

FHIRO has since developed an appropriate technology for making acceptable bean flour. The most critical aspect of the production is the removal of the seed coat. This has been achieved through the use of hydrothermal pretreatment of the cowpeas seeds prior to mechanical dehulling using the common village stone mill. Details of the process are available at FHIRO.

The equipment required are: collocated dryer, attrition mill, aspirator and hammer mill.

Cashew Nut Hot Oil Roaster
Cashew kernel is a rich source of protein and unsaturated fatty acid. The cashew kernel is highly nutritious and contains the fat soluble vitamins A, D and K; it is also a good source of calcium, phosphorus and iron, and can be processed into a low cholesterol, highly edible oil.
The cashew nut kernel is extracted in a hand mill in which the cashew nuts are repeatedly rotated and vigorously ground between the millstones, making the kernel fall into a hand machine or to the manual separation and extraction of the shell with a knife. The kernel is then washed, dried, and roasted before processing.

Groundnut Processing

Groundnut is an oil seed widely grown in Nigeria, with a high demand for export and home consumption. It is mainly utilized for oil extraction. The oil is used for cooking, in the production of margarine, and as a source of energy. The shells are used for animal feed.

Shelling

Shelling machines are used to remove the shells from the groundnut kernels. These machines can be manually operated or powered by electricity. The kernels are fed into the machine, and the shells are separated by centrifugal force or other mechanical means.

Processing

The groundnut kernels are then processed to remove any remaining shells or debris. This is typically done using a winnowing process, where air is passed over the kernels, and the lighter, air-tight husks are blown away. The kernels are then dried and stored for further processing.

Oil Extraction

The groundnut oil is extracted using a solvent process, where the kernels are immersed in a solvent (such as hexane) to dissolve the oil. The solvent is then removed, typically by distillation, leaving the pure oil.

By-products

The by-products of groundnut processing include the groundnut shells, which can be used as animal feed, and the groundnut oil cakes, which are used as fertilizers or feed supplements.
various groundnut products, a longer shelf life, better packaging and presentation for export or sale in supermarkets.

PEANUT BUTTER
Peanut butter is a nutritious food spread made from groundnut paste. It is high in protein but low in carbohydrates. It is an ideal food product for children and adults, especially in Nigeria, where groundnuts are grown on a commercial basis. Peanut butter is used as a spread on bread; in the production of snacks such as cookies, candy bars, fudge; and can be added to sauces.

Raw materials: Groundnut

Equipment: The major machines include: a sheller, roaster, dehuller, and colloid mill. All the units, except the colloid mill, were developed by FIBRO and are described below.

Sheller: This machine, which can be powered by an electric motor or a diesel engine, is capable of shelling groundnuts and separating the shells from the nuts at the same time. The operating capacity is 150 kg/hr.

Roaster: This unit can roast groundnuts in batches and at the same time remove moisture from them during processing. It is fuelled by gas but can also be fuelled by any other combustible material. Its working capacity is 60 kg/hr.

Dehuller: The FIBRO-designed dehuller removes the skin of roasted groundnuts and at the same time separates the nuts from the skin. It can run on an electric motor or a diesel engine, and it is capable of dehulling 60 kg of roasted groundnuts/hr.

Colloid mill: This machine is capable of milling and homogenizing dehulled groundnuts to obtain smooth and consistent peanut butter. The capacity of this machine is 40 kg/hr.

Process/technology: This method of peanut butter production, developed by FIBRO, involves the drying of unshelled groundnuts to a 10-15% moisture content. This is followed by shelling, roasting, cooling, milling into paste; the addition of seasoning and stabilizing ingredients; then homogenization of the paste with additives, and finally the packaging of the finished product.

SALTED GROUNDNUTS

Raw materials: Groundnuts and salt

Equipment: Roaster (developed by FIBRO as previously described) with a capacity of 60 kg/hr.

Process/technology: The FIBRO technology involves the blanching and roasting of the
groundnuts after shelling and dehulling as described above for peanut-butter. The roasting methods are dry or oil charged and oil frying.

**Tiger Nut Processing**

The tiger nut, Cyperus esculentus, is one of the underutilized crops that is widely grown in the Middle Belt and the southern states of Nigeria. The nuts are the storage organs of the grass-like plant. Four varieties have been identified: brown, yellow, big black and small black. The nuts are often eaten as a snack. At present, its industrial potential has not been explored.

FIDRO has begun work on the tiger nut and a number of food products which are being tested are described below.

**Tiger nut Beverage** The processing of the tiger nut starts with the extraction of milk from the nut; the milky liquid is then blended

**Distillation of Fotalbe Alcohol**

It is the practice among the riverine people to make local gin, egogoro, from palm wine that has become sour. The method they use is crude, unhygienic, and the product is sometimes dangerous to the health of the consumer. The maki is also low.

In order to overcome these disadvantages, FIDRO has developed an alcohol distillation plan called the FIDRO still, which is a more hygienic process than the traditional one. With the FIDRO still a higher yield in commercial quantities can be obtained. The machine can be fabricated locally. The FIDRO still can also be used for other raw materials, apart from sour palm wine, which ensures that the project does not become monobran
when palm wine is not available. Molasses has also been successfully used for producing potable alcohol. Thus, the versatile FIRO still can be fed with fermentable waste which could be made from palm wine, molasses or sugar, and yeast. The fermented waste is then poured into the distilling machine after it has attained the desired alcohol level. As the waste is being distilled, the alcohol is collected in another chamber, which is a component of the plant.

The distillation technology and the FIRO still are available at the Institute.

Production of Fruit Juice

Nigeria is blessed with an abundance of fruits such as oranges, pineapples, mangoes, bananas, etc. These fruits are seasonal and highly perishable, resulting in high post-harvest losses annually.

In order to minimize these losses, fruits can be processed into juices, jams, jams, etc. Fruit juice is an excellent source of minerals and vitamins, especially vitamin C, which makes it more nutritious than the popular carbonated soft drinks.

The Institute has simplified the process of fruit juice production using locally fabricated equipment, thereby reducing the capital cost and facilitating the ease of acquiring the technology. A financial analysis by FIRO confirmed that the venture is profitable.

Fruit juice production is done by peeling fully ripe, small, firm fruits and extracting their juice using a locally fabricated juice extractor. The juice is freed after the addition of preservatives, pasteurized, canned, bottled, and packaged.

Full details of the technology can be obtained from FIRO for a reasonable fee.

Production of Pectinase Enzyme

Pectinase is an industrial enzyme used in the fruit juice processing industry to clarify fruit juice. This enzyme breaks down intercellular pectin and increases the solubility of the cell walls and facilitates the extraction of intercellular liquid from pulpy fruits (banana, mango, guava, cashew-apple, etc.).

Currently, pectinase is imported from Europe. The production of purified enzymes requires a huge capital investment and high technical expertise. The Institute has, however, developed a process using agro-industrial waste for the production of the pectinase enzyme. The process involves fermentation of the substrate and inoculation with a known fungi, from which the enzyme is harvested.

Kunun-Zaki Preservation Technology

Kunun zaki is the generic name for all types of non-alcoholic, cereal-based beverages produced in Hausa communities in Nigeria. The word, zaki, denotes the ass-everybody drinks or spits in flavour the drink. Kunun zaki is prepared from millet, guinea corn, or sorghum extract; it is spiced with ginger, cloves, pepper, and usually seasoned.

Kunun is a popular social drink among the Hausas. It has even spread beyond the northern areas to other parts of the country, in spite of the prevalence of other Western-based beverage drinks.

The shortening, which restricts the availability of kunun, however, is its shelf-life. Traditionally-produced kunun spoils within 24-36 hours as it cannot be stored, preserved or transported over long distances to consumers. The study of the traditional method of kunun production which was undertaken by FIRO shows that spoilage is caused by the presence of micro-organisms, part of which is due to the anaerobic method of preparation. FIRO has now eliminated the micro-organisms and added a preservative which has increased the shelf-life of kunun-zaki to
INDUSTRIAL RAW MATERIALS

Sorghum Malt Production
Towards the close of the eighties, FIBO began to research extensively into sorghum malting, and as a result pioneered the art of producing European type lager beer and other alcoholic and non-alcoholic beverages using sorghum malt. Many Nigerian brewers have embraced this innovative technology.

Small- and large-scale production of sorghum malt can be carried out on a commercial basis in both rural and urban areas. Sorghum malt is produced by steeping cleaned wholesome grain in water for a number of hours. The steeped grain is subsequently transferred onto germinable beds where germination is allowed to take place under controlled conditions for a specified number of days. The subsequent grain malt is carefully dried, degerminated and stored, if desired, for use.

The technology for processing sorghum malt into goods and beverages, and details of the necessary equipment can be obtained from FIBO through a training programme and on contract agreements.

Textile Starch from Cassava
Apart from its use in other food products, cassava can be processed into an industrial starch. Industrial starch is largely used in the finishing of textiles, in the production of paper, pharmaceuticals, batteries, and other items. The demand in the textile industry outstrips local supply and is met through importation. There is, therefore, a big market for industrial starch in textile industries.
which should provide an opportunity for farmers to expand cassava production.

To produce industrial starch for textiles, fresh cassava roots are washed, peeled, washed again, and grinded. Water is added to the grinded starch to facilitate sedimentation. The sediment is decanted to form slurry which is broken down, granulated and dried. The dried material is then milled into fine powder, sieved and packed in waterproof bags.

Details of starch production from cassava for various specifications can be obtained from FIKRO on request.

**Cold Water Starch**

The conventional method of preparing textile starch is to mix starch slurry with boiling water. With the rising cost of energy, the textile industry in Nigeria may find the use of hot water starch uneconomical, especially as cold water starch is available in other countries. Cold water starch is imported in large quantities by the Nigerian textile industry as it is one of the raw materials for textile finishing and printing. It is also used in the food, paper and pharmaceutical industries. The high cost of foreign exchange has, however, made the importation of cold water starch an expensive import.

In view of the indispensability of starch as an industrial raw material, FIKRO took up the challenge and developed the technology for cold water starch. FIKRO cold water starch isleveland, gelatious, and comparable favorably with imported ones.

**Equipment**

Grinder, sieving machine, vibrators, centrifuge, weighing scales, mulling machine, dryer, hot sealing machine and mixing tanks. All of these machines are available locally.

**Process**

The production of FIKRO cold water starch involves putting the freshly cooked hot starch in a stainless steel tray and drying it in an oven. The paste is thinly spread on the tray in order to facilitate rapid evaporation. After evaporation, the thin flakes are collected and milled into a fine powder, screened, and then packaged in a thick cellophane bag.

**Economic Benefits**

The economic potential of this project cannot be underestimated because the cold water starch is in high demand by the indigenous textile, paper and pharmaceutical industries. Cold water starch could also have a large export market. Investment in cold water starch production would promote development and boost the income of cassava farmers, and an entire chain of processors and marketers.

**Detoxified Starch from Cassava**

Another major industry that utilizes large quantities of starch is the pharmaceutical industry, where starch is used predominantly as a binder in the production of tablets. Make starch is preferable as a binder, because unlike cassava starch, it does not contain cyanide. FIKRO, however, developed a suitable method of eliminating the cyanide from cassava which makes the starch derived from it safe for consumption. Detoxified cassava starch is an acceptable substitute for the make starch which is presently imported for use in the pharmaceutical industry.

Detoxified cassava starch could also fill the vacuum in the bakery and confectionery industry, in view of the high cost of wheat importation. The Federal Government of Nigeria banned the importation of wheat in 1987 to stimulate local production. During the ban, flour from sorghum and other cereal products had to be used in making bread and other bakery products.

Detoxified cassava starch has proved to be a very good constituent in composite flour formulation.

The production of detoxified cassava starch begins with the peeling, washing and grading of fresh cassava tubers. The resulting slurry is subjected to a detoxification process, and sieved to remove the fibre. The slurry is mixed with water and stored in a tank. After some time, the sedimented slurry is removed and the resulting cake is broken, granulated and dried. The product is subsequently
milled, sieved and packaged in waterproof bags. Further details can be obtained from the Institute.

Gums/Glues and Adhesives from Cassava Starch
Gums/glues and adhesives are important raw materials in many industries such as packaging, printing and binding industries. The demand for adhesives by these industries is largely met through imports. FIBRO took up the challenge and has developed a technology for the production of adhesives from cassava starch, which can compete favourably with the imported ones.

Starch-based adhesives are produced by the addition of appropriate quantities of caustic soda, hydrochloric acid, calcium chloride, and acetic acid to starch which is already dissolved in water. The resultant solution is warmed to acid dissolution and then cooled to room temperature. Formaldehyde solution is then added and mixed in vigorously to obtain a homogeneous consistency. The product is packaged in plastic containers.

The availability of the principal raw material (cassava) and the simplicity of the technology to produce starch make this a good investment opportunity.

Adhesive Reactor
FIBRO developed a simple adhesive reactor that can easily be adopted by small-scale entrepreneurs in the production of adhesives from cassava starch (see: glues and adhesives from cassava starch above). A 100-liter batch reactor was conceptualised, designed and developed.

Equipment: The adhesive reactor consists of an agitator, reactor vessel, steam jacket and control panel. It is unique because the boiler for the steam jacket is incorporated into it, different from some that are separate.
Processing Cassava for Poultry Feed

The important of yellow maize, the main carbohydrate ingredient in the production of poultry feed, has been discussed. Fish meal and limestone, which are the major traditional protein sources used in feed composition, are scarce and expensive. Consequently, the poultry feed produced from these expensive raw materials became very expensive and poor in quality. Many poultry farmers were forced to close down due to the inability to purchase the expensive poultry feed. The situation worsened as the economic recession in the country deepened. There was, therefore, an urgent need to explore cheaper alternative carbohydrate and protein sources for use in poultry feed formulations.

The Institute came up with an innovative technology for utilizing cassava as the main carbohydrate source in poultry feed production. FIBRO has successfully utilized detoxified cassava at 44% level of inclusion, supplements with soybean flour or balanced cake as novel protein sources in feed formulation. The cassava-based poultry feed is acceptable to poultry, as high nutritional standard, have a stable self-life, and acceptable toxicological levels when fed to chicken over two consecutive generations. The project is economical viable on a large scale.

Production of Refined Kaolin

Nearly all the refined kaolin required in raw materials by local industries is imported, despite the large deposits of kaolin in the country. These deposits are awaiting exploitation and necessary refining to suit specific industrial needs. The Institute has successfully refined kaolin for use in the same, ceramic, paper, and allied industries.

The refining of kaolin consists of a simple process whereby the crude clay is crushed, mixed with water and agitated into a slurry. Depending on the desired quality of the end product, a small amount of sodium dichromate may be added to decolorize it.
The impurities in the slurry are then removed and the cleaned slurry is filtered to remove most of its water content. The filtered cake is dried until the moisture content becomes negligible and then milled into fine powder before storage.

Secondly, ceramic wall tiles, commonly fixed on the walls of toilets, kitchens, bathrooms, offices, etc., are among the numerous decorative products of ceramic technology which are made from clays and non-clay materials.

FIRGO has successfully identified six types of ceramic clays suitable for the production of ceramic wall tiles; these include ball clay, kaolin, feldspar, silica, and calcium carbonate. Furthermore, the Institute has developed high standard wall tiles that compare favourably with those made in technologically advanced countries. Technical reports can be prepared for interested inventors for a fee. Technical assistance to set up the projects can also be provided by the Institute.

Fibreboard Production

Fibreboard is a flat surface material obtained by pulping wood or non-wood plant material and converting it into board with the help of binders. It is used for ceilings, partitioning, the covering of some electronic devices and framing of enlarged photographs.

Apart from cement fibreboard, others are not presently produced in Nigeria; even though all the raw materials are available locally.

Process Technology: In the production of fibreboard, the wood is chopped into small pieces and then cooked. The cooked material is de-warmed and ground into fine particles. The pulp so obtained is beaten into a dilute suspension to impart the required strength to the fibre. Additives are incorporated to ensure a suitable end product. After thoroughly mixing the pulp and additives, the slurry is poured into moulds. The moulded board is de-watered, hot-pressed and then dried. The technology for fibreboard production can be acquired at FIRGO.

Biogas and Biofertilizer Production

FIRGO has looked into turning domestic organic wastes, i.e., plant and animal wastes, into useful domestic sources of fuel and fertilizers. Using a relatively simple technology, household wastes can be converted to methane gas for cooking, and fertilizer for agriculture. This breakthrough has numerous benefits, including putting an end to the unnecessary felling of trees for firewood, while the fertilizer will provide a readily source of manure for farmers.

Raw materials: These are water hyacinth (Eichhornia crassipes) from coastal and riverine areas of Nigeria, other household plant waste, agricultural waste, and animal dung (cow, chicken, pig, etc).

Figure 13. Biogas and biofertilizer plant
Equipment: Biogas digesters of various sizes have been designed and fabricated by FERRO. Each digester is made up of a reaction chamber with an inflow and overflow manholes. It also has a gas holder with built-in spikes, which are capable of being rotated to facilitate the breaking of waste slurry surface layers to release the gas.

Other accessories developed are a mixer (for waste preparation), gas fittings with controls, atmospheric dryer, dry-milling machine, and packing machines.

Operating capacity: The units developed fall into three categories: (i) Laboratory (ii) pilot and (iii) community scale.

The data obtained are tabulated below.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Capacity</th>
<th>Liquid</th>
<th>Semi-liquid</th>
<th>Solid</th>
<th>Gas</th>
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<tr>
<td>Laboratory</td>
<td>3</td>
<td>25</td>
<td>0.25</td>
<td>1.1</td>
<td></td>
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<tr>
<td>Pilot</td>
<td>100</td>
<td>50</td>
<td>40</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Community</td>
<td>15000</td>
<td>5000</td>
<td>400</td>
<td>100</td>
<td></td>
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</table>

Process / technology: The process involves the collection of biological wastes from various sources, weighing, and mixing the waste with water in a numerically equal weight to volume ratio. The mixture is then fermented anaerobically for 3 to 4 days with an inoculum, during which period gas is collected.

Sewage materials which are in wet forms are then dried, mixed, and packaged as fertilizer – which has been tested and found to be satisfactory for farming.

Pottery and Ceramics

Pottery and other ceramic products such as teacups, plates, and flower vases – which are called awa in Yoruba, sango in Hausa and obari in Igbo – are extensively used in homes and offices across the country and all over the world.

Nigeria, however, still remains a commercial consumer of a wide variety of pottery/ceramic products imported from all over the world. Pottery products flood the market from places such as China, Taiwan, India, UK, Germany, Belgium, France, Indonesia, and Malaysia. Pottery has been found in most archaeological sites in Nigeria, proving that the manufacture of pottery has always been an important traditional occupation. Examples of terracotta items include cooking pots, decorative pieces, pipes, beads and bowls. Many successful small-scale pottery works exist in Nigeria, but the markets they supply are relatively small.

Pottery is made from solid mineral clays of various physical and chemical properties using simple pottersing techniques. Solid mineral deposits, such as kaolin, ball clay, feldspar, quartz, calcium carbonate, silica, etc., are found in virtually all the states of Nigeria. Large deposits of these materials exist in such quantities that can contain small-scale, medium and large-scale industries.

Figure 20: Industrial minerals in Nigeria.

FERRO has carried out research and development on the identification, refining, and processing of a wide range of solid clay minerals found in the country, and has developed several pottery product formulae suitable for production. Based on an applied technology analysis, a simplified pottery production process has
from Local Gypsum

Plant of Paris (POC) is used in the manufacture of hydraulic cement. The plant was divided into two sections: a new plant for manufacture of hydraulic cement and an old plant for production of concrete. The new plant was designed for the production of hydraulic cement, while the old plant was used for the production of concrete.

Hydraulic cement is used in the construction of buildings, roads, bridges, and other structures. It is produced by mixing Portland cement with water and adding an activator, such as lime or fly ash. The mixture is then poured into a mold and allowed to harden. The hardened cement is then used to construct the desired structure.

Ready-mixed concrete is used in the construction of buildings, bridges, and other structures. It is produced by mixing Portland cement, aggregate, water, and sometimes other materials, such as fly ash or slag, in a mixer. The mixture is then poured into a mold and allowed to harden. The hardened concrete is then used to construct the desired structure.

Ceramic Glaze Production

Glasses in the ceramic industry are used to improve the properties of ceramic materials, such as porcelain, stoneware, and earthenware. These glasses are made by melting a mixture of glass-forming oxides, such as silica, alumina, and lime, in a furnace. The glasses can be colored by adding metallic oxides, such as iron, cobalt, and copper, to the mixture.

The glazes are applied to the ceramic materials before firing. The glazes are then fired in a kiln, where they melt and adhere to the ceramic materials. The glazes can be used to enhance the appearance of the ceramic materials, such as by adding color or luster.

Several low temp.: reg: 260° feed. For por., an additional production step that has not been developed for production.

Developed for production. Many locally available raw materials have been used in the development of these processes.
The institute has the expertise and experience to provide technical and economic feasibility reports and project consultancy. It can also undertake machinery fabrication and assist with project implementation.

**Hydrated Lime Production from Local Limestone**

Limestone, which has a number of important industrial uses, is one of the most abundant solid minerals in Nigeria. Although limestone has been mined for several decades, apart from its use in cement production, the nation's limestone resources are highly under-exploited.

Hydrated lime — Ca(OH)₂, which is produced from limestone, is used extensively in water purification, iron and steel processing, in foundry practice, and in waste disposal. It is imported on a large scale and at a very high cost.

**Process/technology:** Limestone is crushed and calcined at the appropriate temperature and transferred to a hydration/agitation to react with water. The slurry (wet process) is deaerated, dried, and pulverized for packaging.

**Equipment:** Kiln/calciners, jaw crushers, hydrator, hammer mill, and screen.

FIRD has carried out extensive research and development work on hydrated lime production, and has the capacity to provide the relevant technical support, project feasibility studies, machinery fabrication, and consultancy services for implementation.

**Putty from Beniseed Oil**

Putty is a mixture prepared from earth material and oil. It is used as a sealant in woodwork, to fix glass in windows, as a bonding agent in plumbing works to prevent the leakage of water, waste water, sewage, etc. As an important sealing material, putty will continue to be in high demand. One of the major components in putty production is linseed oil, which is imported into the country at a considerable expense. FIRD, therefore, began to search for a local substitute and discovered that beniseed oil has the same desirable properties for making putty as linseed oil. The institute then developed this simple technology for putty production with 100% local raw material input.

FIRD putty, called 'Plumbers' Choice' has been rated by construction experts as being better than the imported commercial samples both in quality and cost.

**Process/technology:** Beniseed oil is extracted using a manual press designed by FIRD, after which it is heated to a pre-determined temperature, which is crucial for thickening. It is then mixed thoroughly with an additive of known weight to produce putty.

**Adhesive from Cow Bone**

Adhesives are substances capable of holding materials together. Bone adhesive, otherwise known as animal glue, is essentially the hydrolytic product of collagen — the main protein in animal skin and bones.

The conversion of the collagenous component of animal bone, skin, and sinew into a soluble gel, either as a food component or as glue, dates back to prehistoric times. Its wide acceptance as an adhesive stems from its unique ability to be stored as a powder and reconstituted when needed. When dissolved in warm water, it gives a viscous solution, and on cooling, passes into a gelled state, which provides an immediate, moderately strong initial bond. Subsequent air drying provides a permanent strong, resilient bond between polar materials. Ease of preparation, ready application, good machining properties, relatively low cost, and high-speed operations — these are the characteristics and qualities that encourage interest in its use.
FIBRO has developed, through successful laboratory work, a modified process technology for the production of adhesive from cow bones. Cow bones are available in local abattoirs situated all over the country.

Raw materials: The major raw material for the production of cow bone glue is cow bone. The availability of this major raw material makes the adoption of this technology appropriate for industrialization.

Equipment: The equipment used in the production of the cow bone adhesive comprises pressure vessels, aluminium vessels, an oven, adhesive reactor and packaging materials. All these components can be fabricated at FIBRO.

Process / technology: The FIBRO-modified process technology for the preparation of cow bone adhesive involves the pre-treatment of the processed bone, followed by degreasing, demineralization and extraction with an autoclave.

The extracted glue is then filtered and concentrated after adding some additives to improve the quality of the adhesive. The product is packaged in a plastic container.

The FIBRO bone glue meets commercial standards going by the quality assurance tests, especially the bond strength, viscosity and shelf life.

Bleaching Earth Production

Bleaching is the term used to describe the adsorptive cleansing process associated with edible and non-edible oil refining. The major raw material used in bleaching operations is clay, both in its natural and activated forms. All of the bleaching clay used in Nigerian vegetable oil industries is imported, despite the large deposits of various types of clay in Nigeria.

FIBRO has successfully developed natural and activated bleaching earth from local clay deposits, which could be used as a substitute to imported bleaching earth.

Raw materials: Montmorillonite type of clay, ball clay

Equipment: Hammer mill, ball mill, filter press, dryer and disc mill

Process / technology: The clay materials are crushed in a hammer mill and sieved. The materials are then transferred into a blunger and water is introduced. The slurry obtained is stirred and then filter pressed; the pressed product is dried and milled into a fine powder.

Activated bleaching earth: The hammer-milled product is transferred into a reactor where the requisite amount of mineral acid is added and boiled, the product is washed, dried and milled into a fine powder and packed.

FIBRO can provide technical and economic feasibility reports on this project. The Institute also has the technical ability to assist in the sourcing of raw materials and machinery.
ESSENTIAL OILS

Citronella Oil
Among the various lemon grasses in the genus Cymbopogon cultivated commercially, the most important citronella oil-yielding species are Cymbopogon winterianus (Java citronella) and Cymbopogon nardus (Ceylon citronella). These two species are indigenous to Sri Lanka, but are now widely cultivated in many tropical and subtropical regions around the world, including Nigeria. There are quite a number of citronella farms in the country especially in southwestern Nigeria.

Citronella oil is an essential oil and is in high demand in the cosmetic, pharmaceutical, and food industries. It is highly valued for its flavour and fragrance.

The annual global production volume of citronella oil is less than 100 tonnes and it is of very high value in the world market. It is estimated that the 100 tonnes is worth more than US $10 million per annum, and more than 90% of this output comes from the developing world. Nigeria, regrettably, is not part of this trade.

Equipment: Realizing the importance of citronella oil as an industrial intermediate, FIRIO designed and fabricated a multi-purpose distillation plant for citronella oil production (based on the principles of steam distillation) that is simple, appropriate and easy to operate.

PROCESS / TECHNOLOGY: Citronella oil can be isolated from the various oil-yielding species through a steam distillation process or a hydro-distillation process due to the purity and high quality of the essential oil produced.
Flavouring and Perfumery Extracts from Plants.

Essential oils are the volatile oils obtained from aromatic plant materials. They are mixtures of highly volatile compounds which vary widely with regard to their chemical and physical properties. They are vital ingredients of perfume or fragrances, and flavours. The process of distillation is obviously of considerable importance to essential oil producers.

FIGRO has developed a method which uses steam to extract essential oils from aromatic plant materials.

Raw materials: FIGRO's steam distillation unit is designed for aromatic plant materials such as lemon grass, eucalyptus, citronella, etc. The main markets for the oils are the perfume, paint, pharmaceutical, food, textile, paper industries, and a host of others.

Equipment: The FIGRO distillation equipment is constructed with stainless steel. It consists of four major components: the heating section, the reactor or still, the heat exchange/condenser, and the distillation collector/vial separator. It is a medium-sized machine of about 30 kg capacity.

Process / technology: Various methods are used in the extraction of essential oils from aromatic plants, but FIGRO has developed an equipment that employs the steam distillation method.

Under this method, the leaves are harvested early in the morning and shredded or cut to size. The materials are then fed into the feed chamber or reactor. Steam is allowed to pass through the plant materials for about four hours so that the essential oils can be extracted. The distillate is then collected at the collection point and the oil is separated from the water through gravity.
COSMETICS AND SOAPS

Body Cream and Hair Pomade Production

FIBRO has successfully produced simple body creams and hair pomades through its research efforts. The major raw materials are petroleum jelly, mineral oils and lanolin.

The equipment needed is simple to operate and therefore suitable for small-scale industry production. The raw materials can be purchased and stored for a long time. The finished products are in high demand in both the rural and urban areas.

Body cream is prepared by mixing certain quantities of petroleum jelly and mineral oils together. Dye and perfume are then added and the products packaged. Hair pomade is likewise prepared by mixing petroleum jelly, mineral oils and lanolin together in appropriate proportions. Dye and perfume are also added and the product is then packaged.

The production technique can be transferred to interested investors through group training.

Laundry and Toilet Soap Production

Soap is an essential commodity in the industrial and the domestic sectors. FIBRO has developed a process for small- and medium-scale production. Soap production is simple and the raw materials required can be purchased and stored for long periods without getting spoilt.

Soap production involves the addition of caustic soda solution to palm kernel oil while stirring properly. Soda ash is then added...
and the mixture is heated until the soap mass has properly melted. Extra water, dye, perfume, and other additives are also added and stirred in. On cooling, the soap is cut into the required shape and size and packaged.

FIRO training workshops on soap production technology are available for a modest fee.

Production of Traditional Black Soap

Black soap is becoming more popular as people are becoming aware of its natural beneficial properties. Therefore, the producers must strive to meet the increasing demand if they are to capitalize on this trend. They can only do this through the mechanization of the production of the basic ingredient Of black soap, potash.

FIRO has developed a mechanized method to produce ash for soap. Ash is defined as the inorganic residue of organic materials after combustion. It is composed mainly of potassium, calcium, iron, and phosphorus. Ash from selected organic materials has been used in the preparation of black soap in FIRO.

Raw materials: The raw materials for the black soap process, as stated above, are cocoa pods, oil palm branches, banana stems, banana leaves, coconut husks, and palm kernel shells.

Equipment: FIRO has developed two types of kilns: metal and masonry block.

FIRO’s metal kiln is rectangular and comes in two basic sizes: (i) small and (ii) medium. It consists of a metal door, an exhaust pipe, and windows to allow easy flow of air for effective combustion. It also has ash collection hoppers, a feed chamber, and a drying chamber. The capacity is about 600 kg of raw materials.

Process / technology: FIRO’s method of black soap production involves the following stages:

1. Prepare ash from plant waste, ie, cocoa pod husk, banana stems and leaves, palm branches, etc.
2. Leach potash from the ash using 1x water.
3. Heat to a pre-determined specific gravity to obtain concentrated potash.
4. Add oil gradually while stirring vigorously to break up the mass. The process continues until thick jelly-like substance is formed. The colour ranges from dark brown to black.
Appendix 18

contribution to Research and Development in five decades
FIIRO'S Contribution to Research and Development in Five Decades

Federal Institute of Industrial Research, Osbodi
(Federal Ministry of Science and Technology)
FIIRO'S CONTRIBUTION TO RESEARCH AND DEVELOPMENT IN FIVE DECADES

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To promote technological activities and industrialization of the national economy through research and development.

**OUR VISION**
To be the centre of excellence in industrial research and development for socio-economic development of the nation.

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FOREWORD

What does the future hold for Nigeria in the area of economic development vis-à-vis industrialization? This question looms large at the dawn of a new millennium. Some ask it out loud and debate, predict or philosophize about it. Others ponder it silently in the inner recess of their hearts. Still others resolutely push it aside and stifle all thoughts of what the millennium might bring. Whatever the case, the question cannot be ignored.

The Federal Institute of Industrial Research, Oshodi (FIRO) through this book provides an answer. What we see and know as FIRO today started as a very tiny laboratory at the back-beach area of Victoria Island, Lagos. Many have boldly confessed that they knew very little or nothing about this great research centre that has through Research and Development (R&D) intervened at various moments of industrial crises in the country. Many lacked the courage to make such confessions. Others who claim to know about FIRO surprisingly discover how much they need to know, when they get to FIRO. This book gives insight into FIRO, her research activities from inception and some of her contributions to quickening the pace of industrialization in Nigeria through research and development. It is a must read and I recommend it to all.

Bashorun Deja Adewole
Chairman, Governing Board
FIRO, Oshodi
November, 2006
PREFACE

The role of science and technology in national development is an important aspect of awareness. Over the last few decades, there has been considerable focus on research findings and inventions. Consequently, research institutions have become more concerned not only with upgrading indigenous technologies, but also finding local substitutes for imported industrial raw materials. This is an aspect in which FIROM has become very significant in the national economy.

While FIROM has the responsibility of producing innovations that provide realistic end products, it is also required to offer products of higher guaranteed levels and long shelf lives. Fifty years ago, FIROM was established to look into possible industrial uses of Nigerian local raw materials and adapt imported technologies while upgrading indigenous technologies for Nigeria. Today, FIROM's mandate remains the same. However, radical changes have taken place in the world within which FIROM operates. Technological revolution has irrevocably impacted nearly every aspect of our professional lives, bringing with it the need to work together to ensure its sustainability. In addition, societal and economic changes are acquiring greater significance as they change the playing fields of industrial research and technology.

As Nigeria is still largely an agrarian economy, FIROM's concentration has been on innovations for improved food processing. Most of these technologies are already in use in cassava processing centres (locally and internationally), groundnut and cashew processing, and other food manufacturing companies. In addition, FIROM has developed a number of engineering innovations for the production of industrial raw materials, e.g., biogas converters, essential oil distillators, adhesive reactors for making glues and adhesives from cassava starch, and manufacturing of laundry and toilet soaps.

As FIROM celebrates the 50th anniversary of its establishment, it does so against a backdrop of local changes with global impact. This necessitates now, more than ever, that if FIROM is to achieve greater heights, it must continue to be the centre of excellence in industrial research and development for the socio-economic development of the nation.

Dr. O. Olutuobi
Director-General/CEO
INTRODUCTION

HISTORICAL BACKGROUND AND MANDATE

Federal Institute of Industrial Research Oshodi (FIRO), was established in 1956 as the Institute of Applied Technical Research, and was located then at Bar Beach (Victoria Island), the present site of the Federal Palace Hotel. The name was later changed from Institute of Applied Technical Research (IATR) to Federal Institute of Industrial Research (FIRO) in December 1958, and was relocated to its present site in Oshodi the same year.

The establishment of FIRO was based on the recommendation of the economic mission of the International Bank for Reconstruction and Development (IBRD) known today as the World Bank. The main objective for the establishment of the Institute at its inception was to "quicken the pace of industrialization in Nigeria" through:

- Research and development of our local raw materials for industrial utilization,
- Upgrading of indigenous technology and adaptation of imported technology,
- Routine technical and consultancy services to industries, government establishments, private organizations and individuals.

The institute was a division under the Federal Ministry of Commerce and Industry headed by a director of research, Mr. E. J. Jefferys who was appointed in October 1957.

In 1965, the institute was transferred to the newly established Federal Ministry of Industry, which became its supervising Ministry. In 1977 a decree was promulgated to review the status and mandate of FIRO. The decree was the National Science and Technology Development Agency (NSTDA) decree No.5 of January 20th, 1977; Research Institutes (Establishment etc.) order 1977. This decree made FIRO an arm of the NSTDA by Legal Notice No. 34 of 29th September, 1977, thus making it a semi autonomous institution. FIRO mandate was extended to include research in industrial raw materials and process up to pilot plant stage, including engineering design, development, fabrication, and shall in particular...
conduct research into:

- Nutritional quality of local foods and their suitability for industrial processing;
- Processing of local foodstuffs of economic values;
- Processing of vegetable oilseeds of economic importance;
- Processing of local woods for pulp and paper making and other uses;
- Processing of textile materials and development of improved processes for their production;
- Processing of ceramic materials and other solid-based materials for industrial uses including development of ceramic, glass and mineral technology;
- Mechanical engineering including design, fabrication, machining and other processes;
- Economic evaluation of industrial research results to establish their viability in industrial projects;
- Technical, analytical and consultancy services for existing and planned industries;
- Any other related matters as may be determined from time to time by the agency.

By 1980, the act of National Assembly, National Science and Technology act, No. 1 of 1980 abrogated the National Science and Technology Agency Decree 1977, thus transferring its supervision, staff, assets and liability to the Federal Ministry of Science and Technology (FMST). However, the mandate of the institute, now a parastatal under FMST, remained the same. The FMST was dissolved in 1992, with a decree establishing National Agency for Science and Engineering Infrastructure (NASENI) decree No. 33 of 1992 transferring FIRRO to the supervision of this Agency. The Institute's mandate was slightly modified and expanded as follows.

A. Research and development, up to pilot plant stage in areas of food science and technology as well as engineering research, development and fabrication of equipment and machine prototypes. In particular, the Institute shall conduct research and development into:

- Local foodstuffs and vegetable oilseeds to determine and enhance their nutritional quality and their suitability for industrial processing and application;
- Textile, especially using locally grown fibre materials as well as synthetic yarns;
- Pulp and paper with special reference to developing local substitutes for imported long fibre pulp;
- Other agricultural and forest products specific to industrial processes.
Utilization of industrial and domestic wastes for fertilizer, biological and other uses.

Engineering design for processes and fabrication of equipment related to i-iv above.

Electrical materials development, design and fabrication of electrical power equipment.

Micro-electronic components development and production of prototype electronic gadgets for industrial applications.

Disseminate research findings to the relevant ministries, industries and organizations.

Collaborate with all other relevant research institute and organizations in carrying out its mandates.

Many other related functions as may be determined from time to time.

In 1984, FIBRO was transferred back to Federal Ministry of Science and Technology when it was recreated by the order of the then Provisional Ruling Council (PRC).

CHIEF EXECUTIVES

Mr. E. J. Jeffries was the pioneer director of research, and he was appointed in 1957. Mr. A. S. Cook took over the leadership of the institute in 1961 following the resignation of Mr. Jeffries in 1959. Dr. P. N. Waughray succeeded Mr. Cook in 1965, while Dr. de la Bude took over from him in 1968.

The first Nigerian director of research, Dr. I. A. Akintele, was appointed in 1969 in an acting capacity before being confirmed as substantive director of research in April 1971. Dr. O. A. Kalenso became the director of research in 1977, following the appointment of Dr.
Akoneke as deputy director of the Centre for Industrial Development in Brussels, when he retired voluntarily in 1990, Professor S. A. Okunfa was appointed as the director of research/chief executive in December 1990.

The current chief executive, Dr. O. Obasunji was appointed as director in April, 2000. The status of FIBRO as a parastatal was elevated and the designation of the chief executive officer was upgraded to director-general in January, 2002.

ORGANIZATIONAL STRUCTURE

The organizational structure has undergone series of restructuring over the years in order to accommodate the expanding mandate of the institute.

Presently, the institute operates through departments, divisions, sections and units. The departments are: Administration, Finance and Supplies; Biotechnology; Chemical, Fibre and Environmental Technology; Food Technology and Analytical Services; Project Development and Design; Planning, Technology Transfer and Information Management. The departments are headed by directors. The governing board formulates and oversees general policy implementation of the institute, while the Federal Ministry of Science and Technology is the overall supervisor. The members of the board are drawn from industries, academia, and other appropriate bodies in the country. Over the years, the institute has had different governing boards, the current being chaired by Bashorun Adedeji Adeyefa.

The divisions are: Administration; Finance and Supplies; Chemical Technology; Fibre and Environmental Technology; Food Technology; Analytical Services; Waste Utilization and Fermentation; Enzymes and Genetics; Process and Project Development; Design and Fabrication; Material Development and Metallurgy; Works and Services; Technology Marketing; Planning and Monitoring; Information Technology; and Library, Documentation and Computer Services. The divisions are headed by deputy directors.

Staff

The institute started operations with a staff of ten in two large wooden buildings, a legacy from the British Royal Airforce. The present staff strength stands at 520, made up of food scientists, chemists, microbiologists, metallurgists, engineers, and other professionals.
ZONAL OFFICES

One of the most important goals of the institute is to extend its technical and economic services to all the states of the Federation. The Kano zonal office was set up in 1975 to complement the research efforts of the main office in Lagos. The office was phased out in 2006. However, there remained the need to maintain interaction between the states and the institute, therefore, the Abia liaison office which was set up in the year 2000, began to serve as a link between the institute and the northern part of the country.

CONTRIBUTION TO NATIONAL DEVELOPMENT

FIRO has impacted positively on the Nigerian economy through its research activities, and the transfer of developed technologies in the last five decades. The country’s foreign exchange has been greatly conserved through import substitution with local alternatives. Some notable achievements are as follows:

- The institute’s research breakthrough in the use of cassava and wheat composite flour for bread-making received presidential attention in the year 2004. Research evidence showed that cassava flour can be incorporated into wheat flour for bread-making at 15% level of inclusion. It is expected that about N30 billion will be saved yearly from wheat importation, thereby conserving foreign exchange.
- Non-wheat composite flour in which maize and other Nigerian grains were used to produce baking flour as a substitute for imported wheat flour. The success of this led the government to ban the importation of wheat flour in 1985, and this saved the country about $50 million in foreign exchange between 1986 and 1987.
- Cassava chips and pellets production. These products are used for animal feeds and production of ethanol. FIRO has successfully fabricated equipment for cassava chips and pellets production.
- Sorghum malting plants were established by the brewery industry based on technology developed at FIRO in the 1980s. This also saved the country about $570 million dollars between 1987 and 1988.
- FIRO adopted the foreign technology of soap production using local raw materials, and this technology has been transferred directly to 906 entrepreneurs to date. Machinery for small and medium scale soap production have been fabricated. This reduced the importation of soaps from about 300 tonnes in 1989 to just about 2 tonnes in 1990.
- The plant resources in the country were extensively screened for fibre suitable for paper
making *Ganfluca arborea* a Nigerian short fibre hardwood was discovered to be a suitable raw material for the manufacture of pulp and paper. This development has led to the establishment of short fibre pulp and paper mills in Nigeria.

- FIBRO developed *âyôgi*, a protein-enriched weaning food for babies made from Nigerian local corn and soya beans. This achievement has led to the production of other weaning foods sourced mainly from local grains by the many multinational and local companies.

- FIBRO developed the processing technology and equipment for bottling and preservation of palmwine, which has led to the establishment of many small-scale palmwine bottling companies in the country. By so doing, FIBRO has in its own small way become a foreign exchange earner, as some producers have found foreign exchange market for bottled palmwines.

- The institute has upgraded and mechanized the traditional method of *fufu* production. Traditionally, *fufu* is produced in wet form with moisture content of 40-50%, making it highly perishable. Unlike the traditional product, the mechanized product is presented in granular form with moisture content below 10%, thereby increasing its shelf life and making it exportable.

- Other achievements are featured in subsequent chapters.

**COMMERClALIZATION OF RESEARCH AND DEVELOPMENT (R&D) RESULTS**

The institute is obliged to put the results of its R&D at the disposal of interested Nigerians, to enable them exploit such results for better living and economic benefits. Since inception, FIBRO has transferred the process technologies of its ready-for-commercialization projects to the public, through scheduled training courses, technical assistance services, acquisition of machinery, equipment and licensing. Over the years, many small and medium scale enterprises have benefited from these services. Industrial extension services are also offered. This involves visits to industries to know and provide solutions to problems they encounter in their operations.
PUBLICATIONS

Information on activities of the institute, research findings, and technologies available for commercialization are made available to the public through the following publications:

- FIRO corporate profile
- FIRO brochure
- Research reports
- Annual reports
- Technical information bulletin for industries (TIBI)
- Technology offers
- Industrial abstracts
- Investment opportunities at FIRO
- Selected FIRO technologies for industrial development
- Industrial profiles of all commercializable projects
- Cassava production, processing and utilization in Nigeria, and other publications.

LOCAL AND INTERNATIONAL COLLABORATIONS

LOCAL

FIRO collaborates locally with some research organizations. These include: Raw Materials Research and Development Council (RMRDC), Projects Development Agency (PRODA), International Institute of Tropical Agriculture (IITA), African Regional Centre for Engineering Design and Manufacture (ARCEDEM), and National Office for Technology Acquisition and Promotion (NOTAP). The collaboration of RMRDC with the institute has yielded results in research programmes such as production of Foundry crucible; cassava-based product processing technology; fruit juice production; kernel processing; henised processing technology.

The IITA in partnership with FIRO has initiated a number of projects aimed at meeting the challenges of food security and eradication of poverty. Such projects include the design and fabrication of flash dryer; and production of modified starch using FIRO reactor.

In pursuance of its engineering design and fabrication programme, FIRO has worked closely with ARCEDEM especially in the areas of skill development and machinery and equipment supply.

The institute also collaborates with some Nigerian universities such as the University of Agriculture, Abeokuta (UNAAU). There are also collaborations with National Poverty Eradication Programme (NAFEP) and National Directorate of Employment (NDE). The institute...
Administration and Finance Department

Historical Background

The administration division was naturally one of the pioneering divisions of the institute and it evolved to form a directorate known as administration and finance department which comprises of two divisions: (i) Administration and (ii) Finance/Accounts. The finance/accounts division is solely responsible for the handling of the daily financial transactions, disbursement, processing of salaries, allowances and budgeting (capital and recurrent expenditures).

Administration Division

The division is made up of several units, which include the following:

- Appointments, promotions and discipline unit which handles personnel matters such as appointments, promotion and discipline of staff.
- The staff welfare unit handles welfare matters.
- The registry keeps the personal files of the staff and other confidential files of the institute. It also handles leave matters of staff.
- The security sub-unit is responsible for the safety of lives and property in the institute.
- The transport sub-unit is responsible for maintaining and servicing the institute's vehicles, transportation of staff and materials, and dispatch of correspondences.
- The medical sub-unit takes care of the health of members of staff of the institute.
- The environmental sub-unit is responsible for the general cleanliness of the institute.

The division is presently headed by Mr. O. W. Akinwani.

Achievements

The department has in the past five decades, made immense contributions towards the effective running of the Institute, thereby enhancing the achievement of its organizational goal. Landmark achievements have been made in the following areas:
Communication
The administration division interprets the public service rules, the scheme of service, circulars from the ministry, and communicates information contained therein to the entire staff in a clear and understandable language. This has in no small measure contributed to personnel efficiency, stability, and peaceful resolution of unions/associations’ requests and obligations.

Establishment
The division is in charge of human resources and administration of the institute, which is essentially management, organization, and maintenance of accurate records. The registry has ensured that records are kept and updated as and when due. Information so kept are easily accessible.

Management Support
The division provides the needed support to the governing board and chief executive from time to time. It assists the chief executive in implementing the mission statement; technical papers, briefings and documentation for the governing board, and other assignments as directed by the chief executive and the governing board. As the repository of information, it receives, stores and releases information, in form of data, statistics etc., needed for high-level decision-making. It also brings together the many and diverse views involved in matters requiring policy decisions, to advise on the appropriate decisions and subsequently put them into effect.

Safeguarding Assets
The division has direct oversight on the physical assets/properties of the institute. It ensures that properties such as buildings, furniture, vehicles, equipment, and generators are well kept against theft, vandalism and misuse. The security staff are well trained, disciplined and motivated to meet the challenges of safeguarding assets.

Industrial Relations
The division supports the governing board and management to manage relationships with registered industrial unions in the institute, namely: Non-Academic Staff Union (NASU), Academic Staff Union of Research Institutes (ASURI), and Senior Staff Association of Universities, Teaching Hospitals and Research Institutes (SSAUTRIHRAI). The institute has had cordial relations with the unions in the past five decades. The division also:

- Heads the committee on the review of the external auditor’s domestic report.
- Ensures the preparation and compilation of the quarterly, half yearly and annual reports for the governing board and management information.
• Maintains close liaison with support and technical departments to ensure maximum productivity.
• Monitors the administrative and financial aspects of the statutory mandate so as to ensure successful implementation and achievement of the objectives.
HISTORICAL BACKGROUND

At the inception of the institute, the present biotechnology department was called applied biology and was part of the food section under laboratory division. By 1970, the food section metamorphosed into the food division, and was later divided into food and microbiology section. In 1979 the two sections became food and applied biology division headed by late Dr A B Omwande. By 1989, the food and applied biology section was headed by Dr O. Olutunji, the present Director-General of the institute.

In 1990, the management separated food and biotechnology into two distinct divisions: Mrs. A. O. Kukoye became the first head of biotechnology division and she retired in 2004.

Dr. (Mrs.) S. O. Akinola, took over as the head after the retirement of Mrs Kukoye. Presently, the department comprises two divisions namely (i) enzymology and genetics (ii) waste utilization and fermentation technology. Between the 1950s and early 1970s, projects were carried out on a trial and error basis. Some of the research scientists of the department were involved in projects such as soy-oil production, mechanized production of fufu and bottling of palmwine.

In the 70s, the department was involved in projects such as production of animal feeds, single cell protein from cassava, microflora of Nigerian foods, production of yeast from molasses, quality control and production of industrial enzymes. By the 1980s and 1990s, projects embarked upon included, production of bakers yeast, soy-gari, production of wines from fruits, production of sugar cane drink, brown sugar, production of high protein cassava, mushroom cultivation from agricultural and industrial wastes, soy dawadawa, production of pectinase enzymes and production of biogas and biofertilizer from agro-industrial waste.

Ongoing projects include production of amylase and glucoamylase for glucose syrup production, development of biochemical and molecular markers for determining quality...
FERO'S CONTRIBUTION TO RESEARCH AND DEVELOPMENT IN FIVE DECADES

Ensurance in the primary processing of cassava in West Africa, development of local technology for oxytetracycline production, ethanol production from cassava starch and development of simulated palm wine.

Some of the departmental projects such as cultivation of edible mushrooms, unclarified and clarified fruit juices production, are on the institute's training workshop schedules.

Pilot Plant for Fruit Juice Production

Departmental Projects

The departmental projects can be grouped into three as follows:

**Group I**

The following projects have been fully completed and are available for full commercialization:

- Biogas and biofertilizer from agro-industrial wastes
- Cultivation of edible mushrooms
- Production of table wines from Nigerian fruits
- Production of pectinase enzyme and its use in the clarification of fruit juice
- Production of soydawshawa, a fermented soybean product

**Group II**

These projects have been scaled up to semi-pilot plant level:

- Production of ale using sorghum malt
- Production of yam gari
- Production of microbial fortified (proteinised) gari
- Development of starter cultures for agri processing and nutritional improvement
- Extraction of milk clotting enzymes from soda apple (Caldicroms procera)
- Preservation and bottling of 'kunum-kazi'
Group III

On-going projects:
1. Fermentative production of L-glutamic acid from agro-industrial wastes
2. Production of amylase and glucoamylase enzymes from agro-industrial raw materials for use in the production of glucose syrup
3. Development of a local technology for oxytetracycline production
4. Biological degradation of aflatoxin in fermented maize and sorghum products
5. Developing biochemical and molecular markers for determining quality assurance in the primary processing of cocoa in West Africa
6. Ethanol production from cassava starch
7. Development of simulated palm wine

Wine Production

Introduction
The wine is the product of grape (Vitis vinifera). However, now, some wines are made from other plant materials, such as pineapple, bananas, mango, citrus fruits, vegetables and flowers. Although many fruits are grown in the tropics, their composition generally is not suitable as that of grapes for wine making. Often times they lack sufficient sugar to produce at least 7% w/v and preferably 11-12% alcohol by ordinary fermentation, and they need to be ameliorated. It is worthy of note that these fruit wines measure up considerably to those of grape wine.

Wines have four main ingredients: yeast, sugar, flavor and water. Of these, the most important is yeast. Yeast is a minute living organism which brings about fermentation, and if the fermentation is to be successful, the yeast must be given ideal conditions required to act. These conditions are found in sugary, slightly acidic solution and favorable temperature (18-24°C). Flavour is obtained from the fruit being used.

General principles
In the production of wine, initial quality of the fruits determines the quality of the finished wine. It is important to start with wholesome, ripe fruits. It is also necessary to use clean equipment free of oil, dirt or rust. The finished wine should be properly filtered to get rid of lees and yeast, which may affect the clarity of the wine. The wine should be stored in a cool room to avoid oxidation and to allow proper ageing of the wines.
Basic operations
i. Sorting: Wholesome, ripe fruits are selected.
ii. Washing: The fruits are washed with clean water to get rid of debris after which they are surface sterilized with potassium or sodium metabisulphite (1% solution i.e. 1g in 100ml of water).
iii. Processing: This includes peeling, trimming or destemming depending on the type of fruit.
iv. Crushing: The processed fruit is then put into a blender, or a crusher or chopped with knife.
v. Sulphiting of pulp: The pulp are sterilized by sulphiting before further processing. The above five steps are basic to the method.

Fermentation process
Step I
Prior to sulphiting, an appropriate volume of boiling water (about twice the volume of fruits) is added to the weighed fruits and covered. It is then allowed to cool to room temperature (25-28°C). When cool, sodium/potassium metabisulphite is added. It is left overnight to achieve sterilisation.

Step II
Preparation of yeast starter culture (as per direction by the manufacturer). Determine what type of wine is desired, specific gravity, pH (this should be in the range of 3.5-4.5).

Step III
At the end of fermentation, rack the young wine into clean, sterile kegs and allow to mature or mellow. At each racking, add 0.44g of metabisulphite. At this stage, the wine is still not clear and needs clarification.

Step IV
Clarification: normally a well-made wine will clear on its own, given time (which can be as much as a year in some cases) but when it does not, it may be necessary to resort to fining or filtering. It is always good to give the wine a chance to clear naturally. If it remains cloudy, it is
probably caused by pectin, starch or protein. Examples of clarifiers or finings include bentonite, pectinase or pectinol. When using bentonite, use 1 g/L of wine.

Step V
Aging, maturation and storage: Mellowing of fruit wines is effected usually at a temperature of 15\(^\circ\)C inside stainless steel, concrete or wooden tanks (casks) filled completely, with racking performed at intervals. The second racking can be allowed after removing the wine from the lees, the third and subsequent ones are done forthwith or at monthly intervals as the need arises. The racking is not only to separate the wine from lees, but also to serve as a means of introducing into the wine a certain amount of oxygen on which mellowing process depends. This is of particular importance in the case of tanks having 'across the tank' walls. During the mellowing and maturation stage, periodic tasting, chemical and microbiological analyses should be carried out each time the wine is racked. Polishing can be carried out by the use of bentonite (appropriate quality as recommended by manufacturer).

Step VI
Bottling: A few days after bottling, make sure the wine is really stable by moving the jar into a warm place to see if fermentation recommences. This is done by pouring out a wine glassful and letting it stand for 24 hours to see if it darkens on oxidation. Red wine should be put into dark bottles (except for exhibition or competitive purposes) or they will lose their original colour. There are many popular stoppers nowadays. After bottling, the bottles should be kept standing or lying, in a rack or bin.

Step VII
Record keeping: Keep a good record of all your wine making activities.

Quality control and safety evaluation
Microbiological analyses: Samples of the fruit must be analyzed before and after cold sterilization, during fermentation, at each racking stage, during maturation period and prior to bottling. Direct microscopic examinations should be carried out.
Collection of fruits
↓
Selection of sound fruits
↓
Washing
↓
Processing
↓
Chopping, crushing or blending
↓
Hot or cold water addition of Pectolytic enzyme
↓
Pulp
↓
Pulp fermentation
↓
Extraction of juice
↓
Fermentation (anaerobic)
↓
After fermentation
↓
Aging
↓
Bottling and labelling

Fig. 3.3. Flow chart on production of wine
Production of Pectinase Enzyme and Utilization for Processing of Pulpy Fruits

Introduction
Pectinases are heterogeneous group of enzymes that degrade pectin-containing substrates. They are widely used in food and fruit juice industries to improve the cloud stability of fruit and vegetable juices; for production and clarification of fruit juices; and for haze removal from wines.

Fruits rich in pectin, for example banana, mango, cashew and guava are suitable for processing into clarified unfermented wines. Data obtained from the Federal Office of Statistics (FOS) indicated that billions of naira is spent annually on importation of enzymes and fruit drinks into Nigeria. The Federal Government of Nigeria banned importation of fruit drinks in 2003 to encourage local productions, and reduce post harvest wastage of fruits for sustainability of food security.

In order to expedite industrial development, and self-reliance through optimal utilization of local raw materials, FIRO pioneered the R&D work on use of local substrates for production of pectinase enzyme, and its use for production of clarified juice.

The production of pectinase enzyme involves solid-state fermentation process using fungal spores. The steps for pectinase enzyme production are shown in fig. 3.2, while the production of clarified fruit juice is shown in fig. 3.3. Table 3.1 indicates a typical analytical data of the physicochemical properties of samples of clarified juice produced in FIRO. Presently, the institute has a pilot plant for production of fruit juice.

Agro waste
↓
Sterilization
↓
Inoculation with fungal spores
↓
Solid state fermentation 3-5 days
↓
Extraction of enzyme
↓
Filtration
↓
Enzyme

Fig 3.2. Flow chart for the production of pectinase enzyme
Selection and weighing of fruits
↓
Peeling
↓
Pulping of fruits e.g. guava, banana
↓
Addition of preservatives and juice
↓
Filtration
↓
Formulation
↓
Mixing
↓
Bottling
↓
Corking
↓
Pasteurization
↓
Cooling and packaging

Fig: 3.2. Flow chart for production of clarified fruit juice

Table 3.1: Physicochemical properties of clarified fruit juice from pulpy fruits

<table>
<thead>
<tr>
<th>Clarified juice sample</th>
<th>pH</th>
<th>% Total Solids</th>
<th>O Brix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mango</td>
<td>4.5</td>
<td>13.4</td>
<td>10.5</td>
</tr>
<tr>
<td>Banana</td>
<td>4.6</td>
<td>10.4</td>
<td>15.8</td>
</tr>
<tr>
<td>Apple</td>
<td>4.0</td>
<td>10.9</td>
<td>8.3</td>
</tr>
<tr>
<td>Guava</td>
<td>4.0</td>
<td>13.3</td>
<td>8.5</td>
</tr>
<tr>
<td>Pawpaw</td>
<td>4.8</td>
<td>12.0</td>
<td>6.6</td>
</tr>
<tr>
<td>Cashew</td>
<td>3.9</td>
<td>10.1</td>
<td>8.0</td>
</tr>
</tbody>
</table>
Conclusion
Production of pectinase enzyme for use in processing pulpy fruits is at pilot plant stage. Juices produced have been tested and found safe and suitable for consumption, by microbiological and chemical assessment. This is a potential project for possible commercialization and sustainable development of the fruit juice industry and food security.

Edible Mushroom Cultivation

Introduction
Mushrooms are edible fungi forming fleshly umbrella-like fruiting bodies. They belong to the class basidiomycetes and order agaricales. Some mushrooms are edible, while others are poisonous. A number of mushrooms are to have medicinal uses. The edible species are popularly known as mushrooms while the poisonous ones are called toadstools. Mushrooms have been prized as a delicacy for more than two thousand years. The rapid development and growth of the mushroom industry from a primitive care culture into one using highly technical and controlled methods was stimulated in the 1960s. However, in the Nigerian traditional farming systems, the art of picking mushrooms has been practiced over the years. Though there are many edible mushrooms in the continent, most Africans still depend on collecting these species from the wild. It has been estimated that about twenty-five species of more than two thousand edible fungi are widely accepted for human consumption but only a few of them are commercially cultivated. The total world production of cultivated mushrooms has been estimated to be 4.77 million metric tones in 1991. The mushroom industry worldwide turnover has a turnover of £3,000 million.

Mushrooms do not have chlorophyll, therefore they do not manufacture their own food. Mushrooms show preference for certain habitat, substrates and seasons of the year. They are widely distributed in the tropical regions. Generally, rainy season is the best season for their growth. Mushrooms are nutritious and are regarded as a healthy food because they contain large amounts of protein, vitamins, minerals and low fat content. Their protein content is comparable to any common vegetable and as good as that of corn, milk and legumes. Besides, mushrooms are high in certain vitamins such as B, C, D and niacin but they are devoid of vitamin A. They are good sources of iron, potassium, phosphorus and folic acid.
Mushrooms have the potential as a source of protein to enrich diets especially in developing countries like Nigeria. Current information indicates that the nutritional standards of Africans are inadequate and majority live on starchy staple food stuffs which are deficient or poor in protein. Studies have shown that most Nigerians take only about 15g protein per day whereas the recommended daily protein intake is 70g protein per day. With the world population of about 7 billion, malnutrition and undernutrition are increasing alarmingly along with food shortage. Mushrooms have the potential of enhancing the nutritional values of food, thereby alleviating malnutrition and making wholesome food available to low and average income groups.

Mushrooms grow mostly on agro-industrial waste materials. Vast quantities of agricultural wastes are generated annually from various farming activities. In Africa about $3.11 \times 10^9$ tons of crop residues are produced annually. In Nigeria, there is an abundant supply of agricultural wastes, which are potential substrates for mushroom cultivation. Bioconversion of these wastes through mushroom cultivation offers the potential of converting them into protein-rich palatable food. In the process, environmental pollution may also be reduced because disposal of these agricultural and industrial wastes may become less of a problem. Mushroom cultivation involves a number of operations. While some growers undertake all the required operations, others have specialized in only one type of operation. A number of issues have to be considered before embarking on mushroom cultivation. The most important factor is choosing the type of mushroom to be cultivated. In making a choice of mushroom, the prevailing climatic condition in the area has to be taken into consideration. This is because some mushrooms are tropical while
others are temperate or subtropical. Availability of the substrate and proximity to the farm site is another crucial factor. Of course, the mushroom has to be acceptable to the local people and market.

Isolation of mushroom culture

The first step in mushroom growing is isolation of pure mushroom culture. Mushroom is grown from selected mushrooms either by germinating the spore or by growing pieces of the tissue of the mushroom in a suitable culture medium. Tissue culture is an assured method of preserving the exact genetic character of a living mushroom. Once a pure culture of the desired mushroom has been obtained, it is transferred into a suitable substrate for storage purposes. Production of good and high yielding starter is the responsibility of culture collection centres.

Preparation of spawn

Mushroom spawn is the mushroom mycelium growing on a given substrate. It serves as the planting material "seed" in mushroom cultivation. A number of agro-industrial wastes can be used for mushroom spawn. These include cotton waste, straw, sawdust etc. The nature of the waste material influences the rate and thoroughness with which the mycelium grows in the spawn container. However, a good spawn should be free of contamination, grow vigorously and survive well in storage.

Preparation of compost

Agro-industrial wastes are used to produce compost for growing edible mushroom. Compost is a suitable medium for the growth of mushroom mycelium. Composting comprises of the following steps: mixing of waste/substrate with water and calcium carbonate, heap-up the composting rectangular wooden frame.

During this period, chemical and physical changes occur in the substrates. Substrate used in a region depend on the availability of agro-industrial wastes.

Spawning

Spawning is the process of planting the spawn in the compost usually at the rate of about 1-2% wet weight. The mushroom mycelium grow from the spawn into the compost and colonize the
substrate. There are two distinguished phases in growth and development of a cultivar mushroom. These are the vegetative stage and reproductive stage or fruitification. During vegetative stage, the mycelium colonizes the substrates and obtains its nutrition by the secretion of enzymes into the substrates thereby degrading it to more simple organic compounds, which are transported into the hyphae. After a certain period of growth, the mycelium which is encouraged by darkness ramifies within the substrate. The mycelia then become interwoven within the substrate.

At this stage of development, the mycelium is said to be “established” and is ready for fruiting when the environmental conditions are favourable. The transition from vegetative to fruiting stage in mushrooms is controlled by nutritional and environmental factors. The nutritional factors are carbon, nitrogen, minerals etc., while the environmental factors include temperature, humidity, moisture, carbon-dioxide, aeration, light, etc. All these factors work together to provide an ideal condition for fruiting.

Sometimes covering the substrate surface with a layer of moist material with specific structural characteristics (casing) encourage fruiting and enhances yield potential in many but not all cultivated mushrooms. Casing protects the colonized substrate from drying out by providing humid microclimate for primordial formation and development. The casing layer maintains mycelia growth, stimulates fruiting and supports continual flushes of mushrooms. Mushroom crop grows in cycles called flushes. Depending on the species being grown, these flushes normally come at seven to ten-day intervals with successive flush bearing fewer mushrooms.

Harvest
During harvest, the base of the stem is grasped, and with a twisting motion, the mushroom is pulled from the substrate layer while being careful not to disturb neighbouring mushrooms. The base is trimmed, removing only the flesh to which the substrate is attached.

Packaging
Mushrooms are packed in nylon bags. Most mushrooms contain high levels of moisture and are highly perishable. If not served within two days, it should be preserved by drying, freezing or canning. Drying is the most widely used method. Dried mushrooms are smaller and lighter than fresh ones. Once dried they are sealed in airtight moisture proof plastic containers and refrigerated. When needed, they are rehydrated in water before cooking and much of the original size and colour is regained.
MODERN DEVELOPMENT IN THE PROCESSING OF OGI IN NIGERIA: FIURO'S CONTRIBUTION

Introduction
Ogi is a traditional lactic acid fermented food from maize, sorghum or millet. Generally, the name given depends on the locality, the cereal used and the form in which it is prepared. The name *ogi* is used by the people of Western Nigeria (Ibadan) to describe both the fermented dough paste and the prepared porridge and solid form. In Nigeria, it is however known as ogi-daka and ogi-jera when sorghum and millet are used respectively. In West African countries such as Republic of Benin, Togo and Ghana, ogi is made from maize known as koko and has a slightly consistancy like that from Northern Nigeria. The inhabitants of Eastern Nigeria consume ogi made mostly from millet and called alausu. When ogi is prepared into a stiff gel by prolonged cooking to more concentrated ogi, it is referred to as oka or ogiri. The consumption cuts across different ethnic and economic classes across the West African region. The product may be prepared by boiling it into a stiff gel or made into gruel or porridge which is popular amongst infants as weaning food for breakfast meal amongst adults. In Nigeria, it is usually a highly viscous product with smooth texture when boiled into porridge called ogi before consumption. The colour varies and depends on the cereal used: cream to yellow for maize, white to reddish brown for sorghum and brownish grey for millet. Ogi has a sour flavour close to that of yoghurt but a distinctive aroma that makes it different from other known products from its substrates. Ogi from millet is the most important traditional weaning food for infants in many parts of West Africa. Most mothers in Nigeria use ogi as weaning food for their babies. Seventy-three percent of those interviewed and 90%, 7.5% used sorghum and 6.5% used millet for the preparations. Mothers in both Ghana and Nigeria prefer the traditionally prepared ogi to all other forms of cereal preparations introduced to them, although there was no difference in acceptance among the infants. Although not confirmed scientifically, mothers interviewed believe that ogi consumption by mothers improves breast milk flow. The per capita consumption of ogi for the year 1980-82 were estimated at 4.8-6.1 kg per person in Nigeria. In the year 1990-91, Nigeria's production of millet, sorghum and maize were 2.562; 3.142 and 2.334 million metric tons respectively. These increased respectively to 3.76 million metric tons of millet, 6.517 million metric tons of sorghum and 9.289 million metric tons of maize in the year 1994-95. It is also estimated that about 40 million people in the country consume *ogi* at least once a week. *Ogi* is mostly consumed as a regular meal in the villages and smaller towns with more space for cottage production and sales.
This write-up aims at highlighting the contribution of FIRO to the improvement of soy processing.

![Packaged Soy Ogi]

**Traditional production and presentation of ogi**

The detailed description of the traditional production process is shown in Figure 3.4. For the traditional process, maize, sorghum or millet grains are cleaned and sorted by hand. These are washed and steeped in clean water for 24-72 hours depending on the type of grains used and their initial moisture contents. The softened (hydrated) grains are then wet-milled with the aid of electrical or diesel powered mills. In a more primitive set-up, the grains are milled manually on stones or pounded in wooden mortars to obtain a wet mash. The mash is sieved by hand sieve to obtain fine sherry, while the pomace retained in the sieve is discarded. The pomace containing hull and germ is sometimes sun-dried and used as livestock feed. The sievate containing ogi-starch along with the water added during sieving is allowed to sediment overnight and decanted to obtain a concentrated starch paste. This paste could be fermented for 1 to 3 days depending on the level of sourness desired. After fermentation, sour ogi water is decanted to give wet ogi paste or cake as the final product.

The wet cakes or gelatinized stiff gel from it (oko or ogiwa) are usually available at various production centres or hawked around at different times of the day. The demand in the cities with increasing population is not met since most women that would normally produce the ogi go to work and have lesser time for domestic duties. The increase in Nigerian cereal production notwithstanding, continued migration of people from the village to the urban centres, as well as the poor development of large scale production of ogi has been the major threat to the regular consumption of this popular product.
FIBRO’S CONTRIBUTIONS OVER THE YEARS

In order to overcome the major problems associated with ogi production, the institute embarked on research and development programs in order to upgrade the traditional production technology for ogi, make it acceptable to the international market, and to compare with similar fermented products consumed worldwide such as cheese, yoghurt, wine, beer, etc. Areas where the institute has significantly contributed to knowledge are as discussed:

1. Development of starter cultures for ogi production

The term starter culture refers to the active microorganisms with special ability to bring about desirable changes from substrate to final product during a fermentation process. Unlike spoilage microorganisms, they help to optimize the important quality features of the finished products such as flavor, taste, texture and other product characteristics. Modern fermentation systems use this production technique involving starter culture application to ensure product consistency, process optimization, reduced fermentation time, predictability of production times, ease of contaminant control and many other important advantages. Examples are in the use of combination of the microorganisms such as Lactobacillus bulgaricus and Streptococcus lactis in yoghurt production or the use of Saccharomyces cerevisiae for beer production. A staff of the institute was one of the first scientists to demonstrate the potential of static culture application for ogi production. He studied the microbiology of the fermentation and reported the isolation of fungi such as Cephalosporium, Exoosporium, Aspergillus and Penicillium in the raw grains, which were eliminated within 6 hours of steeping. This observation was confirmed by many other reports. The institute’s scientists also isolated yeasts such as Saccharomyces cerevisiae, Candida mycoderma, C. krusei, C. valida, Rhodotorula sp. and Geotrichum candidum during ogi fermentation. Various bacteria species isolated from fermenting maize gruel are Corynebacterium michiganense, Enterobacter cloacae, Clostridium sp., Lactobacillus plantarum, L. brevis, Pedicoccus pentosacera and Acetobacter sp., Pediococcus linens, B. oxydans and Bacillus subtilis. The institute also investigated in the late 1980s through her scientists, the significance of the use of single cultures on ogi production quality. The study showed L. plantarum as the highest acid producer amongst the microorganisms tested. This view was confirmed by the dominance of the organism in many similar starch based raw material fermentations. Corynebacterium species equally hydrolyses
the starch of maize to organic acids, while the yeast, S. cerevisiae and C. mycoderma were reported to contribute in the flavour acceptability. Although, Corynebacterium and Bacillus species may have some positive contributions to flavour or aroma, this is believed to be minimal and insignificant. More recently, in a study carried out in the institute’s laboratory between 1999 and 2001, Lactobacillus brevis and Saccharomyces cerevisiae were identified from ogi as viable starter cultures for ogi production. The culture abilities were confirmed in a pilot plant production study. Culture variants were also developed from locally available materials to simplify handling of such starter cultures and to promote the shelf life of the microorganisms developed for use. Few other scientists who have contributed in some ways to promote the use of starter cultures for ogi processing have been identified locally and internationally. The continuous reliance on spontaneous fermentation as done traditionally has discouraged the use of modern food biotechnology techniques to improve the product quality. The vast potentials of the microorganisms such as yeasts and lactic acid bacteria that are involved in the natural fermentation have been grossly underutilized. Lactic acid bacteria from ogi and other related environments have been reported with antimicrobial activities due to products such as organic acids, diacetyl, hydrogen peroxide and bacteriocin produced by them. These cultures have potentials for use in the production of ogi and in treating many water borne diseases.

ii. New process technology

The traditional production of ogi has been modified significantly to accommodate many modern inputs to a simple fermentation process in order to upgrade the product and process technology. Apart from the application of starter cultures to the processing in place of spontaneous fermentation, dehulled or decorticated maize raw material has been introduced by scientists to the institute for use in place of whole grain. Dehulled grains are pre-processed whole grain with the removal of the outer grain cover. The nutritious grain germ is often lost during this process. This has the advantage of better control of water used during fermentation process as well as eliminating the traditional wet sieving process. The wet sieving process is usually of additional cost to the process and is very cumbersome. The over-exposure of the ferment at this stage may encourage microbial contaminant and increase processing time. Dehulled ogi also store better than the whole maize grains which are good target for weevils and other pests. Research results indicate that the nutrient lost by dehulling could be regained by effective control of the fermentation process. Raw materials have also been modified by addition of about 2% glucose
level into dehulled grain. This gave rise to better nutritious ogi products. Figure 3.5 shows the newly modified process for ogi production.

III. Quality control and manufacturing practices of ogi

Traditionally, the assessment of the level of ogi production is carried out using subjective physical methods such as finger feeling and use of sensory techniques. In the late 1940s and 1950s, scientists from the institute were able to establish the correlation between ogi quality and physical and chemical parameters such as 

4.3 of the steeped liquor is used as the standard during ogi production. Aerobic fermentation favours more acid production through increased formation of volatile acids which tend to impair good flavour. The temperature of 35-37°C is optimal for fermentation. At lower temperatures of about 25°C, fermentation rate is low while 45°C retard grain fermentation. In an European Union funded project, the team of scientists who took up the challenge to improve the product nutritionally. Approximately 20-30% of the nutrients available in the original grain are lost through processing. When it can be afforded, ogi may be supplemented with other milk-based weaning formulas and used regularly as infant weaning food. Otherwise it is served and consumed plain without any supplements. The nutritional losses in addition to the low nutritive value of the cereal raw materials are a major problem in ogi processing. The loss of alveolate layer and grain of grains during wet-milling and wet-sieving contribute to the high nutritional losses. Amino acids and vitamin analysis have shown that substantial losses in lysine, tryptophan and niacin in possible during processing.

In the study pioneered in FEBO and reported in 1969, it was observed that the addition of 30% soy-ogi production did not only improve the protein value but also shortened the cooking period. Although several legumes have also been used over the years with the aim of compensating for the nutritional losses or improving ogi nutritional quality, the work on...
soybean fortification, which resulted in asy-ogi production, is most popular and most outstanding. The product from this effort is now available and being commercialized at the institute pilot plant where it is regularly made available to the members of the public. This product has significant advantages above major milk-based weaning foods in the Nigerian market. Other legumes studied by other scientists are cowpea, yam and groundnut. Fortifications generally improve ige nutritional value. While this is achieved, the high proportion of the supplement required for a positive nutritional effect is often enough to negatively affect and change the organoleptic properties and acceptance of the final product as igi. The changes are evident in the new adopted names such as: yam-ogi (from cowpea), rigo-ogi (from groundnut), posowwa-ogi (from posowwa) and many others used to describe the new products formed. The use of refined nutrient concentrates is equally very expensive and quantities could be lost during processing. The added cost might also make the final product less affordable to the consumers.

The problem of product organoleptic quality change and the reliance on spontaneous fermentation with its obvious limitations has caused scientists in the institute to develop starter cultures to enhance the nutritional quality of produced ogi. Lysine and methionine levels of the developed ogi product were increased by the activities of the selected lysine and methionine hyper-producing starter cultures. Lysine is the limiting amino acid in many cereal cereals. The FAO/WHO/UNU pattern on amino acid requirements of 1985 showed that sulphur-containing amino acids (e.g. methionine and cystine) and lysine are the most limiting amino acids in many countries with higher and lower gross domestic product (GDP). Nigeria and Egypt being the two African countries reported on in the study carried out by these United Nations agencies. The application of starter cultures for nutritional improvement of ogi introduced a new dimension to solving nutritional problems in traditional fermented foods.

v. Mechanization of ogi production process

FIRO designed and operates an industrial process based on the traditional production technique with some modifications (Figure 3.6). The main differences are in the mechanization of the processes, equipment and the final product presentation and packaging. The output per day is more than that of traditional method of production. Grains are purchased in large quantities while silos or storage rooms are used for keeping grains and the finished products. Air aspirator is used for cleaning grains while an electrically powered unit is used for wet milling. The wet-milling mesh is sieved in a vibrating sieve (vibroscreen) of 300 μm (BS5 50) to give slurry that is collected in a stainless steel lower deck into aluminium vessel. A bucket centrifuge ash
Reduction and water reduction prior to fermentation. The fermentation is controlled by maintaining the pH and titratable acidity of the mash. The fermented ogi is processed into a dry powder for better shelf-life by drying using any of the various equipment options, like dehydration or preservation by roller-drying, spray-drying, rotary-drying and tray-drying. The application of heat during drying leads to the loss of volatile constituents such as acetic acid, although at different levels. The use of freeze-drying method gives a satisfactory product but is not suitable for commercial purpose. A satisfactory ogi powder was also obtained from spray-drying of ogi. The drum-drying method, although more cost-saving when compared with spray-drying gave a less acceptable product. The low-level technology involved in rotary drying and air-drying are advantageous. The latter is time-consuming and less acceptable than the freeze-drying methods. Gelatinization of starch during canning makes it unsatisfactory, although it could be a useful method when the stiff gel (oko or age/bi) is desired.

4. Packaging and presentation

The final flow product in the industrial process pioneered in the institute is packaged in tins or plastic bags with a shelf-life of up to 6 months. This is in contrast to the traditional practice of using leaves for packaging. When leaves are used for packaging, the shelf life is usually not more than 7 days.
Figure 3.4: Flow diagram of the traditional production of ogi
Maize, millet or sorghum
\[\text{Dehuller}\]
\[\text{Dehulled grains}\]
\[\text{Wash}\]
\[\text{Stir} / \text{ferment (24-72 hours)}\]
\[\text{Wet milling}\]
\[\text{Further fermentation (24-72 h optional)}\]
\[\text{Decant}\]
\[\text{Supernatant}\]
\[\text{Ogi paste}\]
\[\text{Drying process}\]
\[\text{Ogi powder}\]

Figure 3.5: Flow diagram of the newly modified process for the production of ogi
CHEMICAL, FIBRE AND ENVIRONMENTAL TECHNOLOGY DEPARTMENT

HISTORICAL BACKGROUND

The chemical, fibre and environmental technology department has undergone a lot of changes under different names since the inception of FIRO.

It was called “laboratory research and development” in 1961 with some major projects such as pulp and paper making; extraction of cashew nut shell liquid, separation of coconut crot trash being undertaken in the division. In 1975, it was renamed “industrial chemistry and technology division”, sub-divided into textile and fibre section; pulp and paper section; ceramic section, and vegetable oils, essential oils, flavour and fragrances section.

In 1977, the name was changed to material science division with the inclusion of research projects such as refractories technology, industrial chemistry and solid-based minerals for industrial usage.

The institute adopted a new system of operation in July 1981, and the projects executed by the division then came under different programmes such as food waste utilization programme: production of pectin from citrus waste; survey of current agro-industrial wastes and their utilisation and material development programme (pulp and paper, ceramic and textile). In 1987 these programmes were redesignated as sections under the laboratory division (food research section, agro-allied section, materials sciences section and laboratory management section).

Chemical and fibre technology division was created from the laboratory division in 1990 and split into chemical technology section, and fibre technology section. The laboratory management, and environmental technology section was later separated from the chemical technology section in 1999.

The chemical and fibre technology division became a department in 2002, with the appointment of a director, Dr. F.A.O. Osimowo, who was formerly the deputy director of chemical and fibre technology division. The department now has two divisions namely chemical technology (CT) Division headed by Mrs. M.O. Oresanya and fibre and environmental technology (FET) division headed by Engineer J.S. Udohitinhah.
Some of the major projects undertaken by the department since inception in 1961 to date are:

i. Research and development on various Nigerian woods as sources of long fibres in pulp and paper making e.g *Gmelina aborea*

ii. Manufacture of Niauka cream with cocoa butter as base

iii. Production of coir fibre from coconuts as upholstery filling

iv. Modification of cassava starch for textile industry

v. Industrial oils: extraction properties and utilization from lesser known oil seeds such as benniseed, cocoyor, tigernut, melon.

vi. Extraction, properties and utilization of essential oils, flavours and fragrances from local aromatic plant sources such as lemon grass, citronella, eucalyptus

vii. Extraction, purification and utilization of pectin from citrus wastes.

viii. Purification, refining and utilization of gum arabic.

ix. Research and development of black soap and laundry soap.

x. Production of oleochemicals from refined shea fat.

xi. Physico-chemical and bioconversion of effluents from textile, electroplating, tannery, paint, food and beverage industries

xii. Biochemical pulping of *Nigeria* wood.

xiii. Palm oil refining.

xiv. Production of polypropylene cellulose from sawdust.

xv. Production and utilization of gelatine from cow bone.

**ACHIEVEMENTS**

- Oilseeds: vegetable oils and fats processing and utilization under which lesser known and under utilized oilseeds have been worked on to prove their potential. This has lead to the use of cocoa butter, palm kernel oil, shea butter in the making of body cream named Niauka cream which was later taken up by Continental Pharmaceuticals Limited (CPL), Mushin, Lagos for commercialization as ‘Afro Cocoa Butter’ in the late 1970s.

- The use of shea butter for making lip aids, balms etc.

- Pulping of *Nigeria* woods and vegetable fibres for paper making viz: flamboyant tree (*Satochobaea*), mejumbe (*Gnetum spp*), kenea fibre.

- Extraction of fibre from local plants- edible banana fibre, kenea fibre, coir fibre (from...
coconut), fibre testing for strength, extensibility and fineness and spinning test. Testing and evaluation of textile and allied products like carpet, all types of fibres, yarns and fibres.

Technical services for quality control of commodities to aid export and to guarantee the quality of import.

Essential oil extraction from lemon grass, citrus peel, sweet orange, grape fruit, mango, lime and the tender leaves of orange and grapefruit as well as eucalyptus leaves (neat dry) and rose flower petals.

Gem arabic and wood samples (from Niger Delta Development Board) have been investigated for their suitability as pulping material in the manufacture of newsprint.

Modification of cassava starch and corn starch for textile industries was done at the institute as an import substitute in the sizing of textile yarns.

Dyes were extracted from local plants and local dyeing methods were improved upon. FIBRO jig dyeing machine was fabricated and its use has been demonstrated in Kano and some other places in the north. Indigofera leaves (ELI) were used as indigo dyes for pit dyeing demonstrations.

Kona is a fibre from Hibiscus cannabinus and banana plantain is a fibre from Aabana. These fibres like other basa have been tried, and the extractions done successfully. Fibres extracted were converted into yarns of coarse count by hand spinning and semi-mechanized spinning method. The yarn spun has been woven into fabrics for making bags.

The warping process and preparation of warp yarns for weaving Aso Oke was improved, such that the process can be done indoors instead of the usual out door warping (out-doors warping cannot be done during rainy season).

Some notable technologies developed are highlighted as follows:

Soap Production

Soap is an alkaline salt of fatty acid. It is made by splitting the glyceride ester of the oil or fat by inorganic or organic base to produce a salt of long chain fatty acid and glycerol. Chemically, soap is represented as R\text{COOR}, where R is a straight chain hydrocarbon radical saturated or unsaturated with C\_4 to C\_12; R is a base forming radical either inorganic or organic. Metals leached generally involved in soap making are sodium and potassium, which produce water-
soluble soap while divalent metals such as calcium, magnesium and zinc soaps are water-insoluble.

The importation of soaps (laundry, toilet and medicated) dropped drastically from about 300 tonnes in 1989 to just about 2 tonnes in 1990. Nigeria progressively increased its export of soap from about 15 tonnes in 1986 to over 250 tonnes in 2000. The domestic manufacture of soap and detergents progressively increased from 77,702 metric tonnes in 1986 to more than 303,465 metric tonnes in 2000. Between 1985 and 1990, the increase was over 135 percent. In fact, FIKO started its transfer of technology on soap production in 1986. To date about 1000 members of the public have acquired soap production technology from the institute. FIKO has formulated soap to meet the prescribed international standards.

Black Soap

Traditionally, agro-wastes (residues) are used to make black soap. Such agro-wastes are empty palm fruit bunches (from palm oil production) plantain peels and cocoa pod husk.

The soles of the agro-wastes are used. Today, black soap has become one of the commercial soaps in Nigerian market. An example is 'Dudu Osun'. Many brands have developed due to the success of 'Dudu Osun'.

FIKO has improved on the traditional black soap-making process, and other agro-wastes have been studied for their potential in black soap making viz: melon shell, groundnut shell, corn sheath, raphia scales, guinea corn residue, cocobrot nut shell, and sheanut shell. They were found to be suitable as sources of alkali for black soap making.

Biochemical Pulping of Nigerian Wood

Wood is the prime substance for making pulp. It is composed of about 50% cellulose, 25% hemicellulose and 25% lignin.

Biochemical pulping involves the use of fungi to treat wood chips prior to pulping, to reduce chemical and or energy consumption during pulping to remove pitch (extractives) from wood chips.

Lignin is an essential compound of higher plants that gives them rigidity, water permeability and resistance against microbial decay. In pulp and paper industries, lignin is removed chemically and residual lignin in pulp is removed or degraded using bleaching agents e.g.
Production of Alkyd Resin from Oils of Lesser-known Oilseeds: Beniseed

Production of alkyd resin from lesser-known oilseeds is designed to replace the oils traditionally used in alkyd resin production with other vegetable oils, based on availability. Current research is on the use of Beniseed oil in alkyd resin production.

Although beniseed (sesame seed) has been cultivated for centuries, especially in the8


volatile oil. Alkyl resins are the most versatile coating binders, and they are used in architectural, industrial and special purpose coating. It is estimated that alkyl resins are the primary binders of about one third of all organic coatings used in the world. It was estimated that about 17,000 tonnes of alkyd resin are imported annually.

Production of Oleochemicals (emulsifiers) from Lesser-known Oilseeds: Sheanut

The focus of this project is the production of mono-and diglyceride emulsifiers from oils of lesser-known oilseeds (sheanut).

Mono- and diglyceride are produced from fatty acids by esterification reaction or from oils by solvolysis. Mono- and diglycerides and their mixtures are used as food, cosmetics and pharmaceutical emulsifiers. They are the largest food grade emulsifiers because of their stability, great diversity of application and relative cheapness. They are used in preparation of bread, cakes, margarine,
ice-cream, confectionery, whipped toppings, cereal products, frozen and dehydrated foods. They are available in a wide range of physical forms: liquids, semi-solids, soft plastic, flakes, beads and powders.

The Shea tree grows mainly in West Africa. The export quantities of shea kernels from Nigeria, Republic of Benin and Ivory Coast amount to about 30,000 tonnes per annum.

Carboxymethyl Cellulose from Sawdust

Carboxymethyl cellulose (CMC) was prepared using sawdust obtained from local saw mills on laboratory scale. The conversion involved initial pulping of the sawdust in a stainless steel digester, which has cylindrical pressure and temperature gauges for monitoring pulping parameters. The pulp obtained was then bleached and alkalinated. The alkalinated pulp was acetylated using chloroacetic acid. Acetylated cellulose obtained was washed in dilute methanol and then isolated, dried and milled. The various analyses carried out on the prepared CMC i.e. solubility, refractive index, moisture content and microbiological examination confirm its conformity with imported brands. Market survey showed that the demand for CMC was 1,500 tonnes per annum and the raw material survey reveals that the raw material (saw-dust) is abundant enough to sustain commercial production. Production equipment survey showed that equipment could be locally fabricated.

Glue from Cow Bone

Adhesive from cow bone is a new venture in this part of the globe, hence its domestic and industrial consumption is yet to be exploited. Bone processing into glue or gelatin is a viable project going by the abundant availability of raw materials. Production of both glue and gelatin is similar except that, unlike in glue production, one needs to be more careful in terms of purity of the processing equipment in the production of gelatin. FIIRO research gives the modified process technology for the production of both adhesives and gelatin from fresh cow bones obtained from slaughter houses. The product was prepared by simple hydrolysing collagen, the main protein found in the connective tissue of animal bone.

The fresh crushed bones were subjected to thorough washing, degreasing, demineralizing
read and then autoclaved. The extracted liquor was about 5% concentrated after autoclaving; it was rotary-evaporated to get rid of the excess water, and about 25% solid yield was obtained. Various additives are added to improve the quality of the product before packaging.

Adhesive from Cassava Starch

An adhesive is a substance capable of holding materials together by chemical or mechanical adhesion. Numerous substances like glue, cement, mucilage and paste are used as adhesives.

The starch obtained from cassava roots was hydrated to form starch slurry. The cassava slurry was added to a gelatinization agent in this case sodium hydroxide was employed. The gelatinized starch was thoroughly stirred in an adhesive reactor to ensure homogeneity in cooling. Formaldehyde was added as an extender, while hydrochloric acid was later added to it to bring the pH back to neutrality. Sodium metabisulphite was added as a preservative. The prepared cassava glue was packaged in an airtight container.

Cold Water Soluble Starch

Starch in its natural granular structure may not show a noticeable swelling and solubilization in cold water system. But many of its derivatives are soluble in cold water, if the degree of substitution is sufficiently high, or the groups are strongly ionizable. Pre-gelatinization of starch, either mild acid hydrolysis may result in cold water soluble product.

The introduction of substituents into the starch molecule in the granules interfere with the associative hydrogen bonding that holds the granules together. Hence, the weakened granules will gelatinize at lower temperatures. Gelatinization is essential for the optimum utilization of starch in food and other industrial applications. Phosphorylation and carboxymethylation of starch with mono- or di-sodium phosphate salt and chloroacetic acid results in the formation of starch phosphate monoesters and carboxymethyl starch monoesters which are cold water soluble.
Physico-chemical Treatment of the Effluents from Textile, Electroplating, Tannery, Food and Beverage, Plastics, Paints, Chemicals and Allied Industries

Industrial wastewater has become an important issue due to the fact that industries discharge their effluents into rivers, public sewers, fields, or the sea. The pollutants generally pose hazards to human health, cause deleterious effects on aquatic culture and other ecosystems, and degrade underground and surface water resources.

Wastewater treatment in most of the industries is virtually non-existent. Only a few have installed primary pollution control equipment. Where they exist, they are grossly inadequate to cope with the type of wastes generated.

Industrial effluents are characterized by high biochemical oxygen demand (BOD), and chemical Oxygen demand (COD). Suspended solids, almost completely absent from some wastes, are found in high concentration in others. The industrial wastewater may be highly alkaline or highly acidic.

Similarly, the volume of wastes generated and pollutants like toxic compounds and heavy metals present in the effluents vary from one effluent to the other. Generally, industrial wastewater is turbid, colourless, foul-smelling and highly polluted with toxic substances.

There are three basic types of treatment processes namely physical, biological, and chemical. Selecting a treatment method for any of the industrial effluent depends on the following factors:

• Identifying the various pollutants present in the effluent.
• Characterizing the effluent.
• The treated effluent should meet acceptable standards by the regulatory bodies.

The environmental technology division has developed and fabricated a low-cost universal pollution abatement device (UPAD) for treatment of effluents for all categories of industries. The equipment has been tested on effluents from food, paint and textile industries, and found efficient, affordable and economical.
PROJECT DEVELOPMENT AND DESIGN DEPARTMENT

HISTORICAL BACKGROUND

The department, formerly called the engineering division is as old as FIRO. It was set up to turn laboratory research findings into viable projects for cottage, small, medium and large scale industries through project development, design and fabrication of prototype machines and equipment. A number of engineers have over the years been appointed substantive directors of the institute. Amongst them are Dr. De-la-Burde, a chemical engineer (1968-1969) and Engr. W.N. Williams, a mechanical/production engineer who became director during the latter part of 1969.

The role of the department continued to expand with time in the institute as it combined its role of design and fabrication of prototype equipment, component spare parts, production and modification of imported machines with rendering of basic technical services within and outside FIRO for the optimal operation of industrial processes and projects.

In 1973, the department was restructured into process engineering division, general engineering division, and the materials science and technology division. By 1977, when FIRO became semi-autonomous under the National Science and Technology Development Agency (NSTDA), the department was again divided into the following sections:

a. Electro-mechanical design
b. Process design and development
c. Design and fabrication
d. Maintenance and technical services

However, in early 1980, when the institute came under the supervision of the newly created Federal Ministry of Science and Technology (FMST), the department once again witnessed another restructuring into two distinct divisions namely: materials science and technology division and engineering division. Under the leadership of Engr. S.C.O. Onyejekwu, the engineering division was restructured into five sections:

a. Design and fabrication
FIBRO'S CONTRIBUTION TO RESEARCH AND DEVELOPMENT IN FIVE DECADES

b. Process and project development
c. Foundry and metallurgical
d. Electrical and electronics, and

Maintenance and technical services

During this period, research and development work became vibrant, leading to the design and fabrication of both small and medium scale food processing prototype equipment such as rice milling kiln, cabinet and rotary dryers, hammer mill, groundnut processing equipment, grains destoner, cassava/ plantain sleer, low cost extruder, among others. Some of these equipment were purchased by River Basin Development Authorities, Family Economics Advancement Programme (FEAP), commodity boards and private entrepreneurs.

The tenure of Engineer Adebiyi as assistant director also witnessed tremendous achievements. These include the exportation of FIBRO's main plant to some African countries, namely, Cameroon, Togo, Ghana, Sierra Leone and Zaire. The department also executed collaborative projects such as the briquetted plant; cassava chopping machine, rice destoner, cassava mush sifter, among others.

The then director-general, Prof. S.A. Ochuma established the engineering computer aided design section to assist the department in design and prototype development. This has had a great impact on the work done by engineers.

Dr. J.B. Bashir succeeded Engr. Adebiyi in 2004. The department was later split into two namely: materials and metallurgy, headed by Engr. Dr J.B. Bashir, and design and fabrication, headed by Engr. S. K. Adeoye.

With restructuring which came into effect in 2006, the department was renamed project development and design department with the following divisions, each headed by a deputy director:

a. Process and projects development
b. Design and fabrication
c. Materials and metallurgy
d. Works and services

It is obvious that the directorate has witnessed a lot of transformation since inception but its role in the actualization of FIBRO's mandate and research activities has not changed. In the words of the current chairman, FIBRO Governing Board, Bashorun Chief Dosu Adeolu, "No engineering, No FIBRO". The role of engineering in FIBRO activities and relevance cannot be over emphasized.
MANIFEST AND JUSTIFICATION

The manifest and justification of the project development and design department include the following:

a. Development of processes and projects from laboratory tests to pilot plant production for entrepreneurial investment.
b. Process design and optimization of production plants.
c. Synchronisation of unit plant equipment, packaging and installation of small, medium and large scale industrial plants.
d. Design and fabrication of prototype machines and spare parts for processing food and non-food products.
e. Collaboration and liaison with reputable organizations and fabricators for mass production and replication of developed designs and technologies from pilot plant for commercialization.
f. Liaison with the technology marketing division (TMD) for training workshops and packaging of developed technologies and equipment for sale/transfer to small, medium and large scale entrepreneurs.
g. Commercial pilot plant production.
h. Provision of technical assistance to industries in terms of production of spare parts and tools for different kinds of imported machines based on both internal and external resources.
i. Production of special and critical castings intended for manufacture of spare parts for food and non-food prototype processing equipment.
j. Processing of local mineral raw materials for use in major relevant industries, including ceramics, glass, and other related high temperature industrial processes.
k. Providing all sorts of technical services required for installation and maintenance of facilities within the institute.
l. Technical safety, productivity enhancement and monitoring of pilot plant production.

ACHIEVEMENTS

The following are some of the achievements of the department:

Construction and installation of a biogas plant at Okoko Agege, Lagos for the production of
cooking gas from pig waste under the sponsorship of British High Commission in conjunction with Energy Commission of Nigeria and managed by Friends of the Environment, with FIRO as technical partner. The 13m³ capacity biogas plant was constructed between 1995 and 1998 for the purpose of converting piggy waste to methane (cooking gas) and is able to produce up to 9000 litres of methane gas per day. It is made of a concrete cylindrical structure with a central shaft that carries the gas cup and helps to extract the cup. Stirring of the waste being degraded biologically takes place intermittently inside the concrete chamber and gas is released as this is being done. The feeding of fresh waste is done at the level inside the chamber goes down while the spent waste goes out naturally through a spent pipe. It is then converted further into fertilizer through a drying process. The gas pipe can be extended to user points located up to 500meters from the biogas plant, thus making it the largest biogas plant in Africa. The available biogas plant has a maximum piping distance of the point of usage away from the plant of only 50meters. Care is usually taken to eliminate big particles/ stones inside the waste so that only fine slurry are allowed inside the plant.

Sorghum malting plant
FIRO pioneered the construction of the sorghum malting plant in the mid-1980s, the institute was commissioned by the federal government to build a sorghum malting plant for the production of malted sorghum. This was carried out successfully and a floor malting plant of 5 tons per day capacity was built by the engineering division. The plant consists of steeping tanks, germination beds (both constructed with aluminium sheets), de-moisturing machine and a bed dryer. The sorghum is steeped in the tank by full hydration to open up the pores. Steeping is carried out for 36 hours after which the steeped malt is transferred to the germination beds. The germination process takes about 48 hours during which water, air, rays of sunlight and temperature are carefully monitored. Germination is followed by de-moisturing process during which the roots arising from the germination process are cut by de-moisturing machine. The drying of the malted sorghum is done in open culverts or beds. Sedum fans are required to duct away humid air from the drying process. The whole malting process takes about seven days.

This achievement put an end to the importation of malted barley for beer brewing in the country as foremost brewers like Nigerian Breweries and Guinness Nigeria Plc quickly set up malting
plan using this technology. This has been saving a lot of foreign exchange for Nigeria ever since.

Engineering Machine Shop

Starch factories

The department designed, fabricated, installed and commissioned two large-scale starch factories at Agbani in Kwara State for Doyin Group of Companies, and at Owode Auchi, Ogun State for Obasa Bata HOLDINGS Limited. The two starch plants, each with a capacity of 1 metric ton per day of dry product consists of cassava peeling and washing machine, hammer mill for wet milling, detoxifier for cyanide removal, hydraulic press for dewatering, granulator for cake breaking, the dryer (flash), hammer mill for dry milling, vibro-sifter and the packaging machines.

06 fired lift-out furnace

Design and fabrication of oil-fired lift-out furnace for melting of ferrous and non-ferrous metals for small and medium scale levels was also done by the department. This technology has been transferred to two Federal Polytechnics, namely, Auchi Polytechnic and Ado-Ekiti Polytechnic in Ekiti State.

Technical assistance

The department provides regular technical assistance in the areas of casting of critical machine components for industries around Lagos State, especially during Nigerial events.
Brothers Nig Plc, Nigerian Distilleries Limited, Otta, and Toyo Glass Industry, Agbara, Ogun State among others. It is equally noteworthy that in the last decade, the department has licensed some private fabricators especially, NOVA Technologies, Ibadan for the mass production of designed and fabricated groundnut sheller. The company has since been producing and selling groundnut sheller as designed by the project development and design department. Other services worthy of mention are:

1. Assisting small scale electroplating outfit around Lagos environs to set up, maintain, review and standardize their plating solutions.
2. Provision of critical expertise in repair and maintenance of glassware, both for the institute and also for external bodies like Lagos University Teaching Hospital (LUTH), Idd-Araba, Lagos and some glassware suppliers.
3. Provision of expertise in the testing and analysis of grinding balls for cement industries, specifically West African Portland Company (WAPCO), at Eweko, Ogun State.
4. Collaboration and liaison with reputable organizations and fabricators for mass production and replication of designed designs and technologies from pilot plant for the purpose of commercialization.
5. Liaison with T&H division in organizing training workshops for small and medium scale entrepreneurs as a way of transferring PHIRO's technologies to the public.

Equipment designed and fabricated
Apart from the above major achievements, the department has designed, fabricated and commissioned the following prototype equipment for food and agro-allied processing:

- Equipment for cassava processing into flours for bread making and for starch production.
- Essential oil production equipment. Two of such plants have been installed for clients in Ondo and Rivers States respectively.
- Benneed oil press, rice destoner, benneed air screen cleaner, and cowpea dehuller.
- Instant pounded yam flour plant, comprising yamlicer, yam parboiler, cabinet dryer and hammer mill.
- Palm wine preservation and bottling equipment.
Universal waste treatment plant for textile waste water, electroplating effluent, paint waste water, etc.

Fish drying equipment of varying capacities.

Groundnut processing equipment comprising groundnut sheller, dehuller, roaster and colloidal mill.

Aashing kiln for the production of black soap.

Laundry and toilet soap production equipment.

Solar dryer for drying of fruit and vegetables.

Successful development and production of ceramics glaze for pottery and sanitary ware production.

Successful development and production of electrical porcelain insulators for electricity distribution and transmission.

Development of foundry crucible from local raw materials. The 5kg size crucible produced is now being used by small scale gold smelters.

Development of water filter candle for domestic water filtration. Analysis of filtrates obtained from the candles satisfied the World Health Organization (WHO) permissible level of elemental constituents with turbidity level of 1.30, a level far below WHO value of 5.0.

Processing and refining of raw kaolin, gypsum and calcium carbonate from local raw materials.

Design and production of laboratory size autoclave using high grade alloy obtained from local aluminium waste material.

Development and production of electroplating solutions and brighteners for metal surface finishing.

Tilting and rotary furnaces for small-scale industries.

Successful refining of Nigerian clays including gypsum, kaolin, limestone, mica and tile.

Low cost extruder and agro-waste flash dryer.

Production of ceiling board and partitioning board from local gypsum.

Ginger splitting machine and ethanol distillation plant.

Processing of solid minerals of various physical and chemical properties including feldspar, quartz, ball clay, silica etc. from different states throughout Nigeria.
PROSPECTS OF THE DEPARTMENT

With the active involvement of the institute in cassava processing along with other agricultural crops and mainstream industrial processes in line with policy thrusts of the federal government, the prospects of the department is limitless.

The small and medium scale enterprises will continue to be the test benenuous or engineering activities in FIIRO and our country will be the better for it as well and this is our only hope for Nigeria's industrialization.
FOOD AND ANALYTICAL DEPARTMENT

The department consists of the Food Technology and the Analytical Services Divisions.

FOOD TECHNOLOGY DIVISION

Historical background

The food technology division is as old as the institute. The division has been given several names starting from the sixties as food science and technology. It was later renamed in the eighties as food and nutrition division, headed by Mrs. C.C. Edwards.

In the nineties it was named food processing division, headed by Dr. O. Olatunji and under his leadership in late nineties it was renamed food and biotechnology division having been merged with biotechnology division. In 2003 a director was appointed in charge of food and biotechnology division including the analytical services.

In 2006, food and biotechnology division was officially split into two different divisions: food, and biotechnology. Food division combined with analytical services as a division was headed by Mrs. A.U. Ozumba. Later in the year, food and analytical services division was divided into two divisions namely: analytical services division and food technology division headed by two deputy directors Dr. A.O. Bankole and Mrs. A.U. Ozumba respectively. Currently food technology division has seven sections, with an instrumentation unit.

Most of the research activities in the division are geared towards developing appropriate industrial processing methods right up to the pilot plant stage for Nigeria’s local agricultural produce, developing new food products, upgrading indigenous food processing technologies for mechanized production with improved nutritional and microbiological qualities as well as longer shelf life of the products.

The division specializes in developing appropriate process technologies for indigenous agricultural produce for the purpose of extending their shelf-life, adding value to the products and upgrading traditional process technologies for indigenous agricultural produce to pilot plant level.
The mandate of this division therefore includes:

- To conduct research up to pilot plant stage on local food raw materials with a view to developing appropriate processing technologies which can be transferred to small and medium scale entrepreneurs.
- To conduct research into upgrading existing indigenous technologies up to industrial level.
- To conduct research into the development of novelty foods that can be easily adapted to local conditions.
- To conduct training workshops for small and medium scale entrepreneurs geared towards transfer of the developed process technologies.
- To provide consultancy services to industries and individuals on the area of food processing, preservation and solving specific food-related problems.
- To assist Standards Organization of Nigeria (SON) in setting standards for food and allied products.

ACHIEVEMENTS

The division has worked extensively on developing new products, improving/upgrading traditional processing methods of agricultural produce such as root and tuber crops (e.g. cassava, sweet potato, cocoyam and yam), fruits (e.g. mango, citrus, pineapple), legumes (e.g. cowpea, Bambara groundnut, groundnut etc.), cereals (e.g. maize, sorghum, millet, rice), bakery and confectionery products such as (10% cassava bread and cakes, doughnut, meat pie etc.) from 10% cassava-wheat composite flour. Consequently, the division has completed projects for which training courses are offered and these include:

1. Production of instant pounded yam flour
2. Production of bread from 10% cassava wheat composite flour
3. Transfer of baking technology for confectionery products.
4. Production of juices and drinks from indigenous fruits
5. Production of exportable dried cassava chips
8. Mechanized production of fermented cassava products such as gari, lafun and fufu.
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>Production of peanut butter using locally available groundnut.</td>
</tr>
<tr>
<td>12.</td>
<td>Development and production of single/mixed fruit juices and drinks from locally available fruits.</td>
</tr>
<tr>
<td>14.</td>
<td>Production of food thickeners from cassava roots and cocoyam tubers for soups, mayonnaise, salad, etc.</td>
</tr>
<tr>
<td>15.</td>
<td>Production of cassava pellets for export market.</td>
</tr>
<tr>
<td>16.</td>
<td>Production of gari from dried cassava chips.</td>
</tr>
<tr>
<td>17.</td>
<td>Development and production of tiger nut beverages, cookie premix, ice cream and yogurt.</td>
</tr>
<tr>
<td>18.</td>
<td>Development and production of coconut beverages, desiccated coconut, coconut candies and snacks (garri and chik chuk) and cookie premix.</td>
</tr>
<tr>
<td>21.</td>
<td>Production of canned melon soup.</td>
</tr>
<tr>
<td>22.</td>
<td>Production of canned cowpea.</td>
</tr>
<tr>
<td>23.</td>
<td>Production of cowpea flour for akara and moin moin.</td>
</tr>
<tr>
<td>27.</td>
<td>Production of cassava-based custard.</td>
</tr>
<tr>
<td>28.</td>
<td>Production of cassava-based poultry feed.</td>
</tr>
<tr>
<td>29.</td>
<td>Production of local rice based breakfast food.</td>
</tr>
<tr>
<td>30.</td>
<td>Production of tapioca and protein enriched tapioca.</td>
</tr>
<tr>
<td>32.</td>
<td>Utilisation of hambura groundnut in development and production of weaning food, moin moin, akara flours and cookie premix.</td>
</tr>
<tr>
<td>34.</td>
<td>Production of soy cereal malt beverage.</td>
</tr>
</tbody>
</table>
35. Production of salad cream/mayonnaise
36. Dehydration of okra
37. Development and production of tomato paste, puree, powder and ketchup
38. Production of wafer bread
39. Development of local spices and pepper soup mixes
40. Upgrading and mechanization of the production technology of dawadawa from African locust beans and soybeans
41. Production of jams and marmalades from local fruits
42. Production of rosette drink
43. Processing of mango fruits into chips, flakes and powder

RESEARCH ACTIVITIES
Some important projects in the division are:
1. Production of instant pounded yam flour
2. Production of detoxified cassava flour for baking and confectionery uses.
3. Production of unclassified fruit juices and fruit drinks
4. Production of dried cassava chips
5. Production of cassava noodles

Instant Pounded Yam Flour
Production Process
The production process is very simple and can be carried out at village/cottage level. It requires minimum operation.

Yam selection
There are many varieties of yam in Nigeria but not all are suitable for pounded yam flour production. The most commonly used are the white and yellow varieties. The white yam (D. rotundata) is reported to be the most viscous of the yams because of its high gel strength. This unique characteristic makes it a preferred variety for the production of pounded yam for which a stiff dough is required. Bruised yam tubers should be avoided as much as possible during selection. This is because the bruises are sites in which enzyme activity is initiated, and if uncontrolled, may lead to loss of colour.
Washing

The selected yam tubers should be washed properly to remove any adhering sand as much as possible.

Peeling and slicing

Yam tubers are manually peeled with a stainless steel knife. The operation could be done technically but the mechanical peeler increases peeling loss. The peeled yam tuber is then sliced into thin slices with a slicer made of stainless steel blades.

 Sulphurizing

Yam, like other food commodities containing starch and free glucose, tends to discolor rapidly when the tissue is exposed to air. This is due to enzymatic reaction in most cases. Dipping yam slices in a weak solution of potassium metabisulphite (0.05 - 0.1% w/w) for about 25 minutes inhibits this activity. The slices therefore tend to retain their original colour throughout the period of processing.

Pre-simmering

The yam pieces or slices are now partially cooked in boiling water and occasionally stirred. They are allowed to cook completely at this stage. This is to retain both the yam flavour as well as other natural constituents of yam. The process lasts for a few minutes depending on the thickness of the yam slices.

Casting

It is necessary to set-cool the yam slices immediately after removal from the parboiling tank. This is to allow the adhering hot water to drop and thus prevent over cooking of the slices.

Drying

Re-cooked yam slices may be dried in a tray or cabinet dryer. A drying temperature range of 80 -100°C would suffice in a drying time of about 3 hours depending on the thickness of the slices. The yam slices should be dried to about 10% moisture content (MC). At this moisture level, mold growth and enzymatic activity are not expected to occur. The dried yam chips could be stored in an airtight container at this stage and milled when desired. Production of these dried yam chips is one of the major advantages of this processing technique.
Milling

The dried yam chips are milled directly into flour. Plate or hammer mill is effective in pulverizing the chips into flour of specific particle size, 0.015 (375 microns) aperture mesh is found to be most suitable. The particle size is crucial because it affects the reconstitution ability and the smoothness (mouth feel) of the product. Lower or finer mesh will result into a very fine pap-like product upon reconstitution.

Sifting

After milling, the flour is sifted to obtain uniform particle size distribution. This is a mark of quality and it also enhances the aesthetic appeal of the packaged product. After sifting, larger particles are re-milled and blended with the sifted flour.

Packaging

The pounded yam flour is now packaged in air-tight moisture-proof bags; polyethylene and polypropylene bags are suitable packaging materials. The product can be stored successfully for over one year if properly packaged. The final product yield (flour) is about 35%.

Production of Unclarified Fruit Juice

Introduction

Fruit juice is the unfermented but fermentable natural juice intended for direct consumption. It is obtained by a mechanical process from sound, mature fruits preserved by physical and/ or chemical means. The unit operations are shown in Figure 6.1.

Fruit juice may be turbid (unclarified) or clear (clarified). It may also have been concentrated and later reconstituted with water, suitable for the purpose of maintaining the essential composition and quality factor of the juice. Nutritionally, most fruit juices are excellent sources of vitamins especially vitamin C, and are rich in mineral content. Many of them are good sources of beta-carotene, biotin, pyridoxine and folie acids. They are rich in glucose and fructose (simple sugars), very easily digested, supply energy to the body, but are low in fat and protein. To some extent, they have a laxative effect (Ikegoronye and Ngoddy 1985).

Annual post harvest loss of fruits experienced leads to frequent shortages in fruit availability even at the peak of production, thus, making them very expensive especially in the urban areas (Olorisoba and Awoy, 1985). In Nigeria, fruit juices such as pineapple juice, orange juice, apple juice, guava juice, tomato juice, grape fruit juice, etc are imported annually (table 6.1).
Table 6.1: Importation of fruit juice into Nigeria from 2000 - 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity</th>
<th>Value*1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7,233,811</td>
<td>491,247,170</td>
</tr>
<tr>
<td>2002</td>
<td>9,910,790</td>
<td>471,563,835</td>
</tr>
<tr>
<td>2003</td>
<td>13,463,334</td>
<td>306,527,369</td>
</tr>
<tr>
<td>2004</td>
<td>7,083,698</td>
<td>774,295,647</td>
</tr>
</tbody>
</table>

Collection of fresh, ripe fruits
Sorting and Weighing
Washing
Peeling
Juice extraction
Addition of preservatives and nutrients
Mixing/ Homogenization
Filling/ Sealing
Pasteurization
Cooling
Labeling of bottles
Cartoning (Bulk packaging)
Storage

Fig 6.3: Flow diagram for unclarified fruit juice production
Descriptive of unit operation

Preparatory operations: These include sorting, weighing, washing, and peeling, which can be done manually using knives. Mature fully ripe and sound fruits are used for juice production.

Juice extraction: Fresh juice is pressed out of the prepared fruit using the appropriate extractor for each type of fruit, e.g., citrus juice extractors, pulper for mango and other starchy fruit etc.

Juice formulation: The extracted juice is diluted with treated water (if required), sweetened with sugar, and preservatives/nutrients added.

Mixing/homogenization: This juice blend obtained during formulation is thoroughly mixed in a homogenizer.

Filling/bottling: Juice is usually filled into glass bottles and corked before pasteurization. Alternatively, it could be pasteurized and filled hot under vacuum into sterile pouches/tetrapak/plastic bottles.

Pasteurization: This process involves the subjection of fruit juice to heat treatment to destroy any spoilage microorganisms and also to prevent fermentation.

Cooling, labeling, cartoning and storage: These are done on pallets in a cool and dry place.

Production of Detoxified Cassava Flour for Bread and Confectioneries

Introduction

Cassava (Manihot esculenta Crantz) is a perennial, vegetatively propagated shrub that is grown throughout the lowland tropics. It is one of the most efficient carbohydrate producing crops, tolerant of low soil fertility and drought, has the ability to recover from damages caused by most pests and diseases, and the roots can be left in the ground for long periods as a food reserve. Currently, Nigeria is one of the largest importers of wheat flour, which is conventionally used to bake bread and other confectionery products and this constitutes a huge drain on the foreign exchange. In an attempt to reduce this and create a suitable alternative to wheat, particularly in its utilization for baking bread, detoxified, unfermented cassava flour was developed at FIIRO
In 2001, detoxified, unleavened cassava flour, suitable for partial replacement of wheat flour in bread making, is a whitish, free flowing floury product, free from objectionable flavour and odour, with particle size of 250 micron and pH 6.8, and containing less than 5 ppm of hydrogen cyanide. This flour contains essentially starch granules which are uniformly distributed.

**Industrial production of detoxified cassava flour**

The various unit operations involved in the industrial production of cassava flour from freshly harvested roots are as stated below:

- Cassava roots
- Sorting
- Weighing
- Peeling
- Washing
- Grating into mash
- Detoxification
- Dewatering into cake (Removal of liquor)
- Granulating
- Drying
- Milling
- Sieving
- Packaging

**Fig 6.2:** Flow diagram for industrial production of detoxified cassava flour
Sorting: Freshly harvested cassava roots are sorted. Mouldy and over-matured roots are removed from the batch at this stage, as well as other foreign materials, which could adversely affect the quality of the resulting flour.

Weighing: The roots are weighed using an industrial scale (8-1000kg capacity) so as to predict at this stage the expected yield of product and percentage peels.

Peeling: The roots are manually peeled with knives.

Grating: This is a size reduction operation, using a hammer mill. The peeled, washed cassava roots are introduced into the hammer mill and ground into a smooth mash.

Detoxification of the cassava mash: During grating of the roots, linamarase enzyme is liberated and brought into direct contact with the cyanogenic glucoside in the roots. This results in the hydrolysis of linamarin, particularly at optimum pH of 5.5 with the liberation of free hydrogen cyanide. This reaction is allowed to proceed for a maximum period of two hours before dewatering the mash.

Dewatering: After detoxifying the mash, it is dewatered manually using a hydraulic press. The moisture content of the mash is reduced from about 72% to less than 20% to obtain a dewatered cassava mash called “Cake”.

Granulating: The cassava cake is reduced into granules using a hammer mill granulator. Here, the cassava cake is broken into smaller pieces to facilitate the subsequent drying operation.

Drying: The wet cassava granules are dried mechanically using a rotary hot air dryer. The drying is rapid due to increase in the surface area of the cassava granules (Fennema, 1975). Mechanical drying ensures improved and consistent product quality. A Flash dryer can also be used to dry the wet granules. The moisture content of the dried cassava granules is about 8-10%.

Milling: The dried product is milled with a hammer mill to produce a floury product of about 250-micron particle size.

Sifting: The floury product is sieved to separate the fibre from the required cassava flour. The resulting cassava flour has a creamy-white appearance.
Packaging: The cassava flour produced is properly packaged in high density polyethylene bags.

Conclusion: The cassava flour produced can be successfully used as composite with wheat flour to produce bread and other confectionery products, thereby conserving foreign exchange spent on wheat importation.

![Cassava Flour and 10% Cassava wheat composite bread](image)

Table 6.2: Desirable quality attributes in cassava flour suitable for baking

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Observation/Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Creamy white</td>
</tr>
<tr>
<td>Odour</td>
<td>Cassava odour</td>
</tr>
<tr>
<td>Taste</td>
<td>Blend</td>
</tr>
<tr>
<td>Gel elasticity</td>
<td>Elastic</td>
</tr>
<tr>
<td>Gel transparency</td>
<td>Opalescent</td>
</tr>
<tr>
<td>Particle size</td>
<td>0.25-0.35 microns</td>
</tr>
<tr>
<td>Moisture content</td>
<td>Less than 10%</td>
</tr>
<tr>
<td>Protein</td>
<td>-</td>
</tr>
<tr>
<td>Crude fibre</td>
<td>-</td>
</tr>
</tbody>
</table>
Production of Dried Cassava Chips

Introduction
Cassava (Manihot esculenta (crantz) of the family Euphorbiaceae) is the third most important source of calories in the tropics and is eaten by about 600 million people on a daily basis in Africa, Asia and Latin America. It contains about 65% moisture, 32% starch, 0.7 - 2.0% protein, 0.2 - 0.5% fat, 0.88 - 1.3% ash on a wet weight basis. (Wentham, 1995). It also contains high-cyanogenic glycosides. The roots are highly perishable, with a post harvest life of less than 72 hours due to high moisture content, and post harvest loss of about 23% for freshly harvested produce. Cassava is traditionally used as food and for livestock feed. It is rich in carbohydrate especially starch, and is available all year round, making it preferable to the more seasonal crops.

In Nigeria, cassava is a most widely cultivated crop in the southern part of the country. It is fast gaining prominence in the industrial sector as an import substitute for industrial raw materials, and a major cash crop for such countries like Thailand and Brazil which are presently the world leading countries in the International trade (Eastern European countries) for value added cassava products particularly dried chips and pellets. These products serve as carbohydrate base for livestock feeds in Europe.

Dried cassava chips: This refers to non-fermented, cylindrical, dried chips derived from freshly harvested cassava roots. The dried chips are usually 3-5mm diameter, white or cream/brown depending on the method of processing, and are crispy in texture.

Materials and methods: Figure 6.3 shows the unit operations involved in the production of exportable dried cassava chips. Fresh cassava roots were purchased from local markets in Ogun State, Nigeria.

Freshly harvested cassava roots
↓
Washing
↓
Peeling (optional)
↓
Chipping
↓
Drying
↓
Cooling
↓
Packaging of white/brownish chips

Fig 6.3: Flow diagram for the production of dried cassava chips.
Chemical analysis: The chemical composition of raw cassava and dried cassava chips were determined using established procedures of the Association of Official Analytical Chemists (A.O.A.C., 2000) and is presented in Table 6.3.

Table 6.3: Selected chemical parameters in FIRO dried cassava chips

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>10.24 ± 0.05</td>
</tr>
<tr>
<td>Ash (%)</td>
<td>1.3 ± 0.02</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>0.22 ± 0.02</td>
</tr>
<tr>
<td>Starch (%)</td>
<td>85.58 ± 0.04</td>
</tr>
<tr>
<td>Cyanide (mg/kg)</td>
<td>-</td>
</tr>
</tbody>
</table>

Quality control parameters involved in the production of dried cassava chips:

- Freshly harvested and dried roots must be used, so that cassava chips of good quality can be produced.
- The freshly harvested roots must be thoroughly washed in potable water to remove dirt, sand and other foreign materials that can act as contaminants in the finished product.
- Peeling of the roots must be such that the adhering layers in the cassava root are removed.
- Drying of the wet chips must be continuous in a cabinet drier i.e. uninterrupted and the chips must be regularly turned to ensure rapid and uniform drying.
- The dried chips must be crisp, allowed to cool in a well-ventilated room or by using a fan prior to packaging to avoid moisture condensation on the product which could lead to spoilage.
- Polyethylene bags could be used to package the chips under vacuum to prevent rapid deterioration during storage.
- The dried chips could be treated prior to packaging with fumigants such as phosphine, to ensure that a sterile product is produced.
The Development and Production of Noodles from Cassava

Introduction
There is the need to utilize cassava, a locally available root crop commodity, grown and produced abundantly in Nigeria, as a suitable alternative to durum wheat in the manufacture of noodle products. It has been observed that there is a great market for noodle products in Nigeria. The production of noodle products from cassava would ensure reduction in the annual import bill usually incurred on imported pastas.

Noodles are cereal-based pasta products marketed under different trade names such as macaroni, ravioli, spaghetti and vermicelli. They have long been a favorite of Chinese and Mediterranean civilization, but are currently consumed and appreciated worldwide. Consumption of noodle products is increasing, probably due to the ease of preparation and storage.

The production of noodles from cassava, in which Nigeria has a comparative advantage will not only reduce the annual import bill expended on the products, but will also help to develop our local agricultural product as export good, create jobs, alleviate poverty and increase investment opportunities in both rural and urban areas.

The production of cassava noodles will be an added dimension in utilizing the potential of cassava utilization and thus increase food production, generate more revenue for cassava farmers and provide household food security for both rural and urban population. It will also pave way for export opportunities to other West African countries that are already used to cassava as well as support Federal Government policies on import substitution, export promotion and economy diversification from crude oil.
Methodology

The flow chart for noodle production from cassava is shown below.

```
Cassava flour/starch → Pre-gelling → Extrusion → Noodle conditioning → Drying & packaging → Cassava noodles (dried)
```

**Fig. 6.4: Flow chart for cassava based noodle production**

Detoxified, unfermented flour or starch is prepared from freshly harvested cassava roots. A predetermined portion is gelated or cooked, mixed with the ungelatinized portion and other noodle ingredients into a stiff dough. This is extruded at room temperature into desired noodle shape, conditioned in water, dried and packaged in high-density polyethylene films (HDPE) or biaxial oriented polypropylene films (BOPP).

**Future prospects for food technology division**

- Extensive research and development on different indigenous crops grown in the six geo-political zones of the country for local and international markets.
- Carry out food fortification programmes on selected locally consumed foods in the six geopolitical zones.
- Set up a packaging unit and conduct extensive R&D on the packaging materials suitable for processed products and locally consumed products.
- Compile standard developed technologies for different indigenous food crops.
- Provide relevant data suitable for pilot plant production using the technologies for developed indigenous food crops.
ANALYTICAL SERVICES DIVISION

The present analytical services division of FIRO came into existence in April, 1974, with the mandate of:

- Providing consultancy services to industries and other organizations.
- Providing quality control services in the areas of chemical, microbiological, and safety evaluation analysis on finished processed products (food and non-food) that may require registration by the National Agency for Food and Drug Administration and Control (NAFDAC).
- Assisting the Standards Organization of Nigeria (SON) in drawing up parameters for standardization of industrially processed goods
- Assisting in industrial training programmes for students from colleges of technology and universities
- Assisting in training quality control personnel from industries
- Carrying out research projects of analytical nature such as the development and formulation of water sanitizer from local raw materials

The creation of the division was sequel to the increased demand for the analytical services of the institute by the private and public sectors of the Nigerian economy operating in the food, chemical, and allied industries.

A re-organization in the institute in 1977 led to its establishment as the analytical services section, under the industrial chemical division. The section remained in this new division until 1982, when it was split into two sections namely: chemical and microbiological sections respectively. Until it became a full division, from 1985 to date, the section has at different periods had placements with the materials science and laboratory management, industrial chemistry, and food and biotechnology respectively. Throughout these periods, the mandate and focus of the section remained unchanged.

ACHIEVEMENTS

The division has been the analytical arm of research activities and an analytical service provider to the outside world. The division has competent members of staff.
Inputs in FIIRO research projects

The division has been responsible for both chemical and microbiological analyses of research projects. This makes the division an integral part of nearly all research projects in the institute. Requisite analyses are carried out on raw materials, intermediate as well as finished products in order to add credibility and authenticity to the researcher's work. The extent of analytical support rendered since inception is directly proportional to the number of scientific research projects handled in FIIRO. Common examples include such products as traditional palm wine, seypui, bread and diverse cassava and cassava-based products. These were regularly subjected to quality control tests throughout the development process.

Divisional research projects

Four major research projects are:

- Formulation and production of water sanitizer from locally available raw materials. The product has been perfected and made into tablet form awaiting pilot scale production.
- Chemical composition of cooked foods indigenous to Nigeria. This project has been completed, and a recipe book has been published.
- Isolation and production of probiotics from Nigerian food (on-going).
- Evaluation and assessment of potable water in Lagos Metropolis for safety and quality.

External services

These are classified under the following headings:

Chemical, microbiological analytical services

The division continues to serve as (1) First Party Test laboratory for those seeking NAFDAC Certification for their products (2) Third Party Test laboratory for NAFDAC.

Consultancy services/membership in scientific and technical committees

In addition to consultancy services to private individuals, industries, and government bodies on issues of chemical and microbiological analysis of food as well as non-food materials and products, the division is also a member of the technical committee constituted by the Standard Organization of Nigeria (SON) for the purpose of establishing standards for local produce and products.
Some of these committees deliberated upon inorganic chemicals, food materials, such as vegetable oils, sugars, cassava flour and cocoyam products and cosmetics.

**Quality control and capacity building**

The division trains individuals and groups on the principles and techniques of quality control in the areas of chemical and microbiological analyses.

Simply put, the division has helped to set up analytical laboratories, and appropriately trained manpower needed. The UAC Foods, UTC, PZ, Rain Oil Nigeria Ltd, Ojota etc. were some of the beneficiaries of the quality control capacity building services of the division.

**Industrial training programme**

The contribution of the division to the training of students in industrial attachment programmes initiated by government has been very tremendous. These students come from various tertiary institutions (polytechnics, universities, colleges of technology) all over the country to gain experience in their various areas of studies.

**Projection for the future**

With the new organizational structure, which has raised the status of the analytical section to that of a division, and which is being complemented with the acquisition of modern analytical equipment, the division is set to play a leading role in chemical, biochemical and microbiological analytical services to the nation.
PLANNING, TECHNOLOGY TRANSFER AND INFORMATION MANAGEMENT DEPARTMENT

The Department came into being in year 2006 as a result of new expanded organization. It comprises three divisions, namely: planning and monitoring, technology transfer; and library, documentation and computer services division. The historical background, mandates and achievements of each division are featured in this chapter.

PLANNING AND MONITORING DIVISION (PM)

Historical background

The division was created on 20th August, 1990 with a mandate to coordinate research and non-research activities. This coordination was found to be exceptionally important in that it is inherent in the management process and is involved in the performance of each management function: planning, organizing, staffing, directing and controlling. In other words, effective coordination gives rise to the successful attainment of organizational goals.

The division became fully operational on 21st February 1991, and the pioneer head was Dr E.A.O. Onukwe who later handed over to Mr. O.O. Onyekwere in 1993. After his retirement in 2001, Engr. (Mrs.) M. O. Kasim became head until her retirement in January 2005 when she handed over to Mrs. O.I. Adegbehia who is the present head of the division.

It is worth noting that the planning of the institute's activities is a collective effort of all divisions, which is coordinated by the planning and monitoring division. For effective discharge of its functions the division is structured into three main sections namely:

- Planning and budgeting
- Monitoring and evaluation
- Training
Activities of PM division

FHRO's action plan for all research projects

The institute's action plans are prepared annually, with input from all divisions. The plans contain details of the priority target research and pilot plant development projects and the resources required for their implementation.

Capital budget estimates and rolling plan

Capital budget estimates and national rolling plan are prepared and sent to the Federal Ministry of Science and Technology (FMST), Abuja. Documents are also prepared to assist the director-general at all budget defence meetings.

Capital budget monitoring exercise by the federal ministry of finance

Necessary data are collected and used to prepare documents based on formats received from FMST on implementation progress made on the capital projects.

Progress reports on the institute's activities

Detailed annual reports are collected from the various divisions, extracts of which are used to prepare the annual reports of the institute on a regular basis.

Also detailed quarterly reports are collected from the various divisions and used to prepare the institute's quarterly reports which are forwarded to FMST, Abuja.

Monitoring of research projects – project review meetings

Quarterly project review meetings are organized during the year by the division. In conjunction with the DG, review exercises are carried out on all research projects. Findings from these exercises are documented.

Weekly seminars, invited guest seminars and distinguished guest lectures

The division has been able to organize seminars and lectures by both members of staff and distinguished guest lecturers. In the past five years for instance, more than a hundred seminars and ten guest lectures have been successively delivered.
Human Resources Development: Staff Training

A good number of staff have benefited from the institute’s training programmes ranging from postgraduate international training and in-house training programmes. In recent times, more than 20 (twenty) members of staff have undergone further training for PhD, MSc or BNID degrees in local and international institutions. In addition, training courses have been organized by the division for more than 20 participants in specific areas.

The division plays a major role in ensuring that members of staff update their knowledge through participation in conferences. To demonstrate this commitment, more than 33 members of staff were released for local and international conferences in the last five years. Equally, as a way of promoting the institute’s leading role in R&D, the division has supervised the placement of about 700 undergraduates on industrial training (IT) in the various divisions of the institute while engaging the services of up to 20 NYSC members.

In order to improve staff training position, information on available fellowships/grants from sources such as Third World Academy of Science, Gold Spring Corporation (USA and UK) and Association of African Universities (AAU), are sent regularly to divisional heads for dissemination to their staff who might be interested in applying for the grants.

TECHNOLOGY MARKETING AND EXTENSION DIVISION

Historical Background

EIBO was established in 1956 to carry out research activities that would lead to the industrial development of the country. Research activities took off in earnest and it later became obvious that there was a gap between the laboratory scientists and the public. The need to package the research results in a usable form and to allow entrepreneurs have enough economic information to support investment decision became evident. Therefore, in October 1971, the Industrial Analysis division was established to be the link between scientific invention and the marketing public.
Manifesto of the division

The division, under the leadership of Dr. A. Beethakker was to carry out the following major functions:

- Economic and statistical evaluation of projects conceived by scientists and engineers.
- Provision of support for projects.
- Augmentation of the technical services currently offered by the institute to the industrial sector, with analysis of management, production, inventory, financial and marketing systems to be performed for industrial and commercial organizations.
- Operation of a documentation centre that would service both FIHO's scientific staff and the Nigerian industrial sector.
- Introduction of programme budgeting for the various activities performed by the institute.
- Technical assistance to the relevant government institutions with respect to evaluation and/or planning of investment in the industrial sector.

However, the current broad mandate of the division is technology packaging, promotion and transfer to entrepreneurs, inventors, etc., for acquisition and subsequent commercialization of technology. This mandate is being carried out through:

Research
- Industry demand study for proposed research and development projects.
- Economic studies of developed technologies.
- Total packaging of developed technologies for commercialization.
- Publication of research papers in academic journals on techno-economic studies, industrial and market potentials of FIHO developed technologies.

Promotion to corporate bodies

Promotion of the institute's research and developed technologies through:
- Participation in trade fairs & exhibitions, conferences, workshops/seminars.
- Attendance and presentation of papers at conferences.
- Representation of the institute at seminars and workshops both locally and internationally.


<table>
<thead>
<tr>
<th>Technology Transfer Training Workshops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cassava flour for bread &amp; confectionary baking</td>
</tr>
<tr>
<td>Cassava wheat bread baking</td>
</tr>
<tr>
<td>Fruit juices extraction</td>
</tr>
<tr>
<td>Instant pounded yam flour production</td>
</tr>
<tr>
<td>Cassava chips production</td>
</tr>
<tr>
<td>Palm wine bottling and preservation</td>
</tr>
<tr>
<td>Zooh soak production and preservation</td>
</tr>
<tr>
<td>Laundry soap production</td>
</tr>
<tr>
<td>Powdered fish, production</td>
</tr>
<tr>
<td>Tempeh and okra extraction</td>
</tr>
<tr>
<td>Edible mushroom production</td>
</tr>
<tr>
<td>Edible mushroom and pig rearing</td>
</tr>
<tr>
<td>Essential oil extraction</td>
</tr>
<tr>
<td>Body and hair pomade production</td>
</tr>
</tbody>
</table>
Economic evaluation

1. A complete appraisal of the technical, economic and financial implications of a proposed alcohol and yeast plant, 1971
2. Economic and financial appraisal of the FIBRO’s gari project, 1971
3. Study of the feasible utilization of Nigerias cassava, 1972
4. Economic evaluation of kaolin components, 1973
5. Profitability analysis of modified cassava starch manufacturing, 1973
6. Economics of soy-gari production, 1996
7. Economic evaluation of gari processing using UNIDO gari plant, 1997
8. Economic evaluation of maize dehulling and degerming equipment, 1998
10. Economic evaluation of bottling and preservation technology, 1998
11. Project proposals under the research extension linkage programme of the National Agricultural Research Project (NARP), 1998
13. Economic evaluation of laundry and toilet soap production on casual, small and medium scales, 2001
15. Biogas production from wastes, 2003
16. Technical assistance services (TAS) and preparation of feasibility studies on cassava processing into gari, fufu, and palm wine bottling and preservation, 2003
17. Economic evaluation of vinegar production from palm wine, 2005
18. Economic evaluation of edible mushroom production, 2006
20. Economic evaluation of clarified and unclarified juice production, 2006
21. Economic evaluation of cassava processing into fufu, gari, starch, flour, chips, 2006
22. Raw material survey on availability of cassava for commercial production of gari & lofun in Ogun State, 2001
23. Raw material survey on availability of yam for production of yam and glue, 2002
25. The economic studies of clarified production of fruit juices using enzymes, 2003
26. Economic evaluation of FIRO pilot plant operations

Research Projects

4. Shelf-life studies on smoked fish from both traditional and modern technologies in the central zone, 1998.

Pre-feasibility reports/business plans

(9) Pre-feasibility report on smoked fish production (using the FURO tray dryer), 1990

(10) Pre-feasibility report on industrial starch production, 1990

(11) Pre-feasibility report on laundry and toilet soap production, 1993

(12) Pre-feasibility study on peanut butter production, 1999.

(13) Business plan on rey-ogi production, 1999

(14) Business plan on the production of gari from dried cassava chips, 1999

(15) Business plan on clarified juice production, 1999

(16) Business plan on weaning food production, 1999.

(17) Business plan on palm olein production from palm oil, 1999

(18) Business plan on production of gari from dried cassava chips, 1999.

(19) Business plan for the processing of edible mushrooms, 1999

(20) Pre-feasibility report on fruit juice production, 2000


(22) Pre-feasibility report on production of soup, 2001

(23) Pre-feasibility report on commercial production of bread, 2002

(24) Business plan on commercial production of instant pounded yam flour, 2002

(25) Pre-feasibility report on instant pounded yam flour production for the poverty eradication programme of the federal ministry of science and technology, 2002

(26) Pre-feasibility report on fruit juice production, 2002

(27) Commercial production of edible mushrooms, 2002

(28) Pre-feasibility report on laundry and toilet soap, 2002

(29) Pre-feasibility report on kulikuli production, 2004


(31) Pre-feasibility on production of clarified juice using enzymes, 2004

(32) Pre-feasibility report on pharmaceutical grade starch, 2004

(33) Pre-feasibility report on dry milling of legume (cowpea), 2004

(34) Pre-feasibility report on plantain chips production, 2004

(35) Pre-feasibility report on Nuka production, 2004

(36) Pre-feasibility report on semi-instant akara and moin-moin flour production from cowpea, 2005

(37) Pre-feasibility report on fruit juice production, 2005
Feasibility Reports

Feasibility reports were prepared on:

1. Production of ceramics, 1971
2. Glass manufacturing, 1971
3. Production of desiccated coconut for Lagos state government, 1979
4. Tomato canning for North central government, 1972
5. Production of bottled preserved palmwine for Ambassador (Chief) V. N. Chibunda, 1981
6. Mechanized production of gari for Dettis Nig. Ltd., 1982
8. Cassava plantation economics, 1984
9. Mechanized production of gari, at Akure, Ondo State for Mr. Tayo S. Eleche, managing director Dettis Nig. Ltd., 1984
10. Mechanized production of gari for agricultural & food processing complex Ltd., 1984
11. Cassava production at Iwo, Oyo State for indigenous company agricultural and food processing complex Ltd., 1984
12. Gari processing at Ogbomosho in Oyo State, 1985
13. Mechanized production of gari, 1985
14. Tomato puree production, 1985
15. Laundry and toilet soap production for Cooperative Union, Oyo State, 1985
16. Laundry and toilet soap production for A-Z Consolidated Ltd, Benin City, 1986
17. Mechanized production of soap for D & T Foods Nig. Ltd, Ibadan, Nigeria, 1989
(19) Gum production from gum arabic for breweries and packaging industries, 1989
(20) Wine production from Nigerian fruits by Resources Nigeria Limited, 1989
(21) Soy-ogi production for Domino Stores, Lagos, 1989
(22) Mechanized gari production at Maturie Village, via Ireme, Ogun State for BAHSON FARMS LTD, 1989
(24) Alcohol production for Sugetee Enterprises, 1990
(27) Raw kaolin refining for Kavites Industries Limited, 1990
(29) Electrical porcelain insulator production, 1992
(30) Soy-ogi production for MOCON Nig. Ltd., 1992
(31) Production of alcoholic beverages for Odili Trading Company Ltd, 1993
(32) Laundry soap production for Cooperative Supply Association, Ibadan, 1996
(33) Production of hydrated lime from limestone for Delop Nig. Ltd., Lagos, 1997
(34) Groundnut processing into peanut butter, groundnut paste and groundnut snacks for National Agricultural Research Project, 1997
(35) Production of iru (dawadawa) from locust beans, 1997
(36) Production of instant pounded yam flour for National Agricultural Research Project (NARP), 1997
(37) Commercialization of FIBRO baking unit, 1998
(38) Edible mushroom production for Dayin Group of Companies, Lagos, 2000
(39) Production of iru (dawadawa) from soy-beans for Dayin Group of Companies, Lagos, 2000
(40) Mechanized processing of gari for Agro Industrial Company Ltd., 2000

(41) Establishment of agro-processing centre (cassava, yam, rice and oil palm fruit processing) for Ajorhor Group of Companies, 2001

(42) Production of laundry and toilet soap for Ambassador (Chief) V. N. Chibnall, 2001

(43) Production of laundry and toilet soap, for Iyaloja Egba Foundation, 2001

(44) Commercial production of fulfa and lafun for Iyaloja Egba Foundation, 2001

(45) Commercial production of essential oil (lemon grass oil) and lemon grass tea for Sun Sea Limited, 2003


(47) Commercial production of high quality cassava flour (HQCF) for BASA Nig. Ltd, Lagos 2005.

| No. | TECHNOLOGY                     | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 1   |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
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| 3   |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4   |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 5   |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 6   |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
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| 10  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
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| 12  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 13  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 14  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 15  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 16  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 17  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 18  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 19  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 20  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 21  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 22  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 23  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 24  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 25  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 26  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 27  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 28  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 29  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 30  |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| TOTAL|                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

TOTAL: 2,250
Some of the masses have established businesses on these technologies over the years.

**TECHNICAL ASSISTANCE SERVICES (TAS)**
The division also co-ordinated TAS to various industries as indicated in the table below:

<table>
<thead>
<tr>
<th>S/N</th>
<th>COMPANY</th>
<th>TYPES OF TECHNICAL ASSISTANCE SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cadbury Plc, Lagos</td>
<td>Sorghum malt production</td>
</tr>
<tr>
<td>2</td>
<td>International Breweries Ltd, Ogun State</td>
<td>Sorghum malt production</td>
</tr>
<tr>
<td>3</td>
<td>Associated Breweries Company, Aghara, Ogun State</td>
<td>Sorghum malt production</td>
</tr>
<tr>
<td>4</td>
<td>Gloso Plc from Gloso-Welcome Plc, Lagos</td>
<td>Dry milling of cereals &amp; legumes into flours for baby food production</td>
</tr>
<tr>
<td>5</td>
<td>Nigerian Grains Production Company, Kaduna</td>
<td>Dry milling of cereals into flours</td>
</tr>
<tr>
<td>6</td>
<td>Jolly Brothers Ltd, Kano State</td>
<td>Dry milling of cereals into flours</td>
</tr>
<tr>
<td>7</td>
<td>Tate &amp; Lyle Ltd, Ogun State</td>
<td>Dry milling of cereals into flours</td>
</tr>
<tr>
<td>8</td>
<td>Liski Mills Ltd, Lagos</td>
<td>Dry milling of maize into grits for cornflakes production</td>
</tr>
<tr>
<td>9</td>
<td>Lipton/Unilever Plc, Lagos</td>
<td>Dry milling of cereals &amp; legumes</td>
</tr>
<tr>
<td>10</td>
<td>Kavilex Nig. Ltd, Lagos</td>
<td>Infusion beverage drink</td>
</tr>
<tr>
<td>11</td>
<td>Star Flour Mills (Doyin Industries), Lagos</td>
<td>Kaolin refining</td>
</tr>
<tr>
<td>12</td>
<td>Dangote Ekun</td>
<td>Dry milling of cereal and pulses processing</td>
</tr>
<tr>
<td>13</td>
<td>Adighesi Food Ind. Ltd, Oye, Ekiti State</td>
<td>Smoked fish</td>
</tr>
<tr>
<td>14</td>
<td>Continental Pharmaceuticals Ltd.</td>
<td>Cereal and pulses processing</td>
</tr>
<tr>
<td>15</td>
<td>Veritas, Basish</td>
<td>Cereal milling</td>
</tr>
<tr>
<td>16</td>
<td>Kano State government, Kano dyeing Centre, Kano</td>
<td>Upgrading of local technology in dyeing</td>
</tr>
<tr>
<td>17</td>
<td>North Breweries Ltd</td>
<td>Sorghum beer &amp; sorghum malt</td>
</tr>
<tr>
<td>18</td>
<td>Fosty Agro Fzlic, Haminja, Lagos State</td>
<td>Cowpea processing</td>
</tr>
<tr>
<td>19</td>
<td>Texas Gari Ltd.</td>
<td>Mechanized gari &amp; starch production</td>
</tr>
<tr>
<td>20</td>
<td>Ojokoro Holodun Co-operative Farmers Association, Lagos</td>
<td>Biogas production</td>
</tr>
<tr>
<td>21</td>
<td>Ido Co-operative Farm Settlement</td>
<td>Mechanized gari</td>
</tr>
<tr>
<td>22</td>
<td>Continental Pharmaceutical Ltd</td>
<td>Cocoa butter</td>
</tr>
<tr>
<td>23</td>
<td>Eddy &amp; Brothers Enterprises</td>
<td>Palmwine bottling &amp; preservation</td>
</tr>
<tr>
<td>24</td>
<td>Uncle T. Palmwine</td>
<td>Palmwine bottling &amp; preservation</td>
</tr>
</tbody>
</table>
Future Prospects

The future prospects of the division are:

- To sustain market driven research projects.
- To improve on the packaging of technologies for SME's development.
- To promote the establishment of demonstration units in the technology incubation centres (TICs) within the six geopolitical zones based on the raw materials available in these areas.
- To foster improved working relationship with stakeholders on SME's development e.g. finance/credit institutions, NGOs, development agencies etc. within and outside the country.
- To encourage networking among the beneficiaries of FIRO's technologies.

LIBRARY, DOCUMENTATION AND COMPUTER SERVICES DIVISION

Mission statement

The mission of the division is to provide information resources required by researchers, industrialists, entrepreneurs, by acquiring, organizing, housing and maintaining information materials related to industrial processes; as well as the publication of research reports and other corporate publications.

HISTORICAL BACKGROUND

One of the basic functions of FIRO is to promote industrial growth in Nigeria through information dissemination. In recognition of the need to communicate scientific and technological information, a special library was established along with the institute, having the responsibility of promoting the intensive utilization of technological information available globally. Its services are available not only to staff of the institute, but also to industries, other
research organizations, tertiary institutions, entrepreneurs and individuals concerned with industrial development in the country.

The library, which is as old as the institute started as a one-room service outfit. Its initially small collection was easier to arrange alphabetically within subject groups. Over time, the collection of books, journals, monographs etc increased tremendously such that the space used soon became inadequate.

At the early stages of its operation, the library was under the industrial analysis division of the institute, providing information support to research activities. Its main purpose was:

- Identifying sources of scientific and other literature relevant to Nigeria's industrial expansion.
- Identifying potential sources of finance for various industrial investments.
- Disseminating scientific and industrial information generated in industrially advanced countries.
- Publishing of technical information bulletin for industry (TIBI).

In 1976, the library was upgraded to a divisional status and was renamed library, information and documentation (LID). In later years the division was merged with the technology marketing and extension services section, and became the information, technology marketing and extension services division (ITEME), headed by an assistant director Mr. R.O. Sodipe.

FIHRO INDICES

INDICES is the acronym for the industrial information centre and extension services. It was a national development project jointly sponsored by the Federal Government and the United Nations Development Programme (UNDP) and jointly executed by United Nations Industrial Development Organization (UNIDO) and FIHRO.

The establishment of INDICES became necessary because of the need to provide Nigeria industrialists with up-to-date information thereby enhancing their development and making them the key to high standard of living through their contributions to net sustenance and export.
intensive national economy. INDICES brought about a need for computer-based services to
test with the set goals, therefore, the computer services section was included in the
organizational structure of the institute.

FIRO Library

DOCUMENTATION SECTION

The goal of the documentation section is to develop and provide services that improve access to
the information that researchers/technologists need to work productively and cost effectively, to
handle the publishing activities of the institute, and also provide information to industrialists,
entrepreneurs, and researchers.

Several objectives were established to aid the achievement of these goals. These are:

- Providing question and answer service i.e. disseminating information sourced
  through various means including the internet to answer enquiries.
- Compilation of retrospective and current bibliographies and bibliographic reviews on
  projects of high priority to the institute.
- Developing computerized databases and acquire those developed elsewhere or
  on subjects pertinent to the institute’s projects and industries.
- Editing and publishing the reports from the researchers and gather information to write up and publish other institute publications.

**COMPUTER SECTION**

Computer section started in December, 1986 as a unit under the information section, equipped with a SIRIUS micro computer, dot-matrix printer, a battery operated uninterruptible power supply and two staff.

The SIRIUS micro computer with CARDBOX software, was used to design the first database: current awareness services on the economy (CASE), which contained information from daily newspapers. This information was circulated periodically. Not much was done with such equipment because of its limitations.

The dynamic quest for e-information led to submissions of proposals to UNIDO for assistance. The response came as UNIDO donated one IBM-compatible micro computer through INTID (Industrial Technological Information Databank) project in 1987. More databases were designed and created with the computer, which had 20MB hard disc.

In recent times, FRIOU has gained access to the world wide web (WWW) through V-SAT obtained from the Federal Ministry of Science and Technology (FMST) under a project executed by the national research and development council (NMRDC). Communication has greatly been enhanced. A local area network has been established linking most of the computers in the Institute thereby facilitating access to up-to-date global information.

Recently, the library, documentation and computer sections were merged into a division to harmonize all activities, and is presently headed by Mrs. O. O. Adeyemi, a deputy director. The library section is headed by Mrs. P. O. Udokwe (Chief Librarian) and the computer section by Mrs. B. N. Dangor (Chief Research Officer).
SERVICES

Technical inquiry service
Answers are provided to scientific and technological queries on process technologies, raw materials, equipment/machinery, organizations/companies etc. Enquiries can be made through correspondence/telephone, email, or personal visits.

Current awareness service (CAS)
These are services that keep our users abreast of new developments in their respective fields of interest. This service has a great advantage for its up-to-date ness and is mostly to support research works.

(i) Current awareness service on the economy (CASE)
CASE is a service based on newspaper articles and features. Periodically, each client receives a computer print-out compilation of all techno-economic features in the newspapers previous month in his area of interest, which has earlier been indicated through a user profile.

(ii) Selective dissemination of information (SDI)
Clients are regularly updated with information on the latest developments in their fields. Notifications containing list of articles sourced from the Internet, books, journals, conference proceedings, and other relevant sources are regularly communicated.

(iii) Journal content page service
Tables of contents of journals acquired are photocopied and distributed to scientists and senior staff members. Those receiving the service may request for photocopies of articles of interest. This service complements the SDI service for current awareness.
(iv) Publication
Publications tailored to the interest of industries, researchers, etc are regularly issued. Such publications include:

**Industrial abstracts**
A quarterly publication carrying viable information for industrial processes in abstract form collected from international journals. Items abstracted include: abstracts of journal articles, patents, standards, conference proceedings, etc. These abstracts provide access to recent journal articles. Full text of these articles can be supplied on request.

**Latest technology index**
A quarterly indexing journal listing technology-based items. The listed technologies are selected from international journals, abstracts, and indexes, with emphasis on new technologies.

**Document procurement**
A service through which articles not available are obtained on request from our collaborating organizations abroad or within.

**Book Loans Service**
Books may be borrowed by members of staff. The loan period is two weeks. Loans may be renewed provided other persons have not requested for the borrowed item(s).

**Reference Service**
Answers are provided to enquiries by consulting the appropriate sources of information. This could take the form of quick reference service or in-depth reference service.

**Internet Service**
Internet searches are conducted to facilitate research works, and also for workshop participants and other interested individuals. Online open access journals and databases are accessed.
Publishing
Under this service, all research reports generated by research officers and other corporate publications are edited and published. Other corporate publications such as corporate profile, technical bulletins, information brochures and industrial profiles are produced.

Referral service
Information not available, and which are not in the institute’s mandate area are referred to where such information can be obtained.

Bibliographies
This is the compilation and publishing of bibliographies on literature relevant to the institute’s priority projects.

Website management
The documentation section also compiles input into the institute’s website, updates the content and liaises with the internet service provider (ISP) for subscription payment, complaints, and email administration.

Achievements
The centre is stocked with relevant information to support research activities toward the industrialization of the national economy. The division has put in place various products and services for easy access to information in order to enhance R and D.

Database design
In order to allow for easy access to information, computerized information databases have been developed. CDS/ISIS was used to design, create and maintain appropriate databases for the institute and other users. These include computerized library catalogue; library loan system; food science and technology database (FSTD); chemical and fibre technology database (CFT), and computerized database of FIHRO reports using Visual Basic 6.0 and Microsoft Access 2000.
In order to justify the research and technological feats achieved by FIRDO, the division has published various research findings and technological breakthroughs in the form of research reports, technical memorandum, corporate profile, selected technologies for industrial development, industrial profile on various technologies, technology offers, cassava production, processing and utilization in Nigeria etc.

**Software development**

Software Packages developed by the Computer Section are enumerated below:

- Salary software was introduced, implemented and handed over to accounts department through a computer consultant Compute-Rite 1995.
- Human resources package was developed using Microsoft Access, to manage personnel services. This is still being test-run by the administrative division who will eventually use the package.
- A customized program was designed to assist the Analytical Laboratory to perform their analytical routine.

**Training**

The division has conducted series of training both for members of staff and personnel of other corporate bodies on computer appreciation, software packages and the use of CDSSISIS to develop bibliographic databases. Also, librarians and information professionals from other libraries were trained on modern techniques in information management.

**LINKAGES AND COLLABORATION ACTIVITIES**

INDICES has over the years maintained strong linkage with a number of national, regional and international agencies in related areas in order to promote its activities and research findings of the institute. Among the important organizations with which it established formal linkage were:

- United Nations Industrial Development Organization (UNIDO/INTIB)
- National Technical Information Service of the UK Department of Commerce (N155)
- Food and Agricultural Organization of the United Nations (FAO/UN)
PRESENT AND FUTURE VISION OF THE DIVISION

- To equip the library with up-to-date information materials in line with the mandate of the institute.
- To improve access to information through computerized library holdings, databases and other information products.
- To provide a wide range of information services and resources, in order to add value to scientific and technical activities.
- To be a node for the provision of value-added industrial information to industrialists, researchers and entrepreneurs.
- In all, to be the centre of excellence in disseminating industrial information for the industrialization of the national economy.
SOCIO-ECONOMIC CHARACTERISTICS OF THE FARMERS IN LAGOS STATE

For the purpose of this write-up, Lagos State farmers can be divided into two: rural farmers and urban farmers. In line with this division, there are some characteristics that are common to all the farmers in the State. Some of these are as follows:

As a result of continuous interaction with Lagos State Agricultural Authority, most of the farmers in the State now belong to either a cooperative group or their commodity/trade association or both. Consequently, it enables them to enjoy economy of scale in input procurement, other farming activities, marketing, and access to sources of credit, market and inputs.

Most farmers in the State have access to portable water and primary health care within just a few kilometers to their home. The farmers’ children also have access to the regular immunization exercises being carried out in the State.

Most of the farmers in the State live in houses constructed with blocks and the roofing of these houses are done with either corrugated iron sheets or zincoster sheets. The farmers also have access to decent means of transportation. Some of the access roads to the main markets are quite bad though, this brings up the transportation cost.

Farmers in the State have access to electricity, stability of which might not be guaranteed.

Public schools are at the reach of most of the farmers’ homes; this ensures that basic primary education is guaranteed for their children.

Most farmers in the State can boast of modern electronic gadgets in their homes: Items like stereo, television, VCD player are within their reach.

They also have access to mobile phones; this makes it easy to reach them for meetings and other stakeholder fora.

For the very rural farmers access to some of the above might not be as easy as it is for the peri-urban farmers, especially those farmers located at the riverine areas.

However, in addition to all these, the peri-urban and the urban farmers possess some other socio-economic characteristics. Some urban farmers have access to the internet facilities; they have e-mail addresses and can get relevant information from the internet.

Some of these urban farmers run registered farms, which are being run as business units; some of them have their own brands especially in livestock and aquaculture.

Most of these farmers transact businesses with banks on regular basis.
Appendix 19

Social-Economic characteristics of the farmers in Lagos State
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Appendix 20

Lagos State Government Min. of Agric. & Coop. Rice for Job Programme
His Excellency
GOVERNOR BABATUNDE RAJI FASHOLA (SAN)
The Executive Governor of Lagos State
Her Excellency
MRS. SARAH ADEBISI SOSAN
Deputy Governor of Lagos State
Rt. Hon. Adeyemi S. Ikuforiji
Speaker, Lagos State House of Assembly

Hon. Babatunde Jimoh Adewale
Chairman, House Committee on Agriculture & Cooperatives
The Rice for Job Programme is an initiative of His Excellency Governor Babatunde Raji Fashola (SAN), the Executive Governor of Lagos. The objectives were clear:

- Youth empowerment in Modern Rice Cultivation
- Putting Lagos on the map as a Rice Producing State
- Job Creation through Agriculture
- Gradual development of the Rural Lagos.

In 2008 the first year of the program two sites were selected: Iloka Processing site with Iloka as the processing centre in Ikorodu division and Itoin / Idena Production site with Idena as the Processing centre in Epe division.

We started with 65 farmers on 65 Ha at the Iloka site, while Itoin / Idena had 100 farmers on 90 Ha. Iloka had upland / hydromorphic ecology and was planted with NERICA 1 and FARO 44, Itoin on the other hand was a lowland ecology and was planted with FARO 52 and FARO 44.

Participants were drawn from across the state with an age range of between 25 and 55 years old. About 80% of the group were first time Rice farmers. Therefore the program started with training all participants in modern rice cultivation at their individual sites.

Lagos State supported the project with all the inputs needed from improved seed, land preparation, herbicides, fertilizer and technical back stepping both in Agronomy and Extension.

The Program is very grateful for the financial and moral support it enjoyed from His Excellency Governor Babatunde Raji Fashola (SAN)

Chief Enock K Ajiboso
Honourable Commissioner of Agriculture and Cooperatives
Special Appreciation

This pictorial report was put together to show case the humble beginning of the Rice for Job Project and to publicly appreciate the enormous support in financial and moral backing that the project enjoyed from His Excellency Governor Babatunde Raji Fashola (SAN), the Executive Governor of Lagos State, Nigeria without which it would have been impossible for the Project to see the light of day.

The project is equally grateful to the Honourable Commissioner of Agriculture and Cooperatives Chief Enock K Ajiboso for his listening ear and ever present support. The project would equally like to thank all Lagos State EXCO members that approved the project in March, 2008.

The project would like to equally appreciate the support and cooperation given to it by the Permanent Secretary, Mr Segun Onamuli, all Directors and participating staff at the Ministry of Agriculture and Cooperatives.

This initiative is unique in concept in that the project was housed in a Ministry but executed by a Consultant in conjunction with the Ministry staff but the farmers are the main benefactor.

The Report and Pictures were put together by Dr Okuwajo Orenjola Fashola
The Consultant, Rice for Job Project, on behalf of the Ministry of Agriculture and Cooperatives, Lagos State, Nigeria (August 2009)
A total of 155Ha was eventually planted by 165 farmers (both male and female farmers were involved). In Itoga each farmer was given 1Ha, while most farmers at Itookin had 1Ha, few of them had half hectare due to their inability to manage more than that.

- Labour scarcity during planting and at harvest was a challenge.
- The yields ranged from less than one ton to over three tons per hectare with the NEHICA having the lowest yields and as could be expected the lowland varieties had higher yields.
- The rainfall amount expected fell short and a longer dry spell was experienced resulting in massive drought during the growth stages.
- Blast as a result of the severe drought and variability in the management skill of the farmers accounted for the very wide yield differential.
- The paddies were bought back from the farmers and processed at the two processing centres of Ikoga and Idena for Itoiga production and Itookin / Idena production respectively.
- More than 1,000 people benefited directly and indirectly from the project.
- The table rice was sold as "EKO RICE" in 25kg bags.
- The project is extremely grateful to His Excellency Governor Babatunde Raji Fashola (SAN) for his continual support for the project.
The Future

- In 2009 and beyond the project will be mechanizing its planting, transplanting and harvesting operations to reduce dependence on manual activities.
- More boreholes would be made and water pumps bought to mitigate against the ever-increasing days of drought.
- With the population of Lagos State put at 18 million people and 32kg per capita consumption, there is no doubt about the enormous rice market opportunities existing in the state for both producers and processors of rice. However, the State Government will be a willing partner for any would-be investor in commercial production of rice in the state.
- At the Western, Eastern and far Eastern part of the state, there is a large corridor of over 5,000Ha available for rice cultivation.
Itoga Rice Production

LAGOS STATE GOVERNMENT
MINISTRY OF AGRICULTURE
AND
CO-OPERATIVES

"RICE FOR JOB PROGRAMME"

ITOJA SITE

Badagry, Lagos State, NIGERIA
Land Clearing at Itoga site April 2008

Manual Clearing was also done
Ploughing and Harrowing operations before distribution to Farmers

Honourable Commissioner declaring the farmers training open at Badagry town hall in May 2008
Consultant training the Farmers

Candell official Training the Farmers on how to use the Knapsack sprayer
Dr. Ndarubu spraying with the knapsack

A Farmer using the knapsack sprayer during the training
Making of farmer's plot tags

Extension officer training the farmers on rope making
Rope making by the Farmers

Farmers being trained on farm records keeping
A batch of Fertilizers supplied to Iloga site

Farmers collecting / applying fertilizer
Direct Manual Seeding / planting by Farmers

Young Seedlings: few weeks after seeding
NERICA at vegetative stage
Flash tapes for Bird scaring at milking stage
Matured Rice ready for harvest

Training on how to use the Rice Harvester
The harvester in operation

Harvested Rice
Paddy Rice collected from Farmers' plot.
Starting the Processing with cleaning

Cleaning of paddy before soaking
Honourable Commissioner briefing the Press at the commissioning of the Processing Center

Honourable Commissioner during the commissioning of Ikoga Rice Processing Center, 9th February, 2009
Soaking of paddy before Parboiling

Training on how to Parboil paddy rice
Parboiled Paddy Rice being packed for sun-drying.

Collection of Parboiled rice for drying.
Training on how to use the milling machine

Rice milling machine with de-stoner
Quality check of Rice by the Site Manager, Itoga

Eko Table Rice in bags
Briefing the Argentine investor and their Nigerian partners at Ikoga on 18th February, 2009

Argentine investors at Ikoga processing center
Dr. Osiname of ProPcom checking the quality of Eko Rice after processing at Ikoga, Badagry, 30th March, 2009

Dr. Osiname with ready for the market bags of Eko Rice on 30th March 09
ITOIKIN Rice Production

LAGOS STATE GOVERNMENT
MINISTRY OF AGRICULTURE AND COOPERATIVES
‘RICE FOR JOB PROGRAMME’
ITOIKIN SITE

Epe, Lagos State, NIGERIA
Briefing EXCO members and Guest at Itoikin by the Consultant

Visiting Dubai investors with the EXCO members at Itoikin
Farmers Selection Interview at Itokin

Training the farmers by the Consultant
Selected farmers being brief by the Director

Candell team training farmers on proper handling of agro-chemicals
Dr. Ndaru of Candeel training the farmers on how to use the knap sack sprayer.

Dr. Ndaru demonstrating spraying with knap sack sprayer.
A Farmer using the knapsack sprayer

Another farmer using the knapsack sprayer during training
Training the farmers on modern rice variety by the Consultant.

Group picture of selected farmers with the Directors.
The status of the land at Itokin before land preparation

Harrowing operations before distribution to Farmers
Soil sampling for Analysis by an Asst Director

Seeding into the nursery bed
Young Seedlings at the nursery bed.

Direct seeding on the field.
Micro-finance bank officials discussing with farmers

 Newly purchased power tillers
Transporting power tiller to the field

Cultivating the field using the power tiller
Uprooting rice seedlings

Uprooted seedlings wash ready for transplanting
Farmers during Transplanting

Rice vegetative stage
Matured Rice ready for harvest

Harvesting with Sickle
Harvesting manually

Locally fabricated Rice Threshers
Honourable Commissioner entering the processing center at Idena on the 18th of March 2003 for the Commissioning

Farmers welcoming the Honourable Commissioner
Honourable Commissioner and the PS inspecting the Parboiled paddy rice.

Honourable Commissioner briefing the Press at the commissioning of the Processing Center.
Dried paddy rice

Rice milling machine with de-stoner
Staff working with the milling machine

Eko Rice in bags
Bags of Rice paddy from farmers

Honourable Commissioner addressing the host communities of Idena and Itokin
Dr Osiname Consultant to ProPcorn at Idena rice center with staff and farmers on the 31st of March 2009

Farmers at the processing centre
For Enquiry

Please contact: Lagos State Ministry of Agriculture and Cooperatives Alausa, Ikeja, Lagos, Nigeria.
Email: lagosagricng@ymail.com

OR

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Email: rotimi01@yahoo.com
Mobile: +2348034549326
RICE FOR JOB PROGRAMME

EKO RICE

EKO O NI BAJE O
Appendix 21

Rice Production: special focus on the Lagos State Rice for job programme
A World of Opportunities For All Farmers

National Fadama development Project II (Fadama II) is a World Bank, African Development Bank, Federal Government, State Government and Local Government funded project. The main thrust of Fadama II is to sustainably increase the incomes of Fadama users through empowering communities to take charge of their own development agenda. The project will reduce poverty among beneficiaries through the adoption of the Community Driven Development approach; which will empower communities, especially women associations to play the role of primary decision makers, transparently decide on their development priorities, agree on how to address these in a socially inclusive and sustainable manner, and how to utilize the resources put at their disposal judiciously.

Benefits to Fadama Users

- Through the LDPEs, grants and other project assisted developments would be provided to the FCAEs
- Fadama resource users would be encouraged to acquire their own assets based on their LDPEs.
- Fadama resource users would be exposed to better training in the handling and management of their assets.
- Processing and storage facilities would be provided to minimise post harvest losses and to create value added to the products.

Benefits to Fadama Users

- Infrastructure such as good access farm roads, water supply system including irrigation and power support systems generators, water pumps would be provided.
- Where needed, transport vehicles for haulage of farm produce to markets would be provided.
- Empowerment and involvement of women and youths in their Local Community development process.
- Allows fundamental shift in control over resources and decision making to communities and making advisory services tailored to and accountable to users.
- Better management of natural resources and critical ecosystems to ensure that Fadamis are able to support livelihoods and biodiversity for a long time.
- Increase in the real income of Farmers, Fisher folks, Agro processor, Widows, youths, Pastoralists etc.

For enquiries contact:

Lagos State Fadama Development Office (LSFDO)
Agricultural Development Authority Complex (A.D.A)
Old Adekunle Motor Road, P. O. Box 3845, Agege, Oke-Ota Agege, Lagos State.
E-mail: lagosada@yahoo.com, lagosfadama@yahoo.com
Tel: 08033710212/3, 08021811180
Dear Ardent Readers,

Welcome to another exciting edition of your favourite magazine, Lagos Farmer. The saying is "Rice Production: Special Focus on the Lagos State Rice for Job Programme". Nigeria is said to be deficient in the production of most staple food items such as rice, maize, millet, etc. despite the fact that the country is blessed with rich soil and a climate that is suitable for most crops and rice. In order to reduce unemployment and provide nutritious food for its fast growing populace, the Lagos State Government, through the Ministry of Agriculture and Cooperatives, has taken the advantage of this promising opportunity to introduce the Rice for Job Programme. This programme has succeeded in creating direct and indirect employment for 200 and approximately 1,500 individuals respectively within and around the programme sites. It is believed that the global food crisis will bring the best out of Nigeria by looking towards and possibly spearheading the quest of farming an Organisation of Rice Exporting Countries (OPEC).

Detailed information on Grass cutter Rearing, Snail farming and the production of freshwater shrimps, Macrobrachium sp in Nigeria are some of the interesting articles featured. You can also read about how Fadama II, RITEF, NPF and CADP can further empower you. On a last note: remember to plant a tree today for a better tomorrow.

Happy Reading

Lukman Elia
Editor-in-Chief
RICE PRODUCTION: SPECIAL FOCUS ON THE LAGOS STATE RICE FOR JOB PROGRAMME

Rice is the most cultivated cereal in the world after wheat but remains the most important food crop for almost half of the world's population. Rice (Oryza sativa) is indigenous to Nigeria and has been in cultivation for the past 2,500 years. The earliest cultivation of an improved variety (Oryza sativa) started in around 1880 with the introduction of upland varieties to the high forest zone in Western Nigeria (Harcarce, 1999).

By 1980, Nigeria was almost self-sufficient in the rice consumed by the citizens. Two decades later, this self-sufficiency declined to 38%.

Nigeria is one of the many countries in the world with suitable ecologies for different rice varieties which can be cultivated to boost rice production to meet the domestic demand and probably for export. The country has a potential land area of more than 4.6 million hectares for the production of rice. However, less than 2.5 million hectares is being cropped for rice.

The cultivable land to rice is spread over 5 major ecologies:
- Rainfed Upland
- Rainfed Lowland
- Irrigated Lowland
- Deep Water Swamps
- Mangrove Swamps

In line with the mission statement of the Lagos State Ministry of Agriculture and Co-operatives which is to promote sustainable food production in a healthy environment through efficient service delivery, as well as, in alignment with one of the ten points agenda of the Administration of Governor Babatunde Raji Fashola, a special programme tagged "Rice for Job" was initiated.

The Rice for Job Programme commenced in January 2008 and is aimed at creating employment and strengthen the production capacity of existing farmers through rice cultivation. In the first phase of the programme, a total of 200 selected individuals have been directly engaged and provided employment opportunities. Indirectly, more than 1,000 individuals within and around the programme sites are presently benefiting.

The programme is being implemented at two sites, namely, Ikorodu in Epe division and Ilora in Badagry division with a total land area close to 400 hectares. From the cultivational area of the first production cycle, about 1,500 metric tonnes of paddy rice is expected to be harvested.

In order to sharpen the skills, improve the knowledge and change the attitude of the participants positively in the area of rice production and processing, a one-week training was organized at the commencement of
the programme. The training covered Group Dynamics, Record Keeping, Credit management, and Savings Mobilization, Principles of Improved Rice Production and Processing.

The total land area in Lagos State is 3660km² with only 1566km² cultivable, it still remains the commercial and financial capital of Nigeria. With the approximate population of 18 million people, Lagos State is the smallest in land size and the most populous state in the federation with a population density of over 5,000 persons per square kilometer. In addition, the per capita consumption of rice in Lagos State is 32kg per person per annum, the highest in Nigeria. With this demographic structure and demand for rice, it is obvious that there will always be a ready market for food items especially rice in the state.

Lagos State has a flat to nearly level topography but an undulating topography can be found around the eastern part towards Eredo in Epe division. The climate and vegetation of Lagos State is suitable for investing in rice production, processing and marketing. The soil type is loamy; it is of high fertility as well as all year round water availability is another major advantage of Lagos State in rice production.

The farming system in Lagos State which tends towards intensive production as a result of pressure on land makes high value crops such as vegetable and rice more suitable for cultivation when compared to other crops. Some areas suitable for rice cultivation in Lagos State are:

- Lekki axis - about 100ha
- Ikola, Agbovia axis - 2000ha
- Ikota, Eleko axes - about 1500ha
- Iloga-Ara/Adigun axis - 500ha
- Isandola, Ijirin, Ikeja, Ilupeju, Iba, Ajiwe, Egan-(Onomi, Ibehe, Iyagbo, etc. - 2000ha

Some opportunities available to investors in Lagos State in the area of rice include:

- Rice milling cottage industry installation
- Technical back-up and input supply.
- Capacity building for stakeholders
- Intensive Rice Production
- Paddy rice processing
- Rice packaging and marketing
- Rice by-product processing and marketing e.g. Rice Husk for briquette (energy)

**CHOICE OF RICE VARIETY**

The successful cultivation of rice starts with the choice of the variety for the right ecological zones, biological and physical stresses. This will ensure that such chosen variety exhibits its yield potential. A total of 52 rice varieties are high yielding, pest and disease resistant have been developed and are available for commercial production. The choice of variety should be made in such a way as to meet the desires of the farmers.

**SITE SELECTION**

Lowland rice varieties will do well in fertile lands with moderately high water holding capacity. Such soils are found in the Kado, Ikorodu river valleys and flood plains, they normally have a slightly high clay content. Lands to be used for upland rice cultivation must be fertile and free draining but with a good water-holding capacity.

**LAND PREPARATION**

Rice fields can be prepared either under dryland or wetland condition. For upland rice, land preparation is usually under the dryland condition while land preparation for the cultivation of lowland rice can be made under either dryland or wetland condition depending on whether direct seeding or transplanting is to be done. Good control of perennial weeds is achieved when the land is prepared (ploughed) immediately after the crop is harvested. This operation exposes the rhizomes of the perennial weeds to the scorching action of the sun.

The objectives of land preparation are to:

1. Control weeds.
2. Mix rice straw, stubbles and weeds with the soil.
3. Incorporate fertilizers and sometimes granular insecticides with the soil before planting.
4. Make the soil surface soft for transplanting seedlings.
5. Create a hard ploch on "below the puddled soil to minimize losses of water and plant nutrients through leaching.
6. Level the land to obtain uniform water depth throughout the rice field.

**STEPS ON LAND PREPARATION IN LOWLAND RICE CULTIVATION**

Land preparation should start three to four weeks before transplanting. The first step is to irrigate the field a week before initial land preparation, that is ploughing. The irrigation is to allow just enough water to soften the soil. After ploughing, the field is flooded to hasten decomposition of weeds and crop residues that have been ploughed under. The field is then kept flooded until puddling and
THE POWER TILLER TECHNOLOGY

The power tiller is a working tractor which will greatly reduce drudgery in wetland/lowland preparation. It puddles and levels the soil for good water management and destroys selected weeds. Thus, giving the rice a better head start. Where the water is well managed, the transplanted rice seedlings will have close to one month of wood-free environment and on the whole, the weeding is reduced to one major weeding.

NURSERY ESTABLISHMENT

This is only necessary for transplanted rice. Prior to raising seedlings in the nursery, clean, fitted and healthy seeds of desired varieties must be selected. The viability of the seeds should be tested by using either Ragdoll Seed box or Petri-dish methods. Seeds with less than 60% germination should not be used for direct seeding or for raising nursery except there is no other source of good seed. Rice seedlings can be raised in two ways:

- Webed
- Drybed

The commonly used method is the webed. The seedbed which is usually 1.2 metres wide and of any convenient length is prepared by puddling the soil. Pre-germinated seeds are evenly broadcast on the bed. The seeds can also be sown in rows of 10 cm apart by using the planting frames. The seeds should be covered with grass straw for the first seven days to avoid seedling damage during germination. Recommended fertilizer rate for nursery bed is 50 gm Urea, 100 gm of ammonium sulphate or 160 gm of NPK per square metre of the seedbed. Seedlings are uprooted for transplanting between 21 and 28 days after seeding.

METHOD OF CROP ESTABLISHMENT IN THE MANGROVE SWAMPS

Direct Seeding:

Direct seeding in the mangrove is usually by broadcasting. Pre-germinated seeds are broadcast into puddled fields with or without standing water. Stand establishment is generally poor because of poor land preparation, poor water control and at a later state, weed infestation.

Transplanting:

Seedlings are first cultivated in the nursery and transplanted at a suitable stage of development. Traditionally, mangrove swamp seedlings may be allowed to grow for up to 12 weeks in the nursery to minimize damage caused by crabs and ensure survival in tidal conditions. Wetted and dried nursery seedlings are usually transplanted to the mangrove.

SPACING

Many factors affect the spacing of either direct sown or transplanted rice. Varieties that are of short duration and low yielding are planted at closer spacing. Seedlings are planted at closer spacing during the dry season. Closer spacings are used for old seedlings or when the soil is poor. However, during the wet season, or when young seedlings are planted or when long duration and high yielding varieties are planted, wider spacings are used. Generally, a spacing of 20 cm x 20 cm is used for transplanted improved high yielding varieties while a spacing of 25 cm x 25 cm is recommended on the farmers' field. For upland varieties a spacing of 20 cm x
Table 1: Factors affecting spacing of rice

<table>
<thead>
<tr>
<th>Crop</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short duration and low lifting</td>
<td>Close</td>
</tr>
<tr>
<td>Long duration and high lifting</td>
<td>Wide</td>
</tr>
<tr>
<td>Wet season</td>
<td>Wide</td>
</tr>
<tr>
<td>Dry season</td>
<td>Close</td>
</tr>
<tr>
<td>Fertile soil</td>
<td>Wide</td>
</tr>
<tr>
<td>Less Fertile (Poor) soil</td>
<td>Close</td>
</tr>
<tr>
<td>Old seedlings</td>
<td>Close</td>
</tr>
<tr>
<td>Young seedlings</td>
<td>White</td>
</tr>
</tbody>
</table>

*The spacing commonly used for transplanted high yielding varieties is 20 cm x 20 cm while 30 x 30 cm is used for dry seeded.*

15 cm is recommended.

**SEED RATE**

Upland rice or direct sown lowland rice is established by either broadcasting, drilling or dibbling. Seed rate varies with the establishment method used. For example, a seed rate of 50-100 kg per hectare for broadcasting and drilling and 50 kg - 60 kg seed per hectare for dibbling under normal conditions are recommended. Fifty kilograms of seed per hectare have been found to be optimum as seed rate under the lowland conditions.

**WATER MANAGEMENT IN LOWLAND RICE**

Water is the most important factor in rice production. It affects the physical characteristics of the rice plant, nutrient status of soil, nature and extent of weed growth and various cultural practices. Water management in relation to some plant characteristics, grain yield, pest and disease control are discussed below.

**WATER MANAGEMENT FOR WEED CONTROL**

Controlled water management minimizes weed infestation if not totally, suppresses weed growth. The most critical period during which weed growth should be suppressed is from transplanting to the formation of closed canopy (about 25 - 30 days after transplanting depending on variety). The field should not be allowed to dry within this period.

**FERTILIZER MANAGEMENT**

At the time of fertilizer application, the water level in the paddy must be maintained and kept at 2 - 5 cm. Otherwise, fertilizer materials will tend to flow towards the side of the paddy during incorporation. The 2 - 5 cm water level will ensure that the fertilizer materials are brought close to the soil particles to enhance nutrient absorption and minimize losses.

**HARVESTING**

There is conclusive evidence that both early and late harvest are detrimental to both the grain yield and the milling returns of rice. Therefore harvesting should be done when 80% of the grains have turned to straw colour or approximately between 30 and 42 days after heading in the wet season and between 28 and 34 days after heading in the dry season. The earlier dry season harvest is due to higher temperature and solar radiation during the opening period. Harvested rice should be packed from the field immediately or tied into bundles and chained upright to avoid the seeds from coming in contact with the moist soil and preventing the germination of the seeds of rice varieties that have little dormancy. After drying for 3 to 4 days on the field, threshing, winnowing and storage at 14% moisture content should follow.

**RICE PROCESSING**

The urban centres are demanding for good quality rice. An important area for increasing output of acceptable quality of rice and improving the income of rural farmers is to improve the traditional methods of processing rice.

Dr. Rotimi Fashola  
Consultant, Lagos State  
Ministry of Agriculture & Cooperatives  
(Email for Ask Processors)

Dr. Ojide Basarun  
Programme Manager  
Lagos State Agricultural Development Authority

*Plant a tree today, Eko o ni toba.*
RICE PRODUCTION AND PROCESSING AS A BUSINESS

INTRODUCTION
It is no longer news that rice has become a major staple food in Nigeria just as it is all over the world. It is the staple food of urban people because of population migratory patterns and the increasing incidence of urban centres.

The average supply of rice in Nigeria today is about 3.2 million metric tonnes while the demand figure is about 11.2 million metric tonnes. The present rise in the cost of grains, rice inclusive, is a clear evidence of grain shortage in Nigeria with rice constituting a major component.

RICE PRODUCTION
Here, the basis of production consideration is one hectare. Of course, it is possible to go medium scale (5 to 10 hectares) or large scale (over ten hectares). However, it is assumed that a medium or large scale enterprise will start small and test, briefly study and large financial outlay. Although the above activities are not discouraged for those who are new to this area, the small scale方法 is recommended until proven successful.

In production activities, the farmer will have to consider the production costs as well as sales revenues. The figures used below are standard for a specific location in Lagos State which has been found to be applicable to the South Western Agro-ecological zone of Nigeria.

RICE PROCESSING
When venturing into commercial rice processing on a small scale an estimate of N50m would be required for fixed assets which include machinery, tools and other infrastructures as highlighted in table 2. The fixed costs would be off-set over a period of time and could be financed through a co-operative society or a community based joint financial arrangement.

<table>
<thead>
<tr>
<th>Table 1: RICE PRODUCTION DETAILS FOR AN HECTARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td>Land clearing - primary cut</td>
</tr>
<tr>
<td>Land Preparation</td>
</tr>
<tr>
<td>Material inputs (seeds, agro-chemicals, etc.)</td>
</tr>
<tr>
<td>Labour</td>
</tr>
<tr>
<td>Total operational cost</td>
</tr>
<tr>
<td>Yield per Hectare</td>
</tr>
<tr>
<td>Processing cost</td>
</tr>
<tr>
<td>Produce recovered</td>
</tr>
</tbody>
</table>

The variable costs however, are the important determinants of the profitability of the rice processing venture. The paddies rice for processing could be from a hired farm or procured from other farmers. A current study by the Ministry of Agriculture and Co-operatives in Lagos State shows that a total operational cost for rice production is approximately N190,000.

It was also established by the study that the yield per hectare could be as high as 4 tonnes. The value of which is estimated at N270,000. By adding value to the paddy rice, with roughly N100,000 for the processing of 4 tonnes, the 2.5 tonnes milled rice recovered will worth well over N475,000. In unforeseen circumstances, the production cycle of rice from planting to market is 5 months.

<table>
<thead>
<tr>
<th>Table 2: RICE PROCESSING MACHINERY/EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Machinery</td>
</tr>
<tr>
<td>* 1 tonne/batch capacity parboiled with brown rice furnace</td>
</tr>
<tr>
<td>* Rotary steam dryer with 1 hp electric motor and double reduction unit</td>
</tr>
<tr>
<td>* Rice winnowing with 1 hp electric motor</td>
</tr>
<tr>
<td>* Rice Mills with husk aspirator and turner having 10-20 hp electric motor</td>
</tr>
<tr>
<td>* Installation and testing</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

B. Other Structures
- Generator (10KVA) | N400,000 |
- Bunker with overhead water storage | N200,000 |
- Concrete drying arch | N40,000 |
| Sub Total | N1,420,000 |

C. Miscellaneous Items
- 100kg capacity weighing scale | N250,000 |
- 240kg bag seaming machine | N230,000 |
- 50kg plastic bag masticator | N70,000 |
- Plastic bags and plastic carry Straps | N70,000 |
| Sub Total | N550,000 |

Grand Total for Unit | N2,445,000 |
A. Machine | N2,445,000 |
B. Other structures | N1,420,000 |
C. Miscellaneous Items | N550,000 |
| Total | N4,415,000 |
Poultry Association of Nigeria
LAGOS STATE CHAPTER (PANLAG)

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2nd Annual International Poultry Exhibition & Conference

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Special Guest of Honor
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E-mail: justb144@yahoo.co.uk
THE CABINET FISH SMOKING KILN

The cabinet fish smoking kiln is both an indoor and outdoor fish smoking structure with a capacity of approximately 20°C (68°F) fish with a maximum smoking duration of 8 hours at a temperature of about 80°C. It is insulated with iron sheets of 1.7mm (16 gauge) and 0.9mm (14 gauge). It has a double wall and a lagging material (sawdust or sawdust or burlap) between the walls which allows for the retention of heat within the cabinet. The cabinet sits on a base constructed with 50°C (122°F) iron rods.

The cabinet fish smoking kiln is designed to smoke fish in large scale rice production and processing.

A Flowchart of Fish Smoking

1. MATURE CATFISH
2. STUNNING (by Draining or Stinging of Fish)
3. DECAPITATING
4. CLEANING (Removal of Scales)
5. SLICING INTO SHAPE
6. CUTTING INTO CHUNKS
7. DRAINING (in a lever)
8. PUT DRAINED FISH INTO OVEN & ALLOW TO COOK
9. STORE IN AN AIR-TIGHT PACKAGE

For effective and efficient use of the Cabinet Fish Smoking Kiln, observe the following precautions:

a. Clean the cabinet thoroughly, especially the interior, before and after use.
b. Wash the fish thoroughly and rinse them if necessary, depending on the type of fish and the purpose for smoking.
c. Salt the fish.
d. Use some vegetable oil on the trays to prevent sticking.
e. Pre-dry the fish for 30 minutes before placing them in the cabinet.
f. Inspect the fish periodically and interchange the fish from the top to the bottom and vice versa to prevent charing or smoking.
g. When the fish is properly smoked, remove them from the cabinet immediately.
h. Always clean the cabinet immediately after use.
i. When inspecting the fish being smoked, avoid opening the cabinet immediately if it is opened.
j. Use heat gloves or protective materials when removing the hot trays.
k. Maintain a high level of hygiene at all times.

Continued on Page 22
Farm Sanitation And Integrated Farm Waste Management

Being a nation with vast agricultural potential, one form of agriculture or the other is being practiced in both the urban and rural environments of Nigeria. Lagos State is not an exception to this phenomenon and it is therefore not unusual to find agricultural activities such as fish farming, fish processing, livestock rearing and processing, vegetable gardening in the metropolis. In addition to this, Lagos being a coastal state, aquaculture activities are carried out in the urban communities that are close to the fishing water bodies. In addition, Aquaculture is becoming a viable source of environment for urban communities as more people now practice homestead fish farming.

Agro-allied activities in Lagos State in terms of volume have also increased in recent times as a result of the renewed interest of both the public (government and her agencies at all tiers) and private environment for agricultural development. One of the major effects of these interventions is the attraction of more people into agriculture, especially into livestock, fishery and agro-allied farming. Associated with this increase in activities is the level of waste that comes out of these farming enterprises.

There is a general lack of awareness of the negative effects on the environment and vice versa. The negative effects are mainly the result of improper farm waste management and unhygienic farm environment.

There is the need to know that the high bearing of man does not depend only on the food he eats but also effects of the environment on him. Therefore, the interaction between the environment and farm sanitation exercise: waste management in relation to the farmer is of concern, and should be adequately addressed. This effect on farm animals is also of economic importance and farm sanitation need to deal with diseases like African Swine Fever and Bird Flu. Thus, non-resemblance to the improved farm waste management practices, as well as the need to maintain hygiene and farm sanitation will lead to the plethora of the environment as a result of the effluents and solid wastes that are associated with agricultural practices.

Farm sanitation
Farm sanitation simply means farm cleanliness or hygiene and the opposite is dirtiness, messiness or filthiness. Farm sanitation is better understood when the full implications of the impacts of what dirtiness could have on the products, environment, producers, as well as, the consumers. Farm sanitation exercise must be integrated into activities that would result in keeping the agro-related environment in a tidy condition at all times. Rubbish heaps, uncovered or over...
Agricultural enterprises operating in a hygienic environment have a comparative advantage to get assistance from both government and non-governmental organisations.

Reduction in the hazards/dangers associated with the processing and production activities.

Well maintained tools, equipment and other production processing materials would have longer shelf life.

Frequency of farm sanitation exercise could be daily, weekly or monthly, depending on the activity. The frequency of vacuum aspiration is however higher in livestock/fish production and all processing activities than in crop production. In some instances, vacuum of the environment, tools and equipment could be as short as after every operating cycle (e.g. in meat or fish-processing). Again, the fishing gear and crafts must be washed with soap and clean water immediately after every fishing operation. Proper methods including the use of pressurised spray is important for good growth of the fish and therefore proper drainage is important in fish ponds.

The method of farm sanitation exercise to be employed must take cognisance of the environment, as well as the target products. For example, it is dangerous to use toxic agro-chemicals for cleaning processing tools and equipment. Again, an integrated pest management (IPM) approach which is environment friendly should be considered ahead of other approaches in crop pest management.

The observance of farm sanitation practices starts from the planning stage of the farm, where necessary infrastructure that would make the exercise relatively simple, uncomplicated and straightforward for the personnel should be provided. Thus, adequate provision must be made for drainage, fencing of the production/processing area, setting of the windows, etc. Dustbins have to be provided at strategic points on the farm, especially in livestock and fish production processing. In addition, every agricultural enterprise must have a toilet facility and a regular supply of water.

Dumper sites should be used in a strategic location within the agro-ecological environment such that the wastes would not be a source of contaminants to the products. Wastes generated from an agricultural enterprise that has potential to cause pollutants or release odour should be kept in sealed packages if they are to be kept on the farm for some time without final disposal.

Great caution must be observed when carrying out the sanitation exercise. Farm sanitation exercise may be accompanied by danger to the person carrying it out, other members of the public and the environment in general. Apart from the physical injuries, some of the chemicals that are being used can be poisonous. In other words, it is necessary that blanket approvals be obtained from such agencies as the state government, whose officials and bystanders are involved in this activity. There are also some chemicals that are banned and should be avoided. Examples are industrial and organochlorides.

Integrated Farm Waste Management

Integrated Farm Waste Management (IFWM) is being developed as a response to the national need for recycling and disposing farm wastes. Farm wastes were becoming too much to handle and the probable negative effects of wastes on the health of farmers, farm workers, consumers and animals, as well as, the impact of improperly disposed wastes on the environment must be of great concern. Farm wastes, being 50% organic matter and always wet, decomposes rapidly and is most offensive and an ideal breeding ground for pests. Essentially, IFWM
In an approach where the various components and items of farm wastes are dealt with in the most energy efficient and least polluting ways, when several methods of managing farm wastes are used together, the methods are said to be integrated, hence the term Integrated Farm Waste Management. IFWM subsequently developed into a methodology in which farmers were encouraged by financial interventions to themselves in the process of coming to a better understanding of their agro-environment. The IFWM is also focused on the premise that most of the waste from the farm is still of value. The hazards of improperly managed wastes were far greater in livestock production and processing activities.

Energy and material in animal and non-animal form in non-interest or non-useful form (in the wrong place) is what we normally refer to as "pollution". In most instances, it is not the agro-allied production themselves that cause environmental problems, but the poor management of wastes. Proper farm waste management is most important in the prevention of disease in all its ramifications. That is, for both humans and livestock.

In order to create an environment that encourages farmers to adopt IFWM, the problem of reaching out to them with the latest technologies on the use of the farm wastes must be addressed. The relevancy of IFWM projects goes beyond waste disposal techniques, it also deals with getting economic and social value from the waste in a friendly environment.

The array of both proven and promising IFWM technologies developed by innovative researchers and indigenous farmers, offer considerable potential for reducing negative impacts of the waste on the environment.

1. How to incorporate local knowledge and values; 2. Innovative IFWM research into the farming systems.

6. How to mobilize such agro-allied practitioners in order to help scale up such initiatives as described above and making a larger macro-regional impact possible and; 7. How to make a socio-political reform that will deal with proper waste management. These include establishment of waste recycling industries, the sound research on the management and quality control of agro-allied establishments for the farmers.

The wastes can be generated through sanitation exercise as well as from the daily operation of an agro-allied establishment. It could be in liquid, gaseous or solid form.

Highlighted below are some of the wastes that could be generated from some agricultural sectors. The twin goals of IFWM are to:

- Return as much as possible the energy and materials in the wafer and;
- Avoid releasing the energy or material into the environment as pollutants. The challenges in making use of IFWM would be:

IFWM sets up a hierarchy of approaches and technologies for managing waste in order to meet the two goals above.

The highest option in the hierarchy is not to create the waste in the first place, and is termed "source reduction". Generally, the further up the hierarchy from which the technology, in general, the more beneficial it is to the environment and the economic value.

Although farm waste cannot be completely eliminated in agro-allied activities but could be reduced by observing environmental friendly agro-practices such as the use of bio-coproduction materials. Efforts could be concentrated yet. "Recycling" and "Reusing" technologies which are interestingly in the upper section of the hierarchy.

There are so many proven technologies in agro-allied industries that lend themselves to the upper part of the hierarchy. For example, wasted wastes and sludges from farms are better incorporated into the soil as a source of organic matter, which in "Recycling" would be considered ahead of recycling where external resources would be required to make the waste useful. Another good example of recycling technology is the use of water from...
Freshwater Shrimp (Macrobrachium) Farming: The Culture, Operations and Future Prospects in Nigeria

Historical Perspective

Nigeria, being in the tropics, has an abundance of marine and freshwater indigenous shrimp species, many of which can be artificially propagated and cultured all the year round.

According to an FAO/World Bank feasibility report (1982) for the Federal Department of Fisheries, there was about 160,000 hectares of land that could be put to shrimp farming in Lagos State alone. In the recent past in Nigeria, fishery researchers, policy makers and planners focused mainly on fin fish culture with little or no attention on shrimp farming.

Since there are great demands and attractions for shrimp with high premium in the international markets, e.g., Japan, USA, Britain, etc., there has been a tremendous pressure, through

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believes in empowering you to be your best in the Agricultural Sector. This is achieved through the following services:

Advisory services through our numerous extension agents represented in the nooks and crannies of Lagos State.

Linkages to credit facilities, markets, input sources, solutions to agricultural problems and trainings.

Dissemination of current agricultural technical messages in print (e.g. Lagos Farmer, Extension Guides) and electronic media (Boluyo).

Advertise your products & services on our Yoruba Agricultural Radio Programme (BOLUYO) which is aired every Friday on Radio Lagos 107.5FM between 5 25-6 35pm

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EMPOWERING FARMERS TO ACHIEVE SUSTAINABLE FOOD SECURITY AND ENSURING EMPLOYMENT FOR THE CITIZENS

For further details please contact

LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY

P. O. Box 3845, Oga-Oba, Agege.
Tel: 234-1-390-5051, 234-1-353-4002, E-mail: lagsada@yahoo.com
website: www.isads.org
Lagos State Commercial Agriculture Development Project (CADP)

"Enhancing the Commercialization of Poultry and Aquaculture"

Commercial Agriculture Development Project (CADP) is a World Bank Assisted Project that is presently being implemented in five states of the federation: Lagos, Kano, Kaduna, Enugu and Cross River using the bottom to top approach to agricultural development.

The primary objective of the project is to strengthen agricultural production systems and facilitate access to markets among participating small and medium scale commercial farms in the targeted states.

The project will support activities that will bring about improvement in the productivity of 3 major enterprises in Lagos State: Poultry and Aquaculture, as well as, Rice viz. production, processing and marketing. The project will support the provision of Rural infrastructure, through the provision of rural network of roads and energy.

The Matching Grant

The Matching Grant is being used for regions in the Bank as an instrument for meeting part of the funding needs of agricultural and rural development.

Objectives Of The Matching Grant

- To support the adoption of existing technologies and build capacity of small and medium scale commercial agricultural farmers, thereby enabling them take advantage of market opportunities for the produce.
- To support agricultural production and commercialization.
- To serve as a one time capital grant to eligible beneficiaries.

Areas to be supported by the Matching Grant

- Aquaculture: Fingerling production and hatchery development.
- Poultry: Fish feed production, Fish smoking, drying and packaging.

For enquiries contact:

Lagos State Commercial Agricultural Development
Agricultural Development Authority Complex (A.D.A)
Old Abeokuta Motor Road, P.O. Box 3846, Agege, Oshodi-Isolo, Agege, Lagos State.
Tel: 08032939271, 08033251515, 08033250985.
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For more information, contact:
Lagos State Coconut Development Authority (LASCODA) Block 9, 2nd floor, Old Secretariat Complex, Oba Akishobi Way, G.R.A. Ikeja, Lagos, Nigeria
Tel: 01-8151485, 08023189550, 08023246639
Table 1

<table>
<thead>
<tr>
<th>Size</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine 500 micron</td>
<td>7 - 10</td>
</tr>
<tr>
<td>Medium 710 micron</td>
<td>10 - 14</td>
</tr>
<tr>
<td>Large 1060 micron</td>
<td>14 - 30</td>
</tr>
</tbody>
</table>

**Sources of hatched females**

The collection of hatched females may either be sourced from production ponds or from the wild. The state of the animals is a very important factor, therefore animals that are healthy, well pigmented and carrying egg masses or preferably animals above 11cm in size are considered for this exercise. The eggs should be grey or brown in colour. The sizes of the females should be removed before they are transported into hatchery. These animals are disinfected in 1% lime solution for 10 minutes as a prophylactic measure and control against the presence of undesirable protozoa and fungi. Animals are then finally shocked in the female hatching tank of 8pt salinity.

**Female Hatching Tank**

The starting density of hatched females in FHT is one female to every 10 ltr of water. With an appropriate number of hatched tomosae in the FHT, the tank is then covered with a black polythene sheet. During this period, tomosae are not fed until they finally discharge their eggs. Hatching of eggs is always observed in the morning and female always swim towards light (phototropism)

**Larval Rearing Tank**

The freshly hatched larvae are subsequently transferred to a quantity of 12-14 ltr in the LRT. Most of the larvae metamorphose in post larvae (plz) between 23 & 30days in the LRT.

It should be noted that the time taken for the larvae to metamorphose depends on the salinity and environmental conditions especially temperature.

**Acclimatization Tank**

The post larvae require a gradual decrease in salinity before they are transferred to the nursery pond at 0ppt salinity from the Acclimatization Tank.

**Feeds and Feeding Regime**

Feeding of the larvae commence from the second day to the sixth day with Artemia food only. Thereafter, the prepared food is added to the diet of the animals. It is necessary to prepare Artemia food a day before the actual feeding.

**Composition of Compounded Diet**

- **Shrimp Larvae**
  - 10gm of cod liver oil
  - 4gm medium sized eggs
  - 4gm bone meal
  - 1gm vitamin C
  - 25gm Vi-ta-tone granules
  - 17.5 gm Aminoacid

**Larval Environment**

- **Salinity:** An earlier mentioned, salinity of water in the hatching tank must be 8ppt. This salinity triggers off the physiological changes in the hatched females to spawn within 24 hours. Subsequently the newly hatched larvae are transferred to a rearing tank of 12-14 ppt for 35 days which allows the larvae to metamorphose to post larvae (plz). The plz in the acclimatization tank of 8ppt, go through 5 additional stages and adjust their osmo-regulation when the salinity is progressively reduced to zero.
- **Temperature:** Within a selected temperature, larva grow and moult more quickly as temperature increases. The optimum temperature range is 29°C - 30°C. Below 24°C - 26°C the larva will not grow well and the time to obtain metamorphosis will be longer.
- **Oxygen:** Oxygen in the LRT water should be maintained as close as possible to saturation. The aeration system must be turned off for a period only for observation of the larvae and during the cleaning of the tanks.
- **Water Quality:** The changes in the dissolved water quality of LRT are due to the metabolic wastes produced by the degradation of excess food. Some of them might be extremely harmful to larvae. To maintain good water quality the following must be observed:  
  - do not overfeed
  - exchange 50% - 60% of water volume daily
  - turn off the air supply to all the solid particles to settle, and
  - alkaline surplus food particles and metabolic wastes from the bottom of the tank in the morning.

This article shall be continued in the next edition.

**Lukman Bello**

Deputy Director (Extension Services)

LASADA
THE CABINET FISH SMOKING KILN
THE FISH SMOKING BUSINESS: COST IMPLICATIONS

REQUIRED EQUIPMENT

<table>
<thead>
<tr>
<th>AND TOOLS</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cabinet Smoking Kiln</td>
<td>150,000.00</td>
</tr>
<tr>
<td>2. Kinives (15 pieces)</td>
<td>1,200.00</td>
</tr>
<tr>
<td>3. Weighing Scale</td>
<td>3,000.00</td>
</tr>
<tr>
<td>4. Rain Proof Cover</td>
<td>2,500.00</td>
</tr>
<tr>
<td>5. Sealing Machine</td>
<td>5,000.00</td>
</tr>
<tr>
<td>Total</td>
<td>162,000.00</td>
</tr>
</tbody>
</table>

The Cabinet Smoking Kiln can contain 200kg of fish and the smoking duration for this number is 6 hours. If well processed, 45kg of smoked dried fish can be obtained from 200kg of fresh Catfish. This implication is that the cabinet can process 200kg of fresh Catfish in 12 hours. With the current market price, 1kg of well-smoked dried fish can be sold for N2,000.00. In other words, if the cabinet is in operation at full capacity, the 90kg of smoked dried fish obtained within 12 hours could be sold for N192,000.00. Other operational details for processing 100kg of fresh Catfish are highlighted below:

1. Estimated Cost
   - 3 trays of Catfish: 3,000.00
   - 400kg of fresh Catfish: @N40/kg: 160,000.00
   - Vegetable Oil: 500.00
   - Labour and other: 1,800.00
   - Total: 178,500.00

2. Projected Revenue
   - 90kg of well smoked dried Catfish at: N2,000/kg: N180,000.00

Therefore, the smoking kiln is in operation for N178,500.00. However, a total profit of N1,500.00 is realized. The profit is not as favorable in the short term. With the kiln, the initial capital cost of the equipment and tools can be deployed after the first month of processing operations with the use of the cabinet smoking kiln.

Tobiloba Olusanya
Head, Agro-Processing Sub-Committee
LSAADA

Oroolokhe Balogun
Director, Master Specialized (Agro-Processing)
LSAADA

LSADA/UNAAB/NESTLE SOYA BEAN PRODUCTION POPULARIZATION IN LAGOS STATE

A giant step was taken in the 2008 planting season by the Lagos State Agricultural Development Authority (LSAADA) in collaboration with the University of Agriculture Abeokuta (UNAAB) and NESTLE Nigeria Plc. in the area of popuclarization of soybean production in Lagos State. Farmers in Lagos State are now making an impression of optimizing profit from soybean production considering the fact that numerous companies that use soybean as one of their major raw materials are in this state. Again, since soybean is highly rich in protein, with low cholesterol, it is considered a good substitute for eggs and other beans (and is thus always costly in the market).

Soya bean is an important leguminous crop primarily produced for its protein and oil contents. The demand for soya beans is now high in view of the high cost of other sources such as cowpea, eggs, pork and beef.

The erroneous belief that soya beans cannot grow well in Lagos State has been punctured by a lot of farmers. Figures that show that recommended agronomic practices are adhered to a bumper harvest on soya beans is feasible in Lagos State just as in any other part of the country.

It is in line with this that the Agricultural Media Resource Centre (AMREC) of UNAAB, NESTLE Nigeria Plc and the Lagos State Agricultural Development Authority are supporting some farmers for the cultivation of 100 hectares of soya bean in Badagry division of Lagos State in the 2008 planting season. The support given to these farmers ranges from training on recommended practices for soya bean production, input supply on a cost recovery basis, technical back-stopping and assurance of market for the harvested grains.

George Tanko
Zonal Extension Officer (West) LSAADA

Adetimot Adegbeso
Extension Agent (Badagry) LSAADA

Seminar on how to earn a lot of money Breeding Snails & Rearing Grasscutters!!!

Date: Every Saturday

Venue:
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Sango Ota, Ogun State.

Time: 10:00am

Fee: N15,500 (Practicals, Manuals, VCDs, etc)

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www.thythconsulting.com
Tel: 01-7653994, 08023050835

Plant a tree today, Eat it on holiday!
Tips on Grasscutter Rearing

G. senegalensis is a micro livestock that has gained popularity in recent times as it is very easy to rear with less risk of disease infection. It has a high multiple birth rate of at least 10-11 offspring per breeding period.

The demand for grasscutter meat is so large that it is not being met. Market for it exists all over Nigeria especially in the South West where it is popularly known as bush meat (Edan tpile). Apart from the money realized from sales, it is one of those animals that are almost wholly edible. Most of the parts can be eaten except for the claws, feet and fur.

Grasscutters are highly medicinal in

Tips on Snail Farming

Snail Farming or Agriculture is best described as the rearing of domestication of snails for family or commercial use.

The two main breeds of snails are:
- Achatina fulica (slipper snail)
- Archachatina marginata (giant snail)

Snails are hermaphroditic but they do not self fertilize. Cross fertilization has to occur between two sexes through copulation. The percentage hatchability of small eggs in a well-managed breeding should not be less than 70%

Steps involved in the management of snails are:
- Breeding
  1. The soil should be watered to make it moist (not wet)
  2. Small eggs should hatch within 24-35 days
  3. Snail hatchlings should be fed on food plan leaves, pears, leaves etc. at the early stage of life because these leaves are soft
  4. Ground source of calcium must be provided to assist shell development.

Steering Rule
- 1-2 mature snails/square meter for
  - 12-20 organizing species

Medicinal purposes
- Eggs are used for piping, supreme bran: 1.° 2.° 3.° 4.°

Age of snail is rearing
- Age 6 months is best required for healing (matured)

Such as low temperature and high humidity experienced during the rainy season predisposes grasscutters to various diseases, such as the following:

1. Pneumonia
   - This is caused by a bacteria, Diphtheria pneumoniae, and is prevalent during the cold season. Droughts, rains and cold weather affect the body antibodies, thus they succumb to infection easily. The solution to this disease is to provide shelter and warm environment and incorporating oral antibiotics like Terramycin in the water.

2. Coccidiosis
   - The young grasscutters are affected by this disease as well as the fattening ones. This is common in farms where the rearing is done, litter is not properly managed and sanitation is poor. There is a build up of Eimeria organisms and the faeces exerted by these animals can show blood tinge. This situation can be controlled by giving Coccicid inosital to these animals.

Sanitation should be improved upon by the prompt removal of dirty litter and replaced with fresh manure.

Plant a tree today. Eko ni boi!
EFFECTIVE STEPS IN ATTAINING A SUCCESSFUL AGRICULTURAL BUSINESS

With the importance being attached to the agricultural sector in developing countries, agriculture is now being viewed on a business venture. For agriculture to be a business venture, the practitioner must observe the following as the tenets of the activities:

1. AGRICULTURE AS A BUSINESS:
   - It is not a way of life and profit is the primary motive;
   - Ensure thorough supervision and continuous operation at all times, even when absent;
   - Stay on the right side of the law, obtain necessary permits;
   - Establish agricultural business on the basis that is not out of reach;
   - Choose agricultural enterprise that has the potential to deliver substantial returns based on the financials available;
   - Conduct a feasibility study to develop a sound business plan which will set targets, identify possible constraints and how to overcome them, etc;
   - It always pays to start small no matter the business at one disposal as this helps to reduce the risk of losing because the farmer grows in experience and knowledge.

2. APPLICATION OF RELEVANT TECHNOLOGIES:
   - New technologies reduce drudgery, maximized output of production and optimizes the rate of return on investment in agricultural activities. Some of the new technologies include hybrid cattle, improved seed varieties, chemicals, veterinary drugs, fertilizers, feeds and supplements, irrigation facilities, simple farm tools and equipment for cleaning and maintaining water quality, alkalinity and temperature, etc.
   - The right materials and recommended rates of inputs should be maintained;
   - The new technologies enable and encourage the expansion of agricultural businesses with ease.

3. TIMELINESS OF OPERATIONS:
   - Order farm inputs and other requirements well ahead of the growing or production cycle in order to avoid the risks associated with scarcity and price increases;
   - Harvest and sell products as soon as they reach market size;
   - Do not wait until much damage is done before taking corrective action.

4. FINANCIAL MANAGEMENT:
   - Since commercial farming is capital intensive, the amount required to sustain farming operations should be determined before the commencement of activities;
   - Proper record of returns, variable or operating costs, fixed costs, daily activities of the farm, monthly expenses should be kept;
   - Costs should be kept low without compromising quality;
   - While the business should pay the farmer the same way it pays the hired labour, the temptation for the exhibition of wealth should be avoided;
   - Clear targets on production and sales for each year and how to achieve them should be set.

5. MARKET ORIENTATION:
   - Modern marketing is built on the principle that demand and customer preferences (including season, farm produce quality, colour, flavour, consistency, timeliness of supply, volume, whether live or processed), etc., determine what is produced;
   - A marketing plan should be the basis of farm production and to actualize this, the following questions must be answered: Why will they buy the produce? What are the market trends? What are the monopolies for the sales of the product? What is the current information in the market?

6. VALUE ADDITION TO FARM PRODUCE:
   - The market value of farm produce could be enhanced by adding the value of time (storage), form (processing) and place (distribution) because food materials sold in their very raw form attract very low prices;
   - Post-harvest losses should be kept as low as possible.

7. CARE FOR THE ENVIRONMENT:
   - The environment should be utilized wisely without depleting them while having consideration for other people, other farmers and future generations;
   - Toxic and non-toxic wastes must be disposed safely.

8. NETWORKING WITH OTHER FARMERS AND STAKEHOLDERS:
   - Professional and business groups e.g. Cooperatives, Producers Associations, Market Unions, etc. should be joined for synergy;
   - The collaboration with others provides a forum for the exchange of ideas and information;
   - The interaction with other stakeholders also enhances healthy relationships with financial institutions, input suppliers, buyers of products, relevant government ministries and departments, extension services, providers, man-

Plant a tree today. Gbogbo ni boje!
The Use of Salt in Aquaculture

Salt, also known as Sodium Chloride or NaCl, is the generic term applied to the inorganic mineral component of water, a medium in which fish survive. All water, whether from a natural or managed source, contains salt. It is inexpensive, readily available and when properly administered, safe for use in freshwater fish and has many uses in modern aquaculture. Salt is not a “Drug” but used as a component of “Non-Regulatory Policy”.

It has many potential applications in the production which include:
- Prevention of some parasites
- The reduction of osmoregulatory stress during transportation
- The prevention of Brown Blood Disease (Methemoglobinemia) in fish

Salt Concentration:
The effect of salt on fish is determined by the salt concentration and duration of exposure. Some parasitic infections of freshwater fish may effectively be eliminated by dipping fish in a sea water solution for 30 seconds to 10 minutes depending on the species. Concentrations of 0.1% to 0.3% may be used to enhance production and osmoadaptation in freshwater fish during handling and transportation. Less than 0.1% concentration may be used to control Methemoglobinemia in some freshwater fish species.

The Use of Salt as a Parasiticide:
If used as recommended, salt effectively controls parasites on the gills and skin of fish. For instance, a 2% salt dip effectively removes protozoa from the skin, gills and fins of freshwater fish. Depending on the species, fish can remain in a 3% salt solution for 10 seconds to 10 minutes. In practice, fish should be kept in the salt solution until they lose equilibrium and will die.

In dealing with a large number of fish, a biweekly test is used to determine safe concentration (required).

A gentle solution of 0.01% to 0.2% of salt may be used as a permanent treatment in the recirculatary system (with professional guidance).

The Use of Salt to Prevent and Treat Brown Blood Disease:
Freshwater fish are susceptible to Brown Blood Disease which is caused by an accumulation of nitrite (NO2) in water. Nitrite toxicity is directly related to chloride (Cl-) concentration, ammonia (NH3) and nitrite (NO2) and chloride (Cl-) levels.

The use of appropriate concentrations of salt can help to control the disease.

REFERENCE:
Ruth Francis
Pitt, D.V.M., M.S. Associate Professor, Department of Large Animal Clinical Sciences,
College of Veterinary Medicine, Department of Fisheries and Aquaculture Sciences.
Cooperative Extension Services, Institute of Food and Agriculture Science, University of Florida, Gainesville 32611.
FACTS TO KNOW ABOUT MALARIA

Every year, more than 500 million people become severely ill as a result of malaria with most cases and deaths in Africa. Malaria is one of the most common ailments which threaten human life by infecting the red blood cells. Malaria is a disease which can be transmitted to people of all ages. It is caused by parasites that are spread from person to person through the bites of infected mosquitoes.

Symptoms Of Malaria
- Sweating
- Sudden Coldness
- High Body Temperature
- Headache and body ache
- Vomiting
- Restlessness
- Diarrhoea (in few cases)
- Loss of appetite

Complications caused by Malaria
- Cerebral Malaria
- Jaundice
- Renal Failure
- Death

Prevention of Malaria
- Avoiding dirty environment
- Availability of a good drainage system
- Proper window netting of houses
- Indoor residual spraying with insecticide to control the vector (mosquitoes)
- Usage of treated mosquito nets especially for children and pregnant women

Treated Steps on treatment of Malaria
- Check body temperature / vital symptoms
- Administer analgesics to relieve pains
- Administer Anti-malarial drugs
- Haemotransfusions and Bloodtransfusions
- Advise patient to drink a good quantity of fluids and electrolytes

Individual efforts towards ensuring that Malaria occurs, if the following minimum will go a long way to boosting the economic and financial growth of the African Continent.

WORLD BANK/GOVERNMENT/PRIVATE SECTOR ASSISTED AGRICULTURAL PROJECTS

UPDATE ON NATIONAL PROGRAMME FOR FOOD SECURITY (NPFS)

The National Special Programme for Food Security (NSPFS) was operationalised in 70 sites throughout the federation between December 2000 and June 2006. In Lagos State, it was operationalised in 3 sites, i.e. one site in each senatorial district namely: Lagos Island (Lagos East), Ikorodu/Igbeje (Lagos East) and Iju-Ishaga (Lagos Central).

The programme was adjudged a huge success according to the Implementation Completion Report (ICR) completed in January 2007. The Lagos sites were among the sites visited by Ministers of Agriculture from ACP member countries namely: Zimbabwe, Uganda, Botswana and Mozambique, etc. Those Ministers were led by the Director General of the Food and Agriculture Organization (FAO) based on the impressive achievements recorded in Lagos with a view to initiating a similar programme in their respective countries.

The Federal Government of Nigeria, arising from the success of the pilot phase, directed the formulation of the expanded phase to cover 8 additional sites per state totaling additional 327 sites for the whole federation. The pilot phase of NPFS officially closed on the 30th of June, 2007 and the expanded phase is currently ongoing in 47 sites.

The developmental objective of NPFS is to improve household food security and incomes through increases in productivity, diversification and the sustainable use of national resources. At least 180,000 farmers in the nine participating LGA's will directly benefit from the project in the State and will contribute significantly to local employment and infrastructural development.

The Technical Management Committee met and approved 6 new sites in addition to the existing 3 sites scaling 9 sites for the State. The 9 sites include Apapa/Ikeja, Ibolu/Ikorodu, Badagry LGA, Amuwo/Odofin, Ibeju-Lekki LGA, Epe LGA, Ikorodu/Igbeje, Ibeju LGA, Ikoyi/Ishaga in Epe LGA, and Aso-Ikeja LGA.

The preparation of the Annual Work plan is underway.
SHOREMAN AGRO-PRODUCTS NIGERIA LIMITED

MISSION STATEMENT
Honestly, ours is service to humanity, to the glory of Glory of God and benefit of mankind. We help small farmers to grow and big ones to grow bigger. Our motive is to make food available at all times and at affordable prices.
Training services can also be provided for farmers who wish to know how to mill and mix their own feed.

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BE A SUCCESSFUL FARMER IN A MATTER OF MONTHS

Visit Wonderful Agricultural Research

Wonderful Agricultural Research is a trail blazer in Agriculture based seminars/ workshops in Lagos State. The team is made up of veterans/professionals in the Agricultural industry. Areas of specialization include livestock (grasscutter rearing/instry) and fisheries/agriculture (rice rice production).

Through these seminars, numerous would-be farmers and farmers alike have been empowered.

Access to loans has also been facilitated through the First Bank Project (Farmers First). Behind this formidable organization is its distinguished coordinator, Mr. Festus Ado.

Seminar Address
Agidingbi Town Hall,
2, Abiodun Shoraba Street,
Agidingbi, Off Ilefe, Eranak Road,
Abajua Ibeju, Lagos.
08023001860, 08026682744, 07030919555

Office Address 49, Thomas Salako Street, Ogba Ijaye, Lagos.

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Lagos State. Tel: 01-8512560
E-mail: ibukunfarms@yahoo.com
and State Budget for 2008 was carried out in the month of March 2008.

The selection of Animal Health Service Providers for the implementation of the Paraset Module was carried out in the month of April 2008. A total of 9 animal health service providers were selected for the 9 NFFS sites on the basis of 1 per site.

Identification of sites for the implementation of a pilot site was carried out during the month of April 2008. Selection of Outgrowers to participate in the seed-composting material Outgrower Programme of NFFS was carried out in the month of April 2009 based on the directive from the National Office. Outgrowers promoted are maize, cowpeas, yam, cassava, citrus, mango, pineapple and plantain. The selection of the crops was based on the farmer's preference. A total of 23 farmers will participate in the programme on a cost-recovery basis.

Soil Fertility Management: Demonstrations on the management of soil fertility commenced during the month of May 2008. Various demonstrations involving the use of Agrolyser Micronutrient fertilizer, basic extra-liquid fertilizer and Agricultural lime commenced in the month of May 2008. Demonstrations on the use of Agrolyser Micronutrient and use of basic extra liquid fertilizer in presently ongoing in 900 farm sites equally distributed across the 9 NFFS sites.

Prior to the commencement of the implementation of the Farmer Field School Extension Strategy in the 9 NFFS sites, 2 Extension Officers were nominated for the post of Farmer Field School Master Trainers. As a pre-condition for the development of a curriculum for the implementation of the FFS Extension Strategy in Lagos State, Participatory Rural Appraisal was conducted among key stakeholders in the 9 NFFS sites in June 2008.

Lagos State has also been selected as one of the Pilot states for the implementation of partnership with some selected commercial banks for the Expansion Phase. The MOU for accessing the NFFS loan facilities through the selected banks have been prepared. SKYE Bank has been selected as the NFFS site partnership with Lagos NFFS sites while Bowman Microfinance Bank will partner with Igbogbo/Igbomila outreach site.

Oyebola Akinkola
NFFS Officer, LSADA.

UPDATE ON FADAMA II
Lagos Fadama Inaugurates Cassava Processing Centre

The Lagos State Fadama Development Office has inaugurated a cassava processing centre in Igbogbo in the Ikorodu Local Government Area. The cassava processing facility falls under the Rural Infrastructural Investment (RII) Component of the project. This component aims to promote the acquisition and development of rural infrastructure to reduce the problem of insufficiency and non-availability of such facility in the rural areas. It also ensures that such infrastructures are not only available at the local, as well as, the village level, but also, produces meaningful returns with potential benefit, in terms of usage.

The Project Coordinator (SPC), Dr. Olugbogbe Olaniran, at the inauguration ceremony expressed his satisfaction and happiness for the acquisition of such facility by the Ogun/Ikorodu Fadama Users Group (FUG). The Lagos State Government through the Fadama Development Office has empowered the group by supporting its agro-processing activities with a complete processing facility, consisting of a processing bay, washing tanks, drums, bowls and tables to make the facility more business-oriented.

The facility will service the entire Ikorodu Local Government Area. Apart from providing the much-needed processing of cassava and its derivatives on time, the processing facility will reduce the time and cost of buying from locations outside the local government area.

In essence, it is anticipated that the cost of gari, nfu and other food derivatives from cassava will become competitive. In addition, it will also solve the problem of transportation and its cost, which would have been reduced or at most, reduced to an extent due to the nearness of the processing centre to a major source of raw materials.

The Lagos Fadama Development Office has supported the Cassava Processing Centre in alignment with the state government's promise to ensure self-reliance of the state in food production and processing. To this end, Fadama has assisted the Farmers to improve the processing of their food crops, and the processing centre has been established to meet the needs of the farmers.

The SPC further assured the FUG that Fadama II, which would be a major success, will commence by the last quarter of...
2008. He therefore, enjoined all members of the community to partake in all the opportunities that Fadama has to offer.

According to the SPC, Fadama III will be implemented in all the 28 local government areas of the state, unlike Fadama II which was implemented in only 10 local government areas. He added that Lagos State is the first state in the country to get the Fadama III project and it has contributed immensely to the Regional Excellence Award won by the project from the World Bank. Therefore, Lagos State will not exclude Lagos State.

It must be noted that the Fadama scenario is being studied by the Fadama III implementation team as it is expected to repay the loan at a later date in the future.

Bearing this in mind, the State Government has taken over the Fadama funds and facilities granted to farmers from the project. However, beneficiaries are not expected to return the money. The State Government is expected to repay the loan at a later date in the future.

Annual Work Plan and Budget Implementation Progress

A total of 57 sub-projects were initiated, out of which 51 sub-projects have been completed. These are made up of:

- 58: Pilot Model Aquaculture Support (PAMAS)
- 1 Rural infrastructure development (RiD)
- 21 Advisory Services Activities (asa) carried out in 2007 and another 27 new asa were completed in 2008 this year with TANAP going.
- 6 batches of Capacity building workshops for PAASs and FUGs undertakentaken.

Physical Achievements
- 256 Plot Assessment
- 97 Rural Infrastructure Investments
- 137 Advisory Services Activities

<table>
<thead>
<tr>
<th>57 Input Support Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Sets of Capacity Building</td>
</tr>
<tr>
<td>102 Sheep (Breeder) 36 No.</td>
</tr>
<tr>
<td>100 Goat (Breeder) 36 No.</td>
</tr>
<tr>
<td>100 Pig (Weaner) 186 No.</td>
</tr>
<tr>
<td>100 Cattle (N'dama &amp; Udder)</td>
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</tbody>
</table>

57: Input Support Activities
- 12 Cold rooms with combined capacity of 96 tons in Koscio, Ojo, Alimosho and Ikorodu LGAs
- 2 Rural roads rehabilitated in Ikorodu, Ibeju, Ojo, and Ikeja LGAs.
- 2 Markets of 44 stalls with toilet facilities and water supply systems in Ibeju Lekki and Epe LGA.
- 1 Rice processing house complete with water supply and toilet facility was constructed in Ibeju-Lekki.
- 1 Fufo processing centre complete with water supply and toilet facility was rehabilitated in Ikorodu.

Summary of completed PAAS Projects
- 75 Agro-processing equipment.
- 136 Concrete fish ponds
- 20 Farm horses
- 98 Pigs reared
- 20 Poultry houses rehabilitated
- 23 Kippack sprayers
- 100 Bags of Ugwu seeds
- 206 Fishing traps
- 26 Smoking kilns
- 22 Small houses
- 16 Outboard engines
- 12 Wooden canoes
- 20 Bandanas of fishing nets & other fishing gears
- 26 Water pumps and bores
- 21 Generators of varying capacities
- 11 Deep freezers
- 11 Deep well
- 1 Pomade & dye making machine

Input support to FUGs
- 75 Agro-processing equipment.
- 136 Concrete fish ponds
- 20 Farm horses
- 98 Pigs reared
- 20 Poultry houses rehabilitated
- 23 Kippack sprayers
- 100 Bags of Ugwu seeds
- 206 Fishing traps
- 26 Smoking kilns
- 22 Small houses
- 16 Outboard engines
- 12 Wooden canoes
- 20 Bandanas of fishing nets & other fishing gears
- 26 Water pumps and bores
- 21 Generators of varying capacities
- 11 Deep freezers
- 11 Deep well
- 1 Pomade & dye making machine

Environmental Issues
- The implementation of sub-projects has an environmental impact on the environment.
- Mitigation of the design of the sub-projects, mitigation measures have been built into the implementation plan as a tool to reduce possible environmental hazards, such as flooding, contamination of natural water courses, uncontrolled refuse dumping, etc.

However, environmental problems are beyond the scope of Environmental issues such as the menace of water hyacinth on the lagos water body. These are expected to be handled by the State authorities.

Fadama III beneficiaries' assessment
- The World Bank has been working in conjunction with the NITDO commissioned International Food Policy Research Institute, America (IFPRI) to undertake a Beneficiary Assessment of Fadama III. IFPRI was assisted by 4 National Consultants and 4 State Consultants on the assignment.
- The objective was to determine the impact of the Fadama III intervention on the beneficiaries.
- The State's study commenced in Nov. 2006 and was completed in August 2007. The major findings from the study are as follows:

- The main finding from the study is that households' increase dramatically, especially for the...
The Lagos State Government, Federal Government and the International Fund for Agricultural Development (IFAD) have released a grant of ₦8.5m to ten farmers groups under the Root and Tuber Expansion Programme (RTEP) second tri-term (2007-2010).

The groups were drawn from nine communities in five selected Local Government Areas of Lagos State namely, Epe, Alimosho, Ikorodu, Ifako-Ijaiye and Badagry. Speaking at the presentation ceremony held at the headquarters of the Lagos State Agricultural Development Authority (LASADA), Ojo-Ota, Agege, the Commissioner for Agriculture and Cooperatives, Chief Enoch Kolajomomo Ajibosan stated that RTEP was focused on disseminating improved practices, provision of institutional and infrastructural support for root and tuber production, processing, utilization and marketing. He noted that the root and tuber crops being highlighted include yam, cocoyam, sweet potato and cassava. He added that the grant was solely to assist farmers who are engaged in RTEP activities in Lagos State.

The grant enhanced the activities of the Lagos State Agriculture Processing and Market Expansion Group (SAMEG) in motivating all the RTEP beneficiaries regarding the construction of standard processing sheds. In addition, farmers financed, as well as RTEP-supported product and equipment demonstrations on Root and Tuber crops were stepped up in all the cities.

Fumilayo Bamidele
Coordinator Lagos State LASADA

<table>
<thead>
<tr>
<th>S/N</th>
<th>LGA</th>
<th>COMMUNITIES</th>
<th>GROUP(S)</th>
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<tbody>
<tr>
<td>1</td>
<td>Epe</td>
<td>Oko Ogun Keta</td>
<td>Ifelodun Farmers Association Agbegere Multipurpose CAMS</td>
</tr>
<tr>
<td>2</td>
<td>Ikorodu</td>
<td>Oko-Ito Imuni</td>
<td>Oko-Ito United Farmers CAMS Agemagbo Agedere CAMS Ifelodun Imuni CAMS</td>
</tr>
<tr>
<td>3</td>
<td>Ifako-Ijaiye</td>
<td>Arowofela-Iju</td>
<td>Egbe Onilufu Ifelodun CAMS</td>
</tr>
<tr>
<td>4</td>
<td>Badagry</td>
<td>Ilogbo Apaileodo</td>
<td>Owoiloro CAMS Soro Onilofu CAMS, Oluwaileyi CAMS</td>
</tr>
</tbody>
</table>

The grant significantly reduced the number of conflicts over the use of natural resources. While cases of reported conflicts reduced by 30%, there was about 80% success in number of conflicts resolved.

The LDGs implemented were socially inclusive as it provided inputs from the various social and economic groups.

Santos Babajide
Communication Officer
State Fadama Development Office
UPDATE ON COMMERCIAL AGRICULTURE DEVELOPMENT PROJECT

The Commercial Agriculture Development Project (CADD) is a World Bank Assisted Project that is currently being implemented in five states of the Federation: Lagos, Kano, Kaduna, Enugu and Cross River using the Bank's approach to agricultural development. The project will be implemented over a five (5) year period.

The primary objective of the project is to strengthen agricultural production systems and facilitate access to markets among participating small and medium-scale commercial farmers in an organized supply chain in the targeted states. Among other things, farmers will benefit from corporate extension, farm infrastructure development, input supply and secured markets for their produce through involvement in value chain development.

In Lagos State, the project will support activities that will bring about an improvement in the productivity of three major enterprises (Poultry and Aquaculture, as well as rice production, processing, and marketing).

Some of the performance indicators at the end of the fifth year of the project in Lagos State will be the following:

1. 25% increase in total production of targeted value chains (poultry, aquaculture, and rice) among participating small and medium agriculture producers relative to the baseline.
2. 30% increase in volume/value of net sales of agricultural products under the targeted value chains (poultry, aquaculture, and rice) relative to the baseline.

The project components include:

1. Enhancing Agricultural Production and Commercialization under which we have the following sub-components:
   • Technology Demonstration and Dissemination and Advisory Services (Testing Technologies, Technical and Business Advisory Services, On-Test Capital Grant for investment Needed for Adoption of Technology)


4. Support to staple food production/processing & marketing.

5. Rural Infrastructure Component which will involve the provision of rural access roads, and energy.

6. Project Management, Monitoring and Evaluation and Studies which will include:
   • Constitution of the State Steering Committee to be headed by the Permanent Secretary Ministry of Agriculture and Cooperatives.
   • Consultation of the Project Management Team. (State Commercial Agriculture Development Office)

Management Team: (State Commercial Agriculture Development Office)


So far, the CADD Desk Office has carried out the following activities in preparation for the take-off of the project:

- Written Expression of Interest
- Participation in the Pre-Appraisal Workshop
- Conduct of Baseline Survey
- Conduct of Socioeconomic Impact Assessment
- Assessment of Food and Energy needs of the State
- Release of N1.5bn Preparatory fund by the Lagos State Government
- Participation in the Decision Meeting
- Participation in the Appraisal Workshop
- Conduct of Stakeholders’ Workshop and Inauguration of State Commercial Agriculture Development Association (CADDA)

Within the next few weeks, the following activities shall be embarked upon:

- Commissioning of the State Commercial Agriculture Development Office (SCADD)
- Inauguration of the Steering Committee
- Notice of Negotiation and circulation with World Bank
- World Bank Board meeting

Fatasi Osnawulade
Chief Executive Officer, Lagos State CADD.
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(Research & Development Consultants)

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TREE PLANTING EXERCISE TAKES PLACE IN LAGOS STATE

The "Tree Planting Programme" was inaugurated in a State-wide campaign on the 2nd of Sept., 2008, by His Excellency the Executive Governor of Lagos State, Mr. Babatunde Raji Fashola (SAN). He implored all Ministries and Parastatals to carry out the planting of trees within and around their premises.

In line with the above initiative, the Lagos State Agricultural Development Authority also carried out the tree planting exercise on the 2nd of September, 2008. The Programme Manager, Dr. Ogidi Basorun, led the Management Team and staff of the Authority with the exercise of planting ornamental and fruit bearing trees within the premises of the Authority.

Before the commencement of the tree planting exercise, the Programme Manager emphasized the importance of trees in the environment as follows:

- Trees enrich the landscape and their branches make it easier for birds to find resting places.
- They add aesthetic beauty and character to the environment.
- They add to the prestige and beauty of the surroundings.
- They add to the prestige and beauty of the surroundings.
- They add to the prestige and beauty of the surroundings.

Dr. Basorun enjoined members of staff to assist in the tree planting exercise, as the exercise has the potential of changing the face of the Authority and the environment overall.

COMMERICAL AGRICULTURE DEVELOPMENT PROJECT (CADP) CONDUCTS STAKEHOLDERS' WORKSHOP IN LAGOS STATE

A Stakeholders' Workshop on the Commercial Agriculture Development Project (CADP) was held in August, 2008 at the Lagos State Agricultural Development Authority (LSADA) Training Hall, Oke-Ota, Agege, Development Project, and the role to be played by the stakeholders and the public and private sector in general. He also stated that the Workshop was a prelude to the inauguration of the Commercial Agriculture Development Project (CADP) in Lagos State.

The Workshop was well attended by over 250 participants from different parts of the country.

Eti-Osa Farmers get N3.5m Lagos State Programme for Food Security (SPFS) Grant to Boost Food Production

Some farmers in Eti-Osa Local Government Area of Lagos State recently received a grant of N3.5m from the Lagos State chapter of the National Programme for Food Security (NPFS), in order to boost food production and create job opportunities. The NPFS is a collaborative effort of the Food and Agriculture Organisation (FAO) and the Lagos State Government, aimed at empowering farmers and creating job opportunities for them.

Speaking at the presentation ceremony in the Agbara-Ago area, the Coordinator and Programme Manager of the Lagos State Agricultural Development Authority, Dr. Ogidi Basorun, represented by the Deputy Director of Extension Services, Mr. Lukman Akin, stated that the programme would improve farmers' capacity to tackle issues of food security, while at the same time creating avenues for empowerment. He then urged all farmers to make good use of the funds.
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Appendix 22

Urban Agriculture: Optimizing the use of city resources
LAGOS FARMER

A QUARTERLY MAGAZINE OF

URBAN AGRICULTURE:
Optimizing the Use of City Resources

Vegetable Production
Snail Farming
Grass Cutter Rearing
Fish Farming
Sheep & Goat Fattening
Poultry Production
Updates on Fadama II, NPFS, RTEP Programmes
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   each allotted

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OR Mr. A.A. Fatemi: 08023515215
URBAN FARMING:
OPTIMIZING THE USE OF CITY RESOURCES

OLAKULEHIN J.O., ODELESI A.A.

Worldwide, urban or city farming is expanding fast. According to UNDP, some 800 million people worldwide were involved in urban agriculture in 1996, growing fruits, vegetables, flowers, and herbs, fish farming, agro-processing, as well as raising livestock. UNDP further reported that more than half of the poor people in developing countries now live in urban areas and the figure is still increasing. Poor people in cities farm whenever they can grow something to provide some food and make some money. Thus they save money they would have spent on food. City farming makes a hefty contribution to the fight against unemployment, poverty and hunger. It also makes a hefty contribution to environmental and public health.

City farmers play a major role in waste recycling, creating a closed system in which organic wastes from food, manufacturing and sewage are reused instead of fester in dumps and polluting waterways. Domestic sewage can be used to safely irrigate crops, while aquaculture stabilizes animal manure.

City farming is an economical, environmentally sustainable, as well as, increasingly important occupation in Lagos State. In Lagos State, many families keep pigs, poultry, rabbits, sheep and goats, which roam in their back yards and balconies. In recent times also, there is a surge in fish farming and agro-processing activities in the state, mainly within and outside the residential quarters such as backyards and patches of unused land in the city. Crop farming which includes vegetable and horticultural production is being practiced in uncompleted building sites and buffer zones belonging to government.

Greening the city, which is an important arm of city farming, as one of the developmental agenda of the present administration under the leadership of Governor Babatunde Raji Fashola (SAN), is a laudable one. It is in line with the current and global trend of making cities more habitable, which will not only give the city aesthetic value but also create employment opportunities and assure food security to the citizenry in an environmentally friendly manner.

Other reasons why urban agriculture include the poor wages and salaries of employees, poor national economy and seeing corporate bodies making huge money from city farming. This activity is highly profitable and can lift vulnerable groups out of poverty. It can also contribute to food security, land reclamation and city greening.

For urban households in Lagos who have access to land, either inside or close to their homes, producing crops or keeping livestock is often a cultural norm. Since the 1980s however, the need for urban agriculture has been strengthened by economic crisis. While the production of crops or livestock by urban households may not be as significant as that of rural households - it still makes an important contribution to livelihoods. In other words, it augments urban dwellers' income thereby making possible a standard of living that would otherwise be unsustainable.

There is an increasing influx of people from other parts of the country to Lagos and the recent population census indicated that Lagos has the highest number of people per square meter. Informal irrigation in urban and peri-urban areas for vegetable production, for example, is taking advantage of the growing urban markets, the common lack of refrigeration transportation and storage of products from rural agriculture in feeding the cities with fresh vegetables. Such farms could be found in Festac area, LASU/Volkswagen axis, the marshy land between
the National Stadium and Togbebo Market, unused land within the police and armed forces barracks, undeveloped land within the premises of Lagos International Airports, etc. In addition, there is growing homemade flower and vegetables farming in Alimosho, and Ifako-Ijaye LGAs.

Not all agricultural activities can be practiced in the urban setting. People in the cities and other densely populated areas have developed highly intensive forms of farming particularly in the area of horticulture and livestock production. The closeness of large markets offers city farmers the chance to specialize in farming activities. Urban agriculture compared to rural farming is more limited to crops and short gestation periods especially when the farmer is not sure of how long the land can be put to use. Again, city farming tends to be more market oriented and less diversified as it is a response to economic stress. Some of the agricultural activities that could be practiced in the city includes:

- **Aquaculture:** The production of table-size fish, fingerlings and rearing of ornamental fishes could be practiced with ponds made of fibreglass, block/concrete, tarpaulin supported with wooden planks and metal or plastic drums, all of which require little space which are readily available, such as balconies, backyards, unused rooms and attics within the living room.

- **High value vegetable production:** Leafy and fruit vegetables of short gestation periods and with high plant density per unit area of land such as TefHara (Ugu), Pepper, Amaranthus species, Cochorsus species, Water Melon, Lettuce, Spinach, Spring Onion, Cabbage, etc. could be grown on the patches of land which abound in the cities.

- **Floriculture:** The production of flowers as a business venture in polythene bags, earthen pots, vases, etc. for both indoor and outdoor beautification is a common phenomenon along the major road sides in the city of Lagos.

- **Small stock rearing (Rabbit, Grass-cutter and Snail):** The rearing of these animals is very compatible to the city setting in the sense that their rearing generates less odour, low noise and requires little land space. The attraction to rearing these animals is that they are rich in protein and low in cholesterol.

- **Sheep and Goats:** Considering the limited quantity of fodder crops in the cities, the fattening regime of these animals within a short period for specific festivals is considered ahead of rearing them for breeding purposes.

### Benefits of City Farming

The primary objectives of the social workers, community organizations, educators, psychologists, health workers, nutritionists and crime fighters can easily be achieved with advancement of city farming. City farming has important environmental, economic and social benefits. During downpours, the cultivated land allows drainage of water which will otherwise run off on closed or compacted surfaces and cause flooding. The ornamental plants and crops filter dust from the air and their transpiration improves the micro-climate. A further environmental advantage of city farming, where products are consumed, is that less energy is used than in transporting products from distant rural areas. The closeness of the farms also allows easier recycling of urban wastes used in farming.

Given the level of urban youth unemployment and the resultant moral decadence, a coordinated approach to city farming that supports the physical well-being of street children and youths is urgently needed.

Again, most of the output of city farming is consumed by the household and this contributes to improvement of their nutritional status.

### Constraints

It is striking that the potential benefits are closely linked with environmental threats much more so in urban than in rural farming. Dust, garbage and sewage can also pollute the crop products. Although animals can convert waste to food and their manure can fertilize gardens, if not well handled, they and their manure can threaten human health in congested areas.

The use of untreated sewage water, for example, can lead to
food contamination and health risks for consumers. Pollution from industries and motor vehicles can lead to dangerous concentration of heavy metals such as lead in farm produce. Both producers and consumers need more information about sources of contamination, ways of diminishing it and suitable choice of products depending on the type and level of pollution. These are challenges for agricultural researchers in order to improve on the present level of urban farming. Other problems of urban farming are theft, land speculators, government regulations which constrain production. More conflicts can also be expected from city farming because resource users from different specialization and different ethnic groups are living closer to each other in urban than in rural areas.

**Conclusion**

Urban planners, agricultural experts, lawmakers and relevant governmental and non-governmental agencies need to work together with the resource users to find ways to negotiate and safeguard use rights and to manage conflicts.

City farmers could assert their claims for legislative support if they organize themselves into interest groups. The government and other stakeholders in agriculture also need to have a closer look at the potentials of city farming for the benefit of all and sundry. In this regard, serious considerations should be given to the demarcation of the existing areas where serious farming activities are going on as city gardens and haggled up with enabling laws. The effort of the Lagos State Ministry of Agriculture and Cooperatives in establishing farm estates such as the Fish Farm Estate in Ikotun and Piggery Estates at Oke-Aro and Gberigbe is highly commendable. With these types of initiatives in place, the survival of urban farming is assured.

Ozukweh, J.O.,
Head of Field Activities, LSADA
Dupolozokweh@yahoo.com

A.A. Odunsi
Communication Officer, LSADA

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**City-Friendly Agricultural Enterprises**


Sustainable economic growth can be brought about only when all segments of the populace are meaningfully engaged in one economic activity or the other. Unless concerted action is taken, poverty and unemployment are not expected to diminish much in the near future. The situation in the country demands that a family or an individual can be more stable economically if the legitimate sources of income are more than one. The urbanites, however, have limited sources of income options because they are usually fully engaged in their primary jobs in terms of availability of resources. For example, they are left with little or no time to engage in other economic activities that can fetch them additional income apart from their regular income. Further more, their income is so structured that little or nothing is saved for venturing into other legitimate business activities. Again, the rate of increment of urbanites income from their regular activities is not commensurate with the prevailing inflationary rate of the country. In order to make ends meet, a lot of people do engage in nefarious activities that are unseemly to themselves, their families and the country in general.

The concern is therefore to come up with legitimate economic activities that can fit perfectly into the fixed time schedule, as well as, resources available to the urbanites without jeopardizing or having negative impacts on their primary source of income.

Some agricultural enterprises such as small livestock (snail, rabbit and grass-cutter) farming, fish farming, mushroom production, high value vegetable production, piggery, poultry, etc could perfectly be practiced by the city dwellers for additional sources of income without reducing their effectiveness and efficiency in their primary place of work. This is obvious, for the fact that these sets of agricultural enterprises are not time nor labour consuming,
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08023424891, 08055201014
AQUA-CULTURE (FISH FARMING) background

Aquaculture is the rearing of organisms in enclosed water bodies such as ponds, dams, cages, pens and aquaria. The aquaculture as a term is not limited to fish farming alone, it covers the culturing of any organism in an aquatic habitat. A pond is a water body usually contained by earthen or concrete wall which can be easily emptied but through which water does not necessarily flow. Fish culture is principally practiced in ponds. A pond permits the supervision and regulation of reproduction, feeding, qualitative growth control of the size of fish as well as, the stocking and maintenance of the ponds instead of leaving these to nature.

Attractions

- Nigeria with a population of over one hundred million people has her annual national fish demand and production at 1.5 million metric tonnes and 250,000 metric tonnes, respectively. Nigeria therefore, spends millions of naira to import fish into the country every year to bridge the gap between the demand and supply of fish in the country.
- The conversion rate of feed to fish is high in fish when compared to other livestock.
- The rate of return on investment per production cycle of a maximum of 6 months is more than 140%.
- The decreasing catches in capture fisheries due to over exploitation also makes fish farming a rewarding venture for any intending investor.
- The labour requirements for fish farming are so flexible that one can combine it with regular occupations.
- Its non-generation of offensive odour, as well as, being noiseless makes fish farming attractive to urbanites.
- Fish farming requires relatively small piece of land on a medium to large scale level in the urban areas where the competition for land by other sectors of the economy is high. The use of movable tanks with fiber, plastics, planks, carpets, etc even makes it possible for tenants in the urban centres to practice fish farming and it could be reared close to human habitation.
- The waste water from the fish pond is very rich in nutrients that could be used for vegetable production.

Basic Requirements

- Minimum capital requirements of N200,000 and as from N1.8 million for homestead / small scale and medium/large scale, respectively. This includes the cost of pond construction and working capital for the first production cycle. Ownership or accessibility to land at no cost is assumed.
- Land space of up to 1/4 of a plot for small scale / homestead (which can be used to raise more than 20,000 fish) and as from 1 plot for medium / large scale.
- Availability of regular and quality water in required quantity from wells, boreholes, etc. An industrial borehole is recommended for medium to large scale fish farming. Water analysis is highly required to confirm the suitability or otherwise of the available water.
- Well constructed fish pond either earthen or concrete, tank, etc.
- Timely availability of quality fingerlings and feed in required quantity.
- Good knowledge of fish farm management especially in the areas of water quality management, fish feed and feeding practices.
- Feed takes about 70% of the total cost of production.
- Provision of adequate security.

Risks / Constraints

- Determination and control of the price per kg by the middle-men / market women.
Restriction of farmers to rearing of just catfish at commercial level due to inadequate information/knowledge (at farmers level) on the rearing of other socially acceptable species such as Tilapia.

Waste (water) disposal may consume a major portion where public drainage system is not in place.

Other investment opportunities in aquaculture:
- Fingerling production.
- Fish feed milling and marketing.
- Fish feed ingredients marketing (including importation).
- Fish processing for both local and international markets.

HIGH VALUE VEGETABLE PRODUCTION

Background
Crops are plants grown for a definite purpose. The main purpose of planting a crop is to make use of one or more of its various parts. Crop production involves the cultivation and management of crop plants grown for human and animal consumption or for industrial uses. The type of crop grown is determined by factors such as the amount and distribution of rainfall, temperature, wind, relative humidity, the length of the day, soil type and the land space available for cultivation etc.

Before any crop can be grown, the vegetation has to be partly or wholly cleared and seed-beds or nurseries have to be established, where the seeds are planted and grown until they can be transferred to the field. Sowing of seeds must be done at the proper time and season and the crops should be cultivated to control weeds and pest infestation as much as possible such as diseases and pests.

Examples of high value vegetables that can be cultivated in Lagos State include Talinana, Amaranthus, Celtosia, Corchorus and exotic ones such as spring onion.

Attractions
- In urban areas where large expanses of land are scarce, the cultivation of crops with short production cycle, specifically high value vegetables is preferred.
- The nature of the high value vegetables which has short production cycles precipitates them to improved and intensive cultivation technologies on a small piece of land. In some instances, the production cycle could be as short as 6 weeks for some vegetables.
- From the environmental point of view, high value vegetable production is one of the few economic activities that can be practiced in the 'buffer zones' that are well abound in most of the urban areas. Unlike some other economic activities, it will not further pollute the environment but further purify it.

The vegetables being produced in the metropolis have ready markets, as well as, command very good prices as they are fresher than those brought from the inland.

The return on investment could be as high as 200% within a very short period.

Minimum capital requirements of N50,000 and as from N200,000 for small-scale and medium/large-scale respectively.

This includes the farm tools required and the working capital for the first production cycle. It could be practiced on outrightly owned or rented land but preferably where the water table is high.

Land space of up to a plot for small scale (which is enough for the cultivation of more than 40 standard vegetable beds of 1 x 10 metres and as from 6 plots for medium/large scale).

Availability of regular and quality water in the required quantity from wash-holes, dug-wells, boreholes, running or stagnant water, etc particularly during the dry season.

Provision of irrigation facilities ranging from the manual to the highly mechanized type depending on the scale of production and must be provided.

Timely availability of inputs such as seeds, fertilizer (organic and inorganic), etc.

Good knowledge of management (preventive and...
- Control of pests and diseases
- Assured market outlets.

Risks/Constraints
- Labour, in terms of availability and cost, may be a major obstacle if the production cycle is not properly planned.
- Cost of water extraction for irrigation purposes may be too high and unnecessarily add to the cost of production especially where the water table is low.
- The period of profit maximization in a year is restricted to the dry season which in recent times is always less than 4 months and the level of fluctuation is very high. For example, a standard vegetable bed that may cost as high as N1,000 at the peak of the dry season could cost as low as N400 during the wet season.
- Stringent measures and thorough supervision are required for quality production, preservation and processing to meet the requirements of good outlets such as international markets and local ones like hotels, shopping malls, etc where the products of high value vegetables command better and attractive prices.
- The production is dependent on vagaries of weather, as well as pests and disease infestation which the producer may not have control over.

CANERAT (GRASS CUTTER) Rearing

Background
Cane-rat which is otherwise known as grass-cutter is found in the rainforest and savannah areas of Nigeria. Grass-cutter is very easy to rear for the urban and peri-urban dwellers in that its labour requirement is very low. The animals are non-evasive and do not generate offensive odour. In essence, grass-cutter can be reared in a densely populated area without constituting nuisance to the neighbours.

The demand for grass-cutter meat is so large that it is not being met. Market for it already exists all over Africa. Apart from money that can be realized from the sale, it is one of those animals that are almost wholly edible. Most of its parts can be eaten except the claws, laces and fur. Their pancreas is believed to be rich in insulin, which can be used to produce drugs used in curing diabetes.

Physiological maturity for the male is attained at 6 months while that of the female is 5 months. Presently a weaner of 900 - 1200g and 2½ - 5 months old for breeding purposes ranges between N=3,000 - N=4,000. While an adult grass-cutter at 1½ - 2 years, weighing between 5-6kg, for slaughtering sells for between N=2,500 - N=3,000.

Other attractions for the rearing grass-cutter are as follows:
- Grass-cutter requires minimal capital outlay, thus it can serve as a considerable income earner for the peri-urban farmer.
- Has both domestic and export market potential.
- It does not require large expanse of land.
- It does not present high level of offensive odour.
- Its rearing does not require imported materials and does not compete with man for food.
- They are highly prolific (up to 5 pups per litter per doe) with short gestation period (5 months). The implication of this is that the rate of return on investment is high.
- The potential for domestic and export markets is very high and not yet close to being met.
- The meat has high carcass quality and protein level is comparable to that of poultry.
- There is no known religious discrimination against grass-cutter meat which tastes well and is highly retuned.
- Source of income to farmers.

Basic Requirements
- An initial capital outlay of not less than N75,000 and N250,000 for small and large scale, respectively. This includes the cost of housing, stocking and working capital for the first six months of operation.
- A minimum of one family (which is made up of an adult male and four females) for small scale rearing and as from four families for large scale production. A family presently costs between N25,000 and N30,000.
A standard room of 4 x 3 metres could house up to 4 families. The housing could be cage or floor type either of which is good for small or large scale operation. Cage type will however house more animals.

Site to be selected must be close to good source of water. Windy areas should be avoided.

Sourcing of the initial stock is recommended from an already established farm where the record of performance of the parent can be obtained.

Sound knowledge of management practices such as:
- Allowing forage freshly cut to wilt for about 12 hours before feeding to the animals.
- Avoid giving supplementary feed in the morning before forage to avoid indigestion.
- Avoid giving rotten or contaminated feed as this may poison the animals.
- Avoid giving crumbly granulated feed that can choke the animal or lead to respiratory infections.
- De-worm grass-cutter regularly at 3 months intervals using pawpaw seeds or commercial de-wormers.

Risks/Constraints
- Grass-cutters are very fragile and if not handled with care, high economic losses may occur as a result of incidence of mortality.
- Grass-cutters are highly susceptible to diseases such as Coccidiosis, worm infestation, Staphylococcaemia and Pneumonia. The effects of any one of the diseases could result in a fatal economic loss to the farmer.
- The market opportunities for grass-cutter meat are yet to be fully 'opened' and most commercial farmers still rely on 'closed markets' such as hotels which are generally being patronized by the elites. The elites have high purchasing power but they are very few in number to meet the supply demands from the commercial farms. At small scale level, however, marketing may not be a problem.
- Adequate provision has to be made for expansion or culling in order to prevent overcrowding as a result of prolificacy.
- High cost of veterinary services.

SNAIL FARMING
Background
Snail farming or heli-culture can be described as the rearing of snails. The farmer does not focus on RUST picking snails from the wild and eating but the actual domestication of snails in order to have snails to eat on a regular basis and for sale by providing a pseudo-forest environment that looks like the natural habitat that supports the growth of snails.

The snails are hermaphroditic, though they do not self-fertilize but reproduce by simultaneous exchange of sperms. The snail is divided into 2 parts (shell and body). The snail body consists of foot, head, eye, tentacles and mouth (which consist of sharp teeth like structures called radula). The snails start laying at 10 months (i.e. Sexual Maturity).

The species of snail recommended for commercial rearing in Lagos State are as follows:
- Archachatina marginata or big black snail (Igbina Apinaa);
- Achatina achatina or giant land snail (Iako);
- Archachatina margina.
- Achatina fulica (Ibako): It has 7 whorls but lighter shell colour than the 2 previous ones (polymorphism).

The recommended stocking rate is between 8 and 10 mature snails per square meter especially Marginata but more for Achatina spp, which is between 18-25 snails. Snail can live up to 7-8 years under favourable environment condition and good feeding. As snail continues to grow old, the production rate will be decreasing.

Economic importance of snail rearing
- Low initial cost compared to other livestock enterprises.
- High and increase patronage because of.
Present trend in health and beauty sector stressing on good diet with emphasis on snail meat.

Claims of medicinal effect of snails' meat people with cardiac related problems.

Low cholesterol: snails have a thick shell, making it attractive to every class of humans.

Liquid from snails and its mucus can be used in treating a variety of other diseases such as anemia, asthma, poor eyesight, restoration of virility and fertility, reduction in labour pains, stopping of excess bleeding during labour in women, reduction of hemorrhoids and constipation. These qualities in snail could be added to the fact that it has low sodium, fat and cholesterol as well as high amount of protein, iron and calcium.

There is no competition with man for food. Feeding materials are cheap and easy to come by as snail utilizes kitchen leftovers, crop residues, peas etc.

Snail farming can be combined with other farming activities as well as service of regular employment.

Snail rearing is a source of foreign exchange earning and brings additional income to the family.

All members of the household can handle small farming - women and children inclusive.

Less attention and time is required in rearing snails thus, affording farmers more time to engage in other ventures.

Export potential yet untapped.

Basic requirements
- Culture of snails which are used for housing, stocking of at least 30 adult snails and feeding for six months for small scale snail farming and as from N250, 000 for medium / large scale with about 150 adult snails as initial stock.

The selection of sites for snailery must be done with the special attention to the following:

- The snailery must be sited in areas where there is vegetation cover or trees to reduce the impact of wind. Snails would loose moisture when exposed to high wind on exposed land.

- The soil must be rich loamy soil or rich top soil with high calcium content since the snail requires calcium for shell formation. The soil must not be sandy which is loose with low water holding capacity or clayey which may be compact or waterlogged depending on the prevailing season. Note that any soil that can be used to plant vegetables is ideal for soils.

- The temperature range for rearing snails ranges between 25-29 degree centigrade and relative humidity of 75% In order to have this temperature range, snailery should be sited under trees or forest with dense vegetable cover.

- The housing system is what is referred to as a snailery and this could be intensive, semi-intensive or extensive. The intensive system where the snails are housed in huches or boxes or trenches and are not allowed moving out is highly recommended for both small-scale and large scale production. Feed, water and mineral supplements are given to them inside the huches.

Irrespective of the type of housing, snailery must possesses the following features:

- Be escape proof since snails always wanted to escape.

- Keep predators (e.g. soldier ants) out.

- Allow easy access to tend the snails.

- The snails to be selected for starting a snailery must show the following traits:
  - Edible portion must fill their shells to the brim.
  - Active and healthy snails.
  - Sexually matured medium size of between 150 and 250g and which can produce eggs soon after stocking.
  - Must not have wounds or scars on exteriorisation of fleshly parts.
  - Must not have broken shell.
  - Young snails must be used for purpose of egg laying.

- Mating of the snailery is very important in order to
Some factors that can affect hatchability of eggs are as follows:

- **Soil:** The soil must be well aerated for proper exchange of air between the developing embryo and the environment. Clay soil is too compacted, humid or garden soil is the best soil.

- **Wetting:** Whether artificial or natural, soil must not be dampened or too dry. Dryness will kill developing embryo while too much water in the soil will hinder respiration of developing embryo.

- **If eggs are laid on the surface of the soil and not well buried.**

- **Careless movement** inside the pen could cause handler to step on eggs.

- **Tilling:** care must be taken when using equipment like hand fork, hand trowel or hoe to loosen the soil or searching for eggs laid.

Snails eat little quantity of feed compared to other conventional livestock such as poultry and sheep etc. Summarized below are some factors that may affect feed consumption:

- **Environmental condition:** Snails eat well when the relative humidity is high, i.e. above 85% or when temperature is low (25-28 degree centigrade). Snails will not eat if the environment is too dry and after rainy day consumption rate or feed intake is high.

- **Age of snail:** The younger hatchlings prefer leaves of paw-paw and cocoyam etc. to fruits and tubers.

- **Moisture content of the feed:** Feed consumption will be high if the feed is in wet form or having high moisture content.

- **Quality of feed:** Fresh feed e.g. maize chaff (crill) should be given to snails.

**Risks/Constraints**

The rate of return on capital investment would be very slow in the first 3 years of operation.

Early detection of disease outbreak is very difficult since snails are nocturnal and serious economic loss might have occurred by the time the problem is detected.

Farmers may be complacent about thorough management practices since snails do not have ability to quickly and conspicuously respond adverse conditions like hunger in form of e.g. noise making, restlessness etc. as could be exhibited by other livestock like pig.

Adequate provision has to be made for expansion or calling in order to prevent overcrowding as a result of prolificacy.

**Fattening of small ruminants (Sheep And Goats)**

**Background**

Small ruminants, sheep and goats, provide food security throughout the year because of their short generation period of 5 to 6 months. These medium sized animals are in great demand for various ceremonies such as weddings to-plate, as well as popular in the butchers shops and pepper soup dishes. The rearing of small ruminants is not difficult due to the fact their feed, which is 50% to 60% of the cost of production, is from grasses, crop residues and agricultural by-products.

The marketing of small ruminants in Nigeria indicates that sheep are consumed particularly during the Muslim festivals of Eid-Kabir while goats are consumed throughout the year. Most of the sheep and goats consumed in the southern part of Nigeria not from the northern region. An established trade therefore exists between the north and the south in this regard. Traditionally, the investments in small ruminant production are almost zero. This is however not the case for the improved method of production. In the improved method, the net income is the sale price of the animal fattened minus the purchase price of animal, price of drugs, feed and salt lick. In essence, fattening is recommended ahead of breeding in Lagos State.

The breeds of sheep and goats recommended for the South-West are those adaptable to the zone in terms of tolerance and resistant to diseases such as Trypanosomiasis. These include
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Tel: 234-1-898-0561, 234-1-898-0562 E-mail: lagosada@yahoo.com
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- Agro-processors
- Marketers
- Service providers
- Widows
- The elderly
- Youth
- Pastoralists
- Hunters

For enquiries contact:
Lagos State Fadama Development Office (LSFDO)
Agricultural Development Authority Complex (A.D.A)
Old Abeokuta Motor Road, P. O. Box 3643, Agege, Oke-Odo, Agege, Lagos State.
E-mail: lagosada@yahoo.com, lagosfadama@yahoo.com
Tel: 00033712512-2, 00023311000

Infrastructure such as good access farm roads, water supply system including irrigation and power support system generation, water pumps would be provided.
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**Attractions**
1. Fattening of sheep and goats could be done on short term basis and one does not need to tie capital down for too long before realizing the income. It could be used to hedge against inflation and maintain the capital.
2. It could be practiced purely on part-time basis.
3. Proper planning could be made regarding the timing, investment cost and anticipated returns because it is relatively easy to determine when the prices will peak.
4. The animals are not fragile and could better withstand vagaries of weather if compared with other stocks like rabbit.
5. The rearing of the animals is socially, religiously and traditionally compatible with our environment and as such, it is easy for farmers to adopt and adapt the improved practices.
6. Though sheep and goats are not as prolific as grass-cutter and rabbits, the management practices required are not so intensive.

**Guide for selecting animals for fattening**
1. Animal to be used for production must be purchased from a reputable source.
2. Animals must not be purchased during the festivals when the price soars.
3. The animals selected must be free from physical abnormalities, viz: blindness, lameness or any form of physical deformities.
4. The animals must not have obvious diseases such as running nose, watery eyes, diarrhoea, cataract, and skin disease or ectoparasites infestation.

**Health Care for Animals Purchased for Fattening**
Animals newly purchased should be isolated and not allowed to come in contact with others. They should be quarantined as follows:

1. Provide enough water, feed and necessary vaccination such as anti-PPR.
2. Give prophylaxis treatment of antibiotics
4. Give a tick bath against ectoparasite
5. Repeat anthelmintics treatment and tick bath, and then trim overgrown hooves.

**Basic Requirements for Sheep and Goats Fattening**

The initial capital required for fattening is a function of the number of animals to be reared. At commercial level however, an estimated sum of N120, 000.00 is required for the fattening of 20 animals for between 4 and 6 months. This cost will take care of the cost of procuring 20 animals, feeding, labour and other incidentals for a period of 4 months when the animals are recommended for culling. The profit is to be made from the weight gain of the animals during the fattening period.

Sheep and goats housing should be located on a well-drained soil and well ventilated area. It can be a house made with wood by the side and the roofing can be made of corrugated metal sheet. A total of 50 adult sheep/goats can be housed on a pen of 85 square meter with 5 watering troughs measuring 4m x 0.3m x 1.5m. The flooring of the house should be made of materials that can be easily cleaned while wood shaving is recommended to cover the floor.

Establishment of pasture is a must for commercial sheep and goats farming. The pasture should be a mixture of Gliotrichia Septent (agumante), Leucaena leucocephala and Elephant Grass. The pasture can be fenced into paddock and rotational grazing done or it can be Zero grazing (cut and carry). Grazing should be done for 6 hours in a day or given 1.5-2.5kg hay per day. Small ruminants consumed 2-3 liters of water/day depending on the...
prevailing temperature.

Adequate nutrition and good pen hygiene must be maintained. Animals should be dewormed once in 3 months and be dipped once a month in Ariston® solution to prevent ecto-parasite infestation.

Pen houses should be cleaned daily and disinfected periodically. Mineral salt lick should be provided for the animals to aid digestion and absorption of feed. Hooves should be trimmed once in 6 months and cleaned. Sick animals should be isolated in a sick pen.

Risks / Constraints
The common diseases like pneumonia, diarrhoea, oestrous, foot rot and paraties such as mules/worms, flies, ticks and fleas could drastically reduce the gain weight of the animals if not properly taken care of. If not properly controlled and managed, sheep and goats can stray to the crop farms and cause destruction which may lead communal clash (farmers / pastoralists conflict)

Availability, cost and labour of pasture could constitute a major hindrance / obstacle to the enterprise especially for the livestock farmers in the urban and peri-urban areas.

The recommended land space (required per animal for housing as well as for pasture) per hectare would vary, and may not be readily available for both small and large scale livestock farmers.

Poultry production
Background
Poultry are birds (fowl, duck, turkey, goose, ostrich, etc.) which are reared for meat and eggs. Poultry in Nigeria had undergone tremendous changes over the past years, both technologically and management wise. The poultry breeder had moved from the backyard poultry rearing (traditional methods) to the present modern poultry keeping for mass production of eggs, broiler and cockerel production for meat. The two management practices currently being recommended are the deep litter and the battery cage systems.

Poultry are mainly reared for egg and meat production in Nigeria. The utilization of poultry by-products in Nigeria is still at a very low ebb. Poultry business is also an attractive business and as such could not be practiced on part time basis if the production is on medium to large scale. Poultry business is not as risky as we think, if sound management practices are put in place.

Exotic Breeds (e.g. Hauss, ISA Brown, etc.) are available at commercial farms as cockerels, broilers, pullets, breeders (foundation stocks). These are less hardy but large in size and can produce up to 250 -320 eggs per year under quality intensive management systems (battery cage system). They may not reach their genetic potential if reared under harsh environmental condition of temperature, humidity (moisture) and ventilation. They are more susceptible to disease and should be kept under proper hygiene.

Attractions
- Poultry still remains the fastest source of animal protein worldwide and Nigeria is not an exception.
- The rate of return on investment is very fast and almost immediate especially for layers.
- More information is available regarding poultry business if compared to other sectors in agriculture. This may be as a result of quite large number of farmers dealing in poultry.
- There is no known religious barrier against its consumption.
- It could be practiced at economic scale with few number of stocks.

Basic Requirements for 500 Point of Lay (P.O.L.) from 4 months (16 weeks) to 22 months (life span)

A. Capital expenditure - infrastructure
1. Housing: Laying pen of 7.6m x 7.6 m (bricklaying & carpentry work) 710,000
2. Battery Cage (locally fabricated) 8 units @ 50,000 each 320,000
3. Others: Wheel Barrow, bucket, plastic drums, shovel, etc. 28,400
Total for the capital expenditure 1,058,400

B. Recurrent expenditure
1. Purchase of 500 Point of Lay (P.O.L.) @ N800 per one 400,000
2. Feeds
   i. Week 16-20 growers mash (60 bags) @ N1150 per bag 69,000
   ii. Break even point etc 172,500
   iii. Week 21-28 layers mash (150 bags) @ N1150 per bag 1,315,000
3. Medication 50,000
4. Labour @ N500 per month 90,000
Total recurrent expenditure 1,816,500

Basic Requirements for rearing 500 broilers from day old to 10 weeks
- Purchase of stock @ N120 / D.O.C. (Day Old Chicks) 60,000
b. Feeding

Day 1 - 30 days i.e. broilers starter mash
500 DDC x 0.75 bag x N1200 per bag
25kg of feed (a bag)
= 18,000

Day 31 - 60 days i.e. broilers starter mash
485 DDC x 1.5 bags x N1200 per bag
25kg of feed (a bag)
= 34,920

Day 61 - 70 days i.e. broilers finishers mash
473 DDC x 1.5 bags x N1200 per bag
25kg of feed (a bag)
= 34,200

Total cost for feeding
= 87,120

c. Cost of rearing

i. Brooding at N10 per chick
   5,000

ii. Vaccination / medication etc at N20 per chick
   10,000

iii. Labour (1)
     3,000

Total cost of rearing
= 18,000

d. Cost of Equipment and materials (non consumables)

i. Chicks plastic feeders 20 Nos @ N100 / one
   2,000

ii. Chicks plastic drinkers 20 Nos @ N150 / one
    3,000

iii. 6" x 4" wooden feeders 20 Nos @ N150 / one
     3,000

iv. Medium size pots - 5 Nos @ N150 / one
    750

v. Stove 2 Nos @ N500 / one
   2,000

vi. Medium size plastic bowls - 2 Nos @ N150 / one
    300

vii. Scoop size plastic bowls - 2 Nos @ N100 / one
     200

Total cost of consumable materials
= 11,250

These equipments are to be used for at least 20 production cycles i.e.
11,250 - 562.50 = 20

e. Cost of consumable materials

i. Charcoal 3 bags @ N500 / bag
   1,500

ii. Kerosene 10 littes @ N40 / liter
    400

iii. Polythene sheets 4 rolls @ N400 / roll
    1,600

iv. Hard cardboard (4' x 8') 3 Nos @ N250 / one
    750

Total cost of consumable materials
= 4,450

Total recurrent expenditure for rearing
Broilers (A + B + C + D + E)
500
= 170,125.50

f. Housing: An estimated sum of N700, 000 will be adequate for the construction of the house that will accommodate 500 Broilers.

Risks / Constraints

- The working capital for operation of poultry business is very high and not commensurate with the profit margin.

- The price of the poultry products is very erratic and if production is not properly planned, the producer may be left at the mercy of the consumers for price determination. This makes a lot of farmers to be producing at losses.

- Exotic poultry are very fragile, highly susceptible to common diseases, and the business requires a lot of attention at all times. Any little mistake or error along the production line can therefore result in high mortality that could result in colossal waste of resources.

- Waste management / disposal could constitute major problem to the development of the business.

- The odour being generated from the poultry is very offensive which makes it unattractive to practice close to the residential quarters.

- With the recent outbreak of Avian Influenza in the country, bio security measures must be strictly observed in all poultry farms.

By: Ogunsola, A.F.
Olakalehin, J. O.
Adeyemi, B.A
and Ajijola, F.S.
Burkinabe Oven Alternative To Traditional Smoking Kiln for Fish Processors in Lagos State.

Lucman O. Eliaa
Director of Extension Services

Introduction: Lagos State is a large aquaculture producer because it is endowed with all the three water bodies namely: fresh water, brackish and marine waters. Fish production with its by-products such as offal, fish heads and fish bones are important raw materials for fish meal production. Aquaculture in Lagos is well established in the state. The state has 10 fisheries cooperatives, 25% of Lagos State, 20% of Lagos State, 20% of Lagos State, and 50% of Lagos State, are well established in the state. Fish landed by these cooperatives and industrial fishermen are mostly sold locally, while some are sold to the food industry.

Large quantities of fish are sold with heads or without heads to avoid spoilage of fish that are sold wet and wet the water to prevent the spoilage of the fish is either through processing and preservation. Aquaculture facilities to control a large quantity of fish that are sold with heads or without heads.

Smoking is the conventional mode of preservation of fish in Lagos State. Thus, a general removal of this process from the fish that are sold in Lagos State is a need to reduce the pestilent spoilage. Several methods have evolved for smoking techniques; these include; smoking, smoking, smoking, smoking, and smoking. Although, it has been proved that some of these areas can be reduced but due to individual hardships of our fish processors and more importantly the capital costs, the traditional smoking kiln is preferred and adopted.

But the question is, can the fish processors know that the traditional smoking kilns are designed and used differently? Apart from the fact that the taste of the fish in the smoke, the smoke has a color that is found out that the fish processors are the main benefit and the capital and (1) carrying capacity in benefit. Furthermore, the capital costs of the use is small, and there is little or no control over the temperature of the fish.

For this reason, the Lagos State Agricultural Development Authority (LADDAO) was set up by the Federal Government to develop the fish processing with a view to reducing spoilage which always affects the fish processors. This is a model traditional smoking equivalent known as Burkinabe kiln. It was first introduced in the fish processors in Ife-Orangun, hence its called Burkinabe oven. It has been adapted by the fish processors in Ife-Orangun.

Burkinabe Oven
This equipment has been accepted as an acceptable modern oven which can be easily established with simplicity and to different costs from the usual traditional designs. Its construction materials are sourced locally and more infallible smoking can be achieved. This kiln can be easily constructed from a little amount of

Structures of Burkinabe Smoking Kiln
Three sections of a metal structure which can be constructed from a variety of materials such as wood plate and corrugated metal sheets. This structure consists of a metal and the top part can be removed and the fish that is removed in a metal can be placed on the top of the metal. The lower part is filled with wood and the fish is arranged at the bottom to smoke and the fish can be smoked in a box. While smoking, the upper part is covered with a sheet of metal to prevent any embers from escaping.

Operation of Burkinabe Oven
This design removes the dust and smoke that is generated while the fish are being smoked. The fish are placed in a metal box that is filled with wood, which are kept in the kiln to smoke the fish. While smoking, the upper part is covered with a sheet of metal to prevent any embers from escaping.

Advantages and Disadvantages of Traditional Oven
The only advantages of the traditional oven is its cost compared to the new kilns. However, the disadvantages include:

- Constant attention of the processor is required to control the fire and keep the fish which is not the case with the kiln.
- Traditional ovens are not suitable for large-scale processing.
- There is little or no control over the temperature of the fish and the intensity of smoking.
- The wood used is not monitored but the fumes of the fish.
- The fish produced is of poor quality due to insufficient smoking of fish inside the fish.

For further Information
Equipment and Design and Construction
Contact: The Extension Component,
Lagos State Agricultural Development Authority,
Chair: Mrs. A. A. Agbe, Lagos State

For further Information
Equipment and Design and Construction
Contact: The Extension Component,
Lagos State Agricultural Development Authority,
Chair: Mrs. A. A. Agbe, Lagos State
WASTE MANAGEMENT IN URBAN FISH FARMING

Mrs. A.F. Ogunsona & Mrs. F.A. Joshua

With more people going into fish farming, a major problem has emerged which is inadequate disposal of waste water. Waste water is the water released when charging water, this is especially true in the case of a concrete pond fish culture.

The enormous release of water most times poses a problem for the fish farmer which turns him into a water sewer for the fish. There is therefore a need to find some solution to this great problem. The waste water is usually rich in nutrients, this is because it contains a lot of fish feed and waste of fishes released.

Fish farming can be combined with earthworm farming which can be fed directly to the earthworm except in the case of a feed as a form of protein source. Earthworms are a natural food for the fish especially in the wild. It can also be fed to fish under culture as a supplementary feed. When a fisherman uses earthworms in the culture of his fish, it is advisable to stop feeding with earthworm at least two (2) days before harvesting so as to enable them digest the earthworm before sale.

Vegetable farming can also be combined with fish farming. For this farming method, which is known as integrated farming, the fish are fed and they in turn produce nutrient rich waste. Solid waste is removed to feed a worm farm and dissipated nutrient waste is then passed to water vegetables.

The earthworm and vegetable farming can bring in extra income for the farmer. The earthworm farming is very popular in some parts of China in Asia, where it is a delicacy. The farming system can be made popular in Nigeria too, especially to fish farmers.

The earthworm, when cultured, can be fed directly to fish or included in the feed of fish in the dry form since it is a cheap source of protein.

The fish farmer who has a integrated farm can sell to the earthworms to other interested farmers to feed their fish as well as vegetables to consumers.

Apart from this, the fish farmer can sell off his waste waters to farmers in his locality who are into vegetable farming. This can be done during the dry season when there is usually no rainfall to water their vegetable farms. In this way the farmer will be gaining in two ways, first he will have enough water at regular intervals for his farm. Secondly there will be no need to buy fertilizer. Since the waste water is already rich in nutrients.

Mrs. A.F. Ogunsona
Mrs. F.A. Joshua

UPDATE ON NATIONAL PROGRAMME FOR FOOD SECURITY

Fatou Ougasowode

The Pilot phase of the Special Programme for Food Security officially ended on the 30th of June 2007, paving the way for the full implementation of the expansion phase nationwide.

The pre-implementation phase of the Programme commenced in August 2006 with conduction of National stakeholders meeting at the Regional office - Benin. This was followed by the State and Local Government level Sensitization meetings held in November and December 2006 respectively.

The Technical Management Committee met and approved 6 new sites in addition to the 3 existing sites. The new sites include: Apta / Eldeleso, Lriba in Benin, Amissa in Kpekepe, Amfoo / Faye in Anamoo, Odofin LGA, Jega / Jega in Alhaji LGA, Igbada / Gerigwe in Ibabode LGA, Ikoven / Kote in Epe LGA, and Lekki in Ibeja Lekki LGA.

- The Authority has made provision in the 2007 budget for the counterpart contribution expected from the State Government. Necessary correspondence had also been forwarded to the participating Local Government Councils to include their counterpart contribution in the 2007 budget.
- Necessary sensitization and mobilization were carried out at the newly selected communities using the newly appointed Site Managers. The details of the additional Facilities approved for all states have also been forwarded to the National Office in Abuja.

- The State participated at the meeting of the Finance Officers of States as well as the review of the Implementation Completion Reports held at Abuja and Ilmi respectively.
- The Facilitators (PME & REFLS) participated in training workshop on the conduct of NPS participatory Community Planning and Baseline studies held at ABMTL-Ikiri during the month of March 2007.
- The Participatory Community Planning and Baseline Studies were conducted at the six new sites during the month of April 2007. The report on these activities had been forwarded to the National Office.
- Further directives are being expected from the National Office on the implementation of the programme.

Fatou Ougasowode
PM & IE facilitator AFPE-LSADA
STAFF WELFARE PROGRAMME OF THE LAGOS STATE
AGRICULTURAL DEVELOPMENT AUTHORITY

Staff welfare is providing employees with facilities that will assist them in looking after their personal interests. These interests which are not directly connected with their jobs may affect their performances if they are not properly counselled or assisted. Staff spend at least half their working time at work or getting to it or leaving it. They will contribute to the growth of the organisation when they are reasonably free from worry. Therefore, welfare is a means of eliminating or at least reducing the state of anxiety or dissatisfaction. Welfare services increase the morale of employees and loyalty to the employer.

The Authority therefore shares the view of responsible organisations that employees must be assisted to overcome their anxiety and needs especially as they cannot readily leave their troubles/problems at home when coming to their offices.

The Authority has and continues to assist its staff in the following areas.

(A) STAFF REVOLVING LOAN

The Authority gives out soft loans to its deserving staff to solve immediate and pressing financial problems. This assistance does not merely consist of bailing staff out of debt but also gives them relief.

(B) STAFF ACCOMMODATION

Housing is an integral need of any individual. The Authority has two (2) blocks of twelve (12) flats (3 Bedroom) at Ojukoro which are presently occupied by some members of staff of the Authority. Also recently, the Authority commissioned another set of eight (8) comfortable living flats (3 Bedroom) at its headquarters, Oke-Oba, Agege. Indeed, it was a turning point in the life of the Authority as the commissioning was done by the Head of Service, Alhaji Yakubu Babangida on Tuesday 27th March, 2007. The flats have since been allocated to staff.

(C) STAFF CLINIC

The Authority's Staff Clinic is primarily to

attend to mild illness of staff and their immediate families. It is to provide staff with support and counselling on health matters. It cuts down on man hour loss from attending hospitals outside the Authority. It also assists to identify those who need to be referred to Government General Hospitals for further treatment. The Authority runs a day clinic with a staff nurse in charge.

(D) STAFF TRAINING

The Authority places much emphasis on training of its staff to ensure acquisition of more knowledge and skills in order to prepare them for better performance of their duties so that the Authority's objective can be achieved.

(E) STAFF GRATUITY / PENSION

The Authority has been able to pay the sum of #6,637,156.33 as gratuities to the twenty eight (28) staff that retired from the service of the Authority. This ensures that they will be able to cater adequately for themselves in their retirement. Equally is the fact that the Authority has made adequate provision for the gratuity of the staff still in service of the Authority.

CONCLUSION

All Heads of Departments are kindly enjoined to see the welfare of the staff under their responsibility. They should be close enough to each member in their departments in order to be aware of any personal problems affecting their work.
The Lagos State Governor, His Excellency, Babatunde Fashola (SAN) (right) congratulating the newly appointed Hon. Commissioner for Agric and Co-operatives, Chief Emisih Kilabunroye Ajibowo (left).

Commissioning of the new LSADA Staff Quarters, Oke-Ota Agege. From left to right:
1. HOS Alhaji Y.A. Bakun, former Commissioner for Agric & Co-op. (Adiye Kaidi Okusanya);
2. P.S., M.O. of Agric & Co-op. (Mr. Wale Raji);
3. P.M. LSADA (Dr. Y.O. Basorun)

A cross section of LSADA retirees during a ceremony for the presentation of their gratuities.

The LSADA Program Manager Dr. Y.O. Basorun, (right) during the reception held for Mrs. M.O. Adetunmow, former Special Adviser to the President on Food Security (middle).
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Quality Systems
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The Lagos State Fish Farmers' Association

Y. O. Basorun and J.O. Olakulehin

Often referred to as the commercial centre of the country and of West Africa, the state of Lagos is found in south-west Nigeria, lying entirely within the rainforested zone of the humid tropics.

It has a coastline of 130 km and an easily navigable lagoon (1377 square kilometres), approximately 23 percent of which consists of lagoons, creeks and rivers. The estimated number of farm families in the state is 350,000, and fishing is the most important occupation of the rural population along the coastline and river course, ranking next to crop farming in terms of occupations of all rural households in the state.

Unfortunately, fish catch is not as high as would be expected, and the amounts of fish caught have been decreasing in recent years. In 2006, the annual fish catch stood at 31,000 tonnes because fish populations are decreasing. This is not enough to satisfy demand, and about 80 percent of all fish consumed in Lagos is brought in from outside the state.

As less and less fish were being caught, people became more interested in and curious about fish farming. The Lagos State Agricultural Development Authority informed that fish farming offers the possibility of increasing fish production, as well as creating employment opportunities, resulting in an additional source of income for urban dwellers. A few years ago, the Authority decided to include fish farm practices in its extension programmes, covering issues such as the preparation of feed ingredients, the construction of homestead fish ponds with locally available materials, the integration of commercial fish farming with the rural population's daily activities, the production of fingerlings or young fish at the farms, as well as marketing issues, record keeping, and the linkage with financial institutions for credit sourcing.

As a result, the number of fish farms increased from 500 in 1997 to over 2000 by 2004, with the total area covered by fish farms increasing from 150 to 340 hectares in the same period. Fish farm production now averages 9,500 tonnes per year. Fish farming has been promoted as a low-cost input technology benefiting from the availability of natural resources.

But the optimal local conditions: a wide water body almost everywhere in the state, good soil structure and farmers also brought some problems which had not been seen before. Unlike fishermen, who usually reside in one community along the coast and are culturally bonded together, the farmers who are scattered around the state. Fish farming is not an immediate occupation for people in the city, and fish farming being the only thing they share. Fishermen is a particular community that has its own way of life, and they farm themselves into a cooperative society for easier access to credit and market outlets. This is difficult for fish farmers because they are not congregated in one location. In a similar way, the dissemination of improved practices for fish farming was also problematic for the extension agents as the farmers are scattered all over. The practice of homestead fish farming within the residential areas by individuals is often an obstacle for the extension agents, as they have to reach them outside their farms during working hours.

After producing fish for quite some time, fish farmers in different areas realised the disadvantages of the situation they were having limited access to extension services, reliance on middlemen for marketing (which would also determine the price of their produce), inputs available only at inflated prices, and so on. They were at a disadvantage in terms of experience and awareness. This was all reflected in the profits they were making. By working independently, the cost of producing fish was almost the same as the selling price. In addition, they realised that they were not working together. It became virtually impossible for them to be properly represented when this was necessary, for example, in the World Fish Day celebrations or in lobbying activities.

The Lagos State Fish Farmers' Association

The problems mentioned above became so obvious that the Lagos State Agricultural Development Authority

Some of the members of the Lagos State Fish Farmers Association during their recent meeting.
UP-DATE ON FADAMA II

LAGOS FADAMA II WINS AWARD, INAUGURATES NEW MARKET

Fadama II Project of Lagos State Ministry of Agriculture and Cooperatives has formally inaugurated the foodmill acquired by the Progressive Farmers Association of Fadama II project. Speaking at the occasion the Commissioner, also represented by the State Project Coordinator Dr. Olumide Omuakhere, expressed satisfaction and joy on the Fadama project. He congratulated the Progressive Farmers Fadama Community Association (PCA), Sangotedo Enugu Local Government Area, for scaling the rigorous process and procedures of Fadama II participation. In his words, Lagos State Government through the Fadama Development Office has empowered the farmers by supporting their farming activities with a foodmill that will service the entire local government area from providing the much-needed food on time, the foodmill will reduce the time and cost of buying from landlords inside the local government area. In addition, the usual problem of transportation and its cost would have been removed at a cost reduced to an extent.

To further, the SPC encouraged the benefiting Fadama Community Associations (PCA) to ensure proper usage, adequate and timely maintenance of the food mill.

MARKET

In the same vein, the SPC is promoting the sale of produce by the farmers, and the PCA also formally declared for sale, the newly completed fish market and restaurant.

The Lagos State Government through the Fadama Development Office has acquired the new market and the rice mill, which will enable the farmers to sell their produce effectively to Agriculture and farmers in general.

To this end, the government has offered farmers positively, by bringing about improved standards of living, increased income and improved rural infrastructure.

AWARD FOR FADAMA II

In a related development, the Lagos State Agriculture and Cooperatives has given its first Fadama II award to the Lagos State Agriculture and Cooperatives to recognize its contribution to the development of the state.

Speaking at the award forum, the State Project Coordinator, Dr. Olumide Omuakhere, expressed the desire of Fadama II to collaborate with Cooperatives in supporting the activities of farmers, in order to continuously serve as development catalyst that will transform the agricultural landscape of the state.

He pledged the resolve of the State Fadama Development Office to support and ensure that the Fadama II project of the Government in Lagos through the State Bank intervention is not misplaced.

TANGIBLE OUTPUTS

So far the Fadama II project in the state has transformed more than one thousand Farmers into rice and fish farmers, with about 470 rice farmers registered as cooperative group. And in addition there are over 150 (One hundred and fifty) Fadama Community Associations (PCA) registered as cooperative group. This has shown that Fadama has encouraged group activities which is one of the cardinal principles of Fadama II as a project.

PRODUCTION ACTIVITY RESULTS TO DATE

Egusi (400) Local Development Plan (LDP) containing 65 sub-projects have been approved and are currently at various stages of implementation. 400 sub-projects have been completed while 94 and 150 sub-projects are on-going and under preparation respectively. Between the period of project inception in 2004 and September 2005, a total of 343 Fadama Community Associations (PCA) and 150 farmers Group have benefited from the project. This is made up of 90 FCAs/PUGs under Rural Infrastructure Development, 253 Tugas under Pilot Asset Acquisition support, 73 FCAs/PUGs under Demand Responsive Advisory Services and 277 Tugas under Capacity Building programs.
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- Juveniles
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E-mail: orisaquatics@hotmail.com, ocade@infoweb.com.ng

We are hands on farmers not theorists.
LAGOS STATE AGRICULTURAL INPUTS SUPPLY AUTHORITY (LAISA)

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E-mail: lasainfo@lagosagricinputs.org  Website: www.lagosagricinputs.org

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Locations of Party Service Centers Across Lagos State:

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Hanos Osho Close, Oshodi/Isolo, Lagos.

IKO:
1750, Off Apapa Rd, Oshodi/Isolo, Lagos.

KAGI:
Lagos-Ibadan Expressway, Lagos.

LPG:
148, Off Apapa Rd, Oshodi/Isolo, Lagos.

Ecofarm:
Ogun State, Ijebu-Ode.

Lagos State Government

Ecofarm:
Ogun State, Ijebu-Ode.

For all queries, call 01-7923463, 8917992.
Appendix 23

Lagos State Agric. Development Authority annual review of 2006 work plan
LAGOS STATE AGRIC. DEVELOPMENT AUTHORITY

( LSADA)

ANNUAL REVIEW OF 2006 WORKPLAN

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LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY (LASADA)

INTERNAL AUDIT UNIT

ANNUAL AUDIT REPORT 2006

1.0 INTRODUCTION
The Internal Audit Unit of LASADA is responsible for continuous appraisal of control measures established by Authority Management Unit (AMU) to review, verify, report and recommend on discoveries as it affects all financial records. All forms of payments by the Unit.

1.1 OBJECTIVE
The main objective of Internal Audit is to ensure that a complete and continuous audit of the accounts and records of revenue and expenditures, plants and allocated stores and misleading store where applicable.

MAIN OBJECTIVE
The Internal Auditor shall ensure that:
(a) The safeguards introduced for the prevention or prompt detection of fraud and loss of cash is adequate.
(b) The system for the control of the collection of the revenue is adequate that all moneys received have been promptly brought to accounts.
(c) The system for the control of expenditure is adequate that all payments made are properly authorized and correct, that they are paid to the right person from the right head and sub-head and made for the purpose for which they were authorized.
(d) The accounting records are accurate.
(e) Management directives are carried out as may be directed.

ORGANOGRAM
Programme Manager
Chief Executive Officer
Chief Clerk
2.0 **STAFF DISPOSITION**

The table below shows the Internal Audit staff disposition as contained in the 2006 approved budget.

<table>
<thead>
<tr>
<th>SNO</th>
<th>DESIGNATION</th>
<th>GL APPROVED</th>
<th>POST</th>
<th>VACANCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chief Auditor</td>
<td>14</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Higher Executive Officer</td>
<td>8</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Chief Clerk</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

3.0 **ACHIEVEMENT**

The work plan of the Unit for the period under review was fully covered and there was no incident of theft of government properties.

4.0 **RECEIPTS**

Total monies received by this Authority during the year under review from various sources are outlined below:

<table>
<thead>
<tr>
<th>SOURCES</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Government Grant: NSPES</td>
<td>9,249,939.74</td>
</tr>
<tr>
<td>RTEP</td>
<td></td>
</tr>
<tr>
<td>Lagos State Government Capital</td>
<td>6,350,000.00</td>
</tr>
<tr>
<td>Subvention</td>
<td></td>
</tr>
<tr>
<td>Heavy Equipment</td>
<td>62,126,000.00</td>
</tr>
<tr>
<td>FADAMA I</td>
<td>2,160,000.00</td>
</tr>
<tr>
<td>Rent</td>
<td>1,565,698.48</td>
</tr>
<tr>
<td>Others (Cash)</td>
<td>1,438,109.15</td>
</tr>
<tr>
<td>Asset disposal</td>
<td></td>
</tr>
<tr>
<td>Motorcycle</td>
<td>180,119,864.37</td>
</tr>
</tbody>
</table>

5.0 **EXPENDITURE**

Total expenditure of this Authority for the period of January to December 2006 is as analysed below:

<table>
<thead>
<tr>
<th>Components</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmes Manager</td>
<td>1,285,958.00</td>
</tr>
<tr>
<td>Finance and Accounts</td>
<td>-1,444,000.00</td>
</tr>
<tr>
<td>Administration</td>
<td>8,322,304.67</td>
</tr>
<tr>
<td>Engineering</td>
<td>995,380.00</td>
</tr>
<tr>
<td>Extension</td>
<td>11,405,311.62</td>
</tr>
<tr>
<td>Technical</td>
<td>4,662,070.00</td>
</tr>
<tr>
<td>Planning</td>
<td>-7,510,963.00</td>
</tr>
<tr>
<td>NSPES</td>
<td>9,611,644.68</td>
</tr>
<tr>
<td></td>
<td><strong>811,229,159.97</strong></td>
</tr>
</tbody>
</table>
These expenditure figures represent the total payment vouchers raised and verified by the Internal Audit for the period.

6.0 EXTRA-ORDINARY MATTERS

Two blocks of sixteen flats property of this Authority (AHEAD) was disposed during the year for the sum of one hundred and four million naira (N104m). Only forty million naira has been collected while the balance of sixty four million is expected by the Authority in year 2007 where all conditions have been met.

7.0 OBSERVATION/RECOMMENDATION

- Update of all accounting records in good time must be ensured. All recording and postings should be carefully made and crosschecked by superior Officers. This will ensure correctness and accuracy.

- Observations by the Internal Auditor should be promptly addressed without delay.

- One cheque to one payment voucher should be adhered to strictly for clarity.

- Posting of receipt of money into the Cash Book should be made from issued receipts and not from bank pay-in-slip.

- The following records should be maintained:
  - Cheque book register
  - Receipt book stocks register
  - Schedule of cash balances on weekly basis.

Y.A.O. ONIWOINNER
CHIEF EXECUTIVE OFFICER (AHEAD)
31ST DECEMBER, 2008
INTERNAL REVENUE GENERATION

2006 ANNUAL REPORT

The unit was established with the sole aim of applying available resources and setting up ventures to generate income to augment Authority's revenue. Initially, the unit embarked on heavy equipment management and lease programmes. However, most of the lease programme on heavy equipment was terminated in June 2006 with the exception of that of Vibratory Roller (Komatsu JV100) with departmental No. LSADA/HE: 09 leased to Louis Lahi Engineering Ltd from which a total sum of revenue of $580,000.00 was realised throughout the year.

In the second half of the year (i.e., July – Dec. 2006), the Vibratory Roller, Komatsu JV100 with dept. No. LSADA/HE: 18 and the Low-header truck Steyr 32525 were operated and managed by the Authority realizing a revenue of $690,000.00 and $615,000.00 respectively during the period. Revenue of $68,500.00 was realised from tractor and equipment hiring while $726,000.00 came in from sales of scrapped machines.

<table>
<thead>
<tr>
<th>S/No</th>
<th>ACTIVITIES</th>
<th>TARGET $</th>
<th>ACHIEVED $</th>
<th>ACHIEVED %</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vibratory Roller Komatsu JV 100 (HE 09)</td>
<td>$580,000.00</td>
<td>$580,000.00</td>
<td>100%</td>
<td>Leesee has paid up in full.</td>
</tr>
<tr>
<td>2</td>
<td>Motor Grader Komatsu GD 511A (HE 08)</td>
<td>$340,000.00</td>
<td>$140,000.00</td>
<td>32%</td>
<td>Machine retrieved from leesee: Not working.</td>
</tr>
<tr>
<td>3</td>
<td>Motor Grader Komatsu GD 611A (HE 07)</td>
<td>$340,000.00</td>
<td>$195,000.00</td>
<td>57%</td>
<td>Machine retrieved from leesee: Not working.</td>
</tr>
<tr>
<td>4</td>
<td>Vibratory Roller Komatsu JV 100 (HE 10)</td>
<td>$500,000.00</td>
<td>$500,000.00</td>
<td>100%</td>
<td>Equip. partly operated by leesee &amp; Authority.</td>
</tr>
<tr>
<td>5</td>
<td>Hydraulic Excavator Komatsu PC 220 (HE 02)</td>
<td>$340,000.00</td>
<td>$120,000.00</td>
<td>35%</td>
<td>Machine retrieved from leesee: Not working.</td>
</tr>
<tr>
<td>6</td>
<td>Sales of scrapped machines</td>
<td>$776,000.00</td>
<td>$776,000.00</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Hiring of Low Loader</td>
<td>$615,000.00</td>
<td>$615,000.00</td>
<td>100%</td>
<td>Authority operated truck from July – Dec.</td>
</tr>
<tr>
<td>8</td>
<td>Hiring of Tractor &amp; Insp.</td>
<td>$93,500.00</td>
<td>$93,500.00</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY

ADMINISTRATION COMPONENT
2006 ANNUAL REVIEW REPORT

1.0. INTRODUCTION

1.1. The Component is established primarily to provide support services to the Authority as a whole. Apart from General Administration, Personnel and Human Resource Development, it also performs other functions that may be assigned to it by LSADAEC, AMU or the PM.

The Organogram of the Component is provided below:

```
   PM
    |
    v
   AD (ADMIN.)
       |
       v
   MEDICAL UNIT
       |
       v
    GEN. ADMIN. SUB-COMPONENT
    |     |
    v     v
  EXEC. OFF. (ADMIN)  HUMAN RESOURCES DEV. SUB-COMPONENT
                     |                   |
                     v                   v
                     CLERICAL OFF. IV  PERSONNEL SUB-COMPONENT
                                             |
                                             v
                                            EXEC. OFF. (PERS.)
                                            |
                                            v
                                           CHEF CLER. OFF. I
```

6
For the purpose of effective implementation of the Component's objectives, the Component has three (3) Sub-Components as enumerated above with the key staff in place. This has assisted tremendously in ensuring positive achievements.

2.0.0 OBJECTIVES OF THE COMPONENT

2.1.0 The Component performs the following functions or any other functions that may be assigned to it by PARADIGM, AMF or the PM:

(a) Assist the Authority in formulating, compiling, executing and reviewing personnel and administration policies.

(b) Designing and organizing all the recruitment activities of the Authority.

(c) Coordinating the activities within the Component.

(d) Interpreting and applying the relevant personnel regulations.

(e) Establishing and enforcing the disciplinary and grievances procedures.

(f) Establishing performance evaluation and promotion procedures.

(g) Formulating satisfactory employee/employers industrial relation.

(h) Establishing performance evaluation and promotion procedures.

(i) Preparing, organizing and coordinating training programmes for the Authority.

(j) Maintaining and ensuring adequate security and proper use of Authority's properties with the resultant creation of a conducive working environment for staff.

(k) Acquiring, allocating and ensuring maintenance of Authority's vehicles.

(l) Staff welfare matters – Staff Buses, Staff Clinic, Staff welfare Loan etc.

3.0.0 HIGHLIGHTS OF ACHIEVEMENTS: JANUARY-DECEMBER 2006

(a) GENERAL ADMIN

(i) The Authority staff buses are regularly maintained to convey staff to and from their homes.

(ii) Drugs were purchased for the staff clinic between January-September, 2006 to further motivate the staff. Efforts are being made to ensure that a Matron is deployed to the Clinic from Ikeja Teaching Hospital.
The table below indicates the No. of staffs/relatives that received treatment from the clinic during the period under review:

| MONTHS | MALE | | | | FEMALE | | | | | | RELATIONS | TOTAL |
|--------|------|---|---|---|---|---|---|---|---|---|
|        | SNR. | INTER. | INR | SNR. | INTER. | INR | SNR. | INTER. | INR | RELATIONS |     |
| JANUARY | 10   | 13    | 14 | 3    | 6    | 10 | 2 | 58 |
| FEB.    | 24   | 7     | 10 | 1 | 3 | 8 | 5 | 58 |
| MARCH   | 7    | 13    | 12 | 4 | 18 | 9 | 4 | 62 |
| APRIL   | 2    | 3     | 10 | 2 | 18 | 12 | 3 | 71 |
| MAY     | 1    | 56    | 21 | - | - | - | 1 | 79 |
| JUNE    | 6    | 21    | 13 | - | 19 | 7 | 5 | 71 |
| JULY    | 4    | 18    | 26 | 1 | 18 | 18 | 1 | 72 |
| AUGUST  | 3    | 12    | 18 | - | 6 | 31 | 6 | 71 |
| SEPT.   | 11   | 20    | 6  | 4 | 15 | 7 | 1 | 64 |
| OCTOBER | -    | -     | -  | - | - | - | - | - |
| NOV.    | -    | -     | -  | - | - | - | - | - |
| DEC.    | -    | -     | -  | - | - | - | - | - |
| TOTAL   | 74   | 103   | 130 | 15 | 89 | 92 | 28 | 611 |

(iii) Twelve successful (12No.) Monthly Environmental sanitation exercises were held during the period under review.

(iv) Processing and Payment of monthly PHCN Bill was paid under the period.

(v) 4 No motorcycles were allocated to 4 Authority Motor drivers during the period under review.

(b) PERSONNEL

(i) The sub component serviced (12) meeting of the Authority Management Unit (AMU).

(ii) The Nominal Roll was updated twice.

(iii) All records of service were updated.

(iv) 2No. LSADAEC meetings were held.

(v) 2No. Staff/Management Consultative meeting were conducted in the period.

(vi) Members of staff Promoted in 2006 had been issued their Promotion letters.

(vii) Health talk was organized twice during the period under review.

(viii) 41lta. Members of staff were given soft loan.

(ix) Staff Pension Scheme has been established with Pension Alliance Limited (PAL).
The table below indicates the No. of staff/solutions that received treatment from the clinic during the period under review.

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SNR</td>
<td>INTER</td>
</tr>
<tr>
<td>JANUARY</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>FEB</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>MARCH</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>APRIL</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td>MAY</td>
<td>1</td>
<td>56</td>
</tr>
<tr>
<td>JUNE</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>JULY</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>AUGUST</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>SEPT</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>OCTOBER</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NOV</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEC</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>74</td>
<td>133</td>
</tr>
</tbody>
</table>

(iii) Twelve successful (12No.) Monthly Environmental sanitation exercises were held during the period under review.

(iv) Processing and Payment of monthly PHCN Bill was paid under the period.

(v) 4 No motorcycles were allocated to 4 Authority Motor drivers during the period under review.

(b) PERSONNEL

(i) The sub component serviced (12) meeting of the Authority Management Unit (AMU)

(ii) The Nominal Roll was updated twice.

(iii) Records of service were updated.

(iv) 2Nos. LASAHOSEC meetings were held.

(v) 2Nos. Staff/Management Consultative meetings were conducted in the period.

(vi) Members of staff Promoted in 2006 had been issued their Promotion letters.

(vii) Health talk was organized twice during the period under review.

(viii) 41Nos. Members of staff were given soft loans.

(ix) Staff Pension Scheme has been established with Pension Alliance Limited (PAL).
### TABLE II: STAFF REVOLVING LOAN

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>SNR</th>
<th>INTER</th>
<th>INR</th>
<th>SNR</th>
<th>INTER</th>
<th>INR</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>JANUARY</td>
<td></td>
<td>4</td>
<td>2</td>
<td></td>
<td>2</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>FEB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>MARCH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>APRIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>MAY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>JUNE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>JULY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>AUGUST</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>SEPT</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>OCT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>NOV</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>DEC</td>
<td></td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>18</td>
<td>7</td>
<td></td>
<td>11</td>
<td>5</td>
<td>41</td>
</tr>
</tbody>
</table>

**TRAINING**

(i) During the period under review 12 No. Off-project workshops were attended by 9 No. Management staff, 14 No. Senior staff, 16No. Intermediate staff.

(ii) 60 No. I.T. students had Industrial Attachment during the period under review in the Authority.

(iii) 6No staff are still on long Term Courses during the period under review.

(iv) 31 No staff attended six (6) different Management courses organized by the Ministry of Institutions and Training.

(v) 4 No. In-House Training was held during the period under review in the Authority.

### 4.0 CONSTRAINTS

Below are some of the problems encountered in the course of discharging the functions of the Component:

(a) Fixing of meetings for LEADAPAC is beyond the control of the Component.

(b) Insufficient fund in implementing training programmes and other activities.

### 5.0 PROSPECTS AND RECOMMENDATIONS

(i) Adequate fund should be provided by both Federal and State Governments for the Authority as and when due to enhance the performance of the Personnel Management Component and the entire Authority.

(ii) In-plant Training programmes for all categories of staff should be emphasized to improve on the quality of staff.

(iii) The issue of merging of service of the Directly Recollected Staff (DRS) and payment of 4 months Arms's should be tackled at the highest level so as to boost the morale of our staff.

(iv) The staff welfare fund should be increased to N=600,000.00 so that more staff.
<table>
<thead>
<tr>
<th>COMPONENT ADMINISTRATION</th>
<th>ACTIVITY</th>
<th>2006 ANNUAL TARGET</th>
<th>ACHIEVEMENT JUN-AUG 2006</th>
<th>PERCENTAGE ACHIEVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Conduct of interview to fill vacant position.</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>2.</td>
<td>Acquisition and allocation of required Authority vehicles</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>3.</td>
<td>Maintenance of Authority vehicles</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>4.</td>
<td>Provision of secretarial Services: AMU ADAEC</td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>5.</td>
<td>Updating Nominal Roll</td>
<td>3</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>6.</td>
<td>Updating Record of Services</td>
<td>350</td>
<td>342</td>
<td>98%</td>
</tr>
<tr>
<td>7.</td>
<td>Registration of contractors</td>
<td>4</td>
<td>1</td>
<td>25%</td>
</tr>
<tr>
<td>8.</td>
<td>Provision of basic facilities at Zonal and Area offices e.g. A/C, furniture, Renovating etc.</td>
<td>2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td>9.</td>
<td>In-House training</td>
<td>3</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>10.</td>
<td>Local Training</td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>11.</td>
<td>Industrial Training</td>
<td>34</td>
<td>34</td>
<td>100%</td>
</tr>
<tr>
<td>12.</td>
<td>Off-project training</td>
<td>15</td>
<td>12</td>
<td>80%</td>
</tr>
<tr>
<td>13.</td>
<td>Long-Term training</td>
<td>12</td>
<td>6</td>
<td>50%</td>
</tr>
<tr>
<td>14.</td>
<td>Contingencies (Study Tour Conference)</td>
<td>8</td>
<td>8</td>
<td>100%</td>
</tr>
<tr>
<td>15.</td>
<td>Purchase of drugs for staff Clinic</td>
<td>3</td>
<td>2</td>
<td>67%</td>
</tr>
<tr>
<td>16.</td>
<td>Promotion interview</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>17.</td>
<td>Componental meeting</td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>18.</td>
<td>Preparation of Reports: a. Annual b. Quarterly c. Monthly</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>NO.</td>
<td>ACTIVITY</td>
<td>2006 ANNUAL TARGET</td>
<td>ACHIEVEMENT JANU-DEC 2006</td>
<td>PERCENTAGE ACHIEVEMENT</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------</td>
<td>--------------------</td>
<td>--------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>19</td>
<td>Participation at Mid-Year meeting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Participation at Annual Review Meeting</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>21</td>
<td>Participation at MPRM</td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>22</td>
<td>Training Appraisal</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Purchase of stationeries</td>
<td>3</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>24</td>
<td>Security visits to the zones</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Assessment of staff attendance</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>26</td>
<td>Processing and payment of PHCN Bills</td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
<tr>
<td>27</td>
<td>Processing and payment of Telephone Bills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Preparation of Personnel Budget</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>29</td>
<td>Preparation of workplan and Budget</td>
<td>1</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>30</td>
<td>Health talk</td>
<td>10</td>
<td>2</td>
<td>400%</td>
</tr>
<tr>
<td>31</td>
<td>Monthly Environmental Sanitation Exercise</td>
<td>12</td>
<td>12</td>
<td>100%</td>
</tr>
</tbody>
</table>
FINANCE AND ACCOUNT COMPONENT
ANNUAL REVIEW OF ACTIVITIES JAN.-DEC. 2000

1.1 INTRODUCTION
Finance and Accounting Component is one of the supporting components of the Authority. It comprises of two sub-components, namely:
(a) Main Account
(b) Treasury

2.1 OBJECTIVES
The main objective of the Component is to ensure that a sound and current financial management and information processing system are in operation in the day-to-day running of the Authority.

2.2 OTHER SPECIFIC OBJECTIVES
(a) To ensure timely production of Financial Management report to the operations of the Authority.
(b) To ensure timely payment of salaries and allowances as and when due.
(c) To ensure that the annual report and financial statements are audited by the External Auditors and submitted to the Authority by the external Auditors on time.
(d) To ensure prompt payment for goods and services rendered to the Authority.
(e) To ensure that assets and liabilities of the Authority are accounted for.
(f) To ensure timely receipt of funds from all funding parties.
(g) To ensure that the staff of the component are abreast of current financial systems.
ORGANOGRAM OF FINANCE AND ACCOUNT COMPONENT

P.M.

HEAD OF FAC

MAIN ACCOUNT TREASURY

The above is the Organogram of the Finance and Account Component.
<table>
<thead>
<tr>
<th>SN</th>
<th>DESIGNATION</th>
<th>GL</th>
<th>APPROVED</th>
<th>No. IN EST.</th>
<th>VACANCY POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Principal Executive Officer Account</td>
<td>19</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Principal Executive Officer Account</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Senior Data Processing Officer</td>
<td>09</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Accountant II</td>
<td>08</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Executive Officer Account</td>
<td>07</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Chief Clinical Officer</td>
<td>07</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Clerical Officer</td>
<td>04</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
QUALITATIVE ACHIEVEMENT OF THE COMPONENT DECEMBER 2006

1. Salaries and allowances were paid from January to December 2006.
2. Leave bonus for the year 2006 was paid to staff.
3. The books of Accounts of the Authority were Audited by the External Auditor during the period under review.
4. Tax return were paid to the tax office at the state internal revenue during January-December 2006.
5. There was preparation of Payment vouchers based on programme Manager’s approval on the services rendered between January-December 2006.
6. Subventions due to the Authority from the State were promptly collected and paid into the coffers of the Authority between January -December 2006.
7. There was adequate rendition of Componential expenditure report between January-December 2006.
8. Return on Special Project on food security was rendered for the period under review.
9. Statement of expenditure on Root & Tubers Expansion Programme was prepared and sent to RTEP/MU at Ibadan.
10. Assets register was updated for easy reference.
11. The Component successfully participated in all statutory meeting of the Authority and offered useful information and advice where necessary during the period year 2006.
12. The component was able to acquire new computer set during the year 2006 for accounting activities.
13. The component rendered report of the Audited Account for the year 2005 to the Authority and the stake holders during the year 2006.
14. The Component regularly rendered Accounting records to Internal Audit unit on Monthly basis between January-December 2006 for post auditing purpose.
15. Capital allocation for the period were collected by the component on behalf of the Authority.
16. The Component successfully collected the Sum of N14,000,000 on the sales of the Authority Building at Ilesa-eta in the year 2006.
<table>
<thead>
<tr>
<th>No.</th>
<th>ACTIVITY</th>
<th>UNIT OF MEASURE</th>
<th>TARGET JAN-DEC 2006</th>
<th>ACHIEVEMENT JAN-DEC 2006</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Review of 2005 Accounting System Procedure</td>
<td></td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Preparation of financial management report</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(a) Bank reconciliation</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(b) Monthly report</td>
<td></td>
<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(c) Quarterly report</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(d) Variances Analysis</td>
<td></td>
<td>3</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(e) Annual report</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Preparation of Bank of A/C for Audit Purpose</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Preparation of Payment Voucher</td>
<td></td>
<td>{\textit{Continue}}</td>
<td>{\textit{Continue}}</td>
<td>100</td>
</tr>
<tr>
<td>5.</td>
<td>Auditing &amp; Preparation of year 2006 Bank of Account</td>
<td></td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>6.</td>
<td>Mid-year review of Activities</td>
<td></td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>7.</td>
<td>Judgement and withdrawal of funds to Components &amp; Sub-Components</td>
<td></td>
<td>12</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>8.</td>
<td>Attendance at MPREM</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>9.</td>
<td>Vehicle Maintenance</td>
<td></td>
<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>10.</td>
<td>Updating of Computer input forms</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>11.</td>
<td>Tax Returns (PAYE)</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>12.</td>
<td>Preparation of Salaries &amp; Wages</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>13.</td>
<td>Payment of Salaries &amp; Wages</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>

\[ \frac{1200}{1300} = 0.9230 \]

92.30
4.1 PROBLEM/CONSTRAINTS

Despite all the achievements attained in the component between January to December 2006, the undetermined problems were still affecting the efficiency and effectiveness of the Component.

(a) The Component as one of the supporting components of the Authority needs one additional vehicle for the Component operation.

4.2 UNTIMELY RELEASE OF FUNDS/INADEQUATE FUNDING

Most activities of the Authority are time bound hence untimely release of fund will always have negative effect on the release of funds for Authority’s activities. As fund were not released on time by the funding parties, inadequate funding of the Authority is also affecting the operations of the Component. This does not give room for the provision of adequate tools for operations such as training of staff, procurement of adding machines and calculators.

4.3 FLEXIBLE ACCOUNTING SOFTWARE

The unavailability of flexible accounting package for posting of Accounting Data had adverse effect on the preparation of Ledger, Stock Valuation, Trial Balance and Financial Statements.

4.4 SUGGESTED SOLUTIONS

The following solutions are proposed so as to improve upon the present level of operations:

(a) The Authority should research into new ways of generating Internal Revenue so as to increase the present level of funding.

(b) The Staff of the Component should be made to attend relevant training, which will enhance their output in year 2007.

(c) The Authority should acquire the Flexible accounting Software in order to enhance both preparation, storage and utilization of Accounting data.
### FUNDING PERFORMANCE JAN. – DEC. 2006

<table>
<thead>
<tr>
<th>S/N</th>
<th>FUNDING PARTY</th>
<th>2006 TARGET</th>
<th>ACTUAL 2006</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lagos State Government Subvention</td>
<td>85,000,000.00</td>
<td>62,036,340.00</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>Asset Disposal</td>
<td>1,390,000.00</td>
<td>918,500.00</td>
<td>66</td>
</tr>
<tr>
<td>3</td>
<td>Heavy Equipment</td>
<td>2,400,000.00</td>
<td>2,669,600.00</td>
<td>112</td>
</tr>
<tr>
<td>4</td>
<td>Rent Deductions</td>
<td>1,300,000.00</td>
<td>1,300,427.00</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Animal Health &amp; Others</td>
<td>2,051,145.00</td>
<td>2,051,145.00</td>
<td>100</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>71,150,000.00</strong></td>
<td><strong>69,368,012.00</strong></td>
<td><strong>97.25</strong></td>
</tr>
</tbody>
</table>

### EXPENDITURE BY CATEGORY JAN. – DEC. 2006

<table>
<thead>
<tr>
<th>S/N</th>
<th>EXPENDITURE BY CATEGORY</th>
<th>2006 BUDGET</th>
<th>ACTUAL EXPENDITURE 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salaries &amp; Allowances</td>
<td>37,250,000.00</td>
<td>34,341,578.00</td>
</tr>
<tr>
<td>2</td>
<td>Operating Expenses</td>
<td>17,150,000.00</td>
<td>14,498,551.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>74,400,000.00</strong></td>
<td><strong>69,240,129.00</strong></td>
</tr>
</tbody>
</table>
### CAPITAL EXPENDITURE

<table>
<thead>
<tr>
<th>S/N</th>
<th>FUNDING</th>
<th>TARGET</th>
<th>ACTUAL JAN-DEC</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAPITAL</td>
<td></td>
<td>7,550,500.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>7,550,500.00</td>
<td></td>
</tr>
</tbody>
</table>

### CAPITAL EXPENDITURE FOR 2006

<table>
<thead>
<tr>
<th>S/N</th>
<th>EXPENDITURE BY CATEGORY</th>
<th>TARGET</th>
<th>ACTUAL</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Renovation of Office Building</td>
<td></td>
<td>3,900,000.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Purchasing of Official Car for Office</td>
<td></td>
<td>1,280,000.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Furniture for PM's Office</td>
<td></td>
<td>7,450,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>7,550,500.00</td>
<td></td>
</tr>
</tbody>
</table>

Due to the above analysis the total sum of 70,150,000.00 was expended on building and renovation of the office and purchase of office furniture during the year 2006.
### SPFS FUNDING JANUARY – DECEMBER 2006

<table>
<thead>
<tr>
<th>No.</th>
<th>FUNDING PARTY</th>
<th>ACTUAL RECEIPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FAO</td>
<td>8,110,999.00</td>
</tr>
</tbody>
</table>

**TOTAL EXPENDITURE**  
8,110,999.00

---

### ANALYSIS OF EXPENDITURE ON SPFS JANUARY – DECEMBER 2006

<table>
<thead>
<tr>
<th>No.</th>
<th>ANALYSIS OF EXPENDITURE</th>
<th>ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total amount incurred on site activities and payment of allowances to Chinese</td>
<td>8,110,999.00</td>
</tr>
</tbody>
</table>

**TOTAL EXPENDITURE**  
8,110,999.00

Expenditure incurred on SPFS January to December 2006.
### FUNDING PERFORMANCE ON RPET 2006

<table>
<thead>
<tr>
<th>SN</th>
<th>FUNDING</th>
<th>ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>STATE</td>
<td>4,483,958.80</td>
</tr>
<tr>
<td>2</td>
<td>FGN</td>
<td>2,021,024.06</td>
</tr>
<tr>
<td>3</td>
<td>IFAD</td>
<td>7,364,900.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>14,885,882.86</strong></td>
</tr>
</tbody>
</table>

### OUT-FLOW OF FUNDS ON RPET 2006

<table>
<thead>
<tr>
<th>SN</th>
<th>EXPENDITURE BY TYPE</th>
<th>ACTUAL EXPENDITURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RTEP Expenditure</td>
<td>14,083,329.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>14,083,329.00</strong></td>
</tr>
</tbody>
</table>
LAGOS STATE
AGRICULTURAL DEVELOPMENT AUTHORITY
OKO - OBA, AGEJE

EXTENSION SERVICES COMPONENT
2006 ANNUAL REPORT

PRESENTED AT
THE AUTHORITY'S ANNUAL REVIEW WORKSHOP

HELD ON
13TH FEBRUARY, 2007
AT THE
LSADA CONFERENCE ROOM
OKO – OBA, AGEJE
INTRODUCTION

The Extension Services Component was designed and meant to meet the needs of the year 2000 through the provision of qualitative extension services for the development of farm household livelihood activities in order to achieve the Authority’s main objective of improving their standard of living and increasing food production in the State.

The financial and institutional support given to the Component during the period were adequate for the modest achievements made.

The proposal of the Component’s activities for the year 2000 were generated through the Rapid Rural Appraisal (RRA) conducted in October 2005, as well as, from the results of the year 2000 OEAR. These proposals were subjected to discussions at the PCU National Review Meeting in Ibadan. Extension proposals for the year 2000 held in January 2006 at the PCU Regional Office in Ibadan. This was followed by its validation for implementation at the Rural REFLEX Workshop held in February 2006 at SARCEL, Ibadan. The proposal was further scrutinized in the next adequate financial work plan during the Authority’s Annual Work Plan and Budget (AWB) Workshop that was held in March 2006.

The Component embarked on a variety of activities which were evenly spread throughout the period under review. These activities were hinged on meeting the Component’s main objectives of reaching sufficient geographical coverage of Lagos State and making maximum impact on farmers and fisher men through the diffusion of recommended farm practices on Crop, Animal, Fisheries and Agro Processing under a unified agricultural extension system.

Some activities such as advisory and supervisory visits, construction of MPs (Management Planning Cells), Small Plot Adoption Trials (SPATs), demonstrations, farm visits, monitoring for registration of cooperative societies, communication support, etc were done as and when due.

The personnel of the Component were motivated to support and mobilize farmers for the State, Federal Government and World Bank/HABP/AO assisted agricultural development programme. Examples of such programme are the HABP-GRACE Pillar and Rural Extension Programmes (RP), SORHIFAD, Federal Government Agricultural Loan Scheme, National Rural Farmers Development Project (NRFDP II) and Fish Farm Estate established by the Lagos State Ministry of Agriculture and Cooperatives. Expansion phase of the State’s Programme for Food Security, among others.
## COMPONENT STATUS

1. Sub-Components: Extension Field Activities, Communication Support, Women in Agriculture and Rural Institution Development
   1.1 Number of Zones: 3
   1.2 Number of Blocks: 16
   1.3 Number of Extension CeMa: 1.28
   1.4 Number of Extension Agents: 60
   1.5 Number of Block WIA (RIIA): 56
   1.6 Number of BIA (WIA): 5
   1.7 Number of HIA (WIA): 1
   1.8 Extension Agent: Farming Radio: 1,146
   1.9 Total Number of Farm Families at Harvest: 121,216
   1.10 Estimated Number of Farm Families in the State: 1,32,401
   1.11 Staff Disposition: See Table 1 below
   1.12 Staff Mobility: See Table 2 below

### TABLE 1: STAFF DISPOSITION

<table>
<thead>
<tr>
<th>A. HEADQUARTERS</th>
<th>TARGET/EXPECTED</th>
<th>ACTUAL</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Director of Ext. Services</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2. Head of Communication</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>3. Head of WIA</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>4. Head of RIID</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>5. Head of Extension Field Activity</td>
<td>3</td>
<td>2</td>
<td>100</td>
</tr>
</tbody>
</table>
| 6. Principal Information Officer | 2 | 0 | 0%
| 7. Agric. Couns. Officers | 2 | 2 | 100 |
| 8. Graphic Artist | 1 | 1 | 100 |
| 9. Photocopyists | 1 | 1 | 100 |
| B. ZONE | | | |
| 10. Zone Extension Officers | | | |
| 11. Insect & Water Specialist | | | |
| 11.1 Crop | | | |
| 11.1.1 Crop | | | |
| 11.1.2 Crop | | | |
| 11.1.3 Crop | | | |
| 11.2 Animal Health Officers | | | |
| 11.3 Block Ext. Officers | | | |
| 11.4 Block Ext. Agents (WIA) | 16 | 16 | 100 |
| 11.5 Block Ext. Agents (RIID) | 16 | 16 | 100 |
| 11.6 HOUSE | | | |
| 11.6.1 Extension Agents | | | |
| 11.6.1.1 Male | 44 | 40 | 92 |
| 11.6.1.2 Female Ext. Agents (50% of the total) | 90 | 20 | 33 |
TABLE 2: STAFF MOBILITY

<table>
<thead>
<tr>
<th>Staff Type</th>
<th>Type of Vehicle</th>
<th>No in post</th>
<th>No supplied</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dir. of Extension Support</td>
<td>Hilander N/Bag</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Head of Comm.</td>
<td>Information Van</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Head of Field Activities</td>
<td>Pick up Van</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4. Head of RD</td>
<td>Sedan car</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5. Head of W8A</td>
<td>Sedan car</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6. Zone Ext. Officers</td>
<td>Marida Pick Up</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7. Black Extension Supervisors</td>
<td>Motorcycle</td>
<td>10</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>8. Extension Agents</td>
<td>Motorcycle</td>
<td>62</td>
<td>26</td>
<td>41</td>
</tr>
<tr>
<td>9. Prospectivist</td>
<td>Motorcycle</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Riverine Officers</td>
<td>Paramedic Carrier</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Motor Boat</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.0 OVERVIEW OF EXTENSION ACTIVITIES

4.1 GENERAL INFORMATION

With a total of 81 new Field Extension Agent (HEA-W8A) recruited, 1,050 new farm families were identified during the year, bringing the total number of farm families being serviced to 13,213. Thus, the extension agent/farm family ratio is moderate (i.e. 1:14). In the year 2080, a total of 768 new farmers/fishers/craftsmen processes groups were formed, with the percentage achievement ranging from 60% to 100% in the Livestock and Fisheries sectors, respectively. This brings the total number of contact groups to 2,145 (Table 3).

The number of regular advisory visits, primarily aimed at dissemination of proven and improved agricultural technologies by the field extension officers, for the period, was 10,000, an 8% achievement. The Director of Extension Services, Head of Extension Field Activities, Zone Extension Officers and Black Extension Supervisors made a total of 1,700 supervisory visits or 4% achievement while that of the management was 7. The Lagos State Field Office, as well as the offices of the PA and Regional Office, Budu, engaged President in several commodities and BMF, respectively, complementing the supervisory visits. The BMF is in charge of the Federal Agricultural Development Executive Committee (FADPEC) which also made a supervisory visit to some selected Riverine, Fishermen, and producers during the year.

The bird flu outbreak that was reported between March and April had a serious negative impact on the poultry business and the economy is yet to fully recover, as most farmers are unwilling to stock their pens. In addition, African swine fever outbreak was reported in locations such as Balogun, Oke-Aro, Gbajabile and Ijebu during the year. In this wise, the Component, with full support of the Authority, in terms of logistics and finance, carried out door-to-door and intensive entomology campaigns on the control and preliminary of Bird Flu and African Swine Fever.
4.2 TECHNICAL MESSAGES DISSEMINATED

Some of the technical messages disseminated during the period included:

a) Soil improvement technologies such as the appropriate use of Lime, organic manure and
   inorganic fertilizer.

b) Minimum plant population for all crops with special attention to sweet potato, yam, vegetables, tree crops such as coconut, oil palm and kola nut.

c) Soil and production through mini-set technique.

d) Appropriate storage of sweet yam with the use of furan.

f) Planting of improved crop varieties.

g) Improved management practices in livestock with special attention to feeding, housing and
   handling of veterinary drugs.

h) Improved management practices in fisheries with emphasis on water quality, feed
   formulation and hatchery management.

i) Processing options for root and tuber crops.

j) Appropriate use of agro-chemicals that is herbicides and insecticides.

k) Nutrient management on the discourage the use of Caucaio, 90 and other organochloride
   broad-spectrum chemicals.

l) Prevention and control of African swine fever

m) Prevention and control of Avian Influenza.

4.3 SPATs, MTPs AND DEMONSTRATIONS:

A total of 114 ADA financed SPATs on three technologies (two in crops and one in livestock) were conducted in 2006, representing 70% achievement of the set target. The SPAT messages were:

a) Appropriate planting arrangements for Pineapple in Yam/Pineapple mixture.

b) Appropriate time for introduction of sweet potato into Maize/Cassava mixture.

c) Use of fermented Cassava flour mixed with PGC in pig diets.

The SPAT on appropriate time for introduction of sweet potato into Maize/Cassava mixture showed that the Maize component performed better in the introduced technology. The SPAT average yield for Maize was 2.9 tons per hectare as against Farmers’ Adjacent Plots (FAP) of 2.2 tons per hectare (Table 7).

The SPAT on the appropriate planting arrangement for Pineapple in Yam/Pineapple mixture showed that the land was optimally used in the introduced technology, the result of which brought about the increase in yield if compared with the FAP (Table 7).

On Diversified SHELAT, that is the use of fermented cassava flour (Halofen) made with PGC in pig diets, the study showed that the average weight gain of SHELAT and that of FAP are not significantly different. Farmers however got the feed components of SHELAT cheaper than that of FAP (Table 8).

The farmers financed SPATs established by the frontline extension officers cut across the technologies disseminated as highlighted in item 4.0.2 above.
A total of 150 MTPs for 88% achievement were conducted on the following technologies:

a. Improved management practices for Casava production with the use of lime
b. Rice production with the use of improved production package

Table 9 below gives the summary of MTPs conducted in 2006. On rice production, 7.7 tons was recorded in MTP as against 2.1 tons State average. It must however be noted that farmers are having serious problems with processing as the processing facilities are greatly inadequate for the present level of production. There are no link rice farmers with the industrial rice millers in the State in order to address this problem in 2007. The Casava plots are due for harvest in March 2007.

The first line extension officers nominated a total of 282 AIDA input supported farmers representing 92% achievement of the target on 8 technologies that cut across all the agricultural sectors. (Table 10).

4.01 FIELD DAYS

The component conducted a total of 43 field days which cut across all the agricultural sectors in different parts of the State during the year. The topics of the field days were in line with the technologies disseminated during the year. Table 11 below gives the summary of the field days conducted in 2007.

4.02 ROILT AND PLOT EXPANSION PROGRAMME (ROLP)

Under the Roilt and Plot Expansion Programme (RPEP), the component worked closely with the Crop Development and Agro-Processing sub-components and State Agricultural Market Operators Group (SAMAIO), in the areas of identification of out-growers, processors, processors, and linking of the markets.

4.03 FEDERAL GOVERNMENT ASSISTED SPECIAL RICE PROGRAMME

Under the Federal Government Assisted Special Rice Programme, the National Seed Service (NSS) supplied about 4.2 tons of rice seeds to the Authority for onward distribution to farmers at cost. The seeds supplied were sold to farmers statewide with the highest buyers from Epe, Ijede, Ibafo and Ibadan axes. Rice farmers were unable to buy all the seeds for planting in 2007 and rice that 2 tons are still kept in the Authority’s store. Viability and sustainability tests by the Crop Development Component are recommended for the seeds before selling them to the farmers against 2007 planting season.

Six farmers selected as out-growers during the year were given fertilizer and farm inputs in addition to the rice seeds. In general, an estimated 35 hectares were put under cultivation by the 6th farmers that participated in the Special Rice Programme in 2006. The breakdown is as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Area (Hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertilizer</td>
<td>12.9</td>
</tr>
<tr>
<td>Husia-Lasa axes</td>
<td>12.5</td>
</tr>
<tr>
<td>Dalagun axes</td>
<td>5.8</td>
</tr>
<tr>
<td>Others</td>
<td>2.6</td>
</tr>
</tbody>
</table>

A major problem that may militate against rice production in the State is the inadequacy of modern rice processing machines. As at December 2006, rice factories in various locations are
bring close to 6,000,000 kg of paddy rice for milling. The prompt completion of the installation of the paddy rice milling machines at the Bebi Lekki Local Government Area by the Ministry of Agriculture and Cooperatives is expected to moderate the problems of rice milling in the State.

4.3 CREDIT SOURCING ACTIVITIES

A total number of 876 farmers groups' were linked with the leading agencies in the year 2000. Specifically, farmers in the State were adequately mobilized and informed on the modalities for the assessment of the N50 billion agricultural loan scheme of the Federal Government during the period. In particular, the First Bank of Nigeria reported that she had disbursed up to N1.5 Billion under the scheme. It was learned by important farmer groups, cooperatives and larger farmers, however, that the access to the loan from the commercial banks, small and micro-scale farmers were unable to meet the loan from Nigerian Agricultural, Cooperatives and Rural Development Bank (NACRAD).

An NGO called Youth Business Initiative (YBI) made several farm visits to farmers' groups in the State during the year with the intention of advancing loans to farmers below the age of 35. As at December ending, 40 farmers and agro-processors in this category have benefited to a total of N55.0 Million with individuals accessing between N20,000 and N50,000.

4.4 INPUT SOURCING/ MARKETING ACTIVITIES

A total number of 564 farmers groups were linked with sources of inputs such as agrochemicals, farm inputs and processing equipment. In addition to this, another 30 fish farmers were given institutional support such as the quota for selling their fish at the Headquarter premises, publicity through the BUA (RHD) etc. with the objective of:

4.5 GROUP DEVELOPMENT ACTIVITIES

The group development activity of RHD sub-component was stepped up during the year by linking 524 farmers groups in addition to the 1,826 existing ones in order to ensure that farmers access credit under the N50 Billion Federal Government Loan Scheme. In addition to this, RHD sub-component linked 233 farmers group with the Department of Cooperatives and Agricultural Insurance of the Lagos State Ministry of Agriculture and Cooperatives for registration in cooperative societies out of which 10 groups met the laid down conditions for registration and subsequently registered.

An NGO called Action Community Empowerment is currently working with youth (rice farmers) based in the area of improved packaging, methods and quality standards (e.g. standards) for local rice.

The RHD sub-component was involved in resolving conflict among and within more than 10 farmers' state-wide during the period under review.

4.6 WOMEN IN AGRICULTURE (WIA)

The Women-In-Agriculture sub-component with 13 BUA and 4 SMEs WIA was able to coordinate 261 women groups, 12,452 individual women farmers, as well as formed 72 new women groups. 16 girls clubs were formed and trained on different aspects of agriculture during the period in review.
In addition to 2 SKILL Development Centre demonstrations on kola and bread making, 531 other demonstrations were conducted at women production / processing sites during the year 2006.

The WIA-OAR trial on production of 'Noodles' fortified with IFAH using two Cassava products (R. starch and TTOC) was carried out. This was replicated in 7 locations, namely; Ibadan, Ilorin, Abeokuta, Benin, Lagos, Oyo and Ogun.

During the year, WIA subcomponent exhibited cassava flour products, kola and bread, powerfully and actively in the different states of Nigeria, such as Ogun, Osun, Kogi and Lagos. The WIA subcomponent also participated actively at the 60th anniversary workshop / symposium of FIFRO in November.

The Osun State Fadama Development Office under Second National Fadama Development (SNFP II) collaborated with the WIA subcomponent on different types of using kola during the period under review.

Some of the technologies disseminated to the women groups by the BWA (WIA) during the period under review include:
- Starch and tapioca production
- Production of vitamin-rich drinks
- Production of lumps
- Kola and bread-making
- Female making
- Ginger drink production
- Complementary baby food
- Production and utilization of cassava flour

Some demonstrations carried out in women groups during the year are listed below:
- Production and utilization of cassava flour
- Cassava flour production
- Complementary baby food using root and tuber products
- Soybean mill production
- Production of nutritious meals
- Kola, Korma and ginger drinks production

**9.11 COMMUNICATION SUPPORT**

The communication crew disseminated technical messages that were taught to farmers/fishers folks by the frontline extension agents on "Holothur" the weekly Yoruba extension programme. Presently, the Lagos State Agricultural Supply Authority (LASASA), Lagos State Fadama Development Office (LSFDO) and Lagos State Cocoa Development Agency (LASCODA) continued "Holothur" during the year.

The extension programme received a wider listenership during the period under review. This could be a result of the response of the general public, such as practicing farmers who have been involved in the Extension Group, retired and primary, secondary, and tertiary institutions making further contributions to the information process.
During the period under review, the subcomponent supervised the excision of the following schools in the L.SADA province:

1. Olnade High School, Ibadan
2. Olooto Comprehensive College, Ibiowon
3. Mint Blackburn School, Ojokho
4. Neat of Wakaon School, Maryland
5. Deloy Ilkuy School, Igbogbo
6. Air force Primary School, Shasha

The seventh edition of the Authority's agricultural magazine, 'Lagos Farmer', came out in October 2006. The magazine and information leaflets on various technical messages were sold to bean practitioners and were distributed during the period in review.

In addition to the routine activities, the communication crew provided communication support to the activities of the Authority and Ministry of Agriculture such as the Bird Flu sensitization campaign, as well as, Ministerial press briefing by the then Commissioner for Agric, and counterparts in commemoration of the 15th anniversary of the Second Term of Adekunle Dida (Late) Governor.

30 CONSTRAINTS

Some improvement in the release of funds during the period under review, the Component still suffered the following constraints:

4. The small number of the literature and extension personnel is a major constraint. This is because they are being away from residing in the major agrarian areas of the State. Thus, none of them have been stationed. For example, there is only one regular extension agent in Agbowa Block while there is no FCA (FCA) for Ifoa - Iyana Block.
5. Inadequate knowledge of extension supervisors and agents in the areas of information technology as relevant to agricultural development. These officers need to be trained in order to be abreast of the latest developments in agricultural extension delivery.
6. The problem of land speculators is another major constraint, which cuts across the three zones in Lagos State as their activities have adversely affected major agricultural sectors.
7. Inadequate of extension materials and kits such as raincoats, rain boots, sprout balance, communication equipment, skill development center (SDC) materials, etc.
8. The need for the provision of at least 3 utility vehicles for the Component in order to make extension service delivery more effective.
### TABLE 4: RURAL INSTITUTIONS DEVELOPMENT

<table>
<thead>
<tr>
<th>Activity</th>
<th>2006 Target</th>
<th>Achievement</th>
<th>%</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilization for crop</td>
<td>960</td>
<td>713</td>
<td>100</td>
<td>The NITRILNNY Federal Agricultural Loan Scheme provided the group formation and credit linkage activities.</td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training of farmers groups in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Guider</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit, input &amp; market</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of existing groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training of farmers groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Donor activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rape visit by BRINS</td>
<td>44</td>
<td>67</td>
<td>6.60</td>
<td></td>
</tr>
<tr>
<td>Supervisory visit by BRINS</td>
<td>44</td>
<td>94</td>
<td>6.65</td>
<td></td>
</tr>
<tr>
<td>Coordination with NGOs</td>
<td>20</td>
<td>11</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>N720,000</td>
<td>N23,500</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Distribution of IFA with cooperative</td>
<td>20</td>
<td>17</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Mobilization and formation of field</td>
<td>40</td>
<td>35</td>
<td>87</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE 3: COMMUNICATION SUPPORT

<table>
<thead>
<tr>
<th>Activity</th>
<th>2007 Target</th>
<th>Achievement</th>
<th>%</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication support for all activities of the Authority</td>
<td>40</td>
<td>59</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support in Agri. Show</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Video coverage of Agri. TV</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Video coverage of RTTP activities</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Video coverage of WIAb activity</td>
<td>20</td>
<td>10</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Video coverage of OFAB</td>
<td>10</td>
<td>5</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Video coverage of SPAT</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Installation of Technical support Radio</td>
<td>20</td>
<td>23</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Publication of Lagos Farmer magazine</td>
<td>4</td>
<td>1</td>
<td>25</td>
<td>Fund constraints</td>
</tr>
</tbody>
</table>

\[ \Phi = \frac{63}{90} \times 100 = \frac{70.8}{27} \]

\[ \phi = \frac{20}{25} \times 100 = \frac{70.8}{90} \]
<table>
<thead>
<tr>
<th>Activity</th>
<th>2006 Target</th>
<th>Achievement (Jan-Dec)</th>
<th>%</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artisan farmers identified</td>
<td>15,000</td>
<td>14,333</td>
<td>92%</td>
<td></td>
</tr>
<tr>
<td>Registration of existing women groups</td>
<td>372</td>
<td>264</td>
<td>72%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of new women groups</td>
<td>30</td>
<td>72</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Regular advisory visits to women groups</td>
<td>1,000</td>
<td>1,267</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Demonstration for women groups</td>
<td>273</td>
<td>333</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>Fertiliser demonstration</td>
<td>73</td>
<td>44</td>
<td>61%</td>
<td></td>
</tr>
<tr>
<td>Group level demonstration</td>
<td>113</td>
<td>66</td>
<td>58%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of women group by gender</td>
<td>16</td>
<td>16</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Symposy visits to BEA (WIA)</td>
<td>24</td>
<td>21</td>
<td>88%</td>
<td>Affected by public holidays</td>
</tr>
<tr>
<td>Symposy visits to NWIA (NWIA)</td>
<td>126</td>
<td>164</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Symposy visits to SDM (WIA)</td>
<td>8</td>
<td>2</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>All farmers technology</td>
<td>112</td>
<td>92</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>Demonstration</td>
<td>22</td>
<td>16</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation at RH/MEN workshop</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Update of RHAN card</td>
<td>8</td>
<td>4</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation in MTRM</td>
<td>11</td>
<td>11</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation in MTRM</td>
<td>14</td>
<td>14</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of gender specific</td>
<td>4</td>
<td>2</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of newly generated</td>
<td>4</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of newly generated</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of newly generated</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Sensitisation of newly generated</td>
<td>4</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

1000
2006 ANNUAL REPORT OF TECHNICAL SERVICES COMPONENT

PREPARED BY
AGRICULTURAL TECHNICAL SERVICES COMPONENT

LSADA
DEC. 2006.
AGRICULTURAL TECHNICAL SERVICES COMPONENT

1. INTRODUCTION
The Agricultural Technical Services (ATS) Component of the Lagos State Agricultural Development Authority (LSADA) comprises of five sub-components namely:

i. Fisheries
ii. Livestock
iii. Crop Development
iv. Agro-processing
v. Farm Mechanization

1.1 ORGANIZATION

1.2 OVERALL OBJECTIVE OF THE COMPONENT
To coordinate the activities of the various sub-components of Agricultural Technical Services Component for achievement of targets and project objectives.

1.3 SPECIFIC OBJECTIVES
1.3.1 To generate and adapt new and improved agricultural technologies to improve food production in the State.

1.3.2 To liaise with Agricultural Research Institutes and related agencies in the provision of available Off-shelf proven technologies to farmers in the State.

1.3.3 To liaise with LAISA (Lagos Agricultural Inputs Supply Authorities) and other agencies in the provision of farm inputs to farmers in the State.

1.4 TECHNOLOGY REVIEW MEETINGS
Eleven (11) Monthly Technology Review Meetings (MTRMs) were held, and ten Pre-MTRM field visits were made to farmers within the State to solve their production problems. One In-House Review meeting on OFAR and Extension activities was held in December 2006.

2.0 SUMMARY OF ACHIEVEMENTS
The Agricultural Technical Services (ATS) has within the last one year achieved the following:
2.1 (i) Conduct of On-farm Adaptive Research OFAR on Fisheries, Crop development, Livestock, Agroprocessing and Farm Mechanization, Collation of results analysis and interpretation of results for use by farmers in Year 2007.

Please find on the following pages details of achievement on activities of the sub-components.

3.0 PROBLEMS/CONSTRAINTS:

The major constraint confronting the Component include the use of one reliable computer for use by five sub components and no printer.

Harvesting of the Livestocks at Erikuodo could not be done as a result of the condition of the farmlands where the breeds are raised.

Erikuodo seed farm was vandalized by trespassers. Security is inadequate at the location.
FISHERIES ADAPTIVE RESEARCH SUB-COMPONENT
ANNUAL REPORT FOR THE YEAR 2006

INTRODUCTION:

1.0 OVERALL OBJECTIVES OF THE SUB-COMPONENT
The overall objectives of the sub-component is to remove constraint in the artisanal and aquaculture
sector in order to increase fish production.

1.1 SPECIFIC OBJECTIVES:
- To promote aquaculture by providing fish breeders through fingerling out-growers for
  stocking of ponds,
- To improve fisheries extension by developing appropriate technical packages.
- To liaise with relevant Research Institute on proven technologies for Fisheries Adaptive
  Research
- To provide technical backup at Monthly Extension trainings.

ORGANIZATION AND STAFF DISPOSITION:

PM

DD (TS)

(AFFI FISHERIES)

Out growers

Demonstration

Pond at HQ.

STAFF DISPOSITION:

<table>
<thead>
<tr>
<th>STAFF</th>
<th>NO.</th>
<th>GL.</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD (Fish.)</td>
<td>1</td>
<td>15</td>
<td>HQ</td>
</tr>
<tr>
<td>CAO</td>
<td>1</td>
<td>14</td>
<td>SPES (Site)</td>
</tr>
<tr>
<td>ACAO</td>
<td>1</td>
<td>13</td>
<td>HQ</td>
</tr>
<tr>
<td>ACFIS</td>
<td>1</td>
<td>14</td>
<td>HQ</td>
</tr>
<tr>
<td>Senior Fish. Officer</td>
<td>1</td>
<td>10</td>
<td>Far East</td>
</tr>
<tr>
<td>Fisheries Officer I</td>
<td>3</td>
<td>09</td>
<td>East, Far Eastern zone</td>
</tr>
<tr>
<td>Agric. Officer I</td>
<td>1</td>
<td>09</td>
<td>Ojo</td>
</tr>
<tr>
<td>Head Fisheries relat.</td>
<td>1</td>
<td>04</td>
<td>Balagry</td>
</tr>
</tbody>
</table>

45
ACHIEVEMENT:

In the Year 2006, the Fisheries sub component carried out one OFAR trial approved at BIBES Workshop. Culture of Gymnarchus niloticus in polyculture arrangement with Tilapia in carbon pond. Six replicates were established at the rate of two farmers per zone. The OFAR was established in June 2006. It will last for 16 months, hence the OFAR is still ongoing.

Ogogoro farmers:
The fisheries outpours increased from 3600 in 2005 to 7000, in 2006. The concentration of these farmers is more in the western zone than in the other two zones of the State. This is because there are more fish farmers in this part of the state.

The Demonstration ponds at the HQ which were handed over to the Fisheries subcomponent earlier in the year was in a bad state. They were however repaired and eventually stocked with 8000 fry in July 2006. The ponds were managed alongside the water constraint experienced throughout the production period. So far, we have an harvest of 187.5 kgs of fish, at the cost of N5,000 at the end of 5 months production cycle in December 2006. About 70 kgs of fish are still left available.

Activities carried out to date are:
- Review of monthly report to the Planning, Monitoring and Evaluation Component
- Visit to fish farmers’ site on request
- The Sub-component staff attended different seminars and workshops during the year.

LINKAGES:
The sub-composition maintains collaboration with Research Institute particularly Nigeria Institute for Oceanography and Marine Research (NIOMR) for the purpose of technology sourcing. Linkage with Extension component is also maintained through joint field visit, Fortnightly training of Extension Agents, Monthly Technology Review Meeting (MTRM) and delivery of strategies in the Radio programme called "BOLUYO".

The subcomponent representative was always in attendance at the fortnightly meeting of the fish farmers association made up two bodies viz. CAFAN (Catfish Farmers Association of Nigeria) and LASCAFA (Lagos State Catfish Farmers Association).

A sum of N500 million was approved to the Association by Unity Bank, Oba Akran Avenue, Lagos during the year under review. A farmer can benefit up to N2 million if his or her collateral could support it.

PROSPECTS AND RECOMMENDATION:

- For smooth management of the demonstration pond, we implored that the overhead tank be installed and fencing of the pond site from the residential quarters be considered.
<table>
<thead>
<tr>
<th>ANEX 1: QUANTITATIVE PROGRESS REPORT JAN. – DEC. 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITEM/ACTIVITIES</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>1. Adaptive Research trials</td>
</tr>
<tr>
<td>2. No of Replicate</td>
</tr>
<tr>
<td>3. Supervisory visit of SMS to</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>4. Supervisory field visit – AD</td>
</tr>
<tr>
<td>5. Supervisory field visit – FA</td>
</tr>
<tr>
<td>6. No of Technologies in MTRM</td>
</tr>
<tr>
<td>7. Participation at MPBM</td>
</tr>
<tr>
<td>8. Participation at FNTs</td>
</tr>
<tr>
<td>9. Participation at Mid-Year Review</td>
</tr>
<tr>
<td>10. Participation at Annual Review</td>
</tr>
<tr>
<td>11. Preparation of Reports</td>
</tr>
<tr>
<td>- Annual</td>
</tr>
<tr>
<td>- Mid-Year</td>
</tr>
<tr>
<td>12. Establishment of demonstration plot</td>
</tr>
<tr>
<td>13. Staff Training - Short term training: Beneficiaries</td>
</tr>
<tr>
<td>- Senior</td>
</tr>
<tr>
<td>- Intermediate</td>
</tr>
<tr>
<td>- Junior</td>
</tr>
<tr>
<td>14. Visit to outgrowers</td>
</tr>
<tr>
<td>15. Identification of new outgrower</td>
</tr>
</tbody>
</table>

\[\text{\underline{14.28.3}}\]
\[\text{\underline{70.0}}\]

\[\text{\underline{86.95}}\]
<table>
<thead>
<tr>
<th>SN.</th>
<th>NAME OF FARMER</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eniolo Farm</td>
<td>Aboye, Iyana-Ipaja</td>
</tr>
<tr>
<td>2</td>
<td>Ken Jones Farm</td>
<td>Agbamoso, Badagry</td>
</tr>
<tr>
<td>3</td>
<td>Collins Farm</td>
<td>Beckley Estate, Abule-Egba</td>
</tr>
<tr>
<td>4</td>
<td>Ozoide Farm</td>
<td>Musan Abesan Estate</td>
</tr>
<tr>
<td>5</td>
<td>Seye Ogunsika Farm</td>
<td>Ikole, Ikole</td>
</tr>
<tr>
<td>6</td>
<td>Bank Ogunsina (Phuthin Farms)</td>
<td>Ajida Village, Melam</td>
</tr>
<tr>
<td>7</td>
<td>Gbenga Owolabi Farm</td>
<td>29, Oko-Oba Road, Agege</td>
</tr>
<tr>
<td>8</td>
<td>Kedip Farm</td>
<td>Ilori, Ketu</td>
</tr>
<tr>
<td>9</td>
<td>Sapphire Farm</td>
<td>Ayobo</td>
</tr>
<tr>
<td>10</td>
<td>Nwiri Farm</td>
<td>Ayobo, Ido</td>
</tr>
<tr>
<td>11</td>
<td>Osu Farm (Fish farmer)</td>
<td>Isbert-Osun, Ikotun</td>
</tr>
<tr>
<td>12</td>
<td>Ajumma Farms</td>
<td>Ota-Ijanikan Volkswagen, Ojo</td>
</tr>
<tr>
<td>13</td>
<td>Akin Farm</td>
<td>Aden-Epe Festac Town, Lagos</td>
</tr>
<tr>
<td>14</td>
<td>Okon Farms</td>
<td>Iyana Ipaia</td>
</tr>
<tr>
<td>15</td>
<td>Animashun Farm</td>
<td>Ai-Pe, Badagry</td>
</tr>
<tr>
<td>16</td>
<td>Adet Idowu Farm</td>
<td>Agemowo, Badagry</td>
</tr>
<tr>
<td>17</td>
<td>Fajay Farm</td>
<td>Ijuje Oyokoro, Agege</td>
</tr>
<tr>
<td>18</td>
<td>Mr. Tola's Farm</td>
<td>Osotolu, Ikorodu</td>
</tr>
<tr>
<td>19</td>
<td>Mr. Talat Farm</td>
<td>Itibe</td>
</tr>
<tr>
<td>20</td>
<td>Mr. Adeyemi Farm</td>
<td>Agege</td>
</tr>
<tr>
<td>21</td>
<td>Ogunbiyi's Farm</td>
<td>Augusto Estate, Alabagbatore 7th gate, Agege</td>
</tr>
<tr>
<td>22</td>
<td>Mrs. Olayemi (neighbour to farm)</td>
<td>Oke-Ota Community Village, Off Oke-Ota Road, Agege</td>
</tr>
<tr>
<td>23</td>
<td>Falasor's Farm</td>
<td>8, Asemu Rd, New Oke-Ota, Agege</td>
</tr>
<tr>
<td>24</td>
<td>Mr. Obiageli (Sabha Farm)</td>
<td>3, Evergreen Abaga St, Apapa Estates</td>
</tr>
<tr>
<td>25</td>
<td>Mr. Balogun (Kony Farms GSM)</td>
<td>5, Fajamu St, Akowonjo, Ojokoro, Lagos</td>
</tr>
<tr>
<td>26</td>
<td>Mr. Yomi Adebayo Farms (Custom)</td>
<td>7, Ifi-Oniru, Off Adeniyi Jones, Ojokoro</td>
</tr>
<tr>
<td>27</td>
<td>Abdul Dauda Ola-Ipo Farm</td>
<td>Plot 8-3 Ogunbiyi Estate, Ikinin</td>
</tr>
<tr>
<td>28</td>
<td>Elder Ademuyi's farm</td>
<td>7, Egbe Road</td>
</tr>
<tr>
<td>29</td>
<td>Johana Farm</td>
<td>Jakande Estate, (Water Corp.) Ijuo</td>
</tr>
<tr>
<td>30</td>
<td>Mr. Chinelu Ezeilo Farm</td>
<td>7, Surulere Festac St, Ikotun Estate, Ikinin</td>
</tr>
<tr>
<td>31</td>
<td>T. A. Onah's (Dairy Farm)</td>
<td>11, Prince Adeleke Adelaja St, Oka-Afa</td>
</tr>
<tr>
<td>32</td>
<td>Lawyer Ado's Farm</td>
<td>Akinrin Estate, alakuko</td>
</tr>
<tr>
<td>33</td>
<td>Engr. Oniokunla Farms</td>
<td>10, Abeguanloko St, Off Aina St, Ikotun</td>
</tr>
<tr>
<td>34</td>
<td>Mr. Taye Ransome (Taye's Farm)</td>
<td>10, Abeguanloko St, Off Aina St, Ikotun</td>
</tr>
<tr>
<td>35</td>
<td>Mr. Thomas Farm</td>
<td>1-3 Aina Street, Ikotun</td>
</tr>
<tr>
<td>36</td>
<td>Mr. Joshua</td>
<td>10, Bollex Oshunyala street, Ikotun</td>
</tr>
<tr>
<td>37</td>
<td>Mr. John</td>
<td>Pipeline Idimu, Egbe</td>
</tr>
<tr>
<td>38</td>
<td>Pastor David Aoye</td>
<td>Dr. D. D. Street, Ikotun</td>
</tr>
<tr>
<td>39</td>
<td>Ogbeche Farms</td>
<td>49, Bayo Oyesi Street, Okota</td>
</tr>
<tr>
<td>No.</td>
<td>Name of Firm/Person</td>
<td>Address/Locations</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>41</td>
<td>Chief Okunbor (Oris Aquatics)</td>
<td>Ogada GirA, Ogada</td>
</tr>
<tr>
<td>42</td>
<td>Mrs. Adefolu (Oris Aquatics)</td>
<td>9, Ghogbode close, Iju Rd, Agege</td>
</tr>
<tr>
<td>43</td>
<td>Mata Farm (Mrs. Omonoha)</td>
<td>1st gate Abibatun beside Total Petroleum Station</td>
</tr>
<tr>
<td>44</td>
<td>Mr. Victor Falade (Crocs Farm)</td>
<td>Falade Farm Drive Pipeline Idimu</td>
</tr>
<tr>
<td>45</td>
<td>Mr. S. O. Olorun - 08023151283</td>
<td>09033269387</td>
</tr>
<tr>
<td>46</td>
<td>Chief Ayo Ogunjobi 01-8047573, 1910.33</td>
<td>Ekona Road, Abule-Egba</td>
</tr>
<tr>
<td>47</td>
<td>Transgreen Nig. Ltd. - 08023037550</td>
<td>18, Agric, Rossel, Egodo, Lagos</td>
</tr>
<tr>
<td>48</td>
<td>Mrs. Yemi Gbafunye</td>
<td>Aboru c/o Meinan Estate</td>
</tr>
<tr>
<td>49</td>
<td>Mrs. Osara</td>
<td>Ikon Bluestone Estate</td>
</tr>
<tr>
<td>50</td>
<td>Maximum Care Farms</td>
<td>Abah, Aba, Ijebu, Lagos</td>
</tr>
<tr>
<td>51</td>
<td>Mrs. Alfi Balogun (Fish Farm)</td>
<td>Ijaye Med. Housing Estate, Pen Cinema</td>
</tr>
<tr>
<td>52</td>
<td>David Idowu Far - Dormant (Fish Farm)</td>
<td>Teribobo, Badagry</td>
</tr>
<tr>
<td>53</td>
<td>Seriki Farm - Dormant</td>
<td>Owode, Igeolu, Abule-Egba</td>
</tr>
<tr>
<td>54</td>
<td>Yoruba Farm - Dormant</td>
<td>Gateway Hotel arc</td>
</tr>
<tr>
<td>55</td>
<td>Family pride fisheries - Dormant</td>
<td>Provita, Badagry</td>
</tr>
<tr>
<td>56</td>
<td>Jolara Farm</td>
<td>Jakkande Estate (Water corp, Ibadan</td>
</tr>
<tr>
<td>57</td>
<td>Dr. Osinko Farms</td>
<td>Ajegunos Village, Badagry</td>
</tr>
<tr>
<td>58</td>
<td>Aiyomi</td>
<td>Oyo-Ijebu (Volkswagen), Ojo</td>
</tr>
<tr>
<td>59</td>
<td>Mrs. Adetuye Farms</td>
<td>Ibadan, Ikom</td>
</tr>
<tr>
<td>60</td>
<td>Amasa Farm</td>
<td>Ayobo, Ijebu</td>
</tr>
<tr>
<td>61</td>
<td>Gustave Farms</td>
<td>Age-memon, Badagry</td>
</tr>
<tr>
<td>62</td>
<td>Mary Adeyemfi Farms</td>
<td>Shagari Estate, Ijebu, Lagos</td>
</tr>
<tr>
<td>63</td>
<td>S. J. Farms</td>
<td>Alakonomeji, Badagry</td>
</tr>
<tr>
<td>64</td>
<td>David Idowu Farms</td>
<td>Teribobo, Ibenko, Badagry</td>
</tr>
<tr>
<td>65</td>
<td>Seliki Farms</td>
<td>Hiko, Gbagada</td>
</tr>
<tr>
<td>66</td>
<td>Mrs. Osa Oris Farms</td>
<td>Osunle street, Abule-Egba</td>
</tr>
<tr>
<td>67</td>
<td>Chief Okunbor (Oris Aquatics)</td>
<td>Oke-Ira, Addo Village, Lagos</td>
</tr>
<tr>
<td>68</td>
<td>EF &amp; TEE Farms</td>
<td>Ekoro Rd, Abule-Egba</td>
</tr>
<tr>
<td>69</td>
<td>Big Fish Farm</td>
<td>Abule-Egba, Lagos</td>
</tr>
<tr>
<td>70</td>
<td>Shelemsam Agro farms</td>
<td>Ajah, Lagos</td>
</tr>
<tr>
<td>71</td>
<td>Bupol farms ltd.</td>
<td>Alake Besity, Ikorun</td>
</tr>
<tr>
<td>72</td>
<td>Lecom-Jack Farms</td>
<td>Anyafo, Oke-Awari, Badagry exp</td>
</tr>
<tr>
<td>73</td>
<td>Keyfarms</td>
<td>Ayobo</td>
</tr>
<tr>
<td>74</td>
<td></td>
<td>Egbolua, Lagos</td>
</tr>
</tbody>
</table>
LIVESTOCK SUB-COMPONENT

ANNUAL REPORT FOR THE YEAR 2006

1. INTRODUCTION: Presented is the overview of the activities of the subcomponent in Year 2006 in line with the specified guidelines.

2. OBJECTIVES:
The overall objective of the Sub-component is to aid small scale mixed and livestock farmers adopt innovative practices which will guarantee the improved and sustained production. Also, the development of specialized livestock production package for farmers interested in bee keeping and tilapia rearing in the State.

Specific objectives include:
1. To develop improved technological packages for sheep and goat, rabbit, pig rearing, poultry and beekeeping in the State (i.e. Housing, feed, husbandry etc).
2. To provide back-up animal health services to farmers to enhance growth of the sub-sector.
3. To provide technical information and backup to encourage farmers interested in specialized livestock production i.e. (Poultry and bee keeping).
4. To provide routine and emergency veterinary and other services to livestock farmers in the State.

LIVESTOCK ORGANOGRAM

ADTS

CAS (HEAD LIVESTOCK)

SUBJECT MATTER SPECIALISTS

ANIMAL HEALTH OFFICERS

STAFF SITUATION (2006)

<table>
<thead>
<tr>
<th>No.</th>
<th>STAFF SITUATION</th>
<th>NO.</th>
<th>GL</th>
<th>STATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chief Agric. Supt. (Livestock Development)</td>
<td>1</td>
<td>14</td>
<td>HQ.</td>
</tr>
<tr>
<td>2.</td>
<td>Chief Agric. Supt. (Apiculture)</td>
<td>1</td>
<td>14</td>
<td>East</td>
</tr>
<tr>
<td>3.</td>
<td>Agric. Officer I</td>
<td>1</td>
<td>12</td>
<td>West</td>
</tr>
<tr>
<td>4.</td>
<td>Senior Livestock Officer</td>
<td>2</td>
<td>10</td>
<td>West</td>
</tr>
<tr>
<td>5.</td>
<td>Senior Agric. Officer</td>
<td>1</td>
<td>10</td>
<td>East</td>
</tr>
<tr>
<td>6.</td>
<td>Agric. Officer I</td>
<td>1</td>
<td>12</td>
<td>West</td>
</tr>
<tr>
<td>7.</td>
<td>Agric. Supt.</td>
<td>1</td>
<td>12</td>
<td>East</td>
</tr>
<tr>
<td>8.</td>
<td>Higher Livestock Supt. 1</td>
<td>1</td>
<td>09</td>
<td>East</td>
</tr>
</tbody>
</table>
QUALITATIVE ACHIEVEMENT

12. SITUATION REPORT ON OFAR TRIAL

The Livestock 2006 OFAR title is: "Comparing the performance of birds fed fermented copra meal in a mixed diet to those on conventional layers ration".

The following are the objectives:

1. To compare the performance of birds fed 10% level of inclusion of fermented Copra meal (FCM) to those on Conventional layer ration.
2. To determine the cost efficiency of feed supplemented with fermented copra meal.
3. To determine the cost benefit analysis of including fermented copra meal.
4. To encourage the utilization of fermented copra meal.

CURRENT STATUS:
The OFAR commenced in July 2006 and was concluded in October 2006. The report of the OFAR has been presented at the in-house on the 19th of December 2006. The presentation on the OFAR result is being effected in preparation for presentation at the REHILS Workshop in Addis Ababa in February 2007.

12.6) FURTHER TRAINING AND FUTURE PLANS

The livestock topics treated were as follows:

- February: Non conventional sources of protein and energy for poultry and pig.
- April: Production, preservation and marketing of rabbit.
- June: Indigenous method of prevention and control of African Swine Fever (ASF)
- August: Design and construction of housing for grasscutter production.
- November: Routine management and housing system in Ostrich.

12:i) The subcomponent participated in all Pre-MTRM field visits as well as the MTRM during the year. Supervisory and follow-up field visits were also undertaken when necessary to supervise and coordinate the activities of the frontline field extension Officers and also monitor the rate of adoption of technical messages taught at FNTs.

SMALL RY

The Dryland unit of the sub-component set up at the headquarters with the aim of disseminating technical messages on small ruminant and production to farmers interested in small farming was regularly visited by prospective farmers and pupils of primary and post primary institutions.

14. SITUATION REPORT ON ANIMAL HEALTH EXTENSION/AMBULATORY ACTIVITIES

Routine visits were paid to livestock farms to render health extension services and also carry-out treatments requested for ambulatory case calls. These services were rendered by our committed Animal Health team in all the three zones of the State during the year.
Activity summary data is presented below:

<table>
<thead>
<tr>
<th>Species</th>
<th>Total No of Farmers reached (2005)</th>
<th>Total No of Animals Treated (2005)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabbit</td>
<td>17</td>
<td>113</td>
</tr>
<tr>
<td>Pigs</td>
<td>136</td>
<td>570</td>
</tr>
<tr>
<td>Goat</td>
<td>103</td>
<td>135</td>
</tr>
<tr>
<td>Sheep</td>
<td>237</td>
<td>116</td>
</tr>
<tr>
<td>Cats</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Battery</td>
<td>200</td>
<td>211,137</td>
</tr>
</tbody>
</table>

Total Revenue realised (Year 2005) = $26,000.00

3.6 PREVALENT DISEASES

Prevalent disease conditions treated during the year in review were mange, Diarrhea, Worm infestation, cold and cough, Newcastle disease and Gamboto. Outbreak of African Swine Fever (ASF) in the State was widely reported during the year. An enlightenment campaign on prevention and control of the disease was carried out to prevent its re-occurrence. Again, an outbreak of Avian influenza (Bird flu) was experienced by poultry farmers in the State. Necessary awareness campaign were carried to educate farmers on preventive measures to avert the spread of the disease in the State.

3.6.1 ANTI-PPR VACCINATION CAMPAIGN

The Anti-PPR vaccination/de-worming campaign scheduled for the year could not be carried out due to financial constraints. This resulted in the occurrence of pneumonic and cold-related disease which led to high mortality in sheep and goats.

3.6.2 BEE KEEPING

Regular maintenance of the apiary of Elumango was carried out throughout the year. No harvesting was done on any of the hives due to the non-availability of good bee sites. The damaged beehives are yet to be replaced. Potential bee farmers were however attended to with technical information required for the establishment of an apiary.

3.6.3 OSTRICH FARM

The Ostriches and Emus at the headquarters were regularly fed and good clean water provided on a daily basis. Their paddock was also maintained as required. However, one of the three Emus died during the course of the year, this was caused by natural injury which the Emu sustained during an attack by the other birds in the paddock.

3.6.4 PROBLEMS AND CONSTRAINTS

The major constraints encountered by the subcomponent were inadequate funding particularly anti-PPR vaccinating campaigns, late release of funds and irregular availability of utility vehicle for the subcomponent. These problems had led to low achievement in some activities of the subcomponent especially the Anti-PPR vaccination/de-worming of sheep and goats which was not carried out as and when due.
41. PREFERRED SOLUTIONS

An adequate and timely funding of the activities of the subcomponent should be ensured in order to achieve set targets. Utility vehicle should be made more available to the sub component in order to facilitate movement of Officers and materials to the field.

42. GENERAL

Officers of the sub-component attended to potential livestock farmers that came in to source for critical information on livestock rearing and production. Students of Primary and Post Primary institutions that visited the Authority on excursion were also attended to by the SMS. Extension aides were also lectured during the course of the year.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2016 TARGET</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. On-Farm Advisory Trials (OFAR)</td>
<td>27</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>24</td>
<td>42</td>
<td>37.14</td>
<td>Failed August 2016</td>
</tr>
<tr>
<td>2. Supervisory Field Visits</td>
<td>50</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>Non-release of approved basis</td>
</tr>
<tr>
<td>3. Health units</td>
<td>50</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>Base held in Dec 2016</td>
</tr>
<tr>
<td>4. Animals Statewide Anti-PPR</td>
<td>150</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>100</td>
<td>Base held in Dec 2016</td>
</tr>
<tr>
<td>5. Abatement of MDIR</td>
<td>72</td>
<td>9</td>
<td>18</td>
<td>27</td>
<td>36</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>62.50</td>
<td>Held at VARF on Feb 2017</td>
</tr>
<tr>
<td>6. Participation at SIUT</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7. Linkage with Research Inst. &amp; other OFARs</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>8. Abatement of Abdominal of OFAR Workshop</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9. Analysis of Animal Health-activities</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10. Analysis of Animal Health-activities</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>11. Conduct of Staff meeting</td>
<td>11</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>12. In-house OFAR Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Monitoring of Outgrowers         |             |     |     |     |     |     |     |     |                     |
| rabbits                         | 20           | 50  | 100 | 100 | 100 | 100 | 100 | 100 | 100                  |
| pigs                            | 20           | 50  | 100 | 100 | 100 | 100 | 100 | 100 | 100                  |
| sheep                           | 20           | 50  | 100 | 100 | 100 | 100 | 100 | 100 | 100                  |
| goats                           | 20           | 50  | 100 | 100 | 100 | 100 | 100 | 100 | 100                  |

| Women from Outgrowers           |             |     |     |     |     |     |     |     |                     |
| rabbits                         | 200          | 400 | 800 | 800 | 800 | 800 | 800 | 800 | 800                  |
| pigs                            | 200          | 400 | 800 | 800 | 800 | 800 | 800 | 800 | 800                  |
| sheep                           | 200          | 400 | 800 | 800 | 800 | 800 | 800 | 800 | 800                  |
| goats                           | 200          | 400 | 800 | 800 | 800 | 800 | 800 | 800 | 800                  |

| Non-farm farmers reached        |             |     |     |     |     |     |     |     |                     |
| rabbits                         | 500          | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 900                  |
| pigs                            | 500          | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 900                  |
| sheep                           | 500          | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 900                  |
| goats                           | 500          | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 900                  |

| Net Stock Tracked               |             |     |     |     |     |     |     |     |                     |
| rabbits                         | 100          | 200 | 400 | 600 | 800 | 1000| 1200| 1400| 1600         |
| sheep                           | 100          | 200 | 400 | 600 | 800 | 1000| 1200| 1400| 1600         |
| pigs                            | 200          | 400 | 800 | 1000| 1200| 1400| 1600| 1800| 2000         |
| goats                           | 500          | 1000| 2000| 3000| 4000| 5000| 6000| 7000| 8000         |

Total: 53 8.16

\[
\frac{9.673 \times 3300}{3300} = 8.16
\]
CROPS DEVELOPMENT SUB-COMPONENT

ANNUAL REPORT FOR THE YEAR 2006

10. INTRODUCTION: The Crops Development, Agroforestry and Land use sub-component promotes the production of various arable, horticultural and tree crops in the State. The rainfall pattern during the year was a major concern for the farmers. By and large, it was a good year for crop production.

11. OBJECTIVES: The objectives of the sub-component are determined by the activities being performed. These are:

A. ON-FARM ADAPTIVE RESEARCH UNIT:
1. To design trials to solve identified problems from the farmers.
2. To conduct trials on staple food crops in the State.
3. To develop appropriate package of recommendation of staple food crops.
4. To train and provide support services to Extension staff.
5. To coordinate and participate in Monthly Technology Review Meetings (MTRM).

B. SEED MULTIPLICATION:
1. To multiply Certified seeds of arable crops and vegetables through outgrowers.
2. To produce Cassava cuttings of improved varieties from both direct and out-growers.

C. AGROFORESTRY AND LAND USE:
1. To rehabilitate old plantations of tree crops (especially eucalyptus and kokum).
2. To introduce soil conservation measures.

D. LINKAGE WITH EXTENSION AND RESEARCH INSTITUTES:
The Sub-component maintained very cordial relationship with extension component especially through participation at fortnightly training (FNTs) and MTRMs.
The Sub-component also attended the Area meetings and equally participated at many joint field visit in problem areas.

Our Resource persons were drawn from Research Institutes and Universities. They trained our Subject Matter Specialists (SMs) at MTRMs. Some of the Institutions are: IAR&T, NIFOR, SHORF and University of Ibadan.

STAFF DISPOSITION AND ORGANIGRAM:
The staff disposition is as follows:

Chief Agricultural Officer (1)
Principal Agricultural Officer (1)
Senior Agricultural Officer (1)
Agricultural Officer I (5)
Field Workers (4)
Figure 1: ORGANOGRAM OF CROPS DEVELOPMENT

PM
  /   \
ADTS
  /   \
CAO (CROPS)
      /   \
Research (OFAR) Seed multiplication Agroforestry & Land use
          /   \
          SMS SMS SMS

3. SUMMARY OF ACHIEVEMENTS:

A. ON-FARM ADAPTIVE RESEARCH UNIT (OFAR):

The OFAR trial was approved at REFILS Workshop for the year 2006. The trial was supposed to be done in two seasons i.e. early and late seasons. The trial could not be carried out in the early season due to some logistic problems. The trial will now be carried out in the early season of 2007, however, the one for the late season was carried out. The title of the trial is Evaluation of different varieties of watermelon for adaptability in Logos District.

Objective:

(i) To determine the best variety suitable for the area
(ii) To determine the performance of the varieties in the two planting seasons
(iii) To determine the economic implication of planting the varieties in the two seasons

Data collection and analysis for this particular area had been done. There were 12 replicates altogether. The result showed that variety "Kaozuk" performed better so far. Final conclusion and recommendation would be made after carrying out the next stage of the trial. The list of participating farmers is on Appendix I. The two carry-over trials from 2005 had also been completed. The OFAR trial proposal for 2007 had been written and ready for presentation for approval at the REFILS Workshop.

B. SEED MULTIPLICATION:

At the Erikondo seed farm, 2 hectares of cassava farm were established as part of the new cassava varieties multiplication efforts. The varieties are NRC 8003 and TMS 92/0057.

No. were yam of different varieties (white and water yams) were received from IITA as part of the Nationally Coordinated Research Programme. The objective is to know which variety will have...
In light of yield with a view to introducing it to farmers for planting. Some of the varieties are TDA 380034, TDA 297, TDA 235003. The yams are now being harvested.

With 0.10 ha of Uga farm was established for seed production against the next planting season. In six pots of 4.5 kg each on the average had been harvested and sold for #3,500.00.

Also, Two hundred and ninety-four (294) bundles of cassava stems were harvested from the farm. Out of these, 100 bundles of these were replanted on two hectares while fifty (50) bundles were given to farmers for further multiplication. The remaining one hundred and forty-four (144) bundles were sold at #25.00 per bundle.

Another #10,500 was generated from the sales of cassava tubers. A total sum of #50,000 was generated from the farm.

The breakdown is as follows:
- 294 bundles of cassava stems: #36,000.00
- 14 bundles of tubers: #10,500.00
- 1 pot of Uga: #4,500.00

TOTAL: #50,000.00

OUTGROWERS SCHEME

The existing outgrowers were constantly visited and monitored. A total of 480 bundles of cassava stems were sourced for other farmers from these outgrowers. The list of the outgrowers is on Appendix II.

The Subcommodity was actively involved in conjunction with Extension on the Presidential Initiative on Rice production. The NERICA Rice program and the Commodity seed programmes were done with selected farmers. Some officials of the National Seed Services and the Federal Department of Agriculture were taken round some of the farms during the year. The list of the beneficiaries is on Appendix III.

The Authority equally received 15.7 MT of Rice seeds of various varieties FARO 44, WITA 4, WITA 5, and NERICA from the Federal Government at 50% subsidy through the Commodity subcommodity. Only 680kg has been sold for #41,200. Most rice farmers particularly from the community claimed to have planted their farms before the seeds were brought. Meanwhile the farmers are being sensitized to come for the seed this year.

TRAINING OF STAFF

The following training and workshop were attended during the reporting period:

- National Review Workshop at Moor Plantation, Ibadan
- REFLS workshop at IAR & Y, Ibadan
- Crosscut making and soil fertility management at IAR&T, Ibadan
- Conflict management and resolution workshop at Elephant house, Lagos.
- National workshop on Quality product, maize in Zaria.
- NERICA Rice Promotion training Workshop – OGDEP, Abeokuta.
AGROFORESTRY AND LAND USE:
The sub-component assisted many farmers in sourcing for improved planting materials of plantain/abiu suckers, coconut, citrus, mango, pawpaw etc. from Research Institutes and other well established farms. More than 10,000 seedlings and suckers of these crops were sourced for farmers.

TECHNOLOGY REVIEW MEETINGS & TECHNICAL SUPPORT:
The sub-component coordinated and participated actively in all the Monthly Technology Review (MTRM) meetings. It equally provided technical backup to Extension through the ENETs and field visits.

In some Local Government Areas – Apapa, Oshodi-Ikeja, Ifako-Ijaiye participated in some of the MTRMs. Efforts are on to have good collaboration with these.

GENERAL:
- The sub-component participated in grass root survey of farmer preferred local cassava cultivars grown in Nigeria with the NRCRI, Umudike. In all 9 communities were visited in the 3 zones and some 6 cultivars collected.
- National Seed Service (NSS) meeting was attended for seed distribution.
- RITE Officer from Ijebu-Ife visited the Erikooro seed farm for quality control updating during the year.
- There was a joint visit by FADPEC to some farms in the East and Far Eastern zone as well as Erikooro Seed farm where RITE activities were going on.
- The sub-component participated in the testing of tomato wilt resistant varieties supplied by NIHORT, Badru. The two varieties unlike the local showed a high level of tolerance to wilt. The varieties are MPWT6 and JM 9854. The seeds were extracted and ready for further multiplication.

CONSTRAINTS:
The seed leading to Erikooro seed farm needs attention. Constant removal of the coating sheet of the office block is a major concern. Problem of day and night guard.
### Quantitative Achievements Jan - Dec. 2006

<table>
<thead>
<tr>
<th>No</th>
<th>Item/Activity</th>
<th>2006 Annual Target</th>
<th>Achievement</th>
<th>% Achievement</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1.1</td>
<td>Adaptive Research</td>
<td></td>
<td>2</td>
<td>i</td>
<td>50</td>
</tr>
<tr>
<td>1.2</td>
<td>Conduction of OFAR</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>1.3</td>
<td>Participation at MTRM</td>
<td></td>
<td>10</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>1.4</td>
<td>Provision of Tech. Backup at</td>
<td></td>
<td>72</td>
<td>68</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>TNT organized by Extension</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>component</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Attendance at Annual OFAR</td>
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<td>1</td>
<td>1</td>
<td>100</td>
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<td></td>
<td>Workshop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Participation at In-House</td>
<td></td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1.7</td>
<td>Supervisory field visits</td>
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<td>42</td>
<td>36</td>
<td>85</td>
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<td></td>
<td>Head crops SMS</td>
<td></td>
<td>210</td>
<td>185</td>
<td>88</td>
</tr>
<tr>
<td>1.8</td>
<td>Preparation of 2006 Workplan</td>
<td></td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>&amp; Budget</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>Mid-Year Review participation</td>
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<td>1</td>
<td>1</td>
<td>100</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>Maintenance of Vehicle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Preparation of Reports</td>
<td></td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td></td>
<td>Annual</td>
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<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Quarterly</td>
<td></td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Monthly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>Seed Multiplication</td>
<td></td>
<td>1000</td>
<td>294</td>
<td>29.4</td>
</tr>
<tr>
<td>3.1</td>
<td>Production of cassava cuttings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Maintenance of trees at</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elikonodo seed farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Remarks:*
- Will be done in 2007 early season due to logistic problems.
- Others fell on public holidays.
- Held at IAR&T.
- OFAR Reports & proposals were discussed.
- Engagement on other activities.
- Mid-Year report was rendered.
- No vehicle to maintain.
- All reports were rendered as at when due.
- More cuttings are still available on the farm.

\[800 + 347.4 = 1147.4 \div 1400 = 81.95\]
## Appendix I

**Evaluation of Different Varieties of Watermelon for Adaptability in Magos State**

### List of Participating Farmers

<table>
<thead>
<tr>
<th>Name of Farmer</th>
<th>Location</th>
<th>EA in Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Akinlade</td>
<td>Badagry farm settlement</td>
<td>Mr. Padina</td>
</tr>
<tr>
<td>Mr. Abubu I.</td>
<td>Iraonu</td>
<td>Mr. Amosu</td>
</tr>
<tr>
<td>Mr. Momodu Sali</td>
<td>Ije-ododo</td>
<td>Mrs. Adebayo</td>
</tr>
<tr>
<td>Mrs. Adesokan</td>
<td>Apa</td>
<td>Mr. Aina</td>
</tr>
<tr>
<td>Mr. Julius Onasena</td>
<td>Eke-Offia</td>
<td>Mr. Ogunlana</td>
</tr>
<tr>
<td>Mr. Ukwu</td>
<td>Akowowo</td>
<td>Mr. Adegbola</td>
</tr>
<tr>
<td>Mr. Shrir</td>
<td>Akowowo</td>
<td>Miss. Owode</td>
</tr>
<tr>
<td>Mrs. Lawal</td>
<td>Igbado</td>
<td>Mr. Basami</td>
</tr>
<tr>
<td>Mr. Adesanya</td>
<td>Greta</td>
<td>Miss Obaifemi</td>
</tr>
<tr>
<td>Mr. Marshall</td>
<td>Ikotun</td>
<td>Mr. Ashiposo</td>
</tr>
<tr>
<td>Baba Yori</td>
<td>Imotii</td>
<td></td>
</tr>
<tr>
<td>Mr. Lawrence Enyi</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Appendix II

**List of Existing Outgrowers (Cassava) with Location**

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Size of Farm (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eastern Zone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Mufi Shiha</td>
<td>Agbode</td>
<td>0.3</td>
</tr>
<tr>
<td>2. Babu Oniwade</td>
<td>Adamsu</td>
<td>0.2</td>
</tr>
<tr>
<td>3. Nebide O. Raji</td>
<td>Ebutu-Iju</td>
<td>&gt;1</td>
</tr>
<tr>
<td>4. Mr. Lawrence</td>
<td>Akowowo</td>
<td>&gt;4</td>
</tr>
<tr>
<td>5. Nebunde Obasanya</td>
<td>Igbaku</td>
<td>0.1</td>
</tr>
<tr>
<td>6. Aghenyi Group</td>
<td>Igbalu</td>
<td>20</td>
</tr>
<tr>
<td>7. Aghenyi Group</td>
<td>Igbelu</td>
<td>20</td>
</tr>
<tr>
<td>8. Mr. Femi Taylor</td>
<td>Ide/Izodumun</td>
<td></td>
</tr>
<tr>
<td>9. Mr. Olufis Kayode</td>
<td>Nkwoho</td>
<td></td>
</tr>
<tr>
<td>10. Mr. B. Folowsi</td>
<td>Ede unit</td>
<td></td>
</tr>
<tr>
<td>11. Mr. Bolaji Taiwo</td>
<td>Imowo</td>
<td></td>
</tr>
<tr>
<td>12. Chief Adams Iborisi</td>
<td>Igberigbe</td>
<td></td>
</tr>
<tr>
<td>13. Mr. Ahmad Osakoya</td>
<td>Igbodo/Bagidion</td>
<td></td>
</tr>
<tr>
<td>14. Mr. Adesanya, H. O.</td>
<td>Igbodo village near Giberigbe</td>
<td></td>
</tr>
</tbody>
</table>

<p>| <strong>Western Zone</strong> |                    |                   |
| 15. Chief Ameneji | Ikoko           | &gt;3                |
| 16. Sahde Ahiol Edwards | Ikoko        | 0.2               |
| 17. Mr. Grace Odionejji | Ikoko        |                   |
| 18. Mr. Ajunsie F. |                   | 10                |</p>
<table>
<thead>
<tr>
<th>NAME</th>
<th>LOCATION</th>
<th>VARIETIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pastor Qudmani</td>
<td>Ile-Oje</td>
<td>WITA, NERICA</td>
</tr>
<tr>
<td>2. Mr. Iremul/Osife</td>
<td>Iju, Ijako-Ijaye</td>
<td>WITA, WAB</td>
</tr>
<tr>
<td>3. Mr. Adesanya</td>
<td>Otu-Kosin</td>
<td>NERICA</td>
</tr>
<tr>
<td>4. Mr. Irokpo</td>
<td>Abia, Ilarami</td>
<td>FARO 44</td>
</tr>
<tr>
<td>5. Chief Balogun</td>
<td>Ile-Ife</td>
<td>NERICA, FARO 44</td>
</tr>
</tbody>
</table>
AGROPROCESSING SUB-COMPONENT
ANNUAL REPORT FOR THE YEAR 2006

SECTION
The objective of the sub-component is to promote Agro-processing techniques in the State through introduction of new technologies as a way of adding value to agricultural produce, and diverting the drudgery associated with traditional processing methods of farmers and poverty alleviation by:
- Selecting for technologies acceptable and adaptable to their environment.
- Undertaking OFAR trial on new Agroprocessing technologies
- Demonstrating Agroprocessing technologies for adoption by the entrepreneurs.
- Linking them (Procesors, farmers and youths) with tested and trusted Fabricators for the purchase of equipment useful to them.
- Liaising with Research Institutes to source for off-shelf technologies, so as to formulate technical messages which are labour and time saving thereby enhancing both on-farm and post-harvest activities.
- Teaching at fortnightly trainings (FNTs).
- Demonstrating Agroprocessing equipments to the relevant Agro-processors.

14 ORGANOGRAM

PM

ADTS (HO)

C.A.O (HOS(C))

SMS (F/E)

2

SMS (E)

2

SMS (W)

1

38 STAFF SITUATION:
At present the staff strength of the sub-component is six (6)

48 SUMMARY OF ACHIEVEMENTS (Jan – Dec 2006)
4.1 During the period under review the Sub-component attended various workshops on processing methods in the State and also attended 19th Annual South-West Zonal RIFILS Workshop and liaised with the various Research Institutes.

The Sub-component had linkages with CRIN, NCAM, NISPRD, FIRRO, ITA, OAU, IAB & T.
Demonstration WORKSHOP: The sub-component carried out various demonstration workshops on the use of Agroprocessing equipment i.e. collapsible dryer, Fermenting stands (to collect starch from run-off water during Gari fermentation), manual Chipping machine, cassava grater, hydraulic press, RTEP Combined processing machine to Agroprocessing groups and the Youth in the State.

3.2 RTEP EQUIPMENT PRODUCT WORKSHOP

The demonstration workshops for Year 2006 were carried out at (i) Ikogs Block processors comprising of four (ii) Processing groups and (iii) Epe Block processors comprising of three processing groups. They were taught the production of 11Q.C.F. and Cassava Densified/Industrial starch.

Beneﬁciaries signposts had been ﬁxed at the processing centres of the demonstrations.

3.3 Various cassava processing equipments were demonstrated at the World Food day to intending agro processors and Fabricators.

3.4 Other Demonstrations: Demonstration of Kumpala cloths using kokum waste as dye was done at Imota for kumpala farmers and also at the World Food Day.

3.5 Demonstration Burkina Faso Fish smoking kiln was done during the World Food Day exhibition.

3.6 Demonstration of CRIN Hygienic method of kokum processing and storage was demonstrated for Ibrada and Agudula groups of kokum processors in Imota.

A new agro processor from Abia in Badagry – Mrs. Kemsa Oge was taught the processing method of denoised cassava starch because she had an order of supplying 500kg of starch to textile mill.

A faulty grater was repaired at Ikogs by the sub-component.

A cassava farmer – Mr. Sunday Afolabi from Ajah was linked with two cassava processing groups for the sales of his harvested cassava root.

Ajiro cassava oil processor was taught the appropriate method of cassava oil extraction.

Mr. Adeleye D. O. – Alpha Osenic was trained on the production of cassava chips and was linked with Lekpton Engineering to fabricate cassava chipping machine.

Mrs. E. M. Peters a retiree from Igbogbo was assisted to fabricate appropriate sizes of gari drying trays (3’ x 6’) and 4’ x 8’ that can contain 2 operators.

Mr. D. M. Afolade from LASUN Village Ikunnu was taught on request the procedure for 11Q.C.F.

Some retired soldiers were trained on the processing of cassava tubers into different cassava products.

There (3) fabricators went on a three days training workshop named “training of master fabricators” on fish smoking kiln production at the Federal Ministry of Agric and Rural Development, Moore plantation, Rudum.

LASCOFED Cooperatives were advised on how to establish a viable cassava processing centre.
CRUSS Engineering was contacted to produce a prototype juice extractor for some visiting processors.

Entreine Nig. Ltd. at Odoganyan- Ikere 1 processes HQCF, starch, plantain flour, he supplies the flour mills and also supply starch to textile mills on request. He was taught the improved method of plantain flour.

Cosmopolitan agro processors at Oko-Oba, Agege, they are into yam flour, I.O.F.F., starch, bean flour, milled melon and Apon. They supplies both the local and international market. LSADA intervention was the teaching of appropriate processing methods, proper packaging and handling of the packed foods. He supplies both the local and international markets. He has been assisted to construct a very big collapsible dryer.

Ajido coconut oil processors were taught the appropriate method of coconut oil extraction since their coconut waste still contain a lot of coconut oil yet unextracted.

FABRICATION OF PROCESSING EQUIPMENT

During the period under review LSADA fabricated two relevant agro processing equipments, namely (1) Hydraulic press (2) Big collapsible dryer. Both equipments had been demonstrated to various processing groups in the State.

IDENTIFICATION OF NEW AGRO PROCESSORS

Eleven (11) New agro processors were identified and given technical advises on processing activities.

SUPERVISORY VISITS TO EXISTING AGRO PROCESSORS

Various supervisory visits were made to 63 existing agro processing entrepreneurs during the period under review, such as:

1. Imati Cassava processors
2. Oke-Ito Cassava processors
3. Ojodu Cassava processing group Ikere
4. Agolu Igba Kola at processors
5. Iradehun processors
6. Igbalu-Oju Agboja cassava processors
7. Ajido coconut oil processors
8. Arowolile fuji processors
9. Entreine Nig. Ltd.
10. Oke-Oba processors - Agege
11. Ibadan Barracks processors
12. Oke-egun processors
13. Efunrin Cassava processing group, Epe
14. Owode - Ibehe cassava processors - Ilorin
15. Ohu-Okojun cassava processors - Ibehe
16. Misadjo Cassava processors
17. Gwagwa cassava processors - Apa Ibadan
18. Ibehe Cassava processors - Ibadan
19. Oja-Agbo Women processors - Ikorodu
20. Igbeni/Isegha cassava processors - Ibadan
21. Araga Cassava processors - Epe
22. Ife-Ita Fish processors - Ikorodu
21. Gberigbe fufu processors – Ikotun
22. Abundant Blessing Multi-purpose agricultural processors – Ija-Aga
23. Sangotedo Cassava processors – Ajah
24. Igbozika Cassava Processors – Imota
25. Erinlepe cassava processors – Epe
26. Folu Fish processors – Ibeju-Lekki
27. Sunture processing group – Epe
28. Eniwa cassava processing group, Epe
29. Ouajelju cassava processors – Epe
30. Akodo fish processors – Epe
31. Meloju processing group – Epe

MTRM TOPIC TREATED
The MTRM topics treated were:
(i) Cat fish processing
(ii) Utilization of kolanut pod husk for the production of liquid detergent, bar and black soap.

OFAR SITUATION REPORT
OFAR TOPIC – Determination of the effect of delayed processing on the Quality of unfermented bitter bean flour and chips. The OFAR was established in six (6) locations in the three (3) zones of the State. Namely: (1) Eluwa Alliye cassava processors (2) Ota Ikosi (3) Abundant Blessing (4) Agba/Akoko (5) Osunile-Iseka (6) Gberigbe cassava processors.

Organoleptic tests had been carried out on the H.Q.C.F produced and the results written.

4.0 CONSTRAINTS:
Major constraints were high cost of processing equipments and non-availability of modern processing equipment at Ifako village – Igbeogho-Ikotun. They have been linked to R&D and fabricators.

4.0 PROSPECTS AND RECOMMENDATIONS:
The sub-component is very vital to agricultural production in the State by improving the harvesting method (i.e. timely harvesting), timely and appropriate processing method, post-harvest handling and storage. This will add value to the products and increase the shelf life, secure continuous production of farm produce throughout the year, removing enormous during processing as well as alleviating poverty in the State.

The sub component is relevant to farmers in Lagos State due to the following activities:
- Production of High quality Cassava flour
- Hygienically and well fermented Gari production
- Production of odourless fufu flour and packaging
- Appropriate method of plantain production
- Fruit juice extraction
- Homestead storage
- Rice processing
- Fish processing and preservation
- CRIN Appropriate method of kolanut processing, storage and waste utilization
- Appropriate processing technique of oil palm and waste utilization

21
- Transfer of improved technology
- Sourcing of relevant equipment from fabricators to processors
- Processing & preservation of fresh fruits e.g. pineapple, mangoes and citrus
- Identification/supervisory visit to new and existing agro-processing entrepreneurs
- Promote use of agro-processing equipment through demonstration for adoption
- Conduction of On-farm-Adaptive Research (OFAR).

In the above stated points, it is highly recommended that the sub-component should be given a functional vehicle that can easily accommodate staff and the equipments to demonstration sites.

**QUANTITATIVE PROGRESS REPORT - JAN - DEC 2006**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>2006</th>
<th>2007</th>
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<td>8</td>
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<td>Agroprocessing topics treated at MTRMs</td>
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</table>
FARM MECHANIZATION SUB COMPONENT
ANNUAL REPORT FOR YEAR 2006

I. SUMMARY OF ACHIEVEMENT

I. SOURCING OF SIMPLE FARM TOOLS

The following simple farm tools/equipments were sourced when the unit visited National Centre for Agricultural Mechanization (NCAM), Benin and IAR&T, Ilorin:

i. Ground wheel seed planter
ii. Improved maize Sheller
iii. Sifting machine

II. FABRICATION

The unit fabricated Aluminium grid and cane type fish grader for OFAR 2006. And also iron rod screw press which is due for demonstration.

III. DEMONSTRATION

The unit was able to carry out Demonstration of Cassava lifter at the following locations where Agro-Processing unit carried out their OFAR

i. Ilu-Okuta – Agbowa
ii. Ibano – Ikorodu

Demonstration of Cassava lifter, maize sheller and seed treatment drum was carried out for Agric students from Deluy Valley at Egbada and Ncayo International Comprehensive College at Ojakuro. While operation of farm tractor and farm tools were demonstrated to students at Olaide High School at Ibesi who were on excursion to LSADA.

At the Agric. show held at UTQS ground on 30th October 2006, the following equipments Aluminum grid and cane trash sorting equipments, Cassava lifter, maize sheller and Blacksmithing tools/equipments were demonstrated at the World Fund day.

IV. TRAINING OF FABRICATORS

Mr. Luke Aduyomi from Oko-Ota, Agege (fabricator) and Mr. Ogundiyi (Ibadan) from Badagry (Blacksmith) were sent to Blacksmith/Artisan Training and Support Unit (BATSU), Kwara State for a 5day training workshop on fabrication of Surrose Sickle organized by Food and Agricultural Organization (FAO) during the period under review. The Authority acknowledge their report and materials i.e. Rice Sickle fabricated by them submitted to the Authority.

Mr. Suri Segun (Badagry), Mr. Tolani Alamu (Ibadan) and Mr. Rafiu Joseni (Oyo) were selected by the Federal Ministry of Agric. and Rural Development (SGRD) from a list of nominees for training on production of one (1) Ton metal bin, which was held at SGRD site complex, Ilorin on the 11th – 13th December 2006.

Messrs. Yami Engr. System and Company (Fabricator) participated in the exhibition on small scale cassava processing equipment as part of RTUP 2nd Tri-Term Implementation plan organized by National Centre for Agricultural Mechanization held on the 4th, 7th December 2006.
I. WORKSHOP/SEMINAR
The sub-component participated at the following workshops:

- National Agricultural Extension Research Linkage Services (NAERLS) on the cropping season performance exercises held in September.
- Root Tubers Expansion Programme (RTEP) workshop on rural enterprises management and community driven development held on the 6th September 2006.
- We participated at Rural Appraisal for Implementation of RTEP held for 2-days in September, 2006.
- The Sub-Component attended the 50th Anniversary Celebration of Federal Institute of Industrial Research Onohdi (FIIBO) held 12th November 2006.

F. OFAR 2006 TRIALS
The title is "COMPARATIVE EFFICIENCY OF CANE AND ALUMINIUM GRID TYPE EQUIPMENT AS FISH GRADERS". This was presented and approved at the South-West Reffis workshop held at IAR&T (Moor Plantation) on 20th-24th February 2006.

The Objectives of the OFAR are:
1. To determine accuracy of each equipment on size/weight basis
2. To compare dradgercy in operation of the two equipment
3. To observe stress inducing conditions involved in the use of each sorting method

The OFAR treatments were carried out in six locations of the three zones of the state namely:
- a. (i) Festac town. (ii) Teli village, Ojo – Western zone
- b. (i) Ifako-Ijaye. (ii) Olooto village, Ikorodu – Eastern zone
- c. (i) Igbogbo. (ii) Bonowan – Far-Eastern zone

The result has been collated, analysed and presented at In-house review meeting held in December 2006 with the following recommendation/conclusion:

- Sorting or grading fish using the Aluminium sorting equipment is faster thereby saving time and reducing stress conditions on the fish. Overall advantage in the dradgercy was greatly reduced; accuracy in size of graded fish is higher using the Aluminium sorting equipment.

III. FORTHIGHTLY TRAINING (FNT)
The Farm Mechanization topic treated throughout the zones is the Construction and Management of Movable fish tanks.
2.1 PRE-MTRM AND MTRM

The sub-component participated in Pre-MTRM field visits and MTRM during the period. Supervisory field visits were also embarked upon to supervise the field extension as well as monitor rate of adoption of the technical messages taught at FNT meetings.

The unit participated at pre-implementation on RTEP activities that will commence in year 2017, chaired by the state coordinator-the ADTS (Mrs. C.T. Buntelu)

3.0 PROSPECT & RECOMMENDATION

Timely release of funds will enable the unit to perform better.

### QUANTITATIVE PROGRESS REPORT JANUARY-DECEMBER 2006

<table>
<thead>
<tr>
<th>S/N</th>
<th>ACTIVITY</th>
<th>2006 TARGET</th>
<th>ACHIEVEMENT JAN-DEC</th>
<th>%</th>
<th>REMARKS</th>
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<td>Establishment of workshop/demonstration center</td>
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<td>2</td>
<td>Sourcing of simple farm tools</td>
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<td>3</td>
<td>Fabrication of simple tools</td>
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LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY

OKO-oba, Agege

2006 ANNUAL REPORT OF ENGINEERING COMPONENT

JANUARY 2007
The Engineering Services Component of the Lassie Grain Producing Development Authority comprises the following components, namely:

(1) Maintenance/Workshop
(2) Water Use

The Component also has 100 black/land Engineers attached to the Zone.

Objectives

The Component has its overall objectives of providing Engineering Services to the State Farmers with a view to improving the standard of living of rural dwellers and to provide Engineering Services to the Authority.

The Specific objectives are:

- To carry out the maintenance of the Authority’s infrastructural facilities, roads, staff quarters, etc.
- To maintain the Authority’s environment, e.g. lawns.
- To pre-qualify and access all building contractors for more contracts.
- To carry out repairs/maintenance of Authority’s machinery, vehicles and generators.
- To pre-qualify and access all mechanics for major repairs on all Authority’s vehicle.
- To provide irrigation to affected farmers on dates it would benefit water supply, power, etc. to farmers in Lassie State so that an all season farming could be achieved and sustained.
- To train farmers on operation and maintenance of irrigation facilities.
- To provide agricultural drainage to boost food production.
- To coordinate Farmers development committee Phase I.
- To participate in all the field visits that are being carried out at the Zones and to encourage the Commissioners on the maintenance and repair of such projects.
ORGANOGRAM OF ENGINEERING COMPONENT

HEAD (ENGINEERING)

Maintenance Sub-component

Workshop Unit

Infrastructure Unit

Wash bure / Tube well Unit

Irrigation / Drainage Unit

Zonal Engineers

West

East

Far East
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<th>NO. REG.</th>
<th>NO. IN POST</th>
<th>VACANCY</th>
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<td>16</td>
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<tr>
<td>17</td>
<td>Office Attendant</td>
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WORKSHOP
MAJOR ACHIEVEMENTS

(1) Complete bodywork repairs of Steyr staff bus
(2) Replacement of ignition cables of LA 10 – A32 Nissan Bluebird S/W
(3) Repair of the carburetor and routine service of LA 40 – A32 Mazda Staff bus
(4) Repair of 504 station wagon LA 37 – A32
(5) Repair of fuel tank of Subaru Al54 KIA
(6) Replacement of damaged brake oil pipe of EHIC (Admin.) vehicle
(7) Repair/Replacement of RUPP vehicle without steering, clutch, disc and plate
(8) Replacement of 2no. broken springs of Steyr low-loader
(9) Replacement of vibrating plate and stoppin-oil seal of vibratory roller
(10) Repair of tractor
(11) Replacement of gear box of low-loader in corporation with revised mechanics
(12) Repair/ re-kitting of steyr staff bus water pump and steering pump
(13) Repair of brakes of Toyota Corolla AH 340 GGE
(14) Routine services of RTPP vehicle FG 276 W68
(15) Repair of Clutch hanger, plate and replacement of flywheel of Steyr low-loader
(16) Servicing of valve HV 423 KTI, Nissan Sunny
(17) Re-kitting of Steyr staff bus master brake
(18) Replacement of gear selector of Steyr staff bus
(19) Repair of vibratory rollers kick starters
(20) Repair of gear joint of Steyr staff bus
(21) Repair of rear wheel brakes of Steyr staff bus
(22) Replacement of water pump and routine service of vibratory roller
(23) Repair of transmission pump of vibratory roller
(24) Replacement of worn-out blades of the blower
(25) Servicing of the lawn mower
(26) Repair of Steyr low-bed injector, a nozzle and cabin pump
(27) Repair of clutch system of Landrover LA 34 – A32
(28) Routine service of new RTPP vehicle
(29) Replacement of water pump of Steyr staff bus
(30) Engine overhaul and repair of front suspension of Mazda staff bus
(31) Supervision of the engine replacement of Toyota HiAce (SPFS) 208 UN 24
(32) Supervision of the complete body works repairs of the steyr staff bus
(33) Replacement of cabin pole and repair of throttle valve of steyr staff bus
(34) Replacement of tie-rod, bushing and 4no. shock absorbers of Nissan Bluebird LA 10- A32
(35) Repair of clutch of Nissan Fugl burst LA 01 – A32
(36) Replacement of oil switch of Mazda staff bus
(37) Replacement of front head hose of Steyr staff bus
## REVENUE GENERATED FROM THE WORKSHOP

**Year to Date:** ₦15,200.00

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<thead>
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<th>Expenditure</th>
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<td>a) Purchase of ceiling fan and installation</td>
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<td>b) Purchase of spanners</td>
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<td>c) Door repairs and padlock</td>
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<tr>
<td>d) Drill</td>
<td>500.00</td>
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<tr>
<td>e) 1 No. Socket</td>
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<td>f) 1 No. Rachet</td>
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<td>g) Transportation</td>
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<td>h) Master brake rubber</td>
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<td>i) Oil filter remover</td>
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<td><strong>TOTAL</strong></td>
<td><strong>2,940.00</strong></td>
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**Cash at hand:** ₦5,200.00
INFRASCTURE UNIT

MAJOR ACHIEVEMENTS

1) Repair of HOC (Technical Services) toilet
2) Repair of the leaking roof of the Technical Store
3) Repair of the leaking roof of the communication Sub-Component
4) Washing of the overhead tank of the P.M.'s office
5) Repair of the burst water pipe of the HOC (Ext.) office
6) Repair of water supply line to the P.M.'s Office

APPROVALS AWAITING FINANCIAL BACKING

- Repair of faulty toilets in the old and new building and replacement of overhead tank of HOC (Technical Services)
- Installation and repair of security lights at the Headquarters
- Repair of the driver's office leaking roof
- Repair of collapsed drainage in front of the HOC (Adviser) office
WATER USE SUB-COMPONENT

MAJOR ACTIVITIES OF THE YEAR 2006

WASH BORE DRILLING

A total number of nine (9) wash bores were provided for Fadama farmers in the State so that all season farming could be achieved and sustained.

The list of FUA beneficiaries and locations is presented below:

<table>
<thead>
<tr>
<th>S/N</th>
<th>NAME OF FUA GROUP</th>
<th>LOCATION</th>
<th>NO. OF WASH BORE DRILLED</th>
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<td>Harry</td>
<td>Mowe, Badagry</td>
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<tr>
<td>2</td>
<td>Ajara Farm Settlement</td>
<td>Badagry</td>
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</tr>
<tr>
<td>3</td>
<td>Mallam Ali</td>
<td>Volkswagen, Ojo</td>
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</tr>
<tr>
<td>4</td>
<td>Olatunde</td>
<td>Iroti, Ajah</td>
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<tr>
<td>5</td>
<td>Olanwo</td>
<td>Sangotedo, Ehi-Oda</td>
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<tr>
<td>6</td>
<td>Akinteanyi and Jumind</td>
<td>Otmolu</td>
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<tr>
<td>7</td>
<td>Raji and James</td>
<td>Orofis</td>
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</tbody>
</table>

SUPERVISORY FIELD VISITS

Thirty-two (32) sites were visited in the State to provide technical services for farmers.

Amongst the sites visited include:

- Lagos State Rehabilitation and Skill Acquisition Centre, Tekumle near Ise, Epe to provide solution to water problem.
- Ifeja Lekki LGA with SPFS Official from Abuja to identify suitable sites for pond construction.
- Ministry of Agriculture & Co-operatives Fishery Estate, Ikorodu to ascertain the suitability of wash bore drilling.
- Visits to farmland at Idiomo, Ayobo, Agblekele, Yegoa, Epe and Rehabilitation Centre, Magbon, Ikotun to ascertain the suitability of wash bore drilling and proper water distribution system.
- Repairs of faulty washrooms at Ogunyogo FUA at Ayewo, Harr FUA at Mowe and Olatunde FUA at Ajah.
TRAINING BENEFICIARIES

On the field trainings were carried out and a total number of sixty seven (67) farmers benefited from the Operation and Maintenance of wash bores and water pumps during the year at different locations as follows:

I. 25 No. Farmers trained at Volkswagen, Osu and Ajara Farm Settlement, Badagry
II. 4 No. Farmers trained at Ikota, Ajah
III. 20 No. Farmers trained at Oshimili, Sango-Otula, and Orogen
IV. 18 No. Farmers trained at Awonya

2006 ACTIVITIES AND TARGETS

<table>
<thead>
<tr>
<th>S/N</th>
<th>ACTIVITIES</th>
<th>TARGET</th>
<th>ACHIEVEMENT</th>
<th>%</th>
<th>REMARKS</th>
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<td>Rendition of Monthly report</td>
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<td>7</td>
<td>Participation at MPRM</td>
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\[533/100\]
ZONAL ENGINEERS

Major Achievements

The activities of the (3) three Zonal Engineers are summarized below.

ZONAL ENGINEER (WESTERN ZONE)

✓ Supervised the renovation works at Opu, Zonal Office
✓ Visited Ogbji to ensure that heating and ventilation system works optimally
✓ Visited Micro Credit farm at Age-Mowo to give maintenance tips on the existing water project.
✓ Disseminated relevant engineering information.
✓ Participated in FNTs and Area meetings

ZONAL ENGINEER (EAST – EASTERN ZONE)

✓ Visited Aghowa to proffer solution to the faulty rice-milling machine.
✓ Supplied and repaired the faulty rice water pump at Oke-Tonfa, Epe Zonal Office
✓ Participated in collaboration with mechanics in the dismantling of the diesel engine of the rice-milling machine.
✓ Prepared and submitted cost estimate for the servicing and repair of the rice milling machine.
✓ Disseminated relevant engineering information.
✓ Participated in FNTs and Area meetings.

ZONAL ENGINEER (EASTERN ZONE)

• Supervised the repair of toilet water closets at the Zonal Office
• Diagnosed and repaired the faulty water pump in the Zone.
• Replacement of broken ceiling sheets in the Zonal Office
• Replacement of burnt security bulbs and repair of the switch of pumping machine.
• Involved in dismantling and cleaning of the tank in the Zonal office in order to get clean water for use.
• Proffered solution to the burnt control switch of the pumping machine in the Zonal Office.
• Disseminated relevant engineering information.
• Participated in FNTs and Area meetings.
CONSTRAINTS

The major constraints of the Components are:

- Lack of funds to carry out some of the activities
- Lack of adequate tools. Wash holes drilling equipment needs upgrading to achieve the set target for the drilling of Tube-well/Borehole. The Workshop also requires adequately tools e.g. complete tool/box, wheel balancing and alignment tools etc.

RECOMMENDATIONS AND CONCLUSION

It is recommended that the staff of Engineering Component be trained to acquire necessary skills to boost productivity.

Timely release of funds is also recommended to carry out Componental activities, as agricultural activities are time bound.

Adequate tools should be procured for workshop activities and wash hole drilling equipment be upgraded so that upland farmers can benefit from the drilling programme.
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY (LSADA)

PLANNING, MONITORING AND EVALUATION COMPONENT

2006 ANNUAL REPORT
PLANNING, MONITORING AND EVALUATION COMPONENT
2006 ANNUAL REPORT JANUARY – DECEMBER

1.0 INTRODUCTION AND OBJECTIVE
The general objectives of the Planning, Monitoring and Evaluation Component are to provide planning support for activities of the Authority, to provide timely information on the Authority's progresses, on its plans and achievements, to monitor and report on project's performance and impact.

1.1 ORGANOGRAM In order to accomplish the objectives highlighted above, the component operated with the organogram shown on figure 1.1 below:

Fig. 1.1 PME COMPONENT ORGANOGRAM
Programme Manager

Head [PME]

Computer Unit

Planning Sub-Component
- Sub-Component
- Ass. Ch/Plan Officer
- Sr. Plan Officer

MIS Sub-Component
- Sub-Component
- Library
- APO
- (MIS)

Evaluation Sub-Component
- Sub-Component
- SE
- SF
- (EAST)
- (WEST)
- (NORTH)
- Ex
- Ex
- Ex

And the staff disposition as at December, 2006 is as presented in Table 1.1 below.
TABLE 1 LSADA PME COMPONENT 2006 STAFF SITUATION

<table>
<thead>
<tr>
<th>S/N</th>
<th>DESIGNATION</th>
<th>GRADE</th>
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<th>VACANCY</th>
<th>POSITION</th>
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</tr>
</tbody>
</table>

*Note: Mr. T. O. Musapha was posted to the component from Ministry of Agriculture and Cooperatives, Mlima in the year under review.

1.2 SUMMARY OF ACHIEVEMENT

1.2.1 PLANNING
The 2006 workplan and Budget were produced and distributed to relevant agencies and components of the Authority. Nine monitoring visits were made to OFAR sites in the three zones in the period under review.

1.2.2 MBM
Regular and Special reports on the Authority's activities were submitted in and when due or requested by relevant agencies and Ministries at all levels. The Component participated in the Annual Planning, Monitoring and Evaluation workshop for year 2006 held in Lulus, Nausoro state, between 20th - 23rd of November, 2005. A report was prepared and submitted to the staff, students and the general public during the period. The Monthly Progress Review meeting (MPRM) was coordinated in the period under review.

1.2.3 EVALUATION
The survey was conducted in the Coastal, East and Western Areas of Tanzania. Market Price Survey (MPS) and Weather survey were carried out during the period. The Farm Management Survey Advisory Services (FAMSAS) for upstream and downstream activities under the IFAD assisted Roots and Tuber Expansion Programme commenced during the period.

[Signature]

8/2
2.0 DETAIL ACHIEVEMENT BY SUB-COMPONENTS

2.1 PLANNING:

2.1.1 Preparation of 2006 Workplan/Budget
The Authority's 2006 Workplan and Budget were produced and distributed to relevant agencies and components of the Authority. Meanwhile, the draft copy for the year 2007 Workplan and Budget has also been prepared.

2.1.2 Conduct of Planning Study
The planning study for 2006 was conducted to determine the economic effect of appropriate input use and feed on catfish production in Lagos State. This study revealed that majority of the respondents covered stocked their ponds with fingerlings which resulted in high mortality rate. It was also discovered in the survey that about 72% of the total inputs used were expended on feed and feed ingredients. The detailed report was being worked on and should be ready very soon.

2.1.3 Conduct of Market Price Survey on Agric. Inputs
The survey had been conducted and the result showed a general increase in prices of inputs over the previous year which could be attributed to market forces, governmental policies, natural disasters, and other factors. The increase in prices of inputs, it is still worth while investing in agriculture being the anchor of Nigeria's economy.

2.1.4 Participation in Technology Review Meetings
The component participated in 15 pre-MEREM field trips carried out in different locations in the three zones of the state. The sub-component also participated in 10 of the MTBM Market price surveys for selected Markets existing across both urban and rural areas, and were monitored regularly at the meeting.

2.1.5 Farm Budget Preparation
The farm budget survey was scheduled for re-presentation in July 2006, for various agricultural activities.

2.1.6 Provision of Computer Services
Computer Services were provided in all components of the Authority during the period. The component had 5 functional computers and 3 functional printers during the period under review.

2.1.7 RITEP Workplan/Budget
The reviewed 2006 work plan and budget (AWEB) was received and implemented during the period under review. The 2007 AWEB was also prepared.
and discussed at the 2007 Annual Workplan and Budget Meeting held at AIEH, Horn and RTEP-MU office, Juba, SC between 18th and 23rd of September, 2006, and 3rd October, 2006 respectively. The meeting was organized by RTEP-MU.

2.1.8 Recalibration of Technical Messages
Three (3) technical messages were revalidated during the period under review. The messages are from the Fisheries, Livestock and Women in Agriculture subcomponents.

2.2 MANAGEMENT INFORMATION SYSTEM (MIS)

2.2.1 REPORT PREPARATION
The Component continued to render management information services to the Authority's staff and the general public. The Authority's report were also collated and sent to relevant agencies and when due. The following reports were coordinated and prepared by the Component during the period:

a. Monthly Progress Report of the Authority (December, 2005 and January to December 2006) as well as specialized versions for PCU, MINA, Ministry of Agriculture and Co-operatives and the PMO were prepared during the period.

b. Quarterly Progress Reports of the Authority (1st quarter, 2005 and 2nd, 3rd and 4th quarters, 2006) were prepared and sent to PCU, its regional offices and headquarters as well as the US.

c. Quarterly Activity Reports (1st quarter, 2006 and 2nd and 3rd Quarter, 2006) for the Ministry of Agriculture and Co-operatives were also prepared and distributed appropriately.

d. Monthly Activity Report (December, 2005 and February to December, 2006) of the Ministry of Agriculture and Co-operatives was also prepared.

e. The 2005 Annual Report for the Authority and summarized version (top management) were prepared and distributed to PCU, MINA and RTEP-MU during the year-end review. Authority's Digest of year 2005 and Project Status reports for ADP system were also prepared.

2.2.2 PROGRESS REVIEW MEETINGS
The Component co-ordinated and serviced 2005 Annual and 2006 Mid-year review workshops. Also, the Monthly Progress Review & Excluding where the implementation of the Authority's activities were monitored and decisions taken towards successful implementation were coordinated during the period.

2.2.3 MONITORING
The component made nine (9) monitoring visits to OxaCA office in the
three zones of the state. Details of the visits were as follows:

- Agro-processing H.O.R.A: 3 visits made to:
  - i. Ibite Afeye cassava processing group in Ipo Western zone.
  - ii. Otta Iseri Agbowa - Cassava processing Group in Agbowa
    Eastern zone.
  - iii. Agbowa Oke Aro - Abundant Blessing Cassava Processing
    farmers group. Oke Aro, Eastern zone.

2.2.4 ANNUAL PLANNING, MONITORING AND EVALUATION
WORKSHOP

The year 2006 Annual Planning, Monitoring and Evaluation workshop
was held in Lafia, Nasarawa State. Between 20th and 23rd November
2006. The theme for this year’s workshop is “Participatory PME in the
Community Driven Development Context”. The component was
reported at the workshop and the report has been rendered
appropriately.

2.2.5 LIBRARY SERVICES

a. READERS SERVICES

Library services were provided to the Authority’s staff as well as relatives to the
organization within the period under review.

The details of the Services rendered is hereby presented below:

<table>
<thead>
<tr>
<th>NO</th>
<th>SERVICES</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>LEARNING OF BOOKS</td>
<td>25</td>
</tr>
<tr>
<td>B</td>
<td>CONSULTATION OF TEXTBOOKS</td>
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</tr>
<tr>
<td>C</td>
<td>READING NEWSPAPERS AND MAGAZINE</td>
<td>76</td>
</tr>
<tr>
<td>D</td>
<td>ASSISTANCE TO STUDENTS FROM HIGHER INSTITUTIONS</td>
<td>86</td>
</tr>
<tr>
<td>E</td>
<td>BROWSING FROM INTERNET</td>
<td>504</td>
</tr>
</tbody>
</table>

b. ACQUISITION

The under listed items were acquired for the library within the year:

i. One (1) photocopier machine. (Non-functional)

ii. Twenty (20) Textbooks

iii. Thirteen (13) Journals

c. NEWSPAPER CUTTING

The library endeavoured to disseminate a total of twenty-one (21) information
leaflets photo copied from newspapers and magazines during the year for the
readership of Head of components and sub-components.
II. Browsing From Internet
Non-payment of internet service provider’s charges affected the utilization of this facility throughout the year under review. Library patrons requested for the restoration of this facility and a modality for its sustainability in the new year.

III. Newspaper Supply
The last three months of the year 2006 witnessed non-supply of newspapers and weekly magazines. This is due to two months and eight days debt incurred by the component against vendor’s expectations.

2.2.6 SANEG REPORTS
The regular quarterly report for STEP were received as and when due.

2.3 EVALUATION
The sub-component activities are basically the conduct of surveys and studies that would assess the impact of the Authority on the field. The status of activities conducted during the period are as follows:

2.3.1 PRESEASON TRAINING
The sub-component continued to train the Enumerators during their monthly meetings to refresh their memory on the conduct of surveys and studies. Crop Area and yield survey was reviewed at these meetings during the period under review. A total of 28 Enumerators, 2 Statistical Assistants and Planning officers attended the training.

The training was participatory with emphasis laid on the practical field measurement and yield plot triangle laying in Crop Area and Yield Survey as well as weight estimation in Market Price Survey.

2.3.2 ENUMERATORS MEETING/TRAINING
Enumerators had their regular weekly meetings at the zones and monthly at the Headquarters throughout the period under review. The meetings were used to review activities of the Enumerators and collate returns from the field.

A practical training on weight estimation of foodstuff was conducted on the 15th of July during Enumerators meeting to further equip them to face various challenges on the field.

2.3.3 CROPS AREA AND YIELD SURVEY (WET SEASON CAYS)
The 2005 Wet season CAYS report was finalized and reconciled at the PCB’s Office, Itanu during the period. The result showed that there was a significant increase in area cultivated to major food crops in the State last season. The increased hectares translated to increased production in most cases especially Roots and Tubers crops. Fruit vegetables, most importantly Tomato, pepper experienced some drops in output during the period. Despite increased usage of inputs, there was a marked increase in yield of same major crops such as
Cassava. Marginal decline in yield was recorded for Cowpea and Pepper. Therefore efforts should be made to promote better agronomic practices that would increase crop yield in the state. (See Table below for details)

### CROP, AREA AND YIELD SURVEY

<table>
<thead>
<tr>
<th>CROP</th>
<th>GRAINS</th>
<th>TUBERS</th>
<th>VEGETABLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A GRAINS</td>
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<tr>
<td>1. MAIZE</td>
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<tr>
<td>2. RICE</td>
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<td>1.45</td>
</tr>
<tr>
<td>B TUBERS</td>
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</tr>
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<td>1. CASSAVA</td>
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</tr>
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<td>2. COCOYAM</td>
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<td>0.75</td>
</tr>
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<td>0.75</td>
</tr>
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<td>4. YAM</td>
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<td>1.46</td>
<td>0.75</td>
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<td>5. SAGO</td>
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<td>0.46</td>
<td>0.75</td>
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<td>C VEGETABLES</td>
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</tr>
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<td>1.45</td>
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<td>2. SUGARBEET</td>
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<td>1.46</td>
<td>0.75</td>
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<tr>
<td>3. SUGARBEET</td>
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<td>4. BANANA</td>
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<td>5. SUGARBEET</td>
<td>3.45</td>
<td>1.46</td>
<td>0.75</td>
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</table>
| Source: Field survey 1 Rated on 1 year moving average under the table above.

The 2006 Wet season CAYS was also concluded and data entry had commenced. 251 respondents, with 437 fields and 147 plots were covered. 60% yield plots triangles were laid.

#### 2.3.3 FADAMA CAYS

The 2004/2005 Dry season (Fadama) CAYS was completed during the period. The data was collated, analyzed and report sent to PCEI headquarters, Abuja.
The result was also reconciled along national data at the data reconciliation workshop PCTI, Bwanda.

The 2005/06 Dry season CAYS was completed during the period. The data was collated and analyzed as well. The production of cereals, pepper, millet, beans, amaranthus, and maize increased over what was recorded in the previous dry season. Tomatoes had a sharp drop in production and yield of about 95% and 15%, respectively. These could be attributed to farmers' switch from traditional production to these crops.

The 2006/07 dry season CAYS also commenced during the year under review, and it is still in progress.

2.3.3 MARKET PRICE SURVEY
Market prices of agricultural products were collected and analyzed weekly, monthly, and quarterly during the period from selected urban and rural markets throughout the State. Monthly and quarterly reports were rendered to IITA, National Office, Ilorin, and the Ministry of Agriculture and Cooperatives along with other reports. Market Information services were also rendered to the MTRM on a regular basis.

Market prices data was especially on fruits and vegetable products or their substitutes, were rendered to IITA, under the Integrated Cereals Project via the International Internet on a weekly basis during the year.

The prices of foodstuff continued to fluctuate with marginal variation from market to market as well as month to month but with no alarming increase that could significantly affect planning. The Bird flu problem, strike of fish vendors among others during the period resulted in upward movement of the prices of foodstuff.

2.3.6 FARM MANAGEMENT SURVEY ADVISORY SERVICES
The conduct of Farm Management Survey Advisory Service (FASSAS) for Uplovers and Down east activities under the BAF unterstützt Rural and Value Expansion Programming (HEDP) commenced during the period. Analysis of data and production of reports was carried out. A copy of the report was submitted to the Project Coordinating Unit (PCU).

2006 ANNUAL WEATHER REPORT

Weather data was collected across the State and export required. The data was sent to relevant agencies including the PCTI.

Data was collected from three zones across the State. There was a total of 683 rural weather stations located across the arable/blood rice of the state to produce an estimate of rainfall incidence.
The Far Eastern Zone, in the year 2006 had a total of 1536.9mm with total rainy days of 61 as against a record of 1800.1mm and 73 rainy days in 2005. Similar figures of 1559.6mm and 60 rainy days were obtained in 2006 as against 1795.4mm and 71 rainy days in 2005 for the Eastern Zone. In the Western Zone however, a total of 1391.7mm of rainfall and 64 rainy days was recorded in 2006 as against 1796.8mm and 72 rainy days in 2005.

Total rainfall incidence in the State for the year 2006 was 1561.1mm with 61 rainy days. This was below the figure of 1723mm and 72 rainy days in the year 2005. Temperature ranged between 28 and 33 degree centigrade across the state while Humidity figures ranged between 73 and 80% in the state.

2006 RAINFALL RECORDS IN THE STATE

<table>
<thead>
<tr>
<th>MONTH</th>
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</tbody>
</table>

There was a remarkable shortfall of rainfall incidence in 2006 as observed even at the zonal basis across the state as compared to what was obtained at both the zonal and state level in the state for the year 2005. However, there was no reported case of drought at any part of the state and as a result, agricultural activities went on smoothly without any serious weather disturbances.

2.3.8 MONITORING AND EVALUATION ACTIVITIES AT PROJECT SITES

Agricultural Planning Officers assigned to each of the SPVS sites at Ado-Ibadan, Ife-Ife-Ife and Ibegbara in Ekiti State continued to collect and analyze crop production data for various sites during the period. Quarterly reports were also generated and collated from the sites.

Two Planning Officers were also assigned as Economic and Analysis and Marketing Officers for Lagos State Agro-processing Marketing Expansion Group (NAMEG).
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. PLANNING</td>
<td>1</td>
<td>4</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>1. Preparation of 2010 Workplan &amp; Budget</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>2. Coordination of 2010 Mid-Year Review Workshop</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3. Monthly Staff Meeting</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4. Frequency of Annu</td>
<td>Monthly</td>
<td>12</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>5. Participation in MHEM</td>
<td>10</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6. Consultation and Participations in Various Study Surveys</td>
<td>2</td>
<td>4</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>7. Economic Analysis of Faculty Enrolment</td>
<td>2</td>
<td>4</td>
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<td></td>
</tr>
<tr>
<td>8. Participation in All-Malay Workshop Authority Schedule for 2010</td>
<td>8</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9. Conduct of Market Price Survey of Agri Inputs</td>
<td>2</td>
<td>4</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>10. Participation in Post-Visit MHEM</td>
<td>10</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>11. Provision of Training Session (In-house)</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>12. Cost Budget Preparation</td>
<td>2</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>13. Legal With Financial Handbook</td>
<td>8</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>14. Board of Survey and Inquiry Meeting</td>
<td>8</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>15. Maintenance of Vehicles</td>
<td>8</td>
<td>4</td>
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<td>16. Monitoring Visit to UFAR &amp; Agri Site</td>
<td>Continuous</td>
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**Total:** 1250 X 100%
<table>
<thead>
<tr>
<th>S/N</th>
<th>ACTIVITY</th>
<th>20th WEEK</th>
<th>50th WEEK</th>
<th>%</th>
<th>REMARKS</th>
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<tr>
<td>1</td>
<td>Purchase of Library Services for Project Staff</td>
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<td>Continue</td>
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<tr>
<td>2</td>
<td>Preparation of Quarterly Report:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Progress Report</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Authority</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Preparation of Monthly Progress Report:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Authority</td>
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<td>12</td>
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<td>- PCU</td>
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</tr>
<tr>
<td></td>
<td>- MAC</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- MARS</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- MERS</td>
<td>12</td>
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<td>100</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Coordination of Monthly Progress Meeting</td>
<td>10</td>
<td>10</td>
<td>100</td>
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</tr>
<tr>
<td>5</td>
<td>Coordination of Monitoring Visits Project Site in the Area and Submission of Report</td>
<td>28</td>
<td>28</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Development and Maintenance of OHA lists (for the Authority) (Month)</td>
<td>17</td>
<td>17</td>
<td>100</td>
<td>Monthly</td>
</tr>
<tr>
<td>7</td>
<td>Preparation of the preparation of 2006 Workplan and Budget</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Preparation of 2005 Authority's Annual Report: State</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 2006 Authority's Digest</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Coordination of Annual Review of Authority's Activities in 2005</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Coordination of Mid-Year Review of Authority Activities for 2005</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

1000 \times 1000 = 1000000

\( \frac{1000}{1000000} \times 7.6\% = 0.00076 \)
<table>
<thead>
<tr>
<th>No</th>
<th>ACTIVITY</th>
<th>20th TARGET</th>
<th>ACHIEVEMENT</th>
<th>%</th>
<th>REALIZED</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Evaluation</td>
<td>57</td>
<td>52</td>
<td>100</td>
<td>(Weekly)</td>
</tr>
<tr>
<td>2</td>
<td>Conduct of initial Price Survey on</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>Analysis on pricing</td>
</tr>
<tr>
<td>3</td>
<td>Conduct of BE-CMS</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Conduct of Interactive CMS</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>DM/NCMS/CRF in DMNCMS Analysis Plan</td>
</tr>
<tr>
<td>5</td>
<td>Conduct of Weather Report</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Participation in Annual Market Workshop</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Participation in IMM</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
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<tr>
<td>8</td>
<td>Preparation of Annual Report</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Attendance Training</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Annual Programme Training</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>Organizing</td>
</tr>
</tbody>
</table>

\[
\frac{1100}{1300} \times 100 = 84.61\%
\]
Appendix 24

Lagos State Agricultural Development Authority (LSADA) 2007 Annual Report
# TABLE OF CONTENT

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PROGRAMME MANAGER'S OFFICE INTERNAL AUDIT</td>
<td>3</td>
</tr>
<tr>
<td>2. ADMINISTRATION</td>
<td>5</td>
</tr>
<tr>
<td>3. FINANCE AND ACCOUNT</td>
<td>10</td>
</tr>
<tr>
<td>4. EXTENSION SERVICES</td>
<td>18</td>
</tr>
<tr>
<td>5. TECHNICAL SERVICES</td>
<td>32</td>
</tr>
<tr>
<td>6. RURAL INSTITUTIONAL DEVELOPMENT</td>
<td>57</td>
</tr>
<tr>
<td>7. ENGINEERING SERVICES</td>
<td>65</td>
</tr>
<tr>
<td>8. PLANNING, MONITORING, AND EVALUATION</td>
<td>75</td>
</tr>
<tr>
<td>9. FADAMA II</td>
<td>87</td>
</tr>
</tbody>
</table>
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY (LSADA)
INTERNAL AUDIT UNIT

REPORT FOR THE YEAR ENDED 2007

MAIN OBJECTIVE
The Internal Auditor shall ensure that:

a. The safeguards introduced for the prevention or prompt detection of fraud and loss of cash is adequate.

b. The system for the control of the collection of the revenue is adequate that all money received have been properly brought to accounts.

c. The system for the control of expenditures by officers and that all payments made are promptly authorized and correct, that they are paid to the right person from the right head and sub-head and made for the purpose for which they were authorized.

d. The Accounting records are accurate.

e. Management directives are carried out as may be directed.

ORGANOGRAM
Programme Manager

Chief Executive Officer (Audit)

Chief Clerical Officer

STAFF DISPOSITION
Internal Audit Staff disposition as continued in the 2007-Approved budget is as stated hereunder:

<table>
<thead>
<tr>
<th>DESIGNATION</th>
<th>GL</th>
<th>APPROVED POST</th>
<th>VACANCIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Auditor</td>
<td>14</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Higher Executive Officer</td>
<td>8</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Chief Clerical Officer</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

ACHIEVEMENT
The year 2007 work plan for the unit was fully executed.

RECEIPTS
Total money received by the Authority during the year is as outlined below:

<table>
<thead>
<tr>
<th>States</th>
<th>SPES</th>
<th>RREP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Government</td>
<td>1,780,000.00</td>
<td>6,722,000.00</td>
</tr>
<tr>
<td>Lagos</td>
<td>Capital</td>
<td>Subvention</td>
</tr>
<tr>
<td></td>
<td>5,500,000.00</td>
<td>62,036,340.00</td>
</tr>
<tr>
<td>Heavy Equipment</td>
<td>1,750,000.00</td>
<td></td>
</tr>
<tr>
<td>fringe Benefits</td>
<td>3,977,000.00</td>
<td></td>
</tr>
<tr>
<td>Bank and Others</td>
<td>5,037,000.00</td>
<td></td>
</tr>
<tr>
<td>Month</td>
<td>Expenditure</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>168,774.78</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>5,922,063.45</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>8,505,047.57</td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>2,265,704.81</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>2,206,305.43</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>7,674,250.46</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>6,994,518.82</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>5,654,046.64</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>5,306,686.93</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>6,572,750.05</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>0,418,308.16</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>14,038,742.27</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>79,237,400.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

**OTHERS**

At the year 2006 annual review, the Chairman directed a meeting between the Programme Manager, Audit Unit, Finance and Account to discuss all recommendations contained in the Annual Report of Audit Unit. The meeting took place as directed but my office is of the opinion that another meeting be held to look into those areas of the recommendation that requires further attention.
ADMINISTRATION COMPONENT

II. INTRODUCTION

1. The Component is established primarily to provide supporting services to the Authority as a whole. As part of General Administration, Personnel and Human Resource Development, it also carries out functions that may be assigned to it by LD/K/ADM/AMU or the PM.

The Organogram of the Component is provided below:

For the purpose of effective implementation of the Component's objectives, the Component has three (3) Sub-Components as enumerated above with the key Staff in place. This has assisted tremendously in ensuring positive achievements.
2.0.0 OBJECTIVES OF THE COMPONENT

2.1.0 The Component performs the following functions or any other functions that may be assigned to it by LSGAD, AMU or the PM:

(a) Assist the Authority in formulating, compiling, executing and reviewing Personnel and administration policies.
(b) Designing and organizing all the recruitment activities of the Authority.
(c) Coordinating the activities within the Component.
(d) Interpreting and applying the relevant personnel regulations.
(e) Establishing and enforcing the disciplinary and grievances procedures.
(f) Establishing performance evaluation and promotion procedures.
(g) Formulating satisfactory employee/employer industrial relation.
(h) Preparing, organizing and coordinating training programmes for the Authority.
(i) Maintaining and ensuring adequate security and proper use of Authority’s properties with the resultant creation of a conducive working environment for staff.
(j) Acquiring, allocating and ensuring maintenance of Authority’s vehicles.
(k) Staff welfare matters – Staff Huts, Staff Clinic, Staff Welfare Loan etc.

3.0.0 HIGHLIGHTS OF ACHIEVEMENT: JANUARY – DECEMBER 2007

3.1.0 GENERAL ADMIN.

(i) The Authority staff bus was regularly maintained to convey staff to and from their homes while the big staff bus is yet to be repaired due to fund constraint.
(ii) The office of the Head of Service recently released a 25-seater coaster bus to the Authority to assist in transportation of staff to and from office.
(iii) Drugs were purchased for the staff clinic. Members of staff continue to receive treatment from the clinic.

The table below indicates the No. of staff/relations that received treatment from the clinic during the period under review:

<table>
<thead>
<tr>
<th>MONTH</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEC</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>NOV</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>OCT</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>SEP</td>
<td>0</td>
<td>30</td>
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<tr>
<td>AUG</td>
<td>0</td>
<td>30</td>
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<td>JUL</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>JUN</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>MAY</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: 1. No. successful Monthly Environmental sanitation exercises were held during the period under review.

(iv) Processing and Payment of monthly PHCN Bills were made under the period.
(v) No. Motorcycles were allocated to No. Members of staffs during the period under review.
h. PERSONNEL

(i) The Sub-Component serviced 1 No. meeting of the Authority Management Unit (AMU).

(ii) The Nominal Roll was updated twice.

(iii) 350 No. Records of service were updated.

(iv) 1 No. LSADAEC meeting was held during the period.

(v) 1 No. Staff Management Consultative meeting was conducted in the period.

(vi) 7 No. Members of staff were given soft loan.

(vii) Staff Pension Scheme has been established with IBTC and Crusader Pension Fund Administrator. However, Pension contribution has not commenced.

(viii) 3 No. Health Talk programmes were held during the period under review.

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>SMR</th>
<th>INTER</th>
<th>INS</th>
<th>SMR</th>
<th>INER</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>JANUARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>FEBRUARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>MARCH</td>
<td></td>
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<td>APRIL</td>
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<tr>
<td>SEPTEMBER</td>
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<td></td>
</tr>
<tr>
<td>OCTOBER</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOVEMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DECEMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

9. TRAINING

(i) During the period under review 57 No. Off-project workshops were attended by 9 No. Management staff, 14 No. Senior staff, 34 No. Intermediate staff.

(ii) 40 No. LLI students had Industrial Attachment during the period under review in the Authority.

(iii) 8 No. staff are still on long Term Courses during the period under review.

(iv) 13 No. Intermediate and Management staff attended (11) different Management courses at the Ministry of Establishment and Training.

4.4. CONSTRAINTS

Below are some of the problems encountered in the course of discharging the functions of the Component:

(a) Fixing of meetings for LSADAEC is beyond the control of the Component.

(b) Insufficient fund in implementing training programmes prepared by the Staff Development sub-component.

(c) Many staff could not benefit from the staff welfare programme due to financial constraint.
S.6. PROSPECTS AND RECOMMENDATIONS

(i) Adequate fund should be provided by both Federal and State Governments for the
Authority and when due to enhance the performance of the Personnel Management
Component and the entire Authority.

(ii) In-plant Training programmes for all categories of staff should be emphasized to improve on
the quality of staff.

(iii) The issue of payment of 4 months staff salary arrears May – August 2001 and 10 months
staff salary arrears March – December, 2007 should be tackled at the highest level as to
boost the morale of one staff.

(iv) The staff welfare fund should be increased to N7200,000,000.00 to make bright can benefit
from the programme.

QUANTITATIVE PROGRESS

<table>
<thead>
<tr>
<th>COMPONENT: ADMINISTRATION</th>
<th>ACTIVITY</th>
<th>2007 ANNUAL TARGET</th>
<th>ACHIEVEMENT JAN-JUN</th>
<th>PERCENTAGE ACHIEVED</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Evaluation of interview to fill vacant position</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Replacement and allocation of needed Authority vehicles</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Maintenance of Authority vehicle</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Provision of Secretarial Services</td>
<td>AMU</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ADAS</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAD</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>5. Updating of Nominal Roll</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Updating of Record of Service</td>
<td>390</td>
<td>390</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Negotiation of contracts</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Provision of basic facilities at local and area offices e.g.</td>
<td>R.C. Housing, Renovating etc.</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. In-plant Training</td>
<td>3</td>
<td>3</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Legal Training</td>
<td>11</td>
<td>11</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Internal Training</td>
<td>10</td>
<td>10</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Off-site training</td>
<td>15</td>
<td>15</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Long-Term Training</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Incentives (Study Tour Conference)</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Parcels of bag for staff</td>
<td>5</td>
<td>5</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Franchise interview</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Consultative meeting</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Preparation of Reports</td>
<td>a. Annual</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Quarterly</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Monthly</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td></td>
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</table>


<table>
<thead>
<tr>
<th>NO</th>
<th>ACTIVITY</th>
<th>2007 ANNUAL TARGET</th>
<th>ACHIEVEMENT JAN-DEC 2007</th>
<th>PERCENTAGE ACHIEVEMENT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Participation at Mid-Year</td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Participation at Annual Review meeting</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Participation at MPRM</td>
<td>12</td>
<td>11</td>
<td>98%</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Training Appraisal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Precaution of examinations</td>
<td>3</td>
<td>2</td>
<td>66.6%</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Security visits to the areas</td>
<td>12</td>
<td>6</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Assessment of staff attendance</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Processing of payment of many PHCM Bills</td>
<td>13</td>
<td>12</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Processing of payment of many MHEU Bills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Preparation of Personnel Budget</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Preparation of workplan and Budget</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Heads talk</td>
<td>4</td>
<td>1</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Monthly Environmental Sanitation Exercise</td>
<td>12</td>
<td>11</td>
<td>98%</td>
<td></td>
</tr>
</tbody>
</table>
FINANCE AND ACCOUNT COMPONENT
ANNUAL REVIEW OF ACTIVITIES JAN.-DECEMBER, 2007

1.1 INTRODUCTION
Finance and Accounts Component is one of the supporting components of the Authority. It comprises of two sub-components; namely:
(a) Main Account  
(b) Treasury
It is geared towards result oriented financial management, aimed at ensuring judicious utilization of funds for the intended purposes.

2.1 OBJECTIVES
Ensure cost effectiveness and purposeful application of funds, which has resulted in continuation of funds, in the day to day running of the authority.

2.2 OTHER SPECIFIC OBJECTIVES
(a) To ensure timely production of Financial Management report to the operations of the Authority.
(b) To ensure timely payment of salaries and allowances as and when due.
(c) To ensure that the annual report and financial statements as audited by the External Auditor are distributed to stake holders of the Authority on time.
(d) To ensure prompt payment for goods and services rendered to the Authority.
(e) To ensure that assets and liabilities of the Authority are accounted for.
(f) To ensure timely receipt of funds from all funding parties.
(g) To ensure that the staff of the component are abreast of current financial systems.
## Organogram of Finance and Account Component

![Organogram](image)

### Staff Situation

<table>
<thead>
<tr>
<th>No.</th>
<th>Designation</th>
<th>G/L</th>
<th>Approved</th>
<th>Post</th>
<th>Vancancy Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Principal Executive Officer Account I</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Principal Executive Officer Account II</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Senior Data Processing Officer</td>
<td>09</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Accountant II</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Executive Officer Account</td>
<td>07</td>
<td>2</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Chief Clerical Officer</td>
<td>07</td>
<td>3</td>
<td>3</td>
<td>-</td>
</tr>
</tbody>
</table>
4.1 QUALITATIVE ACHIEVEMENT OF THE COMPONENT DECEMBER 2007

a. Salaries and allowance were paid from January to December 2007.
b. Leave Bonus for the year 2007 was paid to staff.
c. The books of Accounts for the 2006 were audited by the External Auditor during the period under review.
d. Tax return were paid to the tax office at the state internal revenue during January-December 2007.
e. There was preparation of Payment vouchers based on programme Manager’s approval on the services rendered between January-December 2007.
f. Subventions due to the Authority from the State were promptly collected and paid into the coffer of the Authority between January-December 2007.
g. There was adequate rendition of Componential expenditure report between January-December 2007.
h. Returns on Special Project on food security was rendered for the period under review.
i. Statement of expenditure on Root & Tuber Expansion Programme was prepared and sent to RTEP MII at Ipubi I/e.
j. Assets register was updated for easy reference.
k. The Component successfully participated in all statutory meeting of the Authority and offered useful information and advice where necessary during the period year 2007.
l. The Component regularly rendered Accounting records to Internal Audit unit on Monthly basis between January-December 2007 for post auditing purpose.
m. Capital allocation for the period were collected by the component on behalf of the Authority.
n. The Component successively collected the Sum of ₦62,400,000.00 on the sales of the Authority Building at Ife-Ajasa.
<table>
<thead>
<tr>
<th>S/N</th>
<th>ACTIVITY</th>
<th>UNIT OF MEASURE</th>
<th>TARGET JAN-DEC 2007</th>
<th>ACHIEVE JAN-DEC 2007</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Review of 2006 Accounting System Procedure</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Preparation of financial management report</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Bank reconciliation</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Monthly report</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Quarterly report</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>Variances Analysis</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(e)</td>
<td>Annual report</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Preparation of Book of A/L for Audit Purpose</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Preparation of Payment Voucher</td>
<td>1</td>
<td>Continuously</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Auditing &amp; Preparation of year 2006 Bank of</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Balance Sheet</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Mid-Year Review of Activities</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Judgement and withdrawal of funds to</td>
<td>12</td>
<td>Continuously</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td>Components &amp; Sub-Components</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>Assistance at MPRM</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td>Vehicle Maintenance</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Updation of Computer input forms</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Tax Return (PAYE)</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Preparation of Salaries &amp; Wages</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Payment of Salaries &amp; Wages</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
6.1 PROBLEM / CONSTRAINTS

Despite all the achievement attained in the component between January to December 2007 the under listed problems were still affecting the efficiency and effectiveness of the Component.

(a) The Component as one of the supporting Components of the Authority relies on utility Vehicle for the Component operation.

6.2 UNTIMELY RELEASE OF FUNDS/ INADEQUATE FUNDING

Most activities of the Authority are time bound hence untimely release of fund will always have negative effect on the activities of the Authority's activities. As fund were not release on time by the funding parties. Inadequate funding of the Authority is also affecting the operations of the Component. This does not give room for the provision of adequate training for the staff of the component.

6.3 FLEXIBLE ACCOUNTING SOFTWARE

Non availability of flexible accounting package for posting of Accounting Data had adverse effect on preparation of Ledger, Stock Valuation, Trial Balance and Financial Statements due to the inability of the staff to attend the flexible accounting workshop in Kachina.

7.1 SUGGESTED SOLUTIONS

The following solutions are preferred so as to improve upon the present level of operations:

(a) The Authority should solicit for more funds from the State Government to cater for Agricultural activities in the state.

(b) The Staff of the Component should be made to attend relevant training, which will enhance their output in year 2008.

(c) The Authority should acquire the Flexible accounting Software to enhance both preparation, storage and utilization of Accounting data.
### IN Flow of Funds Jan. - Dec. 2007

<table>
<thead>
<tr>
<th>SR</th>
<th>SOURCES</th>
<th>TARGET</th>
<th>ACTUAL 2007</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lagos State Government Subvention</td>
<td>90,000,000.00</td>
<td>62,036,340.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Federal</td>
<td>300,000.00</td>
<td>397,000.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Heavy Equipment</td>
<td>1,000,000.00</td>
<td>1,750,000.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Other Funds</td>
<td>1,500,000.00</td>
<td>1,181,430.00</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Other Revenues</td>
<td>3,637,000.00</td>
<td>1,835,621.00</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>96,937,000.00</td>
<td>67,220,800.00</td>
<td>69</td>
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</tbody>
</table>

### OUT Flow of Funds Jan. - Dec. 2007

<table>
<thead>
<tr>
<th>SR</th>
<th>EXPENDITURE BY CATEGORY</th>
<th>TARGET</th>
<th>ACTUAL EXPENDITURE 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salaries / Wages</td>
<td>81,700,000.00</td>
<td>52,536,472.00</td>
</tr>
<tr>
<td>2</td>
<td>Operating Expenses</td>
<td>14,217,000.00</td>
<td>15,618,927.00</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>95,917,000.00</td>
<td>68,155,399.00</td>
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</tbody>
</table>

### Capital Receipt 2007

<table>
<thead>
<tr>
<th>SR</th>
<th>FUNDING</th>
<th>TARGET</th>
<th>ACTUAL JAN. DEC</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAPITAL</td>
<td>3,000,000</td>
<td>3,590,000.00</td>
<td>43.75</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>3,000,000</td>
<td>5,944,791.80</td>
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</tbody>
</table>
# Capital Expenditure for 2007

<table>
<thead>
<tr>
<th>S/N</th>
<th>Expenditure by Category</th>
<th>Target</th>
<th>Actual</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conduct of On-farm adaptive research.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Conduct of small plot adaptive technologies.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Conduct of MTP.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Conduct of farmers' block meeting.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Conduct of demonstration.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Pre-season training for frontline staff.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Conduct of block farmer meeting.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>3,500,000.00</td>
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</tr>
</tbody>
</table>

## SPSF Costing: January – December 2007

<table>
<thead>
<tr>
<th>S/N</th>
<th>Funding Party</th>
<th>Actual Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C T A O / L A S G</td>
<td>1,780,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Expenditure</strong></td>
<td>1,780,000.00</td>
</tr>
</tbody>
</table>

## Analysis of Expenditure on SPFS January – December 2007

<table>
<thead>
<tr>
<th>S/N</th>
<th>Analysis of Expenditure</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total amount incurred on site activities and payment of allowances to Chinese</td>
<td>1,780,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total Expenditure</strong></td>
<td>1,780,000.00</td>
</tr>
</tbody>
</table>
Expenditure incurred on STF in January to December 2006:
- Baseline survey: 600,000.00
- Participatory community planning: 400,000.00
- Mobilization in SPS: 450,000.00
- Planning workshop: 250,000.00

**Total**: 1,780,000.00

**Funding Performance on RYEP 2006**

<table>
<thead>
<tr>
<th>SN</th>
<th>Funding</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>State</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TGO</td>
<td>21,000,000.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>IFAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Total</td>
<td></td>
<td>5,000,000.00</td>
</tr>
</tbody>
</table>

**Outflow of Funds on RYEP 2007**

<table>
<thead>
<tr>
<th>SN</th>
<th>Expenditure by Type</th>
<th>Actual Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Multiplication of improved planning</td>
<td>6,722,000.00</td>
</tr>
<tr>
<td></td>
<td>Improve adaptive research extension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RYEP programme management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RYEP Evaluation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beneficiaries communities (12)</td>
<td>3,278,000.00</td>
</tr>
</tbody>
</table>
EXTENSION COMPONENT

1.0 INTRODUCTION

The Extension Services Component carried out and met most of the targets set for the year through the provision of qualitative extension services for the betterment of farmers/fisher-folkscape processors. The financial and institutional supports given to the Component during the period were commensurate to the moderate achievements recorded.

The programs and component's activities for the year 2007 were generated through the Rapid Rural Appraisal (RRA) conducted in October 2006, as well as, from the results of the year 2006 OFAR. These proposals were subjected to discussions at the PCU Sectoral Review Meeting on OFAR/Extension proposals for the year 2007 held in January 2007 at the PCU Regional Office in Ibadan. This was followed by its validation for implementation at the Zonal REFLS Workshop held in February 2007 at IAR&T, Ibadan. The proposals were further scrutinized to ensure adequate financial back up during LSADA's Annual Work Plan and Budget workshop (AWPH) that was held in March 2007.

The Component embarked on a variety of activities, which were evenly spread throughout the period under review.

Activities such as the advisory and supervisory visits, conduct of MTPs (Management Training Plots), Small Plot Adoption Trials (SPATs), demonstrations, group monitoring, communication support, etc were done as and when due.

In order to sharpen the skills of the extension personnel, a two day pre-season training was organized in April. The topical issues treated included the principles of agricultural marketing extension and roles of input in effective extension delivery services.

In line with the advice of the Project Coordinating Unit of the Federal Ministry of Agriculture, RDP Sub-Component was made a full-fledged Component during the year.

2.0 OBJECTIVES

The main objectives of the Extension Services Component is to ensure efficient geographical coverage of Lagos State; to make maximum impact on farmers, fisher-folks and agro-processors through the diffusion of recommended agricultural practices. The specific objectives of are as follows:

a. Field Activities Sub-Component

i. Conduct of regular advisory visits to farmers, fisher-folks and agro-processors on their production sites in order to give them information on improved technologies under the Training and Visit (TAV) and Community Participatory Agricultural Extension System (CUMPAES) under the Unified Agricultural Extension System (UAES).

ii. Participation in the conduction of On Farm Adaptive Research (OFAR) trials.

iii. Establishment of Management Training Plots (MTPs), Small Plot Adoption Trials (SPATs) and demonstrations.
9. Communication Support Sub-Component
   a. Production and distribution of guides that will serve as back-up and reservoir of technical information for farmers, fishers, folk and agro-processors.
   b. Dissemination of extension technical messages to farmers through electronic media.
   c. Provision of communication support to LSADA activities.
   d. Propagation of information on LSADA activities.

6. WIA Sub-Component
   i. Conduction of regular advisory visits to women groups on their production sites to give them information on improved production technologies using the Unified Agricultural Extension System (UAES).
   ii. Conduct of gender specific OFAR, MTP, SFATs and demonstrations.
   iii. Dissemination of improved technical messages on rural and non-farm income generating activities to women folk.
   iv. Generating new and improved gender related agricultural technologies.

3.0 ORGANOGRAHAM

4.0 STATUS OF THE COMPONENT

1. Sub-Components: Field Activities, Communication Support and Women-In-Agriculture

2. Number of Zones: 3
3. Number of Blocks: 16
4. Number of Extension Cells: 128
### Table 1: Staff Deployment

<table>
<thead>
<tr>
<th></th>
<th>No Required</th>
<th>No in Place</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. HEADQUARTERS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Director of Est. Services</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2. Head of Communication</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3. Head WIA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Head of Field Activities</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5. Principal Information Officer</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6. Agri. Coop. Officers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7. Group Agent</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8. Waveagent</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>B. ZONE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Soil Extension Officers</td>
<td>3</td>
<td>3</td>
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</tr>
<tr>
<td>2. Subject Matter Specialist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Crop</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>b. Livestock</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>c. Fisheries</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>d. Agro-processing</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>e. Farm Mechanization</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>3. Livestock Health Officers</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>C. BLOCK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Block Est. Supervisors</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>2. Block Est. Agents (WIA)</td>
<td>10</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td><strong>D. CIRCLE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Extension Agents</td>
<td>90</td>
<td>81 (87%)</td>
<td>9</td>
</tr>
<tr>
<td>a. Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Female Est. Agents (WIA of Dec.)</td>
<td>90</td>
<td>23 (52%)</td>
<td>67</td>
</tr>
</tbody>
</table>

### Table 2: Staff Mobility

<table>
<thead>
<tr>
<th>Source</th>
<th>Type of Vehicle</th>
<th>No in Present</th>
<th>No Supplied</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.</strong></td>
<td><strong>B.</strong></td>
<td><strong>C.</strong></td>
<td><strong>D.</strong></td>
<td><strong>E.</strong></td>
</tr>
<tr>
<td>1. No of Extension Agents</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2. Head of Extension</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3. Head of Extension</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4. Head of Extension</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5. Livestock Health Officer</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6. WIA (including WIA)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7. Extension Agents</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>8. Extension Agents</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

### Overview of Extension Activities

**Field Activities**

From the table below, 2,618 new farm families were identified in the year by the front line extension personnel, bringing the total number of farm families being serviced to 17,235. Thus, the extension agent/farm family ratio is moderate (i.e., 1:5,980). In 2007 also, a total of 618 new farmers/fish folks/agro-processors contact groups were identified, bringing the total number to 2,016.
The number of regular advisory visits, primarily aimed at the dissemination of proven and improved agricultural technologies by the frontline extension officers was 10,755 or 75% achievement at the end of year 2007. The Head of Component (Extension), Head of Field Activities, Zonal Extension Officers and Block Extension Supervisors made a total of 1545 number supervisory visits. The Lagos State Field Office of the Federal Department of Agriculture made supervisory / monitoring field visits to LSADA during the year with respect to the Presidential Initiatives on rice and cassava production.

Table 3 General Field Activities Quantitative Report

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Activity</th>
<th>2007 Target</th>
<th>2007 Ach</th>
<th>%</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No. of Extension Agents</td>
<td>128</td>
<td>66</td>
<td>52</td>
<td>For extension agents and BEA (WIA).</td>
</tr>
<tr>
<td>2.</td>
<td>No. of ZEOs</td>
<td>3</td>
<td>3</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Sq. Supervisors</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Advisory visits to farmers group</td>
<td>15,132</td>
<td>10,735</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Supervisory field visit by DO(Ext.)</td>
<td>24</td>
<td>19</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>BFA</td>
<td>24</td>
<td>20</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>ZEOs(at 90% / ZEO)</td>
<td>240</td>
<td>247</td>
<td>86</td>
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</tr>
<tr>
<td>8.</td>
<td>RES (at 90% / RES)</td>
<td>1,336</td>
<td>1,259</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Consolidation of existing individual farmers / fisherfolk</td>
<td>332,401</td>
<td>127,235</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Root &amp; Tuber crops</td>
<td>65,000</td>
<td>28,753</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Other crops</td>
<td>65,000</td>
<td>22,140</td>
<td>34</td>
<td></td>
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<tr>
<td>12.</td>
<td>Homicide farmer</td>
<td>40,000</td>
<td>16,960</td>
<td>42</td>
<td></td>
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<tr>
<td>13.</td>
<td>Tuahmen</td>
<td>60,000</td>
<td>26,421</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Fish farmers</td>
<td>15,000</td>
<td>10,224</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Others, (WIA and mixed)</td>
<td>77,401</td>
<td>29,137</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Formation of new contact group</td>
<td>340</td>
<td>213</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Roots and Tubers</td>
<td>400</td>
<td>335</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Other crops</td>
<td>35</td>
<td>15</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Poultry</td>
<td>25</td>
<td>15</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Livestock</td>
<td>25</td>
<td>18</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Consolidation of contact farmers group</td>
<td>760</td>
<td>709</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Root and Tuber crops</td>
<td>1000</td>
<td>1,325</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Other crops</td>
<td>60</td>
<td>75</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Fish</td>
<td>40</td>
<td>38</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Livestock</td>
<td>40</td>
<td>38</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Mixed</td>
<td>40</td>
<td>38</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>No. of group meeting</td>
<td>340</td>
<td>251</td>
<td>74</td>
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</tr>
<tr>
<td>28.</td>
<td>Zonal Development Committee meeting</td>
<td>6</td>
<td>3</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Conduct of Area Review Meeting</td>
<td>384</td>
<td>320</td>
<td>85</td>
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</tbody>
</table>

Public holidays affected some of the meetings.
<table>
<thead>
<tr>
<th>No</th>
<th>Activities</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Conduction of FNTs</td>
<td>21</td>
<td>52</td>
<td>79</td>
</tr>
<tr>
<td>15</td>
<td>Participation in In-house Review Workshop</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>16</td>
<td>Participation in Mid-Year Review Workshop</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>17</td>
<td>Participation in Pre MTRM</td>
<td>11</td>
<td>9</td>
<td>92</td>
</tr>
<tr>
<td>18</td>
<td>Participation in MTRM</td>
<td>12</td>
<td>11</td>
<td>92</td>
</tr>
<tr>
<td>19</td>
<td>Conduction of pre-season training</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>

**Techniques Disseminated**

Some of the technical messages disseminated during the year are highlighted below:

- Soil improvement techniques such as the appropriate use of Lime, organic manure and inorganic fertilizers on Maize, Rice, Cassava and vegetables.
- Optimum plant population for all crops with special attention to rice, maize, cassava, sweet potato, cocoyam, yam, vegetable, tree crops such as coconut, oil palm and banana.
- Seed yam production through minimum technique.
- Appropriate ware yam storage technique.
- Planting of improved crop varieties with special focus on Rice and Cassava.
- Improved management practices in livestock with emphasis on feeding, housing and handling of veterinary drugs.
- Improved management practices in fisheries with emphasis on water quality, feed formulation and hatchery management.
- Processing options for root and tuber crops.
- Appropriate use of agro-chemicals, that is, herbicides and insecticides.
- Enlightenment campaigns on the discontinuous use of Corexan 20 and other organophosphate-based agro-chemicals.

**Small Plot Adoption Trials (SPATs)**

The 2017 SPATs were aimed at cost and labour reduction in addition to the adoption of improved practices for higher income. The farmers' attained SPATs established by the farm extension officers across the technologies disseminated as highlighted in the list of improved technologies listed above in 772 locations state wide.

In addition to the farmers' financed SPATs, ADA financed SPATs on crops and livestock were established in 216 and 24 locations respectively, representing 93% and 40% achievement of the set target. Drying of FMC due to the vagaries of weather experienced in the year as well as incidence of bird flu were responsible for the low achievement recorded in livestock, NIFAT. The SPATs messages were on 4 technologies with 3 on crops and one on livestock as listed below:

4. Appropriate fertilizer application for Maize / Cassava / Sweet Potato. - The farmers' practice was the irregular use of both organic and inorganic fertilizers. The use of 300 kg of inorganic fertilizers and 1.0 MT of organic manure per hectare with Maize as the base crop in the intercrop was adopted for the SPAT. The result of the harvested components (Maize and
Sweet Potato indicated that the significant difference in the yields of both crops in the SPAT and FAP were very marginal (Table 4). The implication of this is that farmers do incur additional cost through the irregular use of fertilizer without additional benefits.

b. Appropriate time for introduction of sweet potato into maize/cassava mixture: - The farmers’ practice was the planting of the crops in the combination almost at the same time. It was observed that Sweet Potato always suppresses the growth of Cassava in the intercrop. The intervention was the introduction of Sweet Potato into the mixture two weeks after planting the first two crops. The approach effectively controlled weeds on SPAT as against the crop FAP where the growth of the cassava was dominant on the farmers as at the time of preparation of this report. Expecially, the significance of the yield of the harvested crops (maize and Sweet Potato) on both SPAT and FAP were very low as shown in the Table 4 below.

c. Introduction of improved cassava varieties (IR 8082 and NR 8083): - This was in response to the request of farmers for other improved varieties apart from the TMS 30872. The plots were harvested in April 2008.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Treatment</th>
<th>SPAT Yield (t/ha)</th>
<th>Mean SPAT Yield (t/ha)</th>
<th>FAP Yield (t/ha)</th>
<th>Mean FAP Yield (t/ha)</th>
<th>% Increase over FAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>maize</td>
<td>8082</td>
<td>82</td>
<td>2.7 - 3.0</td>
<td>2.95</td>
<td>2.56</td>
<td>2.70</td>
</tr>
<tr>
<td>Cassava</td>
<td>8082</td>
<td>77</td>
<td>2.5 - 2.9</td>
<td>2.75</td>
<td>2.44</td>
<td>2.90</td>
</tr>
<tr>
<td>maize</td>
<td>8083</td>
<td>82</td>
<td>2.7 - 3.0</td>
<td>2.56</td>
<td>2.56</td>
<td>2.70</td>
</tr>
<tr>
<td>Cassava</td>
<td>8083</td>
<td>77</td>
<td>2.5 - 2.9</td>
<td>2.44</td>
<td>2.44</td>
<td>2.90</td>
</tr>
<tr>
<td>maize</td>
<td>8082</td>
<td>82</td>
<td>2.7 - 3.0</td>
<td>2.56</td>
<td>2.56</td>
<td>2.70</td>
</tr>
<tr>
<td>Cassava</td>
<td>8083</td>
<td>77</td>
<td>2.5 - 2.9</td>
<td>2.44</td>
<td>2.44</td>
<td>2.90</td>
</tr>
</tbody>
</table>

4. TCM practice (10%) level inclusion of Fermented Corn Meal (FMC) into layer ration: - The LMC which is readily available in Badagry, Ibeju-Lekki and other areas in the State was used to replace groundnut at 10% in order to reduce the cost of feed in layer production. A total of 180 layers that are 8 months old at an average of 7 layers per SHLAT and equal number of layers and age for FAP were used. Daily egg production records of both birds under SHLAT and FAP were taken for 12 weeks. The differences in the number of eggs recorded under the FAP and SHLAT were very marginal as indicated in Table 4 below. Despite this however, farmers attested to the fact that the aggregate cost of feed was reduced in SHLAT when compared with that of FAP.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Treatment</th>
<th>SPAT Yield (t/ha)</th>
<th>Mean SPAT Yield (t/ha)</th>
<th>FAP Yield (t/ha)</th>
<th>Mean FAP Yield (t/ha)</th>
<th>% Increase over FAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>maize</td>
<td>8082</td>
<td>82</td>
<td>2.7 - 3.0</td>
<td>2.95</td>
<td>2.56</td>
<td>2.70</td>
</tr>
<tr>
<td>Cassava</td>
<td>8082</td>
<td>77</td>
<td>2.5 - 2.9</td>
<td>2.75</td>
<td>2.44</td>
<td>2.90</td>
</tr>
<tr>
<td>maize</td>
<td>8083</td>
<td>82</td>
<td>2.7 - 3.0</td>
<td>2.56</td>
<td>2.56</td>
<td>2.70</td>
</tr>
<tr>
<td>Cassava</td>
<td>8083</td>
<td>77</td>
<td>2.5 - 2.9</td>
<td>2.44</td>
<td>2.44</td>
<td>2.90</td>
</tr>
</tbody>
</table>
Table 5: 2007 SHILATs on livestock

<table>
<thead>
<tr>
<th>Phase</th>
<th>Target</th>
<th>No. Poultry</th>
<th>%</th>
<th>Total number of eggs produced (SHILAT)</th>
<th>Total number of eggs produced (FAP)</th>
<th>% Increase over FAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>&amp; 2nd</td>
<td>80 male broilers with a total of 200 eggs each for SHILAT and FAP</td>
<td>24 eggs with a total of 600 eggs each for SHILAT and FAP</td>
<td>40,000 eggs at 60% of eggs and 30% in terms of number of layers</td>
<td>49,631 (163 eggs) and 13 pieces</td>
<td>4901 (163 eggs) and 4 pieces</td>
</tr>
<tr>
<td>4th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

4.4 Management Training Plan (MTP)

The training was carried out under the management plan for livestock production with the aim of improving performance by training 150 farmers in 15 locations (Table 6). The results of each plot varied. Farmers were trained to improve flock health and management practices, which include the use of lime and lime application techniques. Farmers were also trained in animal health and nutrition.

5.5 Demonstrations

Table 7: Demonstrations

<table>
<thead>
<tr>
<th>Activity</th>
<th>Target</th>
<th>No. Estab</th>
<th>%</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers trained</td>
<td>25</td>
<td>15</td>
<td>60</td>
<td>The technology has been fully adopted by 15 farmers in areas such as Bagamoyo, Arusha, and Mbeya in the Eastern Zone.</td>
</tr>
<tr>
<td>Farmers trained</td>
<td>30</td>
<td>025</td>
<td>90</td>
<td>Though high numbers were achieved but the adoption of the principles is still low.</td>
</tr>
<tr>
<td>Farmers trained</td>
<td>44</td>
<td>17</td>
<td>35</td>
<td>The early learning effect against full adoption of the technology was the high cost of labor.</td>
</tr>
<tr>
<td>Farmers trained</td>
<td>9</td>
<td>7</td>
<td>78</td>
<td>These were carried out on a trial basis. During the demonstrations, fish farmers complained about the high cost of the fish, and wished it could be cheaper.</td>
</tr>
<tr>
<td>Farmers trained for fish</td>
<td>3</td>
<td>6</td>
<td>100</td>
<td>These were carried out in Bagamoyo and Mombasa districts.</td>
</tr>
</tbody>
</table>
15 **Rice and Tubers Expansion Programme (RIPEP)**

The Component supported all the RTDP activities such as the baseline survey, PRA and feasibility preparation for the implementation of the tri-term programme. In addition, the Crop Development and Agro-Processing Sub-Components and State Agricultural Market Expansion Group (SAMECO) were after closely working with in the areas of identification of mid-grows producers, processors, as well as linkage with the markets.

16 **National Programme for Food Security (NPFNS)**

The Component facilitated and participated in the conduction of the baseline survey and Participatory Rural Appraisal (PRA) for the six new sites under the implementation of the expansion phase of the programme. The reports of these activities have been duly submitted to the NRC and farmers sensitization and mobilization towards the implementation of the expansion phase of the project is still in progress.

17 **Collaboration with NFDB II**

The Component collaborated with the Lagos State Fadama Development Office (LSFDO) in the areas of sustained sensitization and enlightenment of stakeholders about the project. In addition to this, the Component, through the facilitation extension agents, was actively involved in the project’s beneficiary assessment that were carried out during the year.

18 **Collaboration with the National Rice / Maize Centre (NRMC)**

The Component collaborated with the NRMC for the conduction of a demonstration on maize production under the Presidential initiative to double maize yield in two locations, namely, Iyana and Araragi on Mr. Sekeduru Oke’s and Mr. Dawodu’s farms, respectively. The demonstration was one hectare of land each in the two sites. While the farmers prepared the land plough and harrow, the NRMC supplied 5 litres each of Primestra and Atozoxine, 8 bags (400 kg) of NPK fertilizer and 20 kg of maize seeds to each location. Soil testing was done for each location to determine the nutrient status and the extension officers supervised the sites were also mobilized.

Planning, fertiliser application, weeding and harvesting operations were carried out as and when due in both sites. The instruction for the application of Agiolyzer came after the application of the inorganic fertiliser and was thereby not applied. Reports from Araragi indicated that the plant population was 45,213 stands per hectare (where there was a dry spell when the maize was 6 weeks old) as against 48,620 stands per hectare on the Lagos site. The harvestable stands from the demonstration sites showed a significant improvement in the Lagos State’s maize farmers average stands of 35,000 per hectare. Field day were conducted on these demonstrations at harvest. A comprehensive report of the demonstrations will be forwarded to NRMC.
Field days:

Sixty six (66) field days or 82% achievements were organised to reinforce the messages being disseminated by the extension personnel. It is hoped that more field days would be initiated before the end of the dry season especially on vegetable production and other dry season farming activities. Listed below are the topics of the field days:

- Soap making using Kola pod husk (3 hrs.)
- The use of Lime for Maize, Cassava and Vegetable production (16 hrs.)
- The use of Sweet Potato to control weed in Maize / Cassava intercrop (8 hrs.)
- Processing options on cassava with emphasis on HCDF (7 hrs.)
- Sow of Sweet Potato through Xylostil soft technology (13 hrs.)
- Introduction of new Cassava varieties HR20082 and HR20083 (5 hrs.)
- Breeding of earthen fish ponds (7 hrs.)
- Safe use of agro-chemicals (8 hrs.)
- Improved Rice cultivation practices (3 hrs.)

Block Farmers Advisory Meeting

A total of 20 Block Farmers Advisory Meetings (BFAMs) were conducted during the year, representing 63% achievement. The average number of attendance per meeting was 55. Apart from the conventional participation of producers and ADA officials, the BFAMs conducted in 2007 were of high quality as a result of the attendance and involvement of other stakeholders in agriculture and rural development such as the Society for Family Health (SFH), Nigerian Agricultural, Cooperatives and Rural Development Bank (NACRDB), Local Government Councils, Department of Cooperative, Marketing, Processors etc. Highlighted in the Table below are other information about the BFAMs conducted in 2007.

<table>
<thead>
<tr>
<th>No. conducted</th>
<th>Date</th>
<th>Basis of special attention at the BFAM</th>
</tr>
</thead>
</table>
| 1             | 24/6/07, 21/11/07 | 1. NACRDB of Ikotus agreed to be meeting farmers once every week at the Block Office, Aj and attend to their needs.  
2. Incorporation of a "Food Fair" into the programme of events where farmers sold their products to the marketers and consumers at reasonable prices.  
3. The meetings were done in conjunction with Farmers Cooperative Societies. |
| 2             | 28/6/05      | Opening of individual savings account for 6 farmers by the NACRDB during the meeting |
|               | 7/7/07       | -                                      |
|               | 12/7/07      | -                                      |
|               | 25/7/07      | -                                      |
|               | 20/8/07, 11/9/07 | On the spot sales of inputs (agrochemicals, fertilizer and seeds) by LAISA to the farmers who attended the meetings. |
|               | 25/6/07      | The official of the Dept. of Cooperatives present but tracked the |
registration of a group as a cooperative society.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/10/07</td>
<td>Presentation on utilities for acquiring a plot in the Fish Farm Estate by an official of Fisheries Department of the Ministry of Agriculture.</td>
</tr>
<tr>
<td>05/10/07</td>
<td>On the spot sales of inputs (agro-chemicals, fertilizer and seeds) by LAPA to the farmers who attended the meeting.</td>
</tr>
<tr>
<td>21/09/07</td>
<td>The meeting was co-sponsored with Fish Farm Estate Farmers.</td>
</tr>
<tr>
<td>08/08/07</td>
<td>The conduct of Voluntary Counseling and Testing (VCT) for the farmers.</td>
</tr>
<tr>
<td>15/10/07</td>
<td>The meeting was sponsored by the SFH/Lagos State Ministry of Agriculture and Health.</td>
</tr>
<tr>
<td>07/10/07</td>
<td>Presentation on the health and safety of farmers by the Ministry of Health.</td>
</tr>
<tr>
<td>09/10/07</td>
<td>Expectations from the UFA in 2008.</td>
</tr>
<tr>
<td>22/10/07</td>
<td>The meetings were co-sponsored with Local Government Development Council.</td>
</tr>
</tbody>
</table>

COMMUNICATION SUPPORT

The Communication crew disseminated messages on Boloy, the weekly agricultural talk programme in conformity to those taught by the front line extension agents. Topics covered ranged from agro-processing, livestock, farm mechanization and crop production to general agricultural issues. Sponsors for the programme include the Lagos State Cocoa Development Authority (LASCODA), Lagos State Fadama Development Office (NSFDO) and Animal Care Consult Nigeria Limited. The programme continues to enjoy a wide listening audience. This is attributed to the number of phone calls from the audience to make enquiries as well as farmers who call in for further information on topics raised. Listed below are the summary of the technical messages disseminated through "Boloy":

I. Crops
   a. Land preparation for early season cultivation.
   b. Preparation for the planting season.
   c. The use of local crop materials as pesticides.
   d. Sustainable soil fertility management for optimum crop production.
   e. Dry season vegetable production.
   f. Management practices in watermelon production.
   g. The economic impacts of cassava industry in Nigeria.
   h. Solutions to low yield in crop farming.
   i. Safe handling of agro-chemicals.

II. Livestock
    a. Bird Flu sensitization, prevention and control.
    b. Management of pregnant cows.
    c. Livestock production options.
    d. Management of birds from day old to point of sale.
    e. Grass-cutter rearing.

III. Fisheries
    a. General fish farming activities.
    b. FISON and its activities.
c. Fish handling, processing and preservation.

d. Safety of fisheries during incidental fishing.

IV. Agro-processing and WFA

a. Processing of plantain in to plantain flour.
b. Bar soap production.

c. Others

b. The importance of bookkeeping in agriculture.
c. Achievements of Fadama II in Lagos State.
d. Interview of the Lagos State Commissioner for Agriculture and Cooperatives, official of the Animal Care Council and Managing Director of Poultry Health Limited.
e. The activities of RID Component.

The eighth edition of the ‘Lagos Farmer’ magazine came out in October 2007 with the theme ‘Urban Agriculture: Optimising the use of City Resources’. Both the magazine and information leaflets on various technical messages were sold to farmers during the year. The Sub-component also supervised students on excursion from 13 schools in Lagos and Ogun States and provided still and video pictures coverage services to field activities such as field days, farmers advisory meetings, pre-MTRM field visits, MTRM, etc.

The Sub-component carried out photographic exhibitions for external visitors during the year in addition to participation in fish fairs organised by the Lagos State Fish Farmers Association and the Cutfish Farmers Association. A quantitative report of the Sub-component’s activities is highlighted in the Table 9 below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>2007 Target</th>
<th>Achievement</th>
<th>%</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Awareness in Agricultural Show</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>b. Training seminars</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>c. RTIP activities</td>
<td>3</td>
<td>3</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>d. WFA activities</td>
<td>20</td>
<td>20</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>e. OFAB</td>
<td>10</td>
<td>10</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>f. SPAI</td>
<td>10</td>
<td>10</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>g. Pre-Season Training</td>
<td>30</td>
<td>15</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>h. Participation in the year’s review</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>i. Promotion of Lagos Farmer magazine</td>
<td>4</td>
<td>4</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>j. Distribution of technical messages on Radio</td>
<td>52</td>
<td>52</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>k. Graphic and photo exhibitions at LSADA</td>
<td>12</td>
<td>6</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>
The Women in Agriculture (WIA) sub-component with 14 REAs and 3 (SMS) WIA was able to consolidate 261 women groups and 15,915 women farmers during the year. A total of 65 new groups were also formed during the period.

 skill development centre demonstrations were conducted during the year. These are:

 1. Soy milk and cheese production.
 2. Fish cake and burger production.
 5. Tie and dye making.

All demonstrations approved at 2007 REFIES were also conducted within the State. A total of 28 field days were conducted on the topics listed below:

 1. Fish cake / burger production (6 nos.)
 2. Ginger beer production (6 nos.)
 3. Production of bar soap (2 nos.)
 4. Pounded production (4 nos.)
 5. Utilization of cassava flour into confectioneries (10 nos.)

The Sub-Component collaborated with NESTLE / AMREC for the conduct of a two-day workshop at Igbeye on health-related issues. The topics treated are listed below:

a. Malaria causes, symptoms and prevention
b. HIV / AIDS sensitization
c. Health is Wealth (Value added products - how most agricultural waste can be used to improve nutrition)
d. Youth awareness and capacity building on healthy lifestyle.

The health talks organized by the Rockin Broucher Nigeria LTD and CAP Plc. for the farmers in all the extension blocks were also facilitated by the Sub-Component.

The WIA Sub-Component exhibited products on cassava flour processing options such as bran, cake, chichias etc. at the briefing of His Excellency, Mr. Raji Fashola and during the ministerial briefing / tour of the Honourable Commissioner for Agriculture and Cooperatives, Chief Enoch Kolapooye Ajibola.

Some of the off farms technologies disseminated to the women groups are as follows:

- Pounded yam production.
- Soy milk and cheese production.
- Fish cake and burger production.
- Utilization of cassava flour into confectioneries.
- Soap making.
- Hat and bead making.
- Ginger, Seb, and Kuma drinks.
- Tie and dye.
- Tapioca production.
- Omo-orelu flour production.
Table 9: Quantitative Report of Women in Agriculture

<table>
<thead>
<tr>
<th>Activities</th>
<th>2002 Target</th>
<th>Achievement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need Women farmers identified</td>
<td>50</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Consolidation of existing Women farmers</td>
<td>16,000</td>
<td>15,915</td>
<td>99</td>
</tr>
<tr>
<td>Consolidation of existing women groups</td>
<td>250</td>
<td>261</td>
<td>100</td>
</tr>
<tr>
<td>Formation of new women groups</td>
<td>64</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td>Regular monthly visit to women groups. Tutors</td>
<td>1516</td>
<td>1500</td>
<td>99</td>
</tr>
<tr>
<td>Others</td>
<td>1290</td>
<td>1218</td>
<td>94</td>
</tr>
<tr>
<td>Demonstration for women groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Routine demonstration Tutors</td>
<td>364</td>
<td>260</td>
<td>71</td>
</tr>
<tr>
<td>b) Nutritional demonstration</td>
<td>300</td>
<td>46</td>
<td>15</td>
</tr>
<tr>
<td>c) Group level demonstration others</td>
<td>120</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>Skill development centre demonstration</td>
<td>1</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Need of off-farm technology demonstration</td>
<td>122</td>
<td>108</td>
<td>89</td>
</tr>
<tr>
<td>0 Supervisory visit to REAs by FWA</td>
<td>24</td>
<td>22</td>
<td>92</td>
</tr>
<tr>
<td>by SMS WIA</td>
<td>176</td>
<td>172</td>
<td>98</td>
</tr>
<tr>
<td>1 With field days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Tuber crops</td>
<td>14</td>
<td>10</td>
<td>71</td>
</tr>
<tr>
<td>b) Marketers</td>
<td>9</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>c) Others</td>
<td>16</td>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>2 Synchronisation of gender specific technologies</td>
<td>4</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>3 Seminar and workshop in collaboration with Research Institution</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>4 Participation in mid-year review meeting</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>

7.1 ADA input supported WIA demonstrations

The Women in Agriculture Sub-component carried out demonstrations on four technologies, namely, 10% inclusion of cassava flour for bread production, introduction of fish burger into the food system of Lagos State, ginger beer production and complementary baby food with the use of malted cereal. In all, the DGA (WIA) and SWS (WIA) conducted a total of 79 demonstrations or 65% achievement of the above listed technologies in different parts of the State during the year. The largest number of women that participated in each demonstration was 15. The proposed demonstration on juice extraction was not conducted as a result of the inability to get a fruit juice extracting machine.

Table 10: ADA input supported WIA demonstration

<table>
<thead>
<tr>
<th>Activities</th>
<th>Target</th>
<th>Achievement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% inclusion of cassava flour for bread production</td>
<td>16</td>
<td>16</td>
<td>100</td>
</tr>
<tr>
<td>Introduction of fish burger into the food system of Lagos State</td>
<td>3</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>Ginger beer production</td>
<td>6</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>Complementary baby food with the use of malted cereal</td>
<td>16</td>
<td>14</td>
<td>88</td>
</tr>
<tr>
<td>Production of fruit juice using fruit extractor</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

7.0 CONSTRAINTS

Despite moderate achievement by the component during the year, the following constraints limited its optimal performance:

38
### Table 5: Quantitative Report of Women in Agriculture

<table>
<thead>
<tr>
<th>Activities</th>
<th>2007 Target</th>
<th>Achievement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for Women farmers identified</td>
<td>94</td>
<td>86</td>
<td>90</td>
</tr>
<tr>
<td>Coordination of existing Women farmers</td>
<td>160,000</td>
<td>15,913</td>
<td>99</td>
</tr>
<tr>
<td>Coordination of existing Women groups</td>
<td>256</td>
<td>261</td>
<td>100</td>
</tr>
<tr>
<td>Formation of new women groups</td>
<td>64</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td>Regular advisory visit to women groups - Tubers</td>
<td>1516</td>
<td>1500</td>
<td>99</td>
</tr>
<tr>
<td>- Others</td>
<td>1300</td>
<td>1218</td>
<td>94</td>
</tr>
<tr>
<td>Demonstration for women groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Rotate demonstration Root &amp; Tubers</td>
<td>264</td>
<td>260</td>
<td>98</td>
</tr>
<tr>
<td>b) Nutritional demonstration</td>
<td>30</td>
<td>46</td>
<td>92</td>
</tr>
<tr>
<td>c) Group based demonstration others</td>
<td>120</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>Skill development centre demonstration</td>
<td>8</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>Skill development centre demonstration</td>
<td>112</td>
<td>108</td>
<td>90</td>
</tr>
<tr>
<td>0) Secretary visit to BEAs by HWIA</td>
<td>24</td>
<td>22</td>
<td>92</td>
</tr>
<tr>
<td>by SMS WIA</td>
<td>176</td>
<td>172</td>
<td>98</td>
</tr>
<tr>
<td>1) WIA field days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Tubers crops</td>
<td>14</td>
<td>10</td>
<td>71</td>
</tr>
<tr>
<td>b) Nutimeters</td>
<td>8</td>
<td>6</td>
<td>75</td>
</tr>
<tr>
<td>c) Other</td>
<td>16</td>
<td>12</td>
<td>75</td>
</tr>
<tr>
<td>2) Training of gender specific technologies</td>
<td>0</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>3) Seminar and workshops in collaboration with Research institute</td>
<td>2</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>4) Participation in mid-year review meeting</td>
<td>1</td>
<td>1</td>
<td>100</td>
</tr>
</tbody>
</table>

#### 7.1 ADA input supported WIA demonstrations

The Women-in-Agriculture Sub-component carried out demonstrations on four technologies: namely, 10% inclusion of cassava flour for bread production, introduction of fish burger into the food system of Lagos State, ginger beer production and complementary baby food with the use of milled cocoyam. In all, the BEA (WIA) and SMS (WIA) conducted a total 39 demonstrations or 83% achievement of the above listed technologies in different parts of the State during the year. The average number of women that participated in each demonstration was 15. The proposed demonstration on juice extraction was not conducted as a result of the inability to get a fruit juice extracting machine.

### Table 3: ADA input supported WIA demonstrations

<table>
<thead>
<tr>
<th>Activity / Topic</th>
<th>Target</th>
<th>Achievement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 10% inclusion of cassava flour for bread production</td>
<td>14</td>
<td>14</td>
<td>100</td>
</tr>
<tr>
<td>b) Introduction of fish burger into the food system of Lagos State</td>
<td>3</td>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>c) Ginger beer production</td>
<td>6</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>d) Complementary baby food with the use of milled cocoyam</td>
<td>16</td>
<td>16</td>
<td>100</td>
</tr>
<tr>
<td>e) Production of fruit juice using fruit extraction</td>
<td>5</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>46</td>
<td>100</td>
</tr>
</tbody>
</table>

#### 8.0 CONSTRAINTS

Despite moderate achievement by the component during the year, the following constraints limited its optimal performance:

| 8.0 CONSTRAINTS |
The problem of load speculators was a major constraint, which cuts across the three zones in Lagos State as their activities have adversely affected major agricultural sectors, and in a large extent, agricultural extension services.

2) Inadequacy of extension materials and kits such as rakes, cutters, etc.

3) Insufficient extension personnel, Skill Development Centre (SDC) materials, etc.

4) Insufficient utility vehicles for the compound in order to make extension service delivery more effective.

5) Inadequacy of extension personnel.
AGRICULTURAL TECHNICAL SERVICES COMPONENT

1. INTRODUCTION

The Agricultural Technical Services (ATS) component of the Lagos State Agricultural Development Authority (LSADA) comprises five sub-components, namely:

1.1 Fisheries
1.2 Livestock
1.3 Crop Development
1.4 Agro-processing
1.5 Farm Mechanization

1.3 ORGANIGRAM

Programme Manager

Director (ATSIC)

Crop

Livestock

Farm Mechanization

Agro-processing

1.2 OVERALL OBJECTIVE OF THE COMPONENT

To coordinate the activities of the various sub-components of Agricultural Technical Services Component for attainment of targets and project objectives.

1. SPECIFIC OBJECTIVES

1.1 To generate and adapt new and improved agricultural technologies to improve food production in the State.

1.2 To liaise with Agricultural Research Institutes and related agencies in the provision of available off-shelf proven technologies to farmers in the State.

1.3 To liaise with LAISA (Lagos Agricultural Inputs Supply Authority) and other agencies in the provision of farm inputs to farmers in the State.

1.4 TECHNOLOGY REVIEW MEETINGS

From (1) Monthly Technology Review Meeting (MTRMs) were held, ten Pre-MTRM Field visits were made to farmers within the State to solve their production problems. One In-Field Review meeting on OFAR and Extension activities was held on 11th and 12th December 2007.
SUMMARY OF ACHIEVEMENTS

The Agricultural Technical Services (ATS) has within the last one year achieved the following:

2.1 Conduct of On-Farm Adaptive Research (OFAR) on Fisheries, Crop Development, Livestock, Agro- processing and Farm Mechanization, Collation of results analysis and interpretation of results for use by farmers in Year 2008.

Please find on the following pages details of achievement on activities of the sub-components.

PROBLEMS/CONSTRAINTS

The major constraints confronting the component include the type of one reliable computer for use by five sub-components and one printer.

Herding of the cows at Ede-owode could not be done as a result of the condition of the road such as an old and tattered and need replacement. Security is inadequate at the location.

FISHERIES ADAPTIVE RESEARCH SUB COMPONENT

Achievement

Only one OFAR trial was approved. Tilted: Substituting trash fish for fishmeal in diet of Clarias gariepinus fry was established with 3 replicates in all the 3 zones. All the established trials were successful. Farmers have started adopting the technology before completion.

During the period under review, the Fisheries sub-component participated fully in the conduct of intensive training of extension staff at the three zones, Pre-MITM field visits, MITMs and others.

The National Agricultural Technical Services Component meeting and the Fish Farmers meeting were also attended.

Technical advisory services were rendered to both prospective and practicing fish farmers, their annual proposed sites for fish farms were visited. Monitoring and supervisory visits were made.

The sub-component also listed with NIMR to source for new-look technologies.

The component Demonstration pond was stocked with 800 juvenile of Clarias gariepinus in June. Trainings were conducted in some adhoc activities, such as enlightenment of students on fish, training of served soldiers and student on industrial attachment as well as delivery of trips at training organized for fish farmers and fisherfolk in conjunction with Fadama II office section carried out.

LINKAGES:

The component maintained collaboration with Research Institute particularly Nigeria Institute for Oceanography and Marine Research (NIMR) for its technical activities/information.
Contact with Extension Component is also maintained through joint field visits, fortnightly visits of Extension Agent, Monthly Technology Review Meeting (MTRM) and delivery of training in the Radio programme titled "BOMEDU".  

New suggestions were identified during the year.  

The extension staff also participated in the various extension block meetings held at different blocks in the State.  

Other activities carried out to date are:  
- Radiation of monthly report to the Planning, Monitoring, and Evaluation component.  
- Visit to fish farms, site visits on request.  
- Radiation of technical advice to fish farmers and fisher folks.  

**Constraints:**  
- Limited water supply in the demonstration pond.  

**Prospects and Recommendation:**  
For proper management, an overhead tank should be installed as well as a pumping machine so as to maintain the ground reservoir beside the farm building.
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 TARGET</th>
<th>ACHIEV. JAN-DEC</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adaptation of Indian vessel</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>Use OFAR topic was approved and successfully completed.</td>
</tr>
<tr>
<td>2. New R&amp;D project</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td>These (13) issues</td>
</tr>
<tr>
<td>3. Establish new OFAR Project</td>
<td>12</td>
<td>13</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4. Streamlining of AD                  (Finance)</td>
<td>20</td>
<td>15</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>5. New Technology at MTR</td>
<td>5</td>
<td>4</td>
<td>67</td>
<td>Two topics were not treated.</td>
</tr>
<tr>
<td>6. Participation at MPRM</td>
<td>30</td>
<td>16</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7. Participation at IMDO</td>
<td>72</td>
<td></td>
<td></td>
<td>Some PhDs fell on Public holiday</td>
</tr>
<tr>
<td>8. Participation at Mid-Year Review</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9. In-charge Nexus OFAR</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10. Attendance at Annual OFAR Meeting</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>11. Setting up new technology</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>13. Preparation of Reports</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>14. Interim Reports</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>15. Preparation of Interim Report</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>16. Measurment of vehicles</td>
<td>1</td>
<td></td>
<td></td>
<td>Thereto no vehicle for Fisheries</td>
</tr>
<tr>
<td>17. Measurement of pils</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>Penal ordered with right handed parents. Syntax has commenced.</td>
</tr>
<tr>
<td>18. Rail Testing - short term</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>19. Rail Testing - long term</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>20. Representation of FTR</td>
<td>11</td>
<td>9</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>21. No of Fisheries visited</td>
<td>36</td>
<td>26</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>22. No of Technologies proposed at FTR</td>
<td>4</td>
<td>4</td>
<td>67</td>
<td>All the four topics treated at the MTRM were determined at the FTR.</td>
</tr>
<tr>
<td>23. Substitution of new depiction</td>
<td>2.4</td>
<td>2.4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Farm Name</td>
<td>Owner's Name</td>
<td>Address</td>
<td>Phone Number</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------------</td>
<td>---------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Amao Farm</td>
<td>John Amao</td>
<td>Lagos, Nigeria</td>
<td>08033456789</td>
<td></td>
</tr>
<tr>
<td>Bello Farm</td>
<td>Mike Bello</td>
<td>Kano, Nigeria</td>
<td>08123456789</td>
<td></td>
</tr>
<tr>
<td>Classic Farm</td>
<td>Richard Classic</td>
<td>Abuja, Nigeria</td>
<td>08054567890</td>
<td></td>
</tr>
<tr>
<td>Delta Farm</td>
<td>Paul Delta</td>
<td>Port Harcourt, Nigeria</td>
<td>08093456789</td>
<td></td>
</tr>
</tbody>
</table>

Note: The table continues with more entries, but these are the first few to illustrate the format.
INTRODUCTION:

Presented is the overview of the activities of the sub-component in Year 2007 in line with the specified guidelines.

Objectives:

1. The overall objective of the subcomponent is to aid small scale mixed and livestock farmers develop rabbits, pigs, sheep and goat breeds for improved and sustained production. Also, the development of specialized livestock production packages for farmers interested in beehkeeping, grasscutter and small ruminating in the State.

Specific objectives are:

1. To develop improved technological packages for sheep and goat, rabbit, pig rearing, poultry and be-keeping in the State (i.e., hedges, feed, husbandry etc.)
2. To provide backup animal health services to farmers to enhance growth of the sub-sector.
3. To provide technical information and backup to encourage farmers interested in specialized livestock production (i.e., poultry, be-keeping and grasscutter).
To provide routine and emergency veterinary ambulatory services to livestock farmers in the State.

QUANTITATIVE ACHIEVEMENTS

1. Status Report on OFAR Trial
   - Livestock 2007 OFAB title is: “Evaluation of Cassava peel supplemented with PKC as an Inoculant for West African Dwarf (WAD) Goats”.
   - Following are the objectives:
     a. To determine the utilization of PKC in the diets of WAD Goats.
     b. To determine the best level of replacement of Palm kernel Cake (PKC) in the diet of WAD Goats.

2. Other
   - OFAR commenced in May 2007 and was concluded in October 2007. The report of the OFAR was presented at the In-house review on the 11-13th December 2007. The corrections on the OFAR were being effected in preparation for presentation at the REHLS Workshop at Nakuru in February 2008.

AMPUTATION TRAINING (FNT)

Livestock topics treated during the year in review were as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>Production and marketing of Grasscutters.</td>
</tr>
<tr>
<td>August</td>
<td>Disease prevention techniques in grasscutters and smalls.</td>
</tr>
<tr>
<td>September</td>
<td>Asian flu symptoms, prevention and control</td>
</tr>
<tr>
<td>October</td>
<td>Design and construction of housing units for sheep and goats</td>
</tr>
<tr>
<td>November</td>
<td>Handling of vaccines</td>
</tr>
</tbody>
</table>

Amputees participated in all Pre-MTRM field visits as well as the MTRM during the year. Summary of follow-up field visits were also undertaken when necessary to supervise and evaluate the activities of the frontline extension officers and also monitor the implementation of technical messages taught at FHTs.

2. Status Report on Animal Health Extension/Ambulatory activities:

Some visits were paid to livestock farmers to render health extension services and also carry out emergency cases for ambulatory cases. These services were rendered by the Livestock Health Teams, which included the SMS and Head of the sub-teams in all the three zones of the State during the year.

3. WORKSHOP: The workshop was set up at the Headquarters with the aim of disseminating technical messages on small ruminants and production potentials received from respective farmers interested in small ruminants. Pupils from Primary and post primary institutions in the State also attended the workshop on excursions.
A summary of Animal Health Activities is presented below:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>790</td>
<td>140</td>
</tr>
<tr>
<td>Sheep</td>
<td>540</td>
<td>552</td>
</tr>
<tr>
<td>Goats</td>
<td>112</td>
<td>233</td>
</tr>
<tr>
<td>Pigs</td>
<td>124</td>
<td>271</td>
</tr>
<tr>
<td>Fish</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>Poultry</td>
<td>302</td>
<td>2784</td>
</tr>
</tbody>
</table>

Total Outreach (Jan - Dec 2007): 8,260

(IRE) PREVALENT DISEASES:

The most prevalent diseases treated during the year in review were Newcastle disease, Avian Influenza (AI), swine fever, and rinderpest. Newcastle disease is endemic in some areas of the country and continues to be a major problem for livestock farmers. Avian Influenza (AI) has been reported in some locations in the three zones of the State during the review period. An intensive campaign on prevention and control of the disease was carried out to prevent its spread.

In addition, outbreaks of Newcastle disease (ND) and lumpy skin disease were experienced by a number of poultry farmers.

Nurturing of poultry farmers was carried out in the form of training and awareness campaigns.

1. BEE KEEPING: Regular maintenance of the Apiary at Imokando was carried out throughout the year. No harvesting was done on any of the hives due to non-availability of harvesting kits. However, technical information was provided to farmers through the Beekeeping programme.

2. OSTRICH FARM: The ostrich farm at Imokando was maintained in good condition. Regular feeding was provided to the ostriches. Their paddocks were also maintained as required.

3. PROBLEMS AND CONSTRAINTS:

Inadequate funding for the subcomponent was a major constraint, particularly for the control of Newcastle disease, lack of funds for the purchase of technical equipment, and irregular availability of utility vehicles for transportation. These problems contributed to the low achievement in some activities of the subcomponent.

4. PREFERRED SOLUTIONS:

Increased funding of the activities of the subcomponent should be looked into in order to improve the programme. Utility vehicles should be made more available to the subcomponent in order to transport officers and materials to the field.

5. GENERAL:

An intensive subcomponent awareness campaign was carried out in order to increase livestock farmers' knowledge of livestock rearing and production. Students from primary school and post-secondary institutions that visited the Authority on excursions were also attended to by the SMSs. Farmers who came for training were also lectures during the course of the year.
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 TARGET</th>
<th>ACHIEV. JAN-DEC</th>
<th>% ACHIEV.</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Non-Anthrop</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>Completed Sept. 2003</td>
</tr>
<tr>
<td>Supervisory Field visit: a. Base of cold</td>
<td>62</td>
<td>42</td>
<td>100</td>
<td>Non-release of approved funds</td>
</tr>
<tr>
<td>b. SIF + health</td>
<td>82</td>
<td>82</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Update Research Annual. FPR inclusion in campaign</td>
<td>7</td>
<td>7</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Nominated MTESS</td>
<td>11</td>
<td>11</td>
<td>100</td>
<td>Not held in Dec.</td>
</tr>
<tr>
<td>Attendance at MTESS</td>
<td>11</td>
<td>11</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Participation in TVCs</td>
<td>26</td>
<td>26</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Communication with Research Centers and other ADRs</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attendance at Annual OFAR meetings</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td>Held at MAF &amp; F</td>
</tr>
<tr>
<td>Factors of Annual Health Bag</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Factors of Annual Health equipment</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Deduction of Staff meeting</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Surface (EURO) Review</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Meeting of Breast Feeding/Family</td>
<td>20</td>
<td>20</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>40</td>
<td>40</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Drop</td>
<td>20</td>
<td>20</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
### Table

<table>
<thead>
<tr>
<th>Sub-component</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal</td>
<td>1500</td>
<td>500</td>
<td>2000</td>
</tr>
<tr>
<td>Crop</td>
<td>1800</td>
<td>700</td>
<td>2500</td>
</tr>
<tr>
<td>Total</td>
<td>3300</td>
<td>1200</td>
<td>4500</td>
</tr>
</tbody>
</table>

### FARM MECHANIZATION SUB-COMPONENT

**PAYMENT:**

<table>
<thead>
<tr>
<th>Method</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### SUMMARY OF ACHIEVEMENT

1. **FARM MECHANIZATION:**
   1. **Transport:**
      - Male: 1500
      - Female: 500
      - Total: 2000

2. **FABRICATION:**
   - Male: 1800
   - Female: 700
   - Total: 2500

3. **DEMONSTRATION:**
   - Male: 50
   - Female: 10
   - Total: 60

---

**REGIONAL SIMPLE FARM TOOLS:**

1. Simple tools/equipment that were sourced when the unit visited Research Institutes are:
   - 1. Serrated and non-serrated sickles for harvesting rice.
   - 3. Corn sheller

**FABRICATION:**

- Hand-fabricated Rice sickles (serrated and non-serrated) for DFAR, 2007. Fish
 icking gender was fabricated for some fish farmers who participated at the 1st International
  Fish Fair held at TTV, Bopa.

Two fabrication Messrs. Mavwab and Fasilatude Anwojel were awarded fabrication of
20 sets of Fish-Bathing Kilo by Federal Ministry of Agriculture and Water Resources
during the year in review which was still in progress at the Authority premises. Total Nos
perfiel in 12.

**DEMONSTRATION:**

The units were able to carry out demonstration of simple farm tools at the blocks farmed
farmers' meetings held at the three zones. Demonstration of cotton picker, water shelter, seed
importance with were carried out for Agric student from the following schools on excursion
in LADP.
OFAR 2007 TRIALS

Objective is to compare the use of serrated and non-serrated sickles for harvesting rice. This was presented and approved at the South West REEL's workshop held at IAR&T on 20th - 22nd February 2007.

The objectives of the OFAR are:
(a) To determine the performance of serrated sickle with the non-serrated sickle for harvesting rice.
(b) To compare the harvesting, rainfed hours of rice harvested using both sickles.
(c) To compare the cost implication and economic benefit of serrated and non-serrated sickles.

The OFAR treatment were carried out in six locations of the three zones of the State namely:
(a) Holo-I虐 (Far Eastern zone)
(b) Ibilo-Asho (Ife-Orignin) area (Western zone)
(c) Non-Ife-Asho (Ife-Orignin) area (Western zone)

The trial has been collated, analyzed and presented at In-house review meeting held in December 2007 with the following recommendation and conclusion:

Performance of serrated sickle had the highest value of paddy harvested in weight, which permits a faster harvest rate when compared with the non-serrated sickle. Overall advantage is that economically the ratio of serrated to non-serrated sickles put the benefits of using a serrated sickle in harvest rice above that at non-serrated sickle.

FERTILIZER TRAINING (FNT)

The fertilizer training topics treated throughout the zones are as follows:
(a) Simple techniques for maintenance of water pumps
(b) Mowing of carbon processing equipment

PREMITION AND MTRM

The team participated in the MTRM, field visits and MTRM during the period. Gender field visit was also embarked upon to supervise the field extension as well as aware of adoption of the technical messages taught at FNT meetings.

A total of 40 farmers attended the visit to selected local government on RITEP sector Tri-Itern project at Ilora, Badary, Alalakoso and Ilake-I}}}e, chaired by the State Coordinator.

RESULTS AND RECOMMENDATION

Data collected and the visit was able to carry out the duty as expected.
AGROPROCESSING SUB-COMPONENT

In the introduction, the objectives of the sub-component aimed to promote Agro-processing techniques in the state through the introduction of new technologies as a way of adding value to agricultural produce and alleviating the drudgery associated with traditional processing methods of farmers and poverty alleviation by:

- Standardizing technologies acceptable and adaptable to their environment
- Conducting a trial on new Agro-processing technologies
- Demonstrating Agro-processing technologies for adoption by the entrepreneur
- Linking farmers (Producers) with tested and trusted fabricators for the purchase of equipment useful to them
- Linking with Research Institutes to source for off-shelf technologies, so as to formulate training strategies which are labor and time-saving thereby enhancing both on-farm and off-farm activities
- Taking in on-farm training
- Demonstrating Agro-processing equipment to the relevant Agroprocessors

STAFF SITUATION

The present staff strength of each component is seven (7).

SUMMARY OF ACHIEVEMENTS (JAN - DEC, 2007)

During the period under review, the sub-component attended various workshops on increasing farmer yields in the state and also attended the 21st Annual South-West REHIL's workshop and liaised with the various Research Institutes.
1. DEMONSTRATION WORKSHOP

A technical component carried out various demonstration workshops on the use of Agro processing equipment such as collapsible skyr, Hydraulic press, RTEF combination processing machine to Agro processors.

The sub-component carried out exhibitions and demonstrations of the equipment, smoking kiln for fish and beef smoking to the Lagos State Fish Farmers.

The exhibitions/demonstrations were carried out at (i) 1st Lagos State Fish Fair held at NTA, Ojota 18th November, 1991 (ii) Lagos State Fish and Allied Farming Association (LAFZA) held at IVY, Ibadan, Oyo and (iii) LSADA headquarters for Catfish Farmers Association.

- The sub-component had assisted some fish processors in the State to fabricate seventeen (17) units of Smoking kilns for fish. Nine (9) in the Far Eastern Zone, 3 in the Eastern Zone and 6 in the Western Zone.

2. ROOT & TUBER EXPANSION PROGRAMME (RTEP)

The sub-component participated fully in the sensitization visits to all the locations in the Local Government areas of the State for the 2nd Tri-term RTEP.

A sub-workshop on Market Linkage (Technology Development) on RTEP was organized by NCAM, held at the Lagos Airport Hotel, Ikoyi. The workshop was well attended by the affected Agro-processing sub-component and some of the agro processors in the State.

7. Various cassava processing equipment were demonstrated at the World Food Day to show Agro processors and farmers. Demonstration on Gbogbo, Fish Smoking kiln, etc. during the World Food Day exhibition. Also production of ordinary and tasteful cassava starch was demonstrated. Jio and dye made from kola nut waste was also demonstrated.

8. Twenty (20) Agro processors were trained on the production of HOCF, I. F. F. & Plantain flour oil, kola nut waste dye.

9. IDENTIFICATION OF NEW AGRO PROCESSORS

Two (2) new Agro - Processors were identified and given technical advice on processing activities and establishment of cottage industries for processing.

10. REFERRAL VISITS TO EXISTING AGRO PROCESSORS

Value upscoping visits were made to 95 existing agro processing enterprises during the year 2007 such as:

1. Enitan (Nig.) Ltd., Bororo - HOCF, JIOF, I.O.F.F., Starch, Plantain flour, bean flour
2. Itafo Cassava processing group, Bororo - Gari, fufu, and HOCF
3. HOCF processors, Agege - HOCF, Yam flour, palm oil, I.O.F.F., & Milled melon
4. Oko le cassava processing group, Bororo - Gari & fufu
5. On-Agoon Cassava processing group, Bororo - Gari & fufu
6. Ogunleja cassava processors, Ype - Gari & fufu
7. Apefilaye Cassava processing group, Bororo - Gari & fufu
The MFRM survey focused on:
1. Proper Harvest Handling of Mango fruits.
2. Fish processing and storage using improved smoking kilns.

9. IMPROVED SITUATION REPORT

(a) The survey conducted at six (6) locations in the three (3) zones of the State, namely:
1) Benin-Crepe processing groups
2) Igbogbo-Crepe processing groups, Igbogbo
3) Awange-Crepe processing groups, Igbogbo
4) Igbogbo-Crepe processing groups, Igbogbo
5) Oba-Osisi-Crepe processing group, Igbogbo
6) Oba-Osisi-Crepe processing group, Igbogbo
7) Oba-Osisi-Crepe processing group, Igbogbo
8) Oba-Osisi-Crepe processing group, Igbogbo

(b) A combination of physical and chemical tests had been carried out on the stored garri and results written:

10. CONSTRAINTS:

(b) The major constraints were high cost of processing equipment and non-availability of modern processing equipment among the cassava processing groups mostly especially cassava peeling machine. Other procurements in need of processing equipment had been linked with R&D and others.
AGRO-PROSPECTS AND RECOMMENDATIONS

The sub-component is very vital to agricultural production in the State by improving the harvesting method (i.e., timely harvesting), timely and appropriate processing method, Post-harvest handling and storage. This will in turn add value to the agricultural produce and products and increase the shelf life and continuous production of farm produce throughout the year, removing drudgery during processing as well as alleviating poverty in the State.

The sub-component is relevant to farmers in Lagos State due to the following activities:
- Unfertilized cotton flake production
- Gar producing
- Can重返 dry production
- Fruity pears production
- Tomato paste (flour) production
- Soap production
- Beekeeping
- Horticultural produce
- Rice processing
- Fish processing, preservation and storage
- Appropriate method of yam fruit cutting and storage
- Maintenance of farm processing tools and equipment
- Processing of oil palm and waste utilization
- Transfer of improved technologies
- Production and preservation of fresh fruits such as pineapple, mangoes, and citrus
- Sensitization: feasibility visit to new and existing agro-processing entrepreneurs
- Provision of agro-processing equipment through demonstration for adoption

Publication (In Farmer Adaptive Research (OFAR)):

AGRO-PROGRESS REPORT JAN.- DEC. 2007

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 TARGET</th>
<th>ACHIEV. JAN.-DEC.</th>
<th>% ACHIEV.</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Unfertilized cotton flake production</td>
<td>10</td>
<td>21</td>
<td>100</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>2. Gar production</td>
<td>20</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>3. Can重返 dry production</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>4. Fruity pears production</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>5. Tomato paste (flour) production</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>6. Rice processing</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>7. Fish processing, preservation and storage</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>8. Appropriate method of yam fruit cutting and storage</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
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<tr>
<td>9. Maintenance of farm processing tools and equipment</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>10. Processing of oil palm and waste utilization</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>11. Transfer of improved technologies</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>12. Production and preservation of fresh fruits such as pineapple, mangoes, and citrus</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
<tr>
<td>13. Sensitization: feasibility visit to new and existing agro-processing entrepreneurs</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
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<tr>
<td>14. Provision of agro-processing equipment through demonstration for adoption</td>
<td>10</td>
<td>9</td>
<td>105</td>
<td>FAMO, NIPSSRL, HTA, NRHORT, TARGET</td>
</tr>
</tbody>
</table>

CHP's Development Sub Component

I. INTRODUCTION:

The Crop Development, Agro-forestry and Land use sub component promotes the production of multiple, intercultural and tree crops in the state. The rainfall pattern during the year was adequate for the farmers. By and large, it was a good year for the crops production.

II. OBJECTIVES:

Objectives of the sub component are determined by the activities being performed. These are:

1. ON FARM ADAPTIVE RESEARCH UNIT:
   - To design units to active identified problems from the farmers
   - To conduct trials on staple food crops in the state
   - To develop appropriate package of recommendation of staple food crops
   - To train and provide support services to Extension staff
   - To coordinate and participate in Monthly Technology Review Meetings (MTRM)

2. HYBRID MULTIPLICATION:
   - To multiply Certified Seeds of staple crops and vegetables through outgrowers
   - To produce Costless sets of improved varieties from both direct and out-growers

AGROFORESTRY AND LAND USE:

Suggestive of plantations of tree crops (especially coconut and kola) and choosing suitable farming techniques.

III. LINKAGE WITH EXTENSION AND RESEARCH INSTITUTES:

A very cordial relationship was maintained with Extension agency especially through participation in fortnightly trainings (FNTs) and workshops. The sub component also attended the Area meetings and one joint visit to problem areas.

Some persons were drawn from Research Institutes and Universities through Subject Matter Specialists (SMSs) at MTRMs. Some of the institutions include IT&I, NIFOR, NIHOF and University of Ilorin.

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STAFF DISPOSITION AND ORGANOGRAM

The staff disposition is as follows:

- Chief Agricultural Officer (1)
- Assistant Agricultural Officer (1)
- Assistant Agricultural Officer (2)
- Assistant Officer (1)
- Field Worker (1)

4. SUMMARY OF ACHIEVEMENTS:

5a. Farm Adaptive Research Unit (OFAR):

The OFAR trial approved at REFILS workshop for the year is, “Controlling Nematodes in Plantain field using treated stakes”. However, the early season OFAR trial on “Evaluation of different variety of watermelon for adaptability in Lagos State for the year 2006 which could not be feasible due to logistic has now been concluded.

The OFAR trial for this year OFAR trial titled “Controlling Nematodes in Plantain field using treated stakes” are:

- To determine the effect of treated stakes in the performance of plantain.
- To determine the most economically viable among treatments to be used.

Culms has now been established in 12 locations across the State and is expected to terminate in June.

In this trial, two treatments were used in the early season due to non-availability of the reference (Charleston grey); however, the replicates were increased to fifteen across the State. In the second season, the above treatments were used.

This trial has been concluded for both seasons. The result showed that treatment 2 (Kaozack) has the highest yield and watermelon planted in the late season did well in both seasons compared. Kaozack and A70 planting were recommended for farmers in the State. The list of participating farmers was presented.

The OFAR proposal for 2007 has been written and ready for presentation for approval at REFILS workshop.

1. SEDIMENTATION:

Life of the farm: 3 hectares of Cassava farm were established last year for multiplication and training. Cuttings were harvested and 2000 bunches were cut and individually packaged. A total of 2000 bunches were sold from the farm. A total of Fifty thousand and five hundred naira (50,000) was realized and has been paid to Account Component.

In order to receive different varieties (white and water yam) received from IITA last year as part of the docket, Coordinated Research Programme were multiplied through Minimum Technology. 150 cassava and yam were sold for N4,500 at N100 each while the remaining 25 pieces were replanted.
OUTGROWERS SCHEME:
The existing outgrowers were been consolidated. New farmers were selected across the State as new outgrowers for seed production during the late season. The lists of all the outgrowers are in Appendix 7.

TRAINING OF STAFF:
The following training and workshops were attended during the reporting period:
- General Review Workshop at Mowe Plantation, Badass
- REFES Workshop at JAR&T, Badass
- Pre-Season training for year 2007 at LSADA, Ijegun.
- Pest biologicals on maize and beans at JAR&T, Badass.
- Pest control training on BIPET at ABMII, Benin.
- Training of farmers for seed Officer at NSS, Badass.

AGROFORESTRY AND LAND USE:
Improved planting materials namely; banana, coconut, citrus, mango, pawpaw, were sourced from research institutes and other well established farms. More than 12,000 seedlings were planted for these crops were sourced from farmers.

TECHNOLOGY REVIEW MEETING AND TECHNICAL SUPPORT:
The sub-component coordinated and participated actively in all the Pre - MTRM and MTRMs. Technical of the sub - component and NSMs attended the FNTs at various zones during the period.

Technical messages on crops production were delivered in support of Extension Services to the benefit of Extension officers. The topics treated were:

1. Insecticides technologies in the control of pests and diseases of arable crops.
2. Soil fertility management for crop production.
3. Classification, Use and Handling of agrochemicals.
4. Impact technology on Rice production.

GENERAL:
The head of Sub – Component represented LSADA at a meeting held in MAC Alamos in respect of field trial on the efficacy of Agrochemical and Biofertilizer from Remsam Biogas Ventures and Harvest Industries Ltd.

An official of NTP - MU helped He visited Okotodo Seed Farm on Quality Control.

Officers of Premier Seed Limited and NSS came to verify seed supplied to LSADA in 2006 which were not sold.

Meetings were held with were held with LSADA, Yen - lek Rice Company on how to improve the Rice farmers’ production to meet the processing requirement of the company.
Report on 2006 MIARD A seed production and community seed production on Rice were sent to Abuja.

Maize doubling trait trials locations were established across the state. The trial has been concluded and the report has been sent to IAR&E, Ibadan.

100 kg of open-pollinated maize foundation seed were received from NSER, Ibadan for the doubling maize programme. The maize seeds were used for maize establishment in the state for five seed multiplication during the late season. Out of the total 100 kg, 80 kg were used for the maize trials.

The head of youth development sub-component, Mr. F. A. Johnson, has been posted to the Department of MACS at Abuja, while Mr. Thomas was posted to the sub-component.

CONTRAST:
- The soil leading to Enkorodo seed farm needs attention. Constant removal of the seeding equipment from the office block is a major concern and problem of day and night guards.

QUANTITATIVE ACHIEVEMENTS: January - December, 2006

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2006 ANNUAL TARGET</th>
<th>ACHIEVEMENT</th>
<th>% ACH.</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adaptive Research</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection of OFAR</td>
<td>2</td>
<td>2</td>
<td>100</td>
<td>Established</td>
</tr>
<tr>
<td>2. Participation at MTRM</td>
<td>12</td>
<td>11</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>3. Participation at Pre-MTRM</td>
<td>10</td>
<td>9</td>
<td>90</td>
<td>No Pre-MTRM in June due to strike action</td>
</tr>
<tr>
<td>4. Turkmen-Trek - Back up of EFU organized by Extension Compan</td>
<td>72</td>
<td>72</td>
<td>92</td>
<td>Other fall on Public Holiday, Strike and Promotion and Interview in September</td>
</tr>
<tr>
<td>5. Absence of Annual OFAR</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6. Participation at ICRAH Review</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7. Supervisory Paid visits: Final Crop</td>
<td>42</td>
<td>42</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>8. Preparatory of 2007 Workplan and Budget</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9. 3rd Year Report presentation</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>10. Preparation of Report: Annual Quantity Survey</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>11. Seed Multiplication</td>
<td>100Bds</td>
<td>100Bds</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>12. Evaluation of Cost of Coops at Enkorodo seed farm</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Note: List of participating farmers and location in the two OFARs.
### FAR 1:

**Soil tolerance of different varieties of Watermelon for adaptability in Lagos State**

<table>
<thead>
<tr>
<th>Location</th>
<th>Farmers Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Zone</td>
<td></td>
</tr>
<tr>
<td>Igbo</td>
<td>Mr. Udo</td>
</tr>
<tr>
<td>Ogun</td>
<td>Mr. Akin</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Johnson</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Western Zone</th>
<th>Farmers Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ilagun</td>
<td>Ms. Sule</td>
</tr>
<tr>
<td>Ilorin</td>
<td>Mr. Adeola</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Johnson</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Adeola</td>
</tr>
</tbody>
</table>

### FAR 2:

**Soil tolerance of different varieties of Cassava for adaptability in Lagos State**

<table>
<thead>
<tr>
<th>Location</th>
<th>Farmers Name</th>
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<td></td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Ogun</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Ms. Agba</td>
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</tbody>
</table>

### FAR 3:

**Soil tolerance of different varieties of Plantain for adaptability in Lagos State**

<table>
<thead>
<tr>
<th>Location</th>
<th>Farmers Name</th>
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</thead>
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<td>Eastern Zone</td>
<td></td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Paul</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Joy</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Onasokan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Western Zone</th>
<th>Farmers Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ibadan</td>
<td>Mr. Ibiti</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Akin</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Fagbohie</td>
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<table>
<thead>
<tr>
<th>Far-Western Zone</th>
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<tr>
<td>Ibadan</td>
<td>Mr. Moses</td>
</tr>
<tr>
<td>Ibadan</td>
<td>Mr. Agba</td>
</tr>
</tbody>
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### Eastern Zone

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Size of Farm /ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Akanih</td>
<td>Aghede</td>
<td>0.3</td>
</tr>
<tr>
<td>II. O. Shekuno</td>
<td>Adeowo</td>
<td>0.2</td>
</tr>
<tr>
<td>III. O. Ile Alagbado</td>
<td>Ijebu Odo (Ogbe)</td>
<td>0.1</td>
</tr>
<tr>
<td>IV. O. Lomaje</td>
<td>Ifo</td>
<td>0.3</td>
</tr>
<tr>
<td>V. O. Onaoye</td>
<td>Ibara</td>
<td>0.3</td>
</tr>
<tr>
<td>VI. O. Oke Apara</td>
<td>Ijebu Odo (Ogbe)</td>
<td>0.1</td>
</tr>
<tr>
<td>VII. O. Oko Oso</td>
<td>Ijebu Odo (Ijebu)</td>
<td>0.3</td>
</tr>
<tr>
<td>VIII. O. Oko Oso</td>
<td>Ijebu Odo (Ijebu)</td>
<td>0.3</td>
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</tbody>
</table>

### Western Zone

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Size of Farm /ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>O. Akanih</td>
<td>Ilaro</td>
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</tr>
<tr>
<td>II. O. Shekuno</td>
<td>Ibadan</td>
<td>0.3</td>
</tr>
<tr>
<td>III. O. Ile Alagbado</td>
<td>Ijebu Odo (Ogbe)</td>
<td>0.3</td>
</tr>
<tr>
<td>IV. O. Lomaje</td>
<td>Ifo</td>
<td>0.3</td>
</tr>
<tr>
<td>V. O. Onaoye</td>
<td>Ibara</td>
<td>0.3</td>
</tr>
<tr>
<td>VI. O. Oke Apara</td>
<td>Ijebu Odo (Ogbe)</td>
<td>0.3</td>
</tr>
<tr>
<td>VII. O. Oko Oso</td>
<td>Ijebu Odo (Ijebu)</td>
<td>0.3</td>
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</table>

### Eastern Zone (continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Size of Farm /ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Akanih</td>
<td>Ilaro</td>
<td>0.3</td>
</tr>
<tr>
<td>II. O. Shekuno</td>
<td>Ibadan</td>
<td>0.3</td>
</tr>
<tr>
<td>III. O. Ile Alagbado</td>
<td>Ijebu Odo (Ogbe)</td>
<td>0.3</td>
</tr>
<tr>
<td>IV. O. Lomaje</td>
<td>Ifo</td>
<td>0.3</td>
</tr>
<tr>
<td>V. O. Onaoye</td>
<td>Ibara</td>
<td>0.3</td>
</tr>
<tr>
<td>VI. O. Oke Apara</td>
<td>Ijebu Odo (Ogbe)</td>
<td>0.3</td>
</tr>
<tr>
<td>VII. O. Oko Oso</td>
<td>Ijebu Odo (Ijebu)</td>
<td>0.3</td>
</tr>
</tbody>
</table>

### OGBABIRI PROMOTION & COMMUNITY SEED BENEFICIARIES

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Varieties</th>
</tr>
</thead>
<tbody>
<tr>
<td>O. Akanih</td>
<td>Ilaro</td>
<td>WITA, NERICA</td>
</tr>
<tr>
<td>II. O. Shekuno</td>
<td>Ibadan</td>
<td>WITA, WAAD</td>
</tr>
<tr>
<td>III. O. Ile Alagbado</td>
<td>Ijebu Odo (Ogbe)</td>
<td>NERICA</td>
</tr>
<tr>
<td>IV. O. Lomaje</td>
<td>Ifo</td>
<td>WAAD</td>
</tr>
<tr>
<td>V. O. Onaoye</td>
<td>Ibara</td>
<td>NERICA</td>
</tr>
<tr>
<td>VI. O. Oke Apara</td>
<td>Ijebu Odo (Ijebu)</td>
<td>FARO 44</td>
</tr>
<tr>
<td>VII. O. Oko Oso</td>
<td>Ijebu Odo (Ijebu)</td>
<td>NERICA &amp; FARO 44</td>
</tr>
</tbody>
</table>
INTRODUCTION
The Lagos State Agro-processing and Market Expansion Group (SAMEG) commenced its activities for the year 2007 (Jan – Dec, 2007).
The Lagos SAMEG with its full complement of staff continued to institute actions to promote R & T P and marketing activities in the State.

OBJECTIVES:
(i) To improve processing, utilization and market outlets
(ii) Establish strong linkages between processors and end-users to improve on value-added at the farm level
(iii) To encourage end-users to assist processors to acquire needed equipment.

ORGANIGRAM

Achievements Jan – Dec, 2007

The piece was under review, the SAMEG officials, agro-processors, fabricators and marketers in the State attended a one-day workshop on market linkage/Technology Development organized by the Lagos Agro-processing and Market Expansion Group (SAMEG) at Airport Hotel, Lagos.

The workshop gave the State’s fabricators and processors the opportunity to show case their various outputs and products to the participants and also interacted with their counter part from the States of the federation.

Market Linkage:

(i) Barratts Ag. Ltd., an agro processor was linked with a marketer, SAN-KAB Ag. Ltd. to supply 30 tons of HOCF.
(ii) Mrs. Owolabi, a cassava processors was linked with Enterprise Ag. Ltd., an agroprocessor for supply of HOCF at cake level. So far a total of 35 tons of HOCF at cake level has been supplied.

Identification of Agro-Processing groups:

Several agro processing groups were identified such as:
- BARRATTS Ag. Ltd., Ikorodu, HOCF, smoked fish
- Mrs. Akindele, Igbogbo – Ikorodu – HOCF
- Mrs. Adebayo, Ikorodu – HOCF and Gari
- Mrs. Owolabi, Ijesha – Starch and HOCF (at cake level)

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BARME linked the following cassava farmers, processors, and marketers with market opportunities for their products:

- **Mpkambo Farmers** (Oyibo) supplied 20 tons of cassava flour to the market.
- **Ozor Fike** (Oyibo) supplied 30 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 40 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 50 tons of cassava flour to the market.
- **Apeka** (Oyibo) supplied 60 tons of cassava flour to the market.
- **Oyibo** (Oyibo) supplied 70 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 80 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 90 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 100 tons of cassava flour to the market.

**Market Opportunities**:
- **Oyibo** (Oyibo) supplied 150 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 200 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 250 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 300 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 350 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 400 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 450 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 500 tons of cassava flour to the market.

**Market Challenges**:
- **Oyibo** (Oyibo) faced challenges in transporting 600 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) faced challenges in transporting 700 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) faced challenges in transporting 800 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) faced challenges in transporting 900 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) faced challenges in transporting 1000 tons of cassava flour to the market.

**Market Opportunities for Expansion**:
- **Oyibo** (Oyibo) supplied 1100 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 1200 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 1300 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 1400 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 1500 tons of cassava flour to the market.

**Market Opportunities for Diversification**:
- **Oyibo** (Oyibo) supplied 1600 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 1700 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 1800 tons of cassava flour to the market.
- **Ikoakon** (Oyibo) supplied 1900 tons of cassava flour to the market.
- **Antonio & Co.** (Oyibo) supplied 2000 tons of cassava flour to the market.
**Quantitative Achievement of SAMEG from Jan - Dec. 2007**

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>2007 ANNUAL TARGET</th>
<th>ACHIEVEMENT</th>
<th>% ACHIEVED</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assist. trained group in the preparation of feasibility report.</td>
<td>4</td>
<td>3</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>2. Construction of model</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Supervised training workshop</td>
<td>2</td>
<td>3</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4. Agric. processing groups</td>
<td>2</td>
<td>1</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>5. Youth groups</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Identification of potential market outlets of various policies</td>
<td>1</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. UKA of potential晨报 to equipment suppliers</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>8. USA of critical few products</td>
<td>4</td>
<td>1</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>9. Establishment of processes</td>
<td>24</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. SAEU meeting</td>
<td>2</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

- Training workshop for SAMEG on crop storage system 10th-12th Dec. 2007
- Training on process flow, machine operation and maintenance 13th-15th Dec. 2007
- Audited by SAMEG Financial analysis.
RURAL INSTITUTIONAL DEVELOPMENT COMPONENT

INTRODUCTION
The establishment of the Agricultural Development Programme to increased food production and farmers' well being nationwide and especially in Lagos State from 1990's to date cannot be overemphasized. The current trend in the Agricultural industry for increased farmers' output is the use of Farmers' Group/associations that is group approach strategy. The Rural Institutional Development Component (RID) was established as a chain process to get the grass root in the communities. It is the Agricultural implementing agency on which group development is based. In line with the Federal Government directives, Lagos State Agricultural Development Authority has established her own RID Component to achieve the following objectives:

1. The main objectives of the Component is to provide institutional supports to farmers/farmers Group and other folks in the area of input, credit and market sourcing as to complement the extension services.

2. Specific objectives of the RID Component are as follows:
   1. Institutional collaboration and formation of farmers into viable groups/cooperatives.
   2. Development of new business ideas for farmers groups
   3. Linking farmers/farmers groups/fishers folks with sources of credits, inputs and markets.

RID COMPONENT ORGANOGRAM

PROGRAMME MANAGER

DEPUTY DIRECTOR (RID)

PRIN. AGRIC. SUPT.
OFFICER

AGRIC. BUSINESS

MICRO FINANCE

2RID 1RID 2RID 1RID 2RID 1RID 2RID
OFF. OFF. OFF. OFF. OFF. OFF.
ET F/E WS ET F/E WS ET F/E
RS
<table>
<thead>
<tr>
<th>STAFF SITUATION</th>
<th>TOTAL</th>
<th>TARGET</th>
<th>NO IN POST</th>
<th>VACANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deputy Director/Head of Component</td>
<td>16</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Assistant Director</td>
<td>15</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Regional Agric Officer</td>
<td>14</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Chef Agricultural Officer</td>
<td>13</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Regional Agric Superintendent</td>
<td>12</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Regional Agric Officer/Superintendent</td>
<td>10</td>
<td>-</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>AGRO Officer I</td>
<td>9</td>
<td>-</td>
<td>9</td>
<td>-</td>
</tr>
<tr>
<td>AGRO Officer II</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>32</td>
</tr>
<tr>
<td>Services</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Other Mandal</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Clerks</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

**COMMENTS ON THE COMPONENT**

The component achieved all its set targets based on the specific objectives in terms of group farmers taking farmers with source of credits, inputs, markets, training in collaboration with AMEND and the stakeholders. The component also collaborated with various institutions.

**ACTIVITIES OF HEAD OF RID COMPONENT**

**QUALITATIVE REPORT FOR JULY – DECEMBER, 2007**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 Target</th>
<th>ACTUAL JULY-DEC</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinating Sub-Component Activities</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Conducting Component Meetings</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Procurement at A.M.U.</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Procurement at FNT</td>
<td>36</td>
<td>36</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Procurement at Pre-MTRM Field Visits</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Procurement at MTRM</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Assignments Reports</td>
<td>Monthly</td>
<td>4</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>- Mid-Year</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>- Annual</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Preparation of Work Plan and Budget</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Assurance Visits of the Field</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Visits at MTRM</td>
<td>4</td>
<td>3</td>
<td>75</td>
<td>Not conducted</td>
</tr>
<tr>
<td>Visits at Mid-Year</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Visits at Annual Review</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
CONSTRANTS
1. Lack of official vehicle for Componential Head (HOC)
2. Lack of computer for Secretarial activities
3. Other constraints are as stated under each sub-componential reports.

PROJECTS AND RECOMMENDATIONS
More technical farmers are now being incorporated into extension services due to the enormous opportunities available for them. More are being encouraged and trained on method of farming. Training is improved/increase fund production
- Provision of adequate trainings
- Linkage with more viable NGO’s to assist the groups
- Linkage with market sources to prevent wastage and increase farmers income
- Introduction of more projects to improve the lot of the farmers.

MICRO-FINANCE SUPPORT SUB-COMPONENT
INTRODUCTION
Provide an overview of the activities of the Sub-component from July to December 2007.

SUB-OBJECTIVES:
- To provide Institutional Support to farmers/farmers group and fisher folk in the areas of input and credit to complement the Extension activities.

SOCIAL OBJECTIVES OF THE MICRO-FINANCE COMPONENT
1. To link farmers with source of credit
2. To ensure timely access to credit
3. To ensure appropriate utilization of the loan accessed by farmers.
4. To ensure cordial relationship between farmers and lending agencies.

ACHIEVEMENT FROM JULY-DECEMBER 2007
Inauguration of farmers groups to sources of credit
- 25 farmers group were linked to various sources of credit while 50 individual farmers were benefitted. A total of N3.45m was accessed by both individual farmers and farmers groups NACRIDB during the year.

SMALL TRACTION AND HAND TOOLS LOAN COMMITTEE
216X1X5 Agro. of the local government are now involved in the meeting. A total of 23 farmers and local governments, namely: Ajah, Okokleri, Ibea and Ikeja benefited from the facilities in the year 2007

COLLABORATION WITH INSTITUTIONS
- Technical collaboration with NACRIDB in terms of loan
- Federal, Assembly, Consortium, Community Development Foundation, Quick project, Lagos State, Farmers Association and other component and sub-component within the Authority were exploitation services.

WASTE RECOVERY
Use of N37, 000 was paid into Federal purse for both pumps and water treatment during period under review in a total of N37,000.00 was paid in for the whole of 2007.
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 TARGET</th>
<th>ACHIEVE JULY-DEC</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local fm. group with credit</td>
<td>25</td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Group of farmers group</td>
<td>30</td>
<td>30</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Institutional Collaboration</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attend and participation at MPRM</td>
<td>4</td>
<td>3</td>
<td>75</td>
<td>Not conducted</td>
</tr>
<tr>
<td>Attend and participation at MTRM</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attend and participation at Pre-MTRM</td>
<td>5</td>
<td>5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attend and participation at INT</td>
<td>16</td>
<td>16</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Ten Sluice and drill of wash bords</td>
<td>200,000</td>
<td>137,000</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Phytophancy field visits</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Extemporaneous Visit Asst. Group</td>
<td>6</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigeon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrap</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeding</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Irrigation</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Performance of 2008 Work plans &amp; Budget</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**RESULTS AND CONSTRAINTS**

The problems encountered during the half year was that of lack of Secretarial materials such as report stationeries which had contributed to lateness in submission of reports, and also lack of staff which.

Efforts in recovering some of the Fadham loan due to inadequate information on beneficiaries and non-recovery.

**PREFERRED SOLUTION**

The need for Secretarial materials is urgent. Provision of utility vehicle and more staff for better service of the entire state is also important so that the RBD component and microfinance Support equipment in particular will be more effective in discharging her duties.

**GENERAL**

The need for sub-componental head to be trained for subject matter concerned and the need for supplementary cards to be issued so as to boost confidence and enhance better performance.

**GRIP DEVELOPMENT AND MANAGEMENT**

In recent times in the agricultural industry for increase farmers output is the use of farmers association that is group approaches strategy, this gave the birth to group development and
The main objectives of the RID component are to provide institutional support to Farmers/Farmers' Group and Fisher folks in the area of input, sourcing, credit and market to complement the extension activities.

**OBJECTIVES**

1. To form farmers into viable groups
2. To linking farmers into co-operative through regular trainings
3. To ensure proper management of farmers groups
4. To develop a user data base for farmers/fisher folks

**ACHIEVEMENT FROM JULY TO DECEMBER 2007**

**ANEX I QUANTITATIVE PROGRESS JULY – DECEMBER**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 TARGET</th>
<th>ACHE JUly- Dec.</th>
<th>%</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of Farmers Group</td>
<td>200</td>
<td>230</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Mobilization of farmers to Co-operatives</td>
<td>45</td>
<td>215</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Consolidation of existing farmers group</td>
<td>300</td>
<td>230</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Training of farmers group</td>
<td>3</td>
<td>-</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Inclusion of farmers group by RID block office</td>
<td>480</td>
<td>460</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>Institutional collaboration with institutions/capacity building</td>
<td>10</td>
<td>16</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Mobilization of Users' Users' Association (TUA)</td>
<td>20</td>
<td>32</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Formation of TUA with Co-operatives</td>
<td>6</td>
<td>11</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Formation of farmers groups</td>
<td>4</td>
<td>-</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Workforce participation in MPRM</td>
<td>6</td>
<td>5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Presence and participation in MTMRM</td>
<td>5</td>
<td>4</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Presence and participation in Pre-MTRM</td>
<td>3</td>
<td>4</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Participation in INT</td>
<td>12</td>
<td>10</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Preparation of Annual Work Plan</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Training/Workshop/Seminar etc</td>
<td>variable</td>
<td>-</td>
<td>0</td>
<td>Need more staff training</td>
</tr>
<tr>
<td>Coordination with existing NGO's/Institutions</td>
<td>4</td>
<td>7</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Preparation of Report</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Monthly</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>- Mid-Year</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>- Annual</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attendance in Annual Review Meeting</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**NARRATIVES**
Some of the list of Farmers Group registered with the co-operative department and certificate reflected are:
1. Awoja co-operative Agricultural/Multipurpose Society Reju Lekki
2. Ilonapo Farmers Oyo
3. Ikenne Olwa Farmers Oyo
4. Cane Blessing CAMs Ikorodu
5. Araromi Farmers Ogun
6. IBAN Foundation fish farmers Association Epe
7. Koko Biogazy Cotonou
8. Tafelz Dealers (Sabo Ikotun) Co-operative Multipurpose Society
9. Fisac Farmers association
10. Adebimpe Farmers co-operative Gomina EkoKoko

**COLLABORATION WITH INSTITUTIONS**

<table>
<thead>
<tr>
<th>NAME/LOCATION</th>
<th>NGOs/INST.</th>
<th>AREA OF COLLABORATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAIC</td>
<td>Nigeria Agricultural Insurance Corporation, Lagos</td>
<td>Sensitisation, Seminar, Training on NAIC activity, workshop for Field Officers at LSADA on the 24th August, 2007.</td>
<td>Awaiting response on the proposal for sensitisation Workshop for farmers groups forwarded to NAIC.</td>
</tr>
<tr>
<td>CMD</td>
<td>Eries for micro enterprises</td>
<td>Trained 20 rice farmers, excursion at Borin Kwara state 1st - 3rd August, 2007. 2nd Training: 2-day enterprise training for the farmers on 15th - 16th November 2007.</td>
<td>1st phase of the programme.</td>
</tr>
<tr>
<td>BATIN</td>
<td>British American Tobacco Nigeria Foundation (BATIN)</td>
<td>Fish farming development empowerment programme at Epe</td>
<td>The Project is ongoing.</td>
</tr>
<tr>
<td>Assembly consortium</td>
<td>Training on cassava for farmers at Johnson Akins Hall on 28th - 29th, 2007.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Nigeria Agricultural Insurance Corporation (NAIC), Lagos.
3. Nigeria Export promotion Council (NEPC), Lagos.
4. Centre for Micro Enterprises Development (CME), Ikotun
5. Association of Small Scale Entrepreneurs and Producers (ASSEP).
8. Assembly Constructions.
9. APF/Quick Project, Ikotun.

SUBJECT AID

The major constraint of the Subcomponent is fund for training, as the main objective of the subcomponent is regular training and development of the farmers' groups.

STRENGTH OF STAFF

The number of officers within the subcomponent is inadequate as Mr. Osaro has been seconded to the State's Fisheries Department.

STATUS OF FARMERS GROUP DATA BASE

Completion of the update of farmers' groups list is in progress. However, the subcomponent will not complete the survey for the effective collation of a data base.

EQUIPMENTS

- 10 Hand crashes cutters.
- 1 Laptop
- Training of Black BOR Officers and Head of Subcomponent.

AGRICULTURAL BUSINESS SUBCOMPONENT

INTRODUCTION AND OBJECTIVES

Agricultural business development as a subcomponent of BOR was established to further develop the new business ideas and marketing practices of farmers/farmers groups and fisher folks and to further agricultural enterprises in the State through agricultural inputs linkages.

The subcomponent is charged with the following Objectives:
1. Development of new business ideas for prospective farmers/farmers groups and fisher folks.
2. Marketing and developing business plans/feasibility study.
3. Lining up farmers groups and individual farmers in simple record keeping for farm enterprise.
4. Linking farmers/farmers groups/fisher folks with market and input sources.

ACHIEVEMENTS IN THE YEAR (JULY - DECEMBER 2007)

INPUT LINKAGES

A total of 30 farmers groups were linked to viable sources of market for their various agricultural produce. Fishermen among these produce are catfishes including Chrysichthys nigrodigitatus. These linking is which our farmers were linked to various cassava processors, poultry products, etc. Also a total of 46 individual farmers were linked specifically to various marketing
quantifies for the sales of their agricultural products which include cat fishes, crayfish, cassava "gari", onion, water melon etc.

MARKETING LINKAGES
A total of 21 farmers groups and 77 individual farmers were linked to various sources of agricultural inputs. Individual farmers and farmers group were linked to LAISA for the purchases of various agricultural inputs ranging from agro chemicals to fertilizers and seeds. Farmers were also linked to other farmers and ISADA from the purchase of cassava cuttings, fingerlings, and market ready inputs.

Marking information as well as trainings on simple record keeping was also done by BISO offices on various field visits. This is to enhance farmers’ profitability.

Feasibility reports on fish farming were prepared for 2 fish farmers in the State to facilitate the sourcing of loans from banks.

QUANTITATIVE REPORT JULY – DECEMBER

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>2007 TARGET</th>
<th>ACTUAL</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linkage of farmers groups with market</td>
<td>25</td>
<td>28</td>
<td>100</td>
<td>Adequate market info.</td>
</tr>
<tr>
<td>success</td>
<td></td>
<td></td>
<td></td>
<td>Information</td>
</tr>
<tr>
<td>Linkage of individual farmers to market</td>
<td>50</td>
<td>46</td>
<td>92</td>
<td>Adequate market info.</td>
</tr>
<tr>
<td>success</td>
<td></td>
<td></td>
<td></td>
<td>Information</td>
</tr>
<tr>
<td>Linkage of farmers group with input</td>
<td>25</td>
<td>23</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>linkage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linkage of individual farmers with input</td>
<td>50</td>
<td>77</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>linkage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional collaboration</td>
<td>10</td>
<td>2</td>
<td>20</td>
<td>NAIC &amp; BATN</td>
</tr>
<tr>
<td>Instruction to MPRA</td>
<td>4</td>
<td>4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>MTRM</td>
<td>8</td>
<td>6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Preparation of business plan of individual</td>
<td>4</td>
<td>2</td>
<td>50</td>
<td>Insufficiency of the farmers.</td>
</tr>
<tr>
<td>farmers and farmers group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CHALLENGES
1. Insufficient number of personnel in the subcomponent to cover the State effectively.
2. Insufficient mobility for personnel to adequately cover the State effectively.
3. Insufficiency of farmers and farmers groups towards having a good business plan.
4. Farmers need to do these businesses on their own way.

CONTRACTS AND RECOMMENDATIONS
1. It is recommended that trainings on agricultural business development, proper and up to date record-keeping report writing and proper work plan towards profitability report writing should be part of the skills of the officers.
2. It is recommended that mobility to the field should be enhanced either by providing a mobility plan or provisions of means of mobility.
3. In agreement with the above recommendations, it is believed that the services rendered to our farmers will be improved and profitability will be ensured for our farmers, hence there will be agricultural progress in the State.
ENGINEERING

INTRODUCTION

The Engineering Services Component is one of the eight (8) Components of Lagos State

Established Development Authority. During the period under review, the Component made a

Substantial achievement within the limit of available funds and resources as provided by the Authority.

The Component consists of 3 Sub-Components as follows:

1) Maintenance
2) Widship
3) Water

The Component also has three (3) Engineers attached to the Zones.

OBJECTIVES

The main objective of the Component is to provide Engineering Services to the State farmers with a view to improving the standard of living of rural dwellers and to provide Engineering Services to the Community.

The specific Objectives are:

To carry out the maintenance of the Authority's

Infratmra (e.g. offices, roads, staff quarters etc.)

To maintain the Authority's environment e.g. lawns,

To qualify and screen all building contractors for major renovations.

To prepare Bills of Quantities (B.O.Q) for the entire Authority project.

To carry out repairs/maintenance of Authority's machineries, vehicles and generators.

To qualify and screen all Mechanics for major repairs on all Authority's vehicle.

To provide irrigation infrastructures/facilities: e.g. wells, tubes, pump etc. to farmers in Lagos State so that all season farming could be achieved and sustained.

To train farmers on operation and maintenance of irrigation facilities such as water pump, fertilizer etc.

To provide agricultural drainage to boost food production

To participate in all the field visits that are being carried out at the Zones and solve

Emerging problems that may occur.

To visit the existing Engineering Project sites in the Communities at the Zones and

Assist the Communities on the maintenance of such projects.
<table>
<thead>
<tr>
<th>No.</th>
<th>Position</th>
<th>Approved</th>
<th>No. in Est.</th>
<th>Vacancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chief Engineer</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Senior Agric. Eng.</td>
<td>1</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Agric. Officer I</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Chief Tech Officer</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Senior Tech Officer</td>
<td>2</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>High Tech Officer</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Senior Foreman</td>
<td>2</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Plant Operators</td>
<td>9</td>
<td>9</td>
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<tr>
<td>9</td>
<td>Mechanics</td>
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<td>11</td>
<td>Secretary</td>
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<td>1</td>
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</tr>
<tr>
<td>12</td>
<td>Office Assistant</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>
WATER USE SUB-COMPONENT

MAJOR ACHIEVEMENTS (JANUARY – DEC. 2007)

WASHBORE DRILLING

(17) Wash bores were drilled at various Fadama locations in the State to enhance farming as follows:
- Wash bores at Okigwe, Iheka, Ogoja and Magbon for Samuel FUA
- Wash bores at Bogije, Awoyaya for Ogundibo FUA
- Wash bores at Lagos State Ministry of Youth, Sports and Social Development
- Wash bores at Tarka in the vicinity of Tarka
- Wash bores at Volkswagen, Ojo for Madueke Iloy FUA
- Wash bores at Afien Village, Epe for Ogundibo FUA
- Wash bores at Magbon, Badagry, for Muyecain FUA

SUPERVISORY FIELD VISITS

Visit to various sites were made to various sites in the state to provide technical assistance on irrigation/water problems as follows:
- Visit to sites in Okigwe, Ogoja, Magbon, Badagry, Bogije, Awowo, Gboko, Ebute, Epe, Ogundibo and Tarka in the vicinity of Tarka.

RIGHTEOUSNESS CAMPAIGN ON OPERATION AND MAINTENANCE OF WASHBORE AND PUMP

Training of Eighty-five (85) farmers were enlightened on the operation and maintenance of the water pump during the period under review at the following locations:
- Farmers at Okigwe, Ogoja and Bogije.
- Farmers at Ijora, Bogbo-Fremti, Magbon, Badagry.
- Farmers at Eleka, Magbon, Awoyaya.
- Farmers at Volkswagen, Ojo.
- Farmers at Afien Village, Epe.
- Farmers at Ogundibo.

EXPERIENCE IN FARMING

Training of farmers on Operation and Maintenance of Wash bore and Water Pump was carried out at Volkswagen, Ojo (Western Zone) on the 16th August, 2008. A total of thirty-three (33) benefited from the training. The same training was held for the Eastern and Farming could not hold due to lack of fund.
<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>TARGET</th>
<th>ACHIEVEMENT</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting of Wash boxes</td>
<td>20</td>
<td>17</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Summary field visits</td>
<td>40</td>
<td>57</td>
<td>&gt;100</td>
<td></td>
</tr>
<tr>
<td>Smt of Farmers</td>
<td>3</td>
<td>1</td>
<td>33</td>
<td>Achievement low due to fund constrain</td>
</tr>
<tr>
<td>No of participants at the meeting</td>
<td>60</td>
<td>39</td>
<td>65</td>
<td>Ditto</td>
</tr>
<tr>
<td>No of beneficiaries at the Replacement Campaign on Drinking and Maintenance (sub bore and water tank)</td>
<td>50</td>
<td>35</td>
<td>&gt;100</td>
<td></td>
</tr>
<tr>
<td>Issue of Monthly Report</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Audit of Monthly Staffing</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Status of MPRM</td>
<td>11</td>
<td>11</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
MAINTENANCE SUB-COMPONENT

MAJOR ACHIEVEMENTS (JANUARY—DEC. 2007)

- Provision of drilling of a new borehole and installation of new pump at the
  Headquarters
- Replacement of damaged galvanized water supply pipes with P.V.C. pipes at the
  Headquarters
- Replacement of faulty basin tap and flushing system of the water closet tank of HOC (RID)
  and replacement of burst pipe supplying water to the HOC (Ext.) toilet.
- Replacement of floating switch of roof overhead tank at the Headquarters
- Planting of the Headquarters Environment and planting of Cashew tree
- Complete installation of the damaged overhead tanks supplying water to the training room
  (Ext.), Conference room, Engineering toilets and HOC (Tech.) toilet.
- Complete installation of water to the Head (Crops) toilet.
- Installation of damaged PHCN pole due to rain storm at the Headquarters, in
  coordination with PHCN officials.
- Replacement of burst pressure pipes and faulty gate valve supplying water to the toilet of the
  HOC (Ext.)
- Replacement of ball valves and gate valves of the overhead tanks supplying water to the
  Manager, Planning and Fisheries toilets.
- Repair of the HOC (PME), HOC (Ext.), HOC (Tech.), Engineering, Admin., Training room,
  and Planning Blocks toilets.
- Repair of the faulty pipe supplying water to the overhead tank for the security officers' use.
- Replacement/repair of damaged pressure pipes behind the Finance and Account Component
  block supplying water to Fadama 11 offices.

PROPOSALS AWAITING APPROVAL/FUNDING:
- Reconstruction/Repairs of collapsed/partially collapsed septic tanks (3000) and repair of
  septic tanks at Ojakuru Staff Quarters
- Repair of driver’s office roof and damaged window
- Repair of Security house roof and Admin. Corridor’s roof
- Replacement of HOC (RID) office, its suite room and one office
- Repair of skill gap acquisition centre, Ilora.
- Separation and partitioning of the L.S.A D.A. Clinic.
### QUANTITATIVE PROGRESS

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>TARGET</th>
<th>ACHIEVEMENT</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of Headquarters</td>
<td>There is no fixed target</td>
<td>13</td>
<td></td>
<td>It is based on request</td>
</tr>
<tr>
<td>Maintenance of Staff</td>
<td>-Dito-</td>
<td>Continues</td>
<td></td>
<td>BOQ underestimated but fund in the constraint</td>
</tr>
<tr>
<td>Maintenance of Zonal and Area office</td>
<td>-Dito-</td>
<td>Continues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lawn Mowing</td>
<td>-Dito-</td>
<td>Continues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation of Bill of Quantity (BOQ)</td>
<td>-Dito-</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance of MPRM</td>
<td>11</td>
<td>11</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Revision of Monthly report</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attendance of Monthly Staff Meeting</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

### WORKSHOP SUB-COMPONENT

**MAJOR ACHIEVEMENTS (JANUARY – DEC, 2007)**

1. Servicing of RTIP vehicle TG 273 WC3 three times.
2. Refurbishments of Steyr Low-loader engine (LA29 A32) in conjunction with hirer two times.
3. Repair/maintenance of Lawn Mower.
4. Servicing of the generator at the Headquarters.
5. Repair/maintenance of Engineering Land rover.
6. Repair and servicing of Headquarters generator.
7. Repair of Knapsack Sprayer.
8. Repair of clutch and brake systems of Morda Staff bus LA40 A32.
8. Relocation of the generator serving the former Staff Quarters, Eshite-Meta to the
LSA D A Staff Quarters, Oko-Oba, Agege.
9. Repair of Steyr Low-loader clutch (L-A29 A32) in conjunction with invited mechanic.
10. Repair of front and rear brakes of RIEP vehicle FG 09 T03.
11. Re-overhauling of the Mazda Staff Bus LA40 A32 in conjunction with invited mechanic.
12. Servicing of Mazda staff bus.
14. The Headquarters generator was operated 23 times for a total of 51.5 hrs between August and December 2007.

### REVENUE FROM THE WORKSHOP

<table>
<thead>
<tr>
<th>REVENUE GENERATED</th>
<th>N11,400.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPENDITURE</td>
<td>N - K</td>
</tr>
<tr>
<td>(a) Purchase of six Sprockets</td>
<td>1,000.00</td>
</tr>
<tr>
<td>(b) Pedestal for Workshop</td>
<td>200.00</td>
</tr>
<tr>
<td>(c) Welding of damaged roller</td>
<td>500.00</td>
</tr>
<tr>
<td>(d) Purchase of long heavy duty screw rod</td>
<td>2,700.00</td>
</tr>
<tr>
<td>(e) Fabrication of two vehicles stands</td>
<td>1,500.00</td>
</tr>
<tr>
<td>(f) Transportation</td>
<td>N1, 700.00</td>
</tr>
<tr>
<td>TOTAL EXPENDITURE</td>
<td>N89,900.00</td>
</tr>
<tr>
<td>REVENUE - EXPENDITURE</td>
<td>N11, 400.00 - N89,900.00</td>
</tr>
<tr>
<td>CASH AT HAND</td>
<td>N11,300.00</td>
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</tbody>
</table>
## QUANTITATIVE PROGRESS

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>TARGET</th>
<th>ACHIEVEMENT</th>
<th>%</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance/Repair of Light Vehicles and Land Rovers</td>
<td>—</td>
<td>19</td>
<td></td>
<td>Repair based on request. There is no fixed target.</td>
</tr>
<tr>
<td>Maintenance/Repair of Heavy Equipment</td>
<td></td>
<td>8</td>
<td></td>
<td>Repair carried out in conjunction with planner. There is no fixed target.</td>
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<tr>
<td>Operation of HQ Generating set</td>
<td></td>
<td>Continues</td>
<td></td>
<td>23rd Aug. – Dec. 2007 the Gen. set was used for 55.5 hrs. There is no fixed target.</td>
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<tr>
<td>Attendance of MPRM</td>
<td>11</td>
<td>11</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Rendition of Monthly report</td>
<td>12</td>
<td>2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Attendance of Monthly Staff Meeting</td>
<td>12</td>
<td>12</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

## ZONAL ENGINEERS ACHIEVEMENTS

The Zonal Engineers on the field serve as a link between it and the Zonal Agent on one hand and the Farmers on the other hand. The achievements of the Zonal Engineer during the period under review are as follows:

### Zonal Engineer (Western Zone)
- Assisted relevant Engineering information at the FNTs and area meetings such as the drilling, rehabilitation, Agricultural drainage, etc.
- Preparatory and preparation of cost estimate to renovate the dilapidated skill gap acquisition centre, the estimate has been approved but awaiting fund release.
- Assisted farmers and also participated in the training on operation and maintenance of Wash house, Main pump that was held at Volkswagen, Orio on the 16th August, 2007.
- Hosted the 2007 Pre-season training at the HQ.
- Attended the 2007 In-House review meeting on UFAR and Extension activities.
- Attended all FNTs, Area Meetings, Pre-MTRM and MTRM.

**REGIONAL ENGINEER (EASTERN ZONE)**

- Distribute relevant Engineering information at the FNTs and area meetings such as the drilling of Washbore, agricultural drainage, etc.
- Mobilized farmers towards the training on operation and maintenance of Wash bore and pumped for the last quarter of the year 2007. Unfortunately, the training could not hold due to lack of fuel.
- Supervised the routine maintenance/cleaning of the Zone office environment by the security staff.
- Involved in the maintenance of water pump and the water system at the zone.
- Attended the 2007 Pre-season training at the HQ.
- Attended all FNTs and Area Meetings.

**REGIONAL ENGINEER (FAR-EASTERN ZONE)**

- Distribute relevant Engineering information at the FNTs and area meetings such as the drilling of Washbore, agricultural drainage, etc.
- Preparations and preparation of cost estimate to rehabilitate the collapsed well at the zone office, Nafurina, Epe.
- Mobilized farmers towards the training on operation and maintenance of Wash bore and pumped for the last quarter of the year 2007. Unfortunately, the training could not hold due to lack of fuel.
- Attended the Sensitization Workshop on Investment Opportunities in Environmentally Sound Management (ESM) of used oil at the Elephant house, Beija.
- Attended the 2007 Pre-season training at the HQ.
- Attended all FNTs and Area Meetings.

**CONSTRAINTS**

- Major constraints are as follows:
  1. Lack of fuel is a major constraint in the performance of the Component.
  2. Lack of adequate tools. The inability of the Component to upgrade the present Wash bore drilling tools to borehole drilling tools is a constraint. This is hampering the provision of water for dual purpose in farmland with low water table.
  3. Lack of serviceable vehicle to carry out our assignments. The Land Rover attached to the component is very old, it is on and off the road.

**RECOMMENDATIONS/CONCLUSION**

- Make the limit of available resources, adequate funds should be provided for the Component to carry out its activities.
- More tools should be procured for the Engineering Workshop to improve its services. The boring drilling tools should be upgraded to borehole drilling tools to provide water for dual purpose in agricultural land with low water table.
- The need to repair the Land Rover to be in a good mechanical condition.
PLANNING, MONITORING AND EVALUATION COMPONENT

I. INTRODUCTION AND OBJECTIVE

The general objectives of the Planning, Monitoring and Evaluation Component are to provide planning support for activities of the Authority, to provide timely information on the Authority's progress, as a basis for decision making and to measure and report on project's performance and impact.

II. ORGANOGRAM

In order to accomplish the objectives highlighted above, the component operates with the organogram shown on figure 1.1 below:

![Organogram](image)

In the staff disposion as at December, 2017 as presented in Table 1.1 below:

<table>
<thead>
<tr>
<th>Position</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme Manager</td>
<td>Head (PME)</td>
</tr>
<tr>
<td>Computer Unit</td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td>MIS</td>
</tr>
<tr>
<td>MIS Sub-Component</td>
<td></td>
</tr>
<tr>
<td>Library APO I</td>
<td>APO II</td>
</tr>
<tr>
<td>APO I</td>
<td>PA</td>
</tr>
<tr>
<td>APO II</td>
<td>SE (EAST)</td>
</tr>
<tr>
<td>APO III</td>
<td>SE (WEST)</td>
</tr>
<tr>
<td>APO IV</td>
<td>SE (EAST)</td>
</tr>
<tr>
<td>APO V</td>
<td>SE (WEST)</td>
</tr>
<tr>
<td>APO VI</td>
<td>SE (EAST)</td>
</tr>
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</table>

---
TABLE 1: SADA PME COMPONENT 2007 STATE SITUATION

<table>
<thead>
<tr>
<th>No.</th>
<th>DESIGNATION</th>
<th>GRADE</th>
<th>PAY APPROVED</th>
<th>POST</th>
<th>VACANCY POSITION</th>
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<tbody>
<tr>
<td>1</td>
<td>Asst. Director Planning</td>
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<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Chief Planning Officer</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Asst. Chief Planning Officer</td>
<td>13</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Prof. Planning Officer</td>
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<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Sr. Planning Officer</td>
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<td>3</td>
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<td>6</td>
<td>Planning Officer I</td>
<td>08</td>
<td>2</td>
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<tr>
<td>7</td>
<td>Planning Officer II</td>
<td>08</td>
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<tr>
<td>8</td>
<td>Prof. Library Asst. F</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
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<tr>
<td>11</td>
<td>Controller F</td>
<td>07</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Sec.</td>
<td>06</td>
<td>4</td>
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<td>3</td>
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<td>Field Asst. II</td>
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<tr>
<td>15</td>
<td>Assistant Inspector</td>
<td>03</td>
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<td>2</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>Chief Statistical Asst. F</td>
<td>07</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>17</td>
<td>Sec.</td>
<td>05</td>
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<td>2</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>&quot; &quot; Officer</td>
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<td>1</td>
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<tr>
<td>19</td>
<td>&quot; &quot; Higher</td>
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<td>1</td>
<td>1</td>
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<tr>
<td>20</td>
<td>Statistical Officer</td>
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<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Asst. Statistical</td>
<td>06</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

1.2 SUMMARY OF ACHIEVEMENT

1.2.1 PLANNING

The 2007 Workplan and Budget were produced and distributed to relevant agencies and components of the Authority. Farm budget for early season crops in the state was prepared during the year under review. The survey covered common farming enterprises mix in the state.

1.2.2 MIS

Regular and Special reports on the Authority’s activities were rendered as and when due at relevant agencies and Ministries at all levels. The Component participated in the Annual Planning, Monitoring and Evaluation workshop for year 2007 held in Abiu, Anambra state between 13th - 16th of November, 2007. The theme for this year’s workshop was “Harmonizing PME Methodologies in the On-going Agricultural and Rural Development projects in Nigeria. The Monthly Progress Review meeting (MPRM) was conducted in the period under review.

1.2.3 EVALUATION

The core surveys vis-a-vis Agricultural production Survey (APS), Market Price Survey (MPS) and Weather survey were carried out during the period. The Baseline Survey, Comprehensive Feasibility Study/ Business Plan under the IFAD assisted Roots and Tubers Expansion Programme were conducted during the period.
1.0 DETAIL ACHIEVEMENT BY SUB-COMPONENTS

7.1 PLANNING:
2.1.1 Preparation of 2007 Workplan/Budget
The Authority's 2007 Workplan and Budget were produced and distributed to relevant agencies and components of the Authority. Meanwhile the draft copy for year 2008 Workplan and Budget had also been prepared. The Sub component participated in the budget defence of the Authority's 2008 budget at the State Ministry of Agriculture and cooperatives, Ministry of Economic planning and Budget, Alausa and the Lagos State House of Assembly.

2.1.2 Conduct of Planning Study
The planning Study for 2006 was conducted to determine the Economic effect of Appropriate Input use and feed on Catfish production in Lagos State. The study revealed that majority of the respondents covered, stocked their ponds with fingerlings which resulted in high mortality rate. It was also discovered in the survey that about 72% of the total input used were expended on feed and feed ingredients. The detail report was being written processed and would be ready very soon.

2.1.3 Conduct of Market Price Survey On Agric. Input
The survey was conducted once in the early season farming to monitor the prices of agricultural input. The result of the survey showed a general increase in the prices of most agricultural inputs over the same period of the previous year. The reason could be attributed to market forces and government policies among others experienced during the period under review. The survey also revealed that the prices of most inputs that were available at the Lagos State Agricultural input Supply Authority (LASASA) were relatively cheaper than those of open market.

2.1.4 Participation In Technology Review Meetings
The Sub component participated in the 26th Annual South West Zonal REFILS workshop conducted between 20th and 23rd February 2007 at IAR&T Badran. The subcomponent also participated to 10no pre-MIRM field trips carried out in different locations in the three zones of the state and to no MIRM. Market price reports for 6 selected Markets making across both urban and rural were rendered regularly at the meeting.

2.1.5 Farm Budget Preparation
One Farm Budget for the early season crops in the State was prepared during the year under review. The survey covered common farming enterprise mix in the State. These include: sole maize; sole cassava; sole vegetable; maize/cassava mixture; cassava/maize/melon mixture and cassaval/maize/sweet potato mixtures. The survey revealed a positive benefit cost ratio and profitable enterprise in the State.

2.1.6 Provision Of Computer Services
Computer Services were rendered to all components of the Authority as well as visiting personnel from outside Agencies and Institutions as and when required. The component had 3 functional computers and 1 functional printer during the period under review.
2.7 RTEP Workplan/Budget

The approved 2007 work plan and budget (AW&B) for RTEP was received and in being implemented during the period under review. The 2008 AW&B was also prepared and discussed at the 2008 Annual Workplan and Budget Meeting held at ARMTI Ilorin during the same period. The meeting was organized by RTEP-MU.

1.8 Revitalization of Technical Message

The sub-component validated six (06) technical messages within the technical services sub-component viz: Fisheries, Crop, Livestock, Agro-processing, and Farm mechanization and Women in Agriculture that is now in the Extension Sub-component.

2.2 MANAGEMENT INFORMATION SYSTEM (MIS)

2.2.1 REPORT PREPARATION

The Component continued to render management information services to the Authority’s staff and the general public. The Authority’s report were also collated and sent to relevant agencies as and when due. The following reports were coordinated and prepared by the Component during the period.

a. Monthly Progress Report of the Authority (December, 2006 and January to December 2007) as well as specialized versions for PCU, CBN, Ministry of Agriculture and Co-operatives and the FMO were prepared during the period.

b. Quarterly Progress report of the Authority (4th quarter 2006 and 1st to 4th quarter, 2007) were prepared and sent to PCU’s regional office and Headquarters as well as the CBN.

c. Quarterly Activity Reports (4th quarter 2006 and 1st and 4th quarter 2007) for the Ministry of Agriculture and Co-operatives were also prepared and rendered appropriately.

d. Monthly Activity Report (December, 2006 and Jan-December, 2007 for the Ministry of Agriculture and Co-operatives Alarms and CBN.

e. The 2006 Annual Report for the Authority and summarized version were prepared and distributed to PCU, CBN and RTEP-MU during the period under review. Authority Digest of year 2006 and Project Status report of ADP system were also prepared.

2.2.2 PROGRESS REVIEW MEETINGS

The Component co-ordinated and service 2006 Annual and 2007 Mid year review workshops. Also 96 Monthly Progress Review Meetings where the implementation of the Authority’s activities were monitored and decisions taken towards successful implementation were coordinated during the period.

2.2.3 MONITORING

The component made nine (09) monitoring visits to OFAR sites in the three zones of the state. Details of the visits were as follows.
12.4 ANNUAL PLANNING, MONITORING AND EVALUATION
WORKSHOP
The year 2007 Annual Planning, Monitoring and Evaluation workshop was held in
Ankwa, Anambra State, between 13th and 16th November, 2007. The theme for this
year’s workshop is “Humanizing PME Methodologies In The On-going Agricultural
and Rural Development Projects in Nigeria”. The Component was represented at the
workshop and the report had been rendered appropriately.

12.5 LIBRARY SERVICES

a. READERS SERVICES

Library services were provided to the Authority’s Staff as well as visitors to the organization
within the period under review.

The details of the Services rendered is hereby presented below

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<thead>
<tr>
<th>SN</th>
<th>NAMES</th>
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<tr>
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<td>B</td>
<td>CONSULTATION OF TEXTBOOKS</td>
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</tr>
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<td>C</td>
<td>READING NEWSPAPERS AND MAGAZINES</td>
<td>31</td>
</tr>
<tr>
<td>D</td>
<td>ASSISTANCE TO STUDENTS FROM HIGHER INSTITUTIONS</td>
<td>26</td>
</tr>
<tr>
<td>E</td>
<td>BROWSING FROM INTERNET</td>
<td>91</td>
</tr>
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</table>

b. ACQUISITION

The under listed items were acquired for the library within the year.

i. One (1) photo copying machine. (Non functional)

ii. Nine (9) Textbooks

iii. Seven (7) Journals

c. NEWSPAPER CUTTING

The library endeavours to disseminate a total of thirty two (32) information leaflets photo
copied from newspapers and magazines during the year for the readership of Head of
components and sub-components.

Revising From Internet

The component was not able to provide this facility in the year under review due to non-
payment of internet service provider’s charges.

d. EVALUATION

The Evaluation sub-component has the mandate to conduct surveys and studies which
would assess the impact of the Authority on the field as well as offering recommendations
for future improvement. The status of activities conducted during the period is as follows:

1. PRESEASON TRAINING

The Pre Season Trainings for the Enumerators was held between Tuesday 6th March and
### AGRICULTURAL PRODUCTION SURVEY

<table>
<thead>
<tr>
<th></th>
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<tr>
<td><strong>YIELD</strong></td>
<td><strong>HECTARE</strong></td>
<td><strong>PER HECTARE</strong></td>
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### VEGETABLE

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<td><strong>USD</strong></td>
<td><strong>USD</strong></td>
<td><strong>USD</strong></td>
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<td>22.74</td>
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<td>22.74</td>
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<tr>
<td><strong>OIL</strong></td>
<td>18.03</td>
<td>22.74</td>
<td>28.13</td>
</tr>
</tbody>
</table>

### FIELD SURVEY

Field survey + Based on 2 years moving average under the table above.

**FADAMA CAYS**

The 2005/2006 Dry season (Fadama) CAYS was completed during the period. The data was collated, analyzed and report rendered to PCU headquarters, Abuja. The result was also reconciled along national data, at the data reconciliation workshop PCU, Bauchi.

The 2006/2007 Dry season CAYS was completed during the period. The data was collated and analyzed as well. The production of cereals, pepper, onion, lettuce, amaranthus marginally increased over what was recorded in the previous dry season. Tomato had a sharp drop in production and yield of about 49% and 36% respectively. These could be attributed to tomato wilt infection still predominant in the state.

The 2007/2008 dry Season CAYS also commenced during the year under review and it is still ongoing.
There was a remarkable shortfall of rainfall incidence in 2007 as observed even at the zonal basis across the state as compared to what was obtained at both the zonal and state level in the state for the year 2006. However, there was no reported case of drought in any part of the state and as such, agricultural activities went on without any serious or critical weather disturbances.

2.1.7 PREPARATION OF BUSINESS PLAN FOR RTEP GROUPS

The Subcomponent prepared Business Plan report for RTEP groups in the state during the period. The report was rendered to RTEP MU and copies were made available to the groups.

2.1.8 MONITORING AND EVALUATION ACTIVITIES AT PROJECT SITES

Two Planning officers were also assigned as Economist/Analyst and Marketing Officers for Lagos state Agroprocessing Marketing Expansion Group (SAMEG) under the Root and Tuber Expansion programme.

3. CONSTRAINTS

3.1 The following constraints were faced by the Component during the period under review:

1. Inadequate field equipment for enumerators.
2. Inadequate chairs and textbook in the Library.
3. Inability to service the Internet facility.
4. Inadequate supply of stationary especially printing paper for report renditions.
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>MARCH</th>
<th>APRIL</th>
<th>MAY</th>
<th>JUNE</th>
<th>JULY</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>%</th>
<th>REMARK</th>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>Zonal</td>
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<td>100%</td>
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<td>Construction and participation in Planning Study/Survey</td>
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<tr>
<td>Maintenance of Vehicle</td>
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*MONTHLY*
## ANNEX I: QUANTITATIVE PROGRESS REPORT JANUARY - DECEMBER 2007

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<th>No.</th>
<th>ACTIVITY</th>
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<th>2007 JAN-JUNE</th>
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<th>REMARK</th>
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<td>2</td>
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<tr>
<td></td>
<td>- Progress Report</td>
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<td>- Authority</td>
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<td>- RUF</td>
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<td>- NCH</td>
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<td>- MMC</td>
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<td>- PNG</td>
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<td>- MEF/CH</td>
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<td>3</td>
<td>Conduct of Monthly Program Meeting</td>
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<td>10</td>
<td>100</td>
<td>Monthly</td>
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<td>4</td>
<td>Conduct of Monitoring Visit, Project Status, and Submission of Report</td>
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<td>20</td>
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<td>5</td>
<td>Development and Maintenance of Data Base for Authority (Monthly)</td>
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<td>Preparation of 2006 Authority's Annual Report</td>
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<td>- Note: 2006 Authority's Annual Report</td>
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<td>9</td>
<td>- 2007 Authority's Annual Report</td>
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<td>10</td>
<td>Coordination of Annual Review of Authority’s Activities for 2006</td>
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<td>Coordination of Mid-Year Review of Authority Activities for 2007</td>
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<td>SN</td>
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<td>2007 TARGET</td>
<td>2007 ACHIEVEMENT</td>
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<td>REMARKS</td>
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<td>1</td>
<td>Evaluation of market price survey on food staples</td>
<td>52</td>
<td>52</td>
<td>100</td>
<td>(Weeks)</td>
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<td>7</td>
<td>Participation in MPBM</td>
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<td>10</td>
<td>100</td>
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</table>
| 8  | Preparation of Report:  
| | Annual | 1 | 1 | 100 | |
| | Quarterly | 2 | 2 | 100 | |
| | Monthly | 1 | 1 | 100 | |
| 9  | Participation in Mid-Year review | 1 | 1 | 100 | |
| 10 | Monitoring and assessment of training | 12 | 12 | 100 | |
| 11 | Conduct of FANAX | 1 | 1 | 100 | |
LAGOS STATE FADAMA DEVELOPMENT OFFICE

1.0 INTRODUCTION

1.1 The NFEIO made record projects in the implementation of sub-projects in the five participating local governments in the state during the year under review. A total of 31 sub-projects were implemented and completed, made up of 5 Pilot Asset Acquisition Support (PAAS) and 3 Rural Infrastructure Investments (RII), while 5 RII and 1 PAAS Sub-project is still on-going.

1.2 In addition to PAAS and RII, the state Fadama Development Office, NFEIO attained a total of 21 Advisory Services activities that were carried forward while another 27 new ASA were completed with 7 ASA ongoing. Seven batches of capacity building training for benefiting Fadama community associations (FCA) and Fadama users group (FUG) were carried out in the course of the year. As at 31st December 2017, total sum of 59.34 million has been disbursed in the FCA/FUG in the state.

1.3 To date, a total of 97 FCAs/FUGs has benefited under rural infrastructure investment, 295 FDUs/FAs has benefited under pilot asset, 137 FCAs/FUGs has benefited under demand responsive advisory services and 500 FUGs and 97 FCAs benefited under capacity building components. Also 37 FDUs have benefited from the newly introduced input support scheme wherein 90% cost of beneficiary's farming inputs is borne by the project.

1.4 In the year 2017, Lagos state together with the other Fadama II participating States conducted Beneficiary Assessment impact study of Fadama II project in their respective states. The study, from the design to implementation, result verification and acceptance was coordinated by the National Fadama Development Office, in conjunction with the International Food Policy Research Institute based in Washington, United States, and the final report for this exercise has been submitted by the Consultant team hired. During the year, Mid Term Review (MTR) exercise was also carried out internally and by independent evaluation.

1.5 In the course of the year, a number of sub-projects that were initiated by various FCAs in 2016 were completed. Under rural infrastructure investment, the completed sub-projects were:

- 12 cold rooms with a combined capacity of 90 tons were constructed in Kosofe, Kosofe, Ikorodu and Alimosho LGAs.
- 5 boreholes with reservoir and generating set were drilled in Kosofe and Ikorodo LGA.
In addition to rural infrastructure investments, Efeama may has benefited under Pilot asset acquisition scheme as follows:

- Cattle (Ndurun and Udker) Breeder: 8 no.
- Sheep breeder: 27 no.
- Goat breeder: 30 no.
- Sheep wethers: 189 no.
- Goat wether: 172 no.
- Pig wether: 398 no.
- Pullets/stockers: 25000 no.
- D.O.C.: 5300 no.
- Fish juveniles: 9900 no.
- Fish fingerlings: 50,650
- Snail breeders: 650 no.
- Upawa seeds: 178 kg.
- Palm oil Seedlings: 5,120 pes
- Maize Seeds: 170 kg.
- Yum seeds: 430 sets
- Other vegetable seeds: 25 kg.
- Fertilizer: 232 bags
- Poultry feed: 51675 kg.
- Pig feed: 82500 kg.
- Fish feed (local): 5,170 kg.
- Fish feed (imported): 21,813 kg.
- Agrochemicals: 1,500 liters
- Palm kernel oil: 19 drums
- Caustic soda: 500 kg.
- Sulphuric acid: 50 liters
2.0 OBJECTIVE

2.1 The objective of the second National Endurance Development Project (NEDP) is to sustainably increase the incomes of Faduma users those that depend directly or indirectly on Faduma resources for their livelihood (that is, farmers, pastoralist, fisher folk, hunters, gatherers, etc.) through empowering communities to take charge of their own development agenda and by reducing conflict between Faduma users.

2.2 The main goal of the SEDO during the year under review was to improve on the progress made with implementation of sub-projects in the year 2006, and to see to the preparation of some Local Development Plans (LDPs) and sub-project proposals that are of acceptable quality. Close monitoring of all ongoing sub-projects remains a priority of the SEDO and to ensure strict adherence to maintenance plan of sub-project by the beneficiaries.

3.0 MANAGEMENT STRUCTURE

3.1 The management of SEDO comprised of 16-member team, headed by the State Project Coordinator. The team is assisted by forty (40) Facilitators and sixteen support staff. These are:

4 No. Drivers
1 No. Internal Auditor (attached to the PEMO)
1 No. Monitoring & Evaluation support staff
1 No. Administrative Support Officer
1 No. Accounting Support Staff (Cashier)
1 No. Secretary (attached to the SPC)
2 No. Office Attendants
3 No. Office Assistants (one each attached to the CD & GO, EO and ASD)
1 No Gardener
1 No. Janitor

IMPLEMENTATION PROGRESS
PREPARATION OF LDPs/SUB-PROJECTS

As at 31st December, 2007, a total of 10 LDPs have been prepared and approved. Also, 76 sub-projects were prepared out of which 23 had been implemented. However, from project inception to date LDPs representing 74.2% are under implementation while 75.5% of the 109 sub-projects that are under implementation have been successfully completed.
4.0 ACTIVITIES OF THE SIFO

The SIFO continued in its pursuit of ensuring that most of the activities contained in the approved 2007 Annual Work plan and Budget (AWPB) were carried out. As in the previous year, appreciable progress was made in respect of scheduled trainings and workshops. Some No Objection were obtained from the Bank. Thus by the end of the year, quite a number of trainings identified in the 2007 AWPB were undertaken.

4.1 DISBURSEMENT PERFORMANCE

The total sum of one hundred and sixty-six million Naira (₦166 million) was disbursed to FADAMA III for the implementation of sub-projects during the year 2007 and the cumulative sum of ₦378.4 million has been disbursed from project inception in December 2007.

On overall performance, though the total number of sub-projects executed was 307 out of 793 sub-projects approved, the percentage of sub-project completed was 75.2% while remaining are under implementation.

4.2 FADAMA COVERAGE

The SIFO has so far implemented BII, PAAS, Capacity Building and Advisory services activities in all the ten participating local governments areas of the state. All the local governments have felt the presence of Fadama in their communities. The population of the beneficiaries in the communities is estimated at about 7500 farm families and as at 31st December, 2007, over 300 Fadama community associations/Fadama users group have benefited from the project.

4.3 PROJECT COMPONENTS

The project is made up of 3 components and those are:
- Capacity Building
- Rural Infrastructure Investment
- Pilot asset acquisition
- Demand responsive advisory services
- Project management, monitoring and evaluation
5.0 KEY ACHIEVEMENTS

The key achievements of the NFDO during the year under review is summarized in the table given below:

<table>
<thead>
<tr>
<th>No.</th>
<th>NFDO ACTIVITIES</th>
<th>PLAN OF MEASURE</th>
<th>TARGETS</th>
<th>Achievement</th>
<th>Reaching</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Training of New FCAs</td>
<td>No.</td>
<td>10</td>
<td>124</td>
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<tr>
<td>2</td>
<td>Expansion of IFPs</td>
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<td>10</td>
<td>10</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>Preparation of Sub-project Proposals</td>
<td>No.</td>
<td>100</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Implementation of FAI Sub-project projects</td>
<td>No.</td>
<td>50</td>
<td>1</td>
<td>5</td>
<td>7 sub-project canceled due to the year 2001 was fully outstanding.</td>
</tr>
<tr>
<td>5</td>
<td>Workshops/Trainings organized for IUDs and FCAs</td>
<td>No.</td>
<td>100</td>
<td>505</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Workshops/Trainings organized for LTDOs and Facilitators</td>
<td>No.</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Workshops/Trainings organized NFDO, MAC &amp; ADA</td>
<td>No.</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

6.0 COMPONENTIAL ACTIVITIES AND ACHIEVEMENTS.

6.1 CAPACITY BUILDING

6.1.1 TRAINING AND WORKSHOPS FOR FACILITATORS AND DESK OFFICERS

During the year under review, all the Facilitators and Desk officers attended training course on participatory methodologies in Agricultural extension management at ARMTI, Ibadan. Another workshop on Agricultural commercial enterprises curriculum was organized for Facilitator by NFDO in Abeokuta, Ogun state. NFDO also organized a 3-days workshop/training for Desk officers on skill enhancement in management information system in Ijebu Ode during the year 2001.
6.1.2 TRAINING AND WORKSHOP FOR FUGs AND FCAs

Members of the various FUGs and FCAs were also trained on aspects of community-based procurement methods, learning event, mobilization and sensitization method during the year under review.

Besides the SFDO organized training/workshop, a large number of FUGs and FCAs participated in sub-project financed capacity building trainings. Seven of such trainings were organized during the year. As at December, 2002, a total of 739 FUGs/FCAs participated in the trainings, which was organized in different locations within the state.

A workshop on Safe Environmental Practices, Integrated Pest Management Techniques and Conflict Resolution was organized by the SFDO. 58 No. FUGs participated at the workshop.

6.1.3 TRAINING AND WORKSHOPS FOR SFDO OFFICERS

The eight officers of the SFDO participated in several SFDO and Bank's organized trainings and workshop within Nigeria and outside.

6.1.4 VISITS AND MEETINGS

Visit to FUGs, FCAs and the Desk Officers were undertaken. A total of 644 visits were to FUG and 384 to FCAs during the year under review.

6.2 COMMUNICATION, EDUCATION AND AWARENESS RAISING STRATEGY

6.2.1 PUBLICITY OF FADAMA ACTIVITIES

The sub-component carried out all the activities identified in the work plan for the year. The sub-component continued to ensure that adequate coverage was given to SFDO activities in the print media as well as on radio. Project posters, SFDO assessment handbook and pamphlets produced were distributed to all the participating local governments.

6.2.2 Fadama Jingles

In the period under review, 12 No. Fadama jingles were aired on Eko FM 107.5 every Friday at 6.25 p.m. on the popular 'BOO ITAYO' programme being sponsored by Fadama.
6.2.3 Field Tours

The Communication sub-component rendered communication support during the field tours by the management of the Ministry, SFDO, National office and World Bank at Fadama sites. The tours afforded the management of the Ministry (who also constitute over half of the State Fadama Development Committee) to have first hand information on Fadama activities, and proffer necessary advice in order to re-position the SFDO for the implementation challenges ahead.

6.3 ADVISORY SERVICES

Routine activities under the component were carried out according to plan. One orientation workshop was conducted for new service providers. The service providers were introduced to various FCA’s visited, creating a conducive interactive forum between service providers and the FCAs.

5.6 PREPARATION OF ADVISORY GUIDELINES

The component carried out all its schedule activities during the year under review. Copies of the Advisory Services guidelines were again distributed to stakeholders at interactive meetings. Overall over 2000 farmers and about 10,000 others have benefited from the 112 ASAs as of February.

6.5.1 CROSS-FCA MARKETING

The component commenced the preparation of cross-FCA marketing activities, document submitted by service providers has been approved and standard design has been adopted while implementation is slated for the year 2008.

6.5.2 UPDATE AND MAINTENANCE OF DATABASE OF SERVICE PROVIDERS

The component carried out quarterly update of service provider database and the updated copy has been sent to national office and all the LGAs.

6.5.4 INTERACTIVE SESSION

The sub-component organized interactive sessions between beneficiaries and service providers. This session was to enhance linkages to inputs/output center and thus improved demand for ASAs by at least 70% by December 2007, also various problems were addressed during the session.

6.6 PROJECT MANAGEMENT, MONITORING AND EVALUATION

6.6.1 PROJECT MANAGEMENT
6.6.2 Officer of the Lagos SFDO joined other South West and FCT SFDOs in February on a joint World Bank Mission to into SFDO to assess implementation progress in the state.

6.6.3 During the period under review, SFDO carried out twelve management visits to sub-project sites and SPC convened only two SFDC meetings during the year and this is due to many engagements of the key members of the committee.

6.6.6 MONITORING AND EVALUATION

6.6.7 Supervision and Monitoring of Sub-Projects

The supervisors engaged by the LGAs key supervision and monitoring of sub-projects visited all the FOGs and PCAs assigned to them and reports rendered to the SFDO on their findings. The Consultants have submitted their final reports.

6.6.9 Monthly Progress Review Meetings

Twelve monthly Progress Review Meetings report were produced during the period. The sub-component also prepared the SFDO Quarterly, Mid year and Annual Progress Review Reports.

6.6.10 Monitoring Visits

The sub-component continued to give support to the LGAs and sub-projects preparation. Several monitoring visits were made to sub-project sites during the quarter. All the local governments were visited at least once during the period.

6.6.11 Monthly Market Price Survey

12 No. Monthly Market Price Surveys were carried out during the year. A general price increase was observed in most of the commonly priced agricultural inputs. A similar trend is noticed in output prices of agricultural products.

6.7 Environment

6.7.1 Screening of LDPs and Sub-projects

The sub-component screened a total of 41 sub-projects and 2 LDPs during the year. The Environmental and Social Impacts of the sub-projects were examined and appropriate mitigation measures put in place.

6.7.2 The sub-component made 100 site visits to FOGs sub-project site covering the 10 LGAs to screen LDPs using the World Bank’s Environmental and Social Screening Format.
6.7.5 The Federal Ministry of Environment accompanied by NFDO’s Officers came to the State as a supervisory mission. While in the State, VIS were made to some sub-project sites to verify the orientation measures that were put in place in terms of adequacy and appropriateness with waterways and canals in Lagos Island.

6.8 Conflict resolution

In the year under review, the state experienced less conflict over Irrigation resources. This can be attributed to the all inclusiveness of the LDPs and the institutionalizing conflict resolution committees in most of the rural communities, the FCAs and CDAs.

However, about six conflicts cases were recorded and resolved in some of the feudal communities.

6.9 Procurement

6.9.1 The sub-component ensured that all the Pilot Assets acquired by the various FUGs were branded “With Lagos State Government/World Bank 50% Support.”

6.9.2 The Procurement Unit undertook a number of important functions covering the procurement of goods, services and training during the year.

6.9.3 The 2007 procurement plan was prepared and forwarded to the Bank for clearance by the sub-component.
Appendix 26

Lagos State Agricultural Development Authority 2008 annual activity report
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY
LSDA, OKO - OBA,
AGEGE.

2008 ANNUAL ACTIVITY REPORT
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY
LSADA, NARRATIVE REPORT 2008.

A. WEATHER
The year 2008 under review witnessed a total of 62 rainy days that cut across the three administrative zones of the state. Some of other days were characterized by shower and sunshine in the afternoon. The temperature ranged between 25°C and 32°C.

B. EFFECT OF WEATHER ON AGRICULTURAL ACTIVITIES
The weather condition experienced during the period under review encouraged various agricultural activities like land preparation, cultivation of various crops like maize, cassava, yam and vegetables as well as tree crop like oil palm, cocoa nut and cashew.

The relatively well spread rain also encouraged the growth of grasses and leguminous for small ruminant animals like goat and sheep to feed on.

On artisanal fishery, the weather condition during the period under review encouraged fishing activities in lagoons, rivers and creeks as appreciable catches were recorded. However, a stormy weather experienced in the early period of the year and the menace of water hyacinth noticed in the middle of the year caused reduction in the number of trips and catches made.

However there were reported cases of collapse of dykes of ponds in the middle of the period under review due to heavy downpour under fish farming.

WIA/AGROPROCESSING
Women in Agriculture activities witnessed ups and downs during the year owing to the vagaries of weather. Tremendous improvements were recorded during the favourable weather condition. WIA activities with downturn during the unfriendly weather situation. Activities like vegetable production, roasting of plantain and corn as well as production and sales of yam, kinnun and ginger were favoured while the weather equally favoured the effective usage of agro-processing equipments like grater, presser and fryer. Mat weaving was not left out during the year.

FIELD ACTIVITIES
Agricultural activities carried out by the farmers in the state included dry season vegetable production especially in fadama areas of the State. Other operations like land preparation, propagation of crops, weeding, fertilizer application, harvesting and marketing were done during the period under review.

On livestock, all necessary routine practices were carried out by livestock farmers during the period under review. No serious outbreak of livestock diseases was recorded, however, pockets of common diseases like mange, cold and catarrh were recorded and treated.
EXTENSION ACTIVITIES.
In line with the main objective of the Extension Component of the Authority which is to ensure sufficient geographical coverage of Lagos State and making a maximum impact on farmers and fishermen through the diffusion of recommended farm practices, the following activities were successfully accomplished during the year under review:

620 no. new farmers/fisher-folk/agro-processors groups were formed while 282 no. women groups were identified and facilitated to form groups.

A total of 1,940 supervisory visits were made during the period to review while 10,185 advisory visits were carried out during the same period to review.

INFORMATION AND PUBLICITY.
A total of 52 technical messages on topical issues were disseminated on “BOLUYO” Radio programme on Radio Lagos (107.5 fm) during the period in review.

Some of the messages include:
(a) Soil improvement technologies such as the appropriate use of lime, organic manure and inorganic fertilizer.
(b) Optimum plant population for all crops with special attention to rice, maize, cassava, sweet potato, yam and vegetable gardening.
(c) Improved management practices in fisheries with emphasis on water quality, feed formulation and hatchery management.
(d) Prevention and control of African Swine Fever.
(e) Prevention and control of Avian Influenza.

Communication support was rendered for the Authority’s activities which include the coverage of the presentation of cheque to the RTEF beneficiaries and the demonstration of the smoking kiln. Activities of the Ministry like tree planting exercise and World Food Day celebration were equally covered during the same period in review.

TECHNICAL SERVICES
OFAR: On Farm Adaptive Research were conducted on fisheries, crops, livestock, agro-processing and farm mechanization during the year under review. The OFAR topics are as follows: The Effect of Broodstock Weight on Production of Clarias gariepinus juvenile for Fisheries; Assessment of the Performance of Growing Fugu Fed With Diets Containing Water Hyacinth (Eichhornia crassipes) for Livestock; (1) Effect of Hot Water Treatment and Pairing on Plantain Yield.
(2) Comparison of Different Rice Varieties for Adaptability in Lagos State and (3) Evaluation of Different Fertilizer Regimes on the Performance of Watermelon Variety (karloack) for Crops Development; Comparison of the Use of Coconut Dehusker Lever for Dehusking Coconut With the Use of Curlast for Farm Mechanization; and (1) Assessment of Smoked Dried Fish From Two Different
Smoking Kilns and (2) Assessment of the Effects of Packaging Materials on the Shelf Life Properties of Smoked Fish. The result of the OFAR conducted had been completed.

Meanwhile the results had been presented at the annual in-house review meeting for correction. The corrected version will be presented at the RFELT workshop slated for February 2009.

The monthly pre-MTRM was conducted in 10 no. times which covered some farms in the three zones of the State. Equally, the monthly technology review meeting (MTRM) were conducted in 10 no. times during the year in review. During such meetings, production problems facing the farmers were attended to and possible solutions proffered.

On livestock, regular routine animal health extension services were carried out during the period in review. Diseases treated include colds and catarrh in pigs as well as vaccination against New Castle and fowl pox in poultry.

On fisheries, technical advisory services were rendered to both prospective and practising fish farmers. Visits were also made to the farmer’s farm. During the year under review the demonstration pond at the headquarters was stocked with 600 no. juveniles of catfish (Clarias gariepinus). The fish had been harvested and sold.

RURAL INSTITUTIONAL DEVELOPMENT.

The Component provided institutional supports to individual farmers/ farmers groups and fisher-folks in the area of input, credit and market sourcing. During the period in review, 150 no. farmers group and 377 no. individual farmers were linked to various sources of inputs, credits and market sources. During the same period, 650 no. farmers group were mobilized for registration with cooperative officers.

On collaboration, the Component consolidated collaboration with National Agency for Food and Drug Administration and Control (NAFDAC) and Nigeria Export Promotion Council (NEPC) for the enhancement of the business activities of the farmers in the State. Collaboration was also extended to Micro Finance Banks like Integrated Micro Finance Bank (IMFB), Bosman Micro Finance Bank, LASU Micro Finance Bank etc. while commercial Banks like UBA, First Bank and Nigerian Agricultural Cooperatives and Rural Development Bank (NACRDB) were not left out.

Over a hundred women from six Cooperatives groups from Ayobo/Ipaja and Lagos Island local government were granted loans ranging between #20,000 and #150,000 to individual women through the collaboration with the Micro Finance Bank.
PLANNING, MONITORING AND EVALUATION

The 2008 Work plan and Budget were produced and distributed to the relevant agencies and Ministries at all levels as and when due or requested. The Monthly Progress Review Meeting (MPRM), the Mid-Year and the Annual Review Meetings were successfully coordinated during the same period in review.

The core Survey vis-à-vis Agricultural Production Survey (APS) Market Price Survey (MPS) and Weather Surveys were carried out during the period. The reports of these survey were produced and made available to all the relevant Agencies as and when due.

LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY
OKO-OBA, AGEGE,
LAGOS STATE
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<tr>
<th>SIN</th>
<th>ACTIVITIES</th>
<th>UNIT OF MEASURE</th>
<th>TARGET 2008</th>
<th>ACHIEV. Y-O</th>
<th>% ACHIEVEMENT</th>
<th>REMARK</th>
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<td>EXTENSION</td>
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<td>Farmers groups</td>
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<td>- Fisheries</td>
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<td>Extension visit paid to</td>
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<td>Farmers/fishermen by WFA</td>
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<td>Establishment of MTP</td>
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<td>- Millet</td>
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<tr>
<td></td>
<td>- Rice</td>
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<td>Small plot Adoption</td>
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<td>Trials (SFAT) established</td>
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<tr>
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<td>For farmers-dry season</td>
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<td>Dry season</td>
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<td>Technological Review Meeting (TMRM)</td>
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<td>Conduction of PNT</td>
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<td>7</td>
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<td>WOMEN IN AGRICULTURE</td>
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<tr>
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<td>Women group formed</td>
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<tr>
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<td>Introduction of women Group to non-farm</td>
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<td>Technologies (4 topics)</td>
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<td>Demonstration carried Out</td>
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<td>112</td>
<td>103</td>
<td>91</td>
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<td>Conduction of on-farm</td>
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<td>500</td>
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<td></td>
<td>Adaptive research</td>
<td></td>
<td></td>
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<td>In collaboration with UNICEF (4 topics)</td>
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<td>SN.</td>
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<td>REMARK</td>
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<td>1</td>
<td>Linkage of farmers groups To credit, input &amp; market</td>
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<td>150</td>
<td>100</td>
<td></td>
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<td>Linkage of farmers To market, input &amp; market</td>
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Appendix 26

Lagos State Agricultural Development Authority planning monitoring and evaluation component
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY

PLANNING MONITORING AND EVALUATION COMPONENT

2008 AGRICULTURAL PRODUCTION SURVEY (APS) RECONCILED REPORT
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY
PLANNING MONITORING AND EVALUATION
2008 AGRICULTURAL PRODUCTION SURVEY REPORT

1.0 INTRODUCTION
The Agricultural Production Survey is a concept in the process of Agricultural data Collection. It was introduced by the National Food Reserve Agency (formerly known as Project Coordinating Unit) in 2006. The survey covers in addition to animal and crop crops the non crop sector that include; Poultry, Ruminants, and Fisheries. It is conducted to generate data for national policies and agricultural planning among other reasons.
However, Lagos State Agricultural Development Authority conducted the 2008 Agricultural Production Survey (APS) data includes the livestock sector in the first year of Lagos, mainly rural, suburban, and the urban zones.
The eastern zone covers Ikorodu Local Government area (LGA), while the far eastern zone is made of Epe, Ibeju Lekki LGA. The western zone covers the remaining 17 LGAs that are considered urbanized.

1.1 OBJECTIVES OF THE SURVEY
The main objectives of the survey are as follows:
• To estimate the area cultivated, output and yields of major food crops including tree crops grown by small scale farmers in the state.
• To measure the incremental differential in the areas cultivated, output and yield of major food crops by farmers between successive years.
• To highlight the level of use of improved agro inputs by farmers in the state.
• To list production problems experienced by farmers with a view to profile solutions.
• To measure the project’s progress using simple indicators.
• To identify the most widely used pond size, type and system of aquaculture with a view of improving the enterprise.
• To measure the level, type of input utilized in aquaculture and Artisanal fisheries.
• To measure the fish production and fish captured by small scale farmers and fisher folks in the State.
• To identify the breeds of livestock reared by these farmers in the State.
• To measure the livestock production level by small scale farmers in the State.
• To measure incremental differential in the non crop produced in the State by farmers between successive years.

2.0 METHODOLOGY
The sample selection was carried out by a two stage random sampling techniques. A total of 242 and 218 households were sampled as respondents from the zones in the state for both wet season and dry season respectively. These represent about 16% and 14% of the expected target of 240 and 150 within the reporting period across the state in 80 per zone and 90 per zone for the 2 seasons respectively. The list of respondents and word word groups were obtained from the extract of the Village Listing Survey (VLS) conducted in 2003 and 2001 Large Scale Enumerators Survey (LSE). It is hoped that as soon as fund is available the State will conduct a fresh VLS this year. The state Ministry of Agriculture and Cooperatives has commenced a baseline survey on Artisanal fisheries, fishermen and fish processors registration in the state. This will assist to a great extent making available a reliable data for fisheries production figures within the state.
A team of 28 Enumerators spread across the State carried out the Survey. Each Enumerator covers all enterprises embarked upon by the selected respondents. Data were captured on Non crop sector mainly especially livestock and fisheries. Their activities were supervised by the Zonal Officers and reports were collated by Statistical Assistants assigned to such zone with the coordination of Evaluation officers and Head (Evaluation). The Data Processing Superintendent carried out the data entry and subsequent analysis done using the newly developed analytical software for APS with the leadership of Head (Planning Monitoring and Evaluation).
2.1 LIMITATIONS
The major constraint remains the inadequate provision of field equipment especially global positioning system (GPS). Some of the compass in use are servicing. This has resulted in error in the use of the equipment. Although, the management intended to buy at least 6 GPS this year as soon as the approved budget for the purchase of these equipment for the Authority is fund effective.

3.0 FINDINGS
3.1 HOUSEHOLD DETAILS
The survey was carried out in 64 households in the Local Government Areas in the 2007/2008 and 2008/2009 season as stated in the findings of 2003 VLS. However, the total farm families for Fish farming, Captured fisheries, Poultry, and Ruminants stood at 3456, 6900, 1680, 920 respectively.

The total cropped area in the survey for the year was 467 hectares (Hac) and this has a significant difference from what was recorded in the previous year. Small scale farming in the State recorded a mean cultivated area of land of 1.18 Hac per household with a mean plot size of 0.65 Hac recorded during the same period. See table below.

Land availability for farming in the state is decreasing as there is continuous increase for non-agricultural uses in almost all the local government areas (LGAs) of the state. The predominantly agrarian LGAs such as Epe, Badagry, Ibeju-Lekki and Ilora are not immune to this problem. Hence, land conservation of existing forest and minimal disturbance of the soil will be of major focus in On Farm Adaptive Research and Extension activities this year. Agricultural activities such as commercial livestock and fisheries production, as well as processing will be given more priority this year (2008 ERA report).

3.2 AREA CULTIVATED
The survey revealed a decrease in area cultivated to major crops in the State for the year. A decline in hectares cultivated were recorded for other vegetables (4.8%), Pepper (3.48%), In view of this decline some major crops still recorded increase in hectares cultivated to them either because they are market induced, response to project being implemented in the state during the period or inclusion in crop mixtures. These include: Cassava (2.35%), Yam (5.33%), Cocoyam (3.47%), Sweet potato (3.83%), Groundnut (1.43%), Soya Bean (0.37%), Chinese Peanut (7.25%), Melon (2.87%), Onion (2.43%), Ginger (0.25%), Carrot (0.15%), Amaranthus (3.55%), Ugu (3.69%), etc.

A total of about 233 ha out of 673 ha of land proposed was cultivated to soy beans with 1.31 crops of seed in the state in collaboration with University of Agriculture, Abeokuta during the period. 'Rice for Jobs' programme, Root and Tuber Expansion Programme etc contributed immensely in agricultural production in view of the attendant problems that surrounds land availability. Progressive impact of these programmes was gradually being noticed in the state. A new yam was also discovered in the state and had since been branded over to I A R & T. Badan.

Training Workshop Organised for Processors On HOCF under RTEP during the Period
A Newly Discovered Yam Tubers - Harvest from One Heap

The Newly Introduced Cassava variety TMS 96/1632 being inspected during a RTEP field supervisory visit to Oke Ogun RTEP site of Lagos State.
PRODUCTION

The output of major crops grown in the State increased significantly during the year. The increase in output could be attributed to increase in hectarage cultivated to such crops, modern management practices adopted by farmers, increased use of improved varieties and progress in research and development projects being implemented in the State.

Major increase were experienced in Yam (35.31%), Cassava (9.44%), Sweet potato (6.2%), Cassava (2.85%), Rice (4.57%), Millet (36.85%), Ginger (10.39%), Chuchuroro (15.61%), Carrot (6.67%), Amaranth (6.94%), Ugo (10.77%). However, decline were recorded for Pepper (8.56%) and other vegetables (4.03%).

1.4 YIELD

The rainfall pattern experienced during the year actually contributed to the positive change noticed in most of the crops in the State. The use of Fertilizers, improved inputs, good management practices were among the factors that contributed to increase yield of crops during the period. Some cases of wilt on tomatoes and pest infestation, disease infections on pepper were noticed during the period under review which has contributed to the drop in the yield of this crop. Progress was made in the management of these diseases through farmers' education.

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Source: ISADA 2008 Annual Weather Report

1.5 THE USAGE OF INPUTS

There was an appreciable increase in the usage of inputs at different levels for different crops during the year.

Optimum usage for inorganic fertilizer was hindered by its high cost as reported by farmers; its adoption is at optimal level in the State. The usage of organic fertilizer was more phenomenal in the State during the period. Total increase in the usage of inorganic fertilizer was noticeable on Yam, sweet potato, Rice, Oliow etc. Agro-chemicals were widely accepted especially in seed dressing and its usage in the year was encouraging.

1.6 NON ARABLE CROP SECTOR

1.6.1 AGRO FORESTRY
The survey revealed that among the crop responses covered, three crops are most popular in the state: they include avocado pears, coconut, oil palm, citrus, rubber, banana, and guava. Among these, coconut had the highest yield and oil palm the lowest with production estimate of 5745 metric tonnes and 22MT of fruits in the state during the period. The development of coconut through the establishment of Coconut Development Authority by the State Government has started yielding its dividend. An increase of 48.76% was recorded for the crop over what was recorded the previous year. See table below.

3.6.2 FISHERIES

The State has 180 km of coastline, and 22% of its land mass as creeks and water bodies. In view of this natural endowment, the State has a lot of potential in fisheries development. The State Government established a lot of programmes in this direction which has contributed to fish production in the State. Among these include:

- Establishment of Fish Farm Farms with 750 concrete tanks constructed on 247 plots of land for 176 fishermen at Borokiri.
- The established fish cage culture contributed to fish production during the period.

There was incidence of water hyacinth observed in the period affected fish catch in the lagoons but deep water fishing in the creeks and major water bodies contributed immensely to the overall fish catch during the period.

NEWLY INTRODUCED SMOKING KILN IN STATE DURING THE PERIOD

MAJOR PRODUCTION PROBLEMS

The major production problems as reported by farmers during the year were increase cost of input, inadequate processing equipment, inadequate planting material, menace of water hyacinth, inadequate OBE, problem of sand diggers, high cost of feed in fisheries and livestock, poor access to improved trawl net system, pestering of trawlers, among others. The incidence of Land Speculators and Real Estate Development is still on the increase and rainfall pattern had been so unpredictable and this affected planning.

MENACE OF WATER HYACINTH IN THE STATE

RECOMMENDATIONS

Based on the findings of the survey, the following recommendations are put forward:

- Group cohesion should be sensitized and bulk purchase encouraged among farmers and fisherfolk.
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Table 11: 206 TREE CROP PRODUCTION DATA.
<table>
<thead>
<tr>
<th>S/N</th>
<th>TREE CROP NAME</th>
<th>TOTAL NO OF TREES IN 2007</th>
<th>TOTAL NO OF TREES IN 2008</th>
<th>TREE HARVESTED</th>
<th>Total Qty Harvested (kg) in 2007</th>
<th>Total Qty Harvested (kg) in 2008</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AVOCADO PEAR</td>
<td>60,000.00</td>
<td>4,013.00</td>
<td>FRUIT</td>
<td>40,000.00</td>
<td>22,302.00</td>
<td>2.35</td>
</tr>
<tr>
<td>2</td>
<td>BANANA</td>
<td>10,880.00</td>
<td>11,102.00</td>
<td>FRUIT</td>
<td>33,340.00</td>
<td>34,259.00</td>
<td>2.74</td>
</tr>
<tr>
<td>3</td>
<td>CITRUS</td>
<td>13,589.00</td>
<td>14,002.00</td>
<td>FRUIT</td>
<td>504,193.00</td>
<td>231,313.00</td>
<td>3.36</td>
</tr>
<tr>
<td>4</td>
<td>COCONUT</td>
<td>188,328.00</td>
<td>282,790.00</td>
<td>FRUIT</td>
<td>888,821.00</td>
<td>1,024,504.47</td>
<td>48.75</td>
</tr>
<tr>
<td>5</td>
<td>GUAVA</td>
<td>24,000.00</td>
<td>24,309.00</td>
<td>FRUIT</td>
<td>870,000.00</td>
<td>583,800.00</td>
<td>1.39</td>
</tr>
<tr>
<td>6</td>
<td>KELAGUT</td>
<td>134,969.00</td>
<td>136,000.00</td>
<td>FRUIT</td>
<td>6,743,525.00</td>
<td>8,743,305.94</td>
<td>9.04</td>
</tr>
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<td>7</td>
<td>OIL PALM</td>
<td>5,000.00</td>
<td>8,102.00</td>
<td>FRUIT</td>
<td>21,000.00</td>
<td>22,857.00</td>
<td>1.31</td>
</tr>
<tr>
<td>8</td>
<td>PLANTAIN</td>
<td>66,170.00</td>
<td>88,000.00</td>
<td>FRUIT</td>
<td>388,374.00</td>
<td>185,114.49</td>
<td>19.71</td>
</tr>
<tr>
<td>9</td>
<td>RUBBER</td>
<td>5,000.00</td>
<td>5,000.00</td>
<td>PULP</td>
<td>67,000.00</td>
<td>67,000.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Table 12: 2008 ESTIMATE OF TOTAL FISH HARVEST**

<table>
<thead>
<tr>
<th>S/N</th>
<th>FISH TYPE</th>
<th>TOTAL HARVEST (LBS) IN 2007</th>
<th>TOTAL HARVEST (LBS) IN 2008</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Catfish</td>
<td>6,920,073.04</td>
<td>9,954,269.17</td>
<td>39.09</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>37,073.02</td>
<td>40,611.87</td>
<td>24.09</td>
</tr>
<tr>
<td></td>
<td>Tilapia</td>
<td>61,832.97</td>
<td>75,254.55</td>
<td>22.09</td>
</tr>
<tr>
<td></td>
<td>Optimosharme</td>
<td>0.00</td>
<td>28,000.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>7,020,885.19</td>
<td>9,320,895.59</td>
<td>28.30</td>
</tr>
</tbody>
</table>

**Table 13: 2008 ARTISANAL FISHERIES PRODUCTION DATA**

<table>
<thead>
<tr>
<th>S/N</th>
<th>FISH TYPE</th>
<th>TOTAL QUANTITY CAPTURED (LBS) IN 2007</th>
<th>TOTAL QUANTITY CAPTURED (LBS) IN 2008</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small Catfish</td>
<td>3,093,253.00</td>
<td>3,171,065.00</td>
<td>2.60</td>
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<tr>
<td></td>
<td>Others</td>
<td>4,233,185.69</td>
<td>4,106,699.00</td>
<td>3.07</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>7,326,438.69</td>
<td>7,277,764.00</td>
<td>0.65</td>
</tr>
</tbody>
</table>

**Table 14: 2008 LIVESTOCK PRODUCTION DATA**

<table>
<thead>
<tr>
<th>S/N</th>
<th>TYPE/BREED</th>
<th>TOTAL</th>
<th>TOTAL NO</th>
<th>TOTAL</th>
<th>TOTAL</th>
<th>TOTAL</th>
<th>TOTAL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OPENING STOCK</td>
<td></td>
<td>SOLD</td>
<td>PURCHASED</td>
<td>NEW</td>
<td>DEAD</td>
<td>EATEN</td>
</tr>
<tr>
<td></td>
<td>Ruminants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TYPE</td>
<td>BRED</td>
<td>TOTAL</td>
<td>TOTAL</td>
<td>TOTAL NO</td>
<td>TOTAL</td>
<td>TOTAL</td>
<td>TOTAL</td>
</tr>
<tr>
<td>---</td>
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<td>----------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>OPENING STOCK</td>
<td>SOLD</td>
<td>PURCHASED</td>
<td>DELIVERIES</td>
<td>DEAD</td>
<td>EATEN</td>
<td>CLOSING</td>
<td></td>
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<tr>
<td>1</td>
<td>Chicken</td>
<td>1,385,645.72</td>
<td>1,972,069.00</td>
<td>19,503</td>
<td>21,062.00</td>
<td>28,398</td>
<td>1,319.00</td>
<td>5,985.00</td>
</tr>
<tr>
<td>2</td>
<td>Ducks</td>
<td>8,493.00</td>
<td>22,596.00</td>
<td>16,920.00</td>
<td>252.00</td>
<td>244.00</td>
<td>2,769.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Turkey</td>
<td>22,210.00</td>
<td>29,766.00</td>
<td>1,210.00</td>
<td>1,332.00</td>
<td>201.00</td>
<td>1,177.09</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Total</td>
<td>1,385,645.72</td>
<td>1,414,876.00</td>
<td>19,503</td>
<td>49,212.00</td>
<td>29,988.00</td>
<td>1,768.00</td>
<td>7,647.08</td>
</tr>
</tbody>
</table>

Table 15: 2008 POULTRY

A fully automated poultry farm in Bawoada LGA of Lagos State
An assessment of socio-economic effect of the outbreak of African Swine fever on Pig farming in Lagos State and present state of farm management practices in forestalling future outbreak
EXECUTIVE SUMMARY

AN ASSESSMENT OF SOCIO ECONOMIC EFFECT OF THE OUTBREAK OF AFRICAN SWINE FEVER ON PIG FARMING IN LAGOS STATE AND PRESENT STATE OF FARM MANAGEMENT PRACTICES IN FORSTALLING FUTURE OUTBREAK

A PLANNING STUDY FOR 2009

(June, 2009)

THE STUDY WAS CONDUCTED BY THE PLANNING, MONITORING AND EVALUATION COMPONENT

LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY

OKE-OHN, AGEGE, LAGOS STATE
1.1 INTRODUCTION

In the last two to three years, Livestock farmers have been facing serious challenges occasioned by various diseases outbreak, chief among which include African Swine Fever (ASF) in pigs and Avian Bird Flu in poultry. For instance, Oke-Aro Pig Farm, regarded as the biggest pig production/market in the West African sub region, was ravaged by ASF to 50% capacity. Also, the largest specialized Poultry Settlement in the State, Ayedoto Farm Settlement was wiped off by bird flu, turning the place to a shadow of its old self.

As a result of these diseases outbreak, many people were rendered jobless hence, loss of steady source of income to the affected people. In the same vein, Livestock production was greatly impaired thus leading to shortage of protein intake.

It is against this background that the Planning, Monitoring and Evaluation Component of Lagos State Agricultural Authority consider it expedient to carry out a post mortem of the last ASF outbreak and its resultant socio-economic effect on the Pig Farming Industry including the farmers. The study also intends examines the preparedness of the pig farmers in the State in case of another outbreak of the epidemic.

1.2 JUSTIFICATION

Since the epidemic does not sound any warning before it occurs the Authority considers it necessary to conduct a planning study on the last outbreak, in order to measure its economic impacts on productivity, insulation from future outbreak and economic improvement of the farmers.

1.3 OBJECTIVE

The study will attempt to diagnose the problems that accompany the outbreak of ASF which as at the last outbreak was further compounded by lack of record keeping which makes it difficult to quantify the volume of damage done by each outbreak.

The study will also sensitize the Lagos State Livestock Farmers of the benefits accruable to them through their cooperation with the officials of the programme.

1.4 METHODOLOGY

1.4.1 Study Area

The scope of this study is Lagos State, with special emphasis on Local Governments Areas where pig farming is prevalent and where an outbreak of ASF had been experienced.

1.4.2 Sampling
Purposive sampling approach was used in selecting the pig farms with ASF experience. The above happened to be the main prerequisite for selecting a pig farm going by the focus of the study.

1.4.3. Data Collection

*Questionnaires:* The main instrument used in collecting primary data from the respondents who are pig farmers of at least three years experience is structured questionnaires.

*Field Visit:* After data collection field visits were conducted to validate certain issues and to confirm some of the data already gathered. The visits also allow us the opportunity to include some of the details omitted while administering the questionnaire.

*Group Discussions/Meetings:* During the visits, some guided discussions and oral interviews were organized among some pig farmers and cooperative groups with a view to finding out the scope and intensity of past ASF outbreaks and how such

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**FINDINGS AND RECOMMENDATIONS**

Among the findings of the study are the following:

- The respondents still have a lot of financial commitment especially in the area of child rearing. Each respondent, according to the study still has an average of four children in school.
- Close to 40% of the respondents still operate unregistered farms. This percentage is still on the high when we are advising the farmers to run their farms like proper businesses.
- Almost all the respondents in both the western and the far eastern zones are registered with the Pig Farmers Association of Nigeria, over 49% of the respondents from the eastern zone are not registered with the body.
- The study reveals that none of the respondents is involved in corporate farming, which shows large scale farming even in piggy is not yet embraced.
- Respondents located within the metropolis (Western zone) make higher farm income than those located at country side.
- Of the 139 respondents analyzed none have above 500 pigs in his/her farm and just one fifth (1/5) of the total respondents have between 200 – 500 pigs in their farms. This means that commercial piggy is short in supply within the State.

- Over 50% of the respondents consider disease outbreak as their major production problem, the respondents unanimously say this problem does not come often but when it comes it can be very devastating.

- 90% of the respondents were aware of the last outbreak of African Swine Fever.

- Over 60% of those respondents that were aware of the last outbreak were affected by that outbreak. The effect was more pronounced within the metropolis, that is, within the Western Zone than the two other zones, but the severity was more within the Eastern Zone.

- The study reveals that roughly 4,000 pigs were lost to the last outbreak of ASF among respondents (61%) located within the Western Zone lost close to 2,000 pigs and those in the Eastern Zone (39) lost roughly 1,500 pigs.

- Job loss was part of the aftermath of the outbreak, with the Eastern Zone recording the highest casualty in terms of proportion.

- The value of products lost was put at thirty million naira (~N30 million) shared in different proportions by the one hundred and thirty-nine respondents.

- It is the belief of most farmers that any matter reported to the any field officer has already been reported to the government.

- Despite the volume of financial loss incurred by the affected respondents, none of them got any compensation from government or any of its agencies.

- None of the affected respondents insured their farms, only less than 10% could get credit facilities from financial institutions. This further buttresses the notion that most of our farmers do not see farming as a serious business.

- Again, value addition does not score high on our farmers score sheet, which is one of the reasons why farm incomes are still very low.

- Most of the data quoted by the respondents about the outbreak were oral, most were not documented and this places a huge question mark on their claims to proper record keeping. This is one of the reasons why they can not get any credit facility from financial institution.

- In case of another outbreak, majority of the respondents still do not know how to handle the situation.
In a situation where group approach is the new world order, especially where intervention projects are concerned, having almost half of the respondents as non-members of any cooperative group is worrisome.

4.2. RECOMMENDATION

- With Integrated Livestock Extension Project (ILEP) on board, it is recommended that ILEP should ensure that all pig farmers in the State register their farms as a business concern, this should be a prerequisite before enjoying any benefit.

- Those pig farmers that have the potentials to expand their farms and run a large scale piggery should be encouraged and assisted to do so. Large scale farming pays better than the subsistence one.

- Corporate and Commercial pig farming should be encouraged, especially by ILEP since these still fall within its jurisdiction.

- Since over 50% consider disease outbreak as their main problem confronting their operations, early warning system which ILEP is embarking upon will come handy here. Farmers need to be sensitized as soon as any signs of likelihood of outbreak of the disease were more pronounced the last outbreak.

- As soon as there is a likelihood of the outbreak, an ad hoc committee should put in place, which functions should document all the losses incurred by the farmers both in form of the number of animals lost, value of the loss in terms of mina and kobo.

- Immediately after the outbreak, all the data gathered should be properly documented for future reference.

- Once the effect of the outbreak is devastating, the Honourable Commissioner through the Permanent Secretary should be informed and advised to recommend that the Lagos State Government should compensate the badly affected farmers.

- ILEP should intensify sensitization on record keeping to the pig farmers and conduct capacity building on why pig farmers should run their farms like a typical business firm.

4.3. CONCLUSION

Lagos State Pig Farmers lost thousands of pigs during the last outbreak of ASF and also lost millions of mina. These losses were not properly documented during the outbreak. As a result, there is no agency of government that can come out with hard figure of losses incurred.
during the outbreak. It is hoped that results of the findings of this study can form the basis of realization of the losses incurred during the last outbreak.

It is also hoped that the outcome of this study will the Authority, the Ministry and the State as a whole realize the importance of capturing the details of significant incident like the last outbreak of African Swine Fever (ASF) and ensuring that such details are well documented.

It is the hope of Planning, Monitoring & Evaluation that PLEP will find the findings of this study useful in the course of discharging its duties.
Appendix 28

Lagos State Agricultural Development Authority mid-year activity report
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY
LSDA, OKO-OBA,
AGEGE.

MID-YEAR ACTIVITY REPORT

JUNE, 2009
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY (LSADA)
NARRATIVE MID-YEAR REPORT, 2009.

1.3 WEATHER

1.3.1 The mid-year in review witnessed a total of thirty four rains with only nine rainy days in the first quarter which was sparsely distributed but assumed even distribution throughout the State during the first two quarters of the year in focus.

The average temperature was between 30°C-37°C while the relative humidity was as low as 62% in the first half and as high as 80% in the last two months of the period in review. The early part of the period under review was also characterized by high degree of aridity while high intensity of sunlight prevailed in the latter part of the same period.


B. EFFECT OF WEATHER ON AGRICULTURAL ACTIVITIES

A. CROP.

The weather condition experienced during the period under review was generally favourable to crop production in the State. The dry and sunny weather condition experienced in the first quarter of the year enhanced dry season vegetable production particularly in the farmland areas of the State as well as land preparation for early season crop production. The inception of full rainy season at the second quarter of the year also encouraged planting of arable crops like maize and cassava as well as transplanting of seedlings of tree crops like oil-palm, coconuts and cashew. However, the weather condition made harvesting of cassava very tedious at the early part of the year due to hardness of the soil which later eased at the inception of the rain.

C. LIVESTOCK

The weather situation experienced during the first quarter of the period under review favored the sun-drying of animal feeds like cassava chips and production of hay and silage. The latter part of the period in review equally favored the fast growth of grasses and legumes for ruminant animals to graze on.

D. ARTISANAL FISHERY

The weather condition favored fishing activities as more trips and appreciable catches were recorded in both lagoons and creeks during the period in review except in early and latter parts of the period when poor visibility/problem of water hyacinth experienced at the lagoon and coastal areas of the State rectified in reduction of trips and catches.

E. FISH FARMING.

The pond water level continued to be low particularly in the earthen ponds as a result of summer afternoon experienced during the early part of the period in focus. However, the weather generally favored the sun-drying of pelletized feeds as well as repair and construction of new ponds.

F. WIA/AGRO-PROCESSING.

Women in Agriculture activities like dry season vegetable bed making, transplanting of vegetable seedlings and application of organic fertilizer were favored by the prevailing weather
condition at the beginning of the season however, harvesting of cassava was found to be tedious due to the hardness of the soil but eased at the latter part of the period in review.

The weather condition also favoured the effective usage of agro-processing equipments like grater, presser and fryer. The sunny afternoon in the middle part of the period in review also encouraged the production and sales of kouma and zobo.

G FIELD ACTIVITIES
The early part of the period under review witnessed various agricultural activities like dry season vegetable production especially in the Fadama areas of the State. Expectedly, the frequency of watering the vegetable beds increased during the period.

The latter part of the period in review witnessed increase in agricultural activities like land preparation for early season crop production. Actual planting, other agronomic activities such as fertilizer application, thinning and harvesting of matured fruits and cassava tubers were carried out by crop farmers in the State.

On livestock, stocking of birds and ruminant management activities were predominant. Repair and construction of new pens were equally carried out by livestock farmers in the State.

On artisinal fisheries, appreciable catches were recorded statewide during the period under review except at the middle of the period when visibility was poor resulting in low catches. Meanwhile, fishermen at the lagoon were engaged in mending and fabrication of nets, repair of damaged canoes, construction of fishing aggregators and maintenance of Out Board Engines (OBE) throughout the period in focus.

Fish farmers using earthen ponds, experienced the problem of drying of ponds during the early part of the period but were however advised to plan their production in such a way that harvesting must be done before the peak of dry season.

Women In Agriculture activities such as vegetable gardening and harvesting of farm produce were alive during the period under review.

Agro-processing activities like production of cassava tubers into fufu and gari fared well during the same period in review while, production of locally made beverages like zobo, kouma and ginger were carried out.

H INFORMATION AND PUBLICITY.
Twenty three no technical messages were disseminated on “BARIYO” radio programme on Radio Lagos (107.5FM) during the period in consideration.

Some of the technical messages disseminated include Fish Farm establishment, Hatchery management, Construction of houses for sheep and goat, Snail rearing, Grass-cutter rearing among others. The impact of these messages had manifested in the large number of farmers/would-be farmers coming for further technical advice on the best practices of agriculture.

Communication support was provided for the Authority’s activities including the coverage of the 2009 Pre-Season Training, inauguration of Fadama III and Commercial Agriculture Development Projects (CADP) among others.
RURAL INSTITUTIONAL DEVELOPMENT

Thirty-eight no farmers groups and forty no individual farmers respectively were linked to various sources of credits during the mid-year under consideration.

Notable among the groups linked with financial institutions included Ajes Wolfe Women CAMS, Ikosi, Progressive Farmers CAMS, Ojo, Able Farmers Association Onagbo, Iruita Farm Settlers, Agbelese CAMS Kosi, BodunwaFe Farmers Association Adegbe Agbelese CAMS Ketu, and Degolu Farmers Association Ijede road among others. Some individuals that were linked with credit sources were messers Osaintechin and Daniel both fishermen and messers Sejolu and Seyin who were both crop farmers at Apo, Mrs. Rickett, a poultry farmer at Aghowa and Mrs. Kudorat Rahamon, a processor at Ijagani to mention a few.

On market linkages, seventy-five no individual farmers and twelve no farmers groups were linked with various market sources in the same period in focus.

On input linkages, eleven no groups and fifty-four no individual linkages were established during the period in focus. Among the groups linked together was Blended CAMS, Ketu that was linked with SGS Agro Comn, Sabo, Ikorodu for the milling and purchasing of 2 tones of fish feed at N150/kg.

During the same period under review, two hundred and fifty-nine no farmers groups were identified while fourteen no groups were mobilized for cooperative registration during the mid-year in consideration.

2.0 TECHNICAL

2.1 OFAR

The 2008 OFAR results as well as 2009 OFAR proposals were presented at the sub-sectorial review meeting held at NFRA Regional office, Ilorin, between 26th to 30th January 2009. These were later presented in the annual EPEFLS workshop held at IARCT, Ilorin between 24th-27th February 2009. Meanwhile the six (6) OFAR topics that were approved for implementation in the year 2009 at the PBMS meeting held at the Authority's headquarters had commenced in earnest in all the various locations of the State. The OFAR topics were:

- Crop protection - Evaluation of different sowing methods in seed yam production.
  - ii. Evaluation of two low rice varieties (FARO 5 and FARO 44) for yield and adaptability to Lagos ecologies.
- Fishery - Evaluation of Tilapia "Oorichromis niloticus" under two different harvesting methods in concrete pond culture system in Lagos state.
- Live stock - Comparing the efficiency of feed with preservative G on growth rate of broiler chicks.
- Farm mechanisation - Comparing the use of solar tent dryer with the traditional method of drying parboiled rice.
- AGRO-PROCESSING - Evaluation of two different methods of drying cassava products.

2.2 PRE-SEASON TRAINING

The 2009 Pre-Season Training for front line Extension and PM&E Field officers was conducted on 25th-26th of March, 2009 at the Authority's headquarters. The workshop was declared open by the Honourable Commissioner for Agriculture and Cooperatives Chief Enoch Ajiboso with the Permanent Secretary of the Ministry, Mr. Olusegun Oyewumi in attendance.
2.3 MTRM

The January, 2009 pre-MTRM was not carried out being the first month of the year. However, the MTRM for the month was held where the topics to be treated this year were considered.

The pre-MTRM visits for the months of February, March, April, May and June were carried out to different zones of the State during which technical problems encountered by farmers in the state were attended to by the team. The MTRM for the same period was equally held where technical topics cutting across various agricultural enterprises were delivered by resource persons to improve the skills and knowledge of officers.

2.4 CROP

During the period in review, the SMBS attended a training workshop on Conservation of Agricultural Technology at Imona. The training was organized by the Federal Department of Agriculture and Water Resources in conjunction with BOTLAS. During the same period in focus, the representative of the Federal Ministry of Agriculture and Water Resources paid a second farm visit to Imona, site of MTP on Conservation Agriculture Technology Demonstration which he expressed satisfaction at the situation of the maize. The maize has since been harvested and data taken.

On Erigoro Seed Farm, the Programme Manager together with the Director of Agriculture Service and the head of Crop Development sub-Component visited the farm to work out modalities for the activities for the year 2009. Sequel to the visit, ploughing of the site has been carried out while planting of cassava would be done soonest.

2.5 LIVESTOCK

During the period under review, routine management practices were carried out by livestock farmers. Treatment of animals was also carried out during the period under review. The animals were treated against ailments such as mange, coccidiosis, anthrax and diseases among others.

2.6 FISHERIES

During the first quarter of the period under review, routine management practices were carried out at the demonstration pond located at the headquarters. However due to the relocation of the pond as a result of the construction of drainage, stocking had not been done. The construction of the relocated pond had been completed and would be stocked as soon as completion of the pond was completed.

During the same period under consideration, technical assistance was rendered to prospective fish farmers in the State.

3.0 ADMINISTRATION

Administrative support was provided to all various activities of the Authority during the period in review.

The Component coordinated the conduction of monthly environmental exercises that were held in every second Thursday of the months within the period in focus. Procurement and distribution of working tools were also carried out. The Component also coordinated health talks held once in each quarter of the reporting period.
ENGINEERING.

Fifteen no wash bores were successfully drilled at Magben,Okimtedo, in Ibeju-Lekki, lag, across the lagoon by Tekulo village for Ogunwuyi FUA, Lagos, Ibeju- Lekki for Awolola FUA and Apa among others, while twenty three no field visits were carried out during the same period in review.

Thirty three no farmers were equally enlightened on operation and maintenance of wash bores and water pumps during the same period in focus.

PLANNING, MONITORING AND EVALUATION.

All regular and special reports on the Authority’s activities were rendered as and when due or requested to the Ministry and other relevant agencies. Internet services were provided to the staff of the Authority during the period in review.

The Component also commenced the monitoring of 2009 OFARs as well as other projects of the Authority.

The core survey vis-à-vis Agricultural Production Survey (APS) Market Price Survey (MPS) and weather survey were carried out during the same period in review.

NATIONAL PROGRAMME FOR FOOD SECURITY (NPFS)

CONDUCTION OF STAKEHOLDERS MEETING.

During the period in review, the Programme conducted a Stakeholders meeting to facilitate the linkage arrangement between NPFS sites with Financial Institutions for the operation of facilities under the Agricultural Credit Guarantee Scheme. Sequential to this, Bowman Microfinance Bank PLC disbursed funds to Apex Associations in the three old NPFS sites, namely: Igbeye/Ijebu, Ado/Bodore and Igbaro/Ijagun for implementation of the 2009 workplan.

DISBURSEMENT OF COUNTERPART FUND.

During the same period in focus, the State counterpart contribution of N=42.2 million was paid to National Office of NPFS at Abuja for the commencement of the implementation of the expanded phase of NPFS in the State.

OTHER ACHIEVEMENTS.

130 MT of organic fertilizer was allocated to Lagos NPFS sites for demonstration in soil fertility management on farmers’ field in the latter part of the period under review.

During the same period, household listing of all the 9 no NPFS sites and non-outreach Communities were carried out.

ROOT AND TUBER EXPANSION PROGRAMME (RTEP)

During the period in focus the RTEP monitoring team comprising all SAMEG members conducted a monitoring visit to RTEP sites on 12th and 13th of March, 2009.

The objective of the visit was to bring up the situation reports on all the 2007 RTEP beneficiaries group and in addition the proposed 2008 RTEP beneficiary groups on the coming of IFAD team.

During the same period, the second IFAD direct supervision of RTEP was also conducted between 16th to 28th of March 2009. The mission took stock of the programme in the
implementation of the programme especially its impacts on the local communities. The mission observed that the processing centers established in 2007 & 2008, lacked basic facilities like chillers. Sequel to the visit four processing centers were earmarked for upgrading namely; Oke-Iroku (East), Ilogbo, (West) Igbala (East) and Aja (West). Specifically, the processing center at Igbala.
Ojo-Agemo had completed the chimney, fencing and floor in including the rehabilitation of the soakaking tank.

3.0 INTEGRATED LIVESTOCK EXTENSION PROJECT (ILEP)

The livestock industry had been devastated in the recent years by epidemic like African swine fever (ASF) and Avian influenza (bird flu). As a result of this, substantial economic and job losses were recorded due to lack of records and down sizing of outright closure of many farms. The revenue loss as well as the negative multiplier effect on the Food Security Programme of the State was unimaginable. It was against this background that the Ministry was putting in place an Integrated approach to Livestock Extension Services which eventually led to the birth of Integrated Livestock Extension Project (ILEP) in April, 2009.

ILEP would among other things facilitate Government’s interventions to support the industry from time to time while also coordinating multilateral support and provide required information for industry expansion and investment.

ACHIEVEMENT FROM APRIL - JUNE, 2009.

During the period under review, the following activities/achievements were recorded:

i. Establishment of ILEP office in the premises of the Lagos State Agric. Development Authority (LSADA), Oko-Oba Agege.

ii. Conducting of base line survey for livestock farmers in the state. The main objective of the survey was to develop a base line data for livestock farmers in the state and to have a comprehensive list of all livestock farmers in the State.

iii. Establishment of ILEP Data Bank. The ILEP data bank had been established and it’s been updated. A total of 1,421 farmers across the five divisions of the State had been registered. These comprised of

381 Poultry, 352 Pig, 397 Sheep/Goat, 40 Cattle, 30 Grasscutter farmers and 21 Feedmills.

PLANNING, MONITORING AND EVALUATION.
LAGOS STATE AGRICULTURAL DEVELOPMENT AUTHORITY.
OKO-OBAA, AGEGE
LAGOS STATE.
<table>
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Appendix 29

Lagos State Agricultural Development Authority 2009 Fisheries production Survey
LAGOS STATE AGRICULTURAL DEVELOPMENT
AUTHORITY
OKO OBA, AGEGE

2009 FISHERIES PRODUCTION SURVEY

EXECUTIVE SUMMARY
1.0 INTRODUCTION

The State’s fisheries sub sector has tremendous potentials. This is because the State is blessed with various water bodies like the lagoon, rivers, and estuaries, brackish and marine waters. Lagos, Nigeria’s commercial nerve centre is one of the maritime states with huge potentials for fish production. Undoubtedly, it is very rich in water resources. It covers over 3,600 km square; with a shoreline of about 180 km, which constitutes over 20% of Nigeria’s coastline.

The State is entirely in the rain forest, characterized by undulating plains in the north and interspersed with extensive swamps in the flood plains of the rivers flowing through it. The coastal belt comprises of sandy ridges intersected by lagoons and creeks.

Fisheries Production Survey is a statutory survey of the Authority being conducted on an annual basis. This survey is very relevant to Lagos State because of its aquatic splendour, which makes artisanal fishing the main traditional occupation of the indigene of the State. As a result of growing popularity of the aquaculture sub sector in the State, attention will also be given to that sub sector.

1.1 JUSTIFICATION

It is the hope of the State to attain the status of self sufficiency in fish production as soon as possible; this will remain a mirage unless there is an accurate and dependable data gathering mechanism that is open to regular update in this sub sector. This survey is very relevant in this regards.

1.2 OBJECTIVES
This survey is being conducted for the purpose of updating fisheries data base of the Authority in particular and that of the State as a whole.

It is also useful in arriving at the annual production estimate; it is also a useful means of determining the gap between the demand and domestic supply of fish.

It remains a dependable source of compiling the problems hindering production within the sub sector.

It is also useful in formulating fishery policy framework in the State and a good source of getting a bottom – top solutions to the farmers' problems in the sub sector.

1.3 METHODOLOGY

1.3.1 Study Area

The scope of this study is Lagos State, with special emphasis on those areas that are naturally endowed with fishery resources, and those areas where fish farming is more prevalent.

1.3.2 Sampling

Both random and purposive sampling approaches were used in selecting the farmers in these sub sectors. Random sampling was used in selecting the fishermen; however, purposive sampling was resorted to in the case of the farmers under aquaculture.

1.3.3 Data Collection
**Questionnaires:** The main instrument used in collecting primary data from the respondents who are both fishermen and fish farmers of at least three years experience is structured questionnaires.

**Field Visits:** After data collection field visits were conducted to validate certain issues and to confirm some of the data already gathered. The visits also avail us the opportunity to include some of the details omitted while administering the questionnaire.

**Group Discussions/Meetings:** During the visits, some guided discussions and oral interviews were organized among some fishermen and Lagos State Catfish Farmers Association of Nigeria (LASCAFAN) and other fishermen cooperative groups with a view to finding out other problems being confronted by the farmers and what they think the solutions are.

### 2.0 REVIEW OF LITERATURE

#### 2.1 Concepts and Theories

The term fishery refers to an aspect of agriculture which involves the use of water culture for the production of animal protein. Its focus bothers on the fishing industry which includes all aspects of maintenance of water culture. The management of natural water bodies for the production of fish and other aquatic food animal is also involved. Basically, there are three major systems of fishing. These are inland, coastal and distance.

**2.1.1 Captured Fishery**
The inland fishing system involves angling for fish in rivers, streams, natural and artificial ponds. It also includes the flood plains of major rivers, where fishes could be caught at certain periods of the year or rainy season.

The coastal fishing system is located along the coast, the estuaries and the lagoon. The water culture is fairly saline and contains fishes that are capable of surviving in both fresh and salt waters. Angling in coastal fishing systems involves the use of fairly sophisticated equipment such as motorized canoe/boat, and big nets, which can cast over a wide area of water surface.

The distance fishing involves fishing in oceans far removed from land. The culture is essentially salty and only salt water fishes are harvestable in the system. Big sea going vessels, trawlers, equipped with giant nets (trawls) and refrigerating equipment are employed.

2.1.2 Aquaculture

Aquaculture or Fish Culture or Fish Farming is just the art of growing or breeding fish in enclosures such as ponds, multi-purpose water reservoirs, irrigation and drainage channels, fish pens constructed at the edges of rivers or lakes, water filled burrow pits as well as fish cages floated on rivers or lakes. The various fish culture systems practiced include, flow through, re-circulatory, spring water, and rain/run-off water.

2.2 Fish Production and Economic Development Nexus

National and global emphasis on the contributions of food to economic growth and development justify the study of the role of domestic fish production in economic development process (Ojo 1991). Fish production contributes by the way of shares in domestic output, employment creation, income generation, domestic and
foreign exchange earnings, resource mobilization and nutrient supply.

The contribution to domestic output is primarily through opportunities for the expansion of the horizon for employment creation as well as income generation and poverty alleviation. Besides, possibilities for the enhancement of living standards are achievable through related employment generation avenues, from the incorporation and development of secondary support activities. Such activities include fish processing, feed milling and hatchery. Auxiliary industrial activities like pond construction, boat building, and production of other higher productivity equipment and inputs further contribute.

With the development of profit-oriented fisheries, domestic and foreign trade in fish produced above subsistence level create a source of domestic income generation and foreign exchange. For our economy, the foreign exchange earnings would form an alternative source, apart from oil exports. These earnings form the basis of the resource mobilization potentials of the sector, as they could translate into capital contributions and sources of development of the other economic sectors. This could come by way of taxation (income, export, etc.) and accumulated surpluses in the form of savings. The contributions of the foreign exchange earnings to the importation of essential capital goods for infrastructure development and industrialization, in addition, play a critical role.

With the boosting of local fish production, something that the Lagos State Ministry of Agriculture & Cooperatives is seriously addressing currently through various initiatives, the economy would be able to embrace mass local processing, saving on imports and improving its balance of payments. Another channel is via the leverage on prices, freeing incomes and leading to the transfer of real incomes to the other sectors. Finally, the contribution to nutrient supply is essential in
economic development through its role in reducing the incidences of diseases and increasing productivity.

2.3 Self-sufficiency in Fish Production

In concept, self-sufficiency in fish production connotes production that suffices demand, consumption and revenue generation. According to Global Environmental Change and Food System (GECC) Report (2002), self-sufficiency relates to satisfying national requirements to satisfying national requirements from domestic production. The dictionary of Agriculture defines self-sufficiency in fish production as being able to satisfy all one's needs from own production. The New Webster's dictionary supports that self-sufficiency is having enough, as much as one requires, from one's efforts, needing no outside help.

Food and Agriculture Organization (FAO) definition centers on the availability of the commodity at all times, such that all persons have access to it, and it is essentially nutritionally adequate in terms of quality, quantity and variety. It connotes the ability of domestic efforts to meet full demand, based on the physiological and calorific requirements of the citizenry, as it pertains to fish protein intake. Attainment of self-sufficiency would mean adequate local production that suffices demand, absence of short fall between demand and supply from domestic sources. This will require creating an enabling environment and empowering the producers, with regard to access to credit, capital, training, etc.

In economies that have attained self-sufficiency in fish production, fish exports are sources of foreign exchange earnings. Thus, an economy is not self-sufficient in fish production if its population remains chronically dependent on imported food fish (FAO).
2.4 Framework for Assessing Self-sufficiency in Fisheries

Calculating the demand-supply gap forms the basis for assessing self-sufficiency, while the percentage self-sufficiency indicates the ability and extent to which the nation supplies all its fish protein needs from local production. In this instance, gap analysis evaluates the difference between domestic fish supply (from artisanal, aquaculture, and industrial sources, factoring out the contributions of distant waters from industrial fishing) and demand (based on the need for food fish, which is a function primarily of the physiological requirement of the population for fish protein). FAO calculates this need based on the caloric or protein requirement of the individual. Gap analysis also identifies situations when future demand could exceed supply or vice versa. In either event, there is need to eliminate the gaps.

However, self-sufficiency in fish production has been an elusive goal of many developing countries, Nigeria inclusive, despite decades of fishery programmes. Ibiarn (2004) feels Nigeria's inadequate fish supply results in annual importation of approximately one trillion naira worth of fish. FAO postulates that in the fisheries of deficient countries, where both social and economic concerns often dominate, intelligent policymaking requires an adequate understanding of both 'economic' and 'human' factors the economic structure and dynamics of the fishery system, on one hand, and the role of social, cultural, institutional and political aspects on the other.

Apart from the traditional role of fish as a source of food, in many countries, it is an important source of foreign exchange. Fish has accounted for nearly seventy percent of total value of traded commodities in countries like Greenland, Seychelles, the Faeroe Island and Iceland. There have been trade surpluses in fisheries in South America, China and Oceania. (FAO).
3.0 FINDINGS

- The workforce under both artisanal and aquaculture fisheries is aging, more so under aquaculture than under artisanal. The situation is however, very worrisome under artisanal because the activities here are very physical.

- The two sub-sectors were both male dominated, the situation tends towards total domination under artisanal.

- Planked canoe is the preferred type of fishing craft in the State, with close to 70% of the respondents using it, while cast net is the preferred gear in the State with close to 50% of the respondents using it.

- Majority of the fishermen in the State go fishing on the average of four times in a week, which they drop up to 50% during unavourable season.

- Productivity is declining as it now requires more efforts to accomplish a particular landing than before. Reasons are dredging, water hyacinth problem, other environmental pollution, over fishing etc.

- Two fishing seasons are recognized, the favourable season which the majority say lasts for average of four months.

- Most of the fishermen sell to the retailers, who buy at low prices and make huge margin for transporting the fishes to the major markets.

- Over 60% of these fishermen procure their fishing inputs on cash and carry basis; close to 35% enjoy government assistance, while less than 5% procure on credit.

- Close to 90% of the respondents say their percentage waste estimate is less than 5% of their landing weight.
• It must be noted that close to 70% of the respondents say they still rely on the local smoking kiln for smoking their fish, a little above 30% use the propagated chakor oven.

• Under aquaculture, over 70% run a registered farm, the remaining less than 30% are unregistered.

• Over 60% of the respondents use concrete ponds, 13% use earthen while the remaining 22% use tanks and the rest.

• Less than 5% of the respondents operate with 1-5 ponds, over 40% operate with 6-10 ponds, close to 10% operate 16-20 ponds and over 20% operate more than 20 ponds.

• All the respondents used stock clarias and its other closely related species. It implies that our fish farmers are not yet familiar with the technology of breeding other common species like tilapia.

• 54% of the respondents complete two production cycles in a year, roughly 46% complete 3 production cycles in a year.

• Close to 50% of the respondents stock 2, 500-5, 000 fingerlings/juveniles per production cycle, it must be noted that over 22% stocks more than 20, 000 fingerlings/juveniles per production cycle.

• Over 60% of the respondents have 2-5 tons as their average harvest weight per production cycle.

• Cost of feed, source of feed, source of stock, constant energy supply are the major challenges confronting this sub sector.

• 66% of the respondents under artisanal fisheries belong to one cooperative group or the other, 80% of the respondents under aquaculture belong to their trade association.
• Under artisanal fisheries, 32% of those cooperating joined in order to assess loan, 31% joined for inputs while 27% joined for market opportunities.

• 46% of the respondents that belong to the trade association joined in order to have access to market opportunities, close to 30% became members in order to get technical assistance, 14% for inputs while 7% joined for access to loans.

• Under artisanal fisheries, roughly 56% of those cooperating are satisfied with their various cooperative groups, while over 80% of the fish farmers that belong to their trade association are satisfied with the activities of their trade association.

• 83% of the artisanal respondents keep various records according to the survey, while over 90% of the fish farmers keep various production related records.

• 20.5% of the artisanal respondents keep record of frequency of their fishing trips, over 30% keep record of fishing inputs purchased, 26% keep sales records and a little more than 21% keep records of their landing size.

• Over 50% of the fish farmers keep sales records, roughly 22% of the respondents keep stocking records, and 21% of the respondents keep feeding records.

• Close to 50% of the artisanal respondents have access to credit facilities from banks, majority of these fishermen enjoy the facility of NACRDB. Only 21% of the fish farmers have access to credit facility from banks according to the survey.
RECOMMENDATIONS AND CONCLUSIONS

• Artisanal fisheries should be more attractive to the youth of the riverine communities in order to preserve the traditional occupation.

• Current effort of the State in providing fishing inputs to fishing folks is commended; the opinion of the fishermen should be sought, so that their preferred input would be provided for them.

• As a result of decline in productivity in artisanal fisheries, current initiative of the Lagos State Government, through the ministry of Agriculture & Cooperatives, at replenishing fishes in the wild by releasing fingerlings into the lagoon is a welcome development, this however should be intensified for the effect to be fully felt.

• This effort should be carried out at a reasonable interval.

• Fishermen should be encouraged to pick interest in marketing and value addition so that the middle men will stop reaping them off their profit.

• Provision of fishing inputs at a highly subsidized rate is highly noticeable by the survey; this effort should be sustained and improved upon.

• Efforts should be increased by LSADA to promote the modern smoking kih with their advantages over the local smoking kih as the majority of our fishing folks still feel comfortable with the local kih with its obvious limitations.

• Under aquaculture, technologies relating to the breeding of other preferred species of fishes should be promoted among our fish farmers, in order to encourage diversification from all cat fish affair that is currently obtainable in the State.

• LSADA should encourage the fish farmers to give the twin issue of marketing and value addition the attention they deserve as the
middle men continue to rub them off their sweat as a result of their nonchalant attitude towards these issues.

- Since they all belong to the same trade association, they should be encouraged to work together as a team in order to reap the benefits of economy of scale especially in the areas of feed procurement/compoundment.
Appendix 30

LSADA participatory rural appraisal for the implementation of 2010 on farm adaptive research and extension activities
LAGOS STATE
AGRICULTURAL DEVELOPMENT AUTHORITY
(LSADA)

REPORT OF THE

PARTICIPATORY RURAL APPRAISAL
(PRA)

FOR THE IMPLEMENTATION OF

2010 OFAR AND EXTENSION ACTIVITIES

NOVEMBER 2009
The LSADA operation being statewide covers the entire territorial area of Lagos State with an area of 3,377 square kilometers with a marine shoreline of about 180 km extending inland to a maximum distance of about 32 km. It lies entirely within the humid rain-forest zone of the humid tropics.

Of the estimated 380,000 farm families in the State, 80 frontline extension agents of the Authority are reaching out directly to roughly 129,925 in their production sites with improved farming practices by making use of techniques such as Farm Visits, Management Training Plots (MTP), Small Plot Adoption Trials (SPATs), On Farm Adaptive Research (OFAR), demonstrations, campaigns, distribution of leaflets, postal, linkage activities etc. The determination of appropriate technique to be used for dissemination technical messages is a function of farmers’ perspective of the problem, their suggested solutions to the problem etc which could be better gotten through the use of tools such as Participatory Rural Appraisal (PRA).

The conduction of PRA to form the basis of the Extension and OFAR activities will also go a long way in eliminating blanket recommendations to the target audience as the solutions to the problems would be sectoral and location specific.

**Methodology**

The conduction of the PRA involved the interaction of as many as available the representatives of all the stakeholders of agricultural activities in each of the 3 zones with the guidance of experts (extension supervisors, subject matter specialists, PM&E personnel and engineers) in reaching a consensus on different issues.

A minimum of 10 representatives of agricultural stakeholders in each of zone participated in the exercise. Efforts were made to ensure fair representation of women, youth, the less privileged and vulnerable. The exercise came up simultaneously in the 3 zones between 9:00am and 4:00 pm on 12th of November 2009.

**Limitations of the appraisal**

The PRA was constrained by the following problems:

- The appraisal was constrained by an interactive session approach of information harvest. This made validation exercise difficult due to time constraint allowed for the appraisal. However, a group approach for the selection of the representatives of the stakeholders was adopted to minimize the possibility of missing details during the exercise.

- Heavy reliance on the memory recall of the participants for detail due to improper record keeping habit might have led to over or under estimation of some of the details.

The limitation, notwithstanding, the outcome of the appraisal will be for a long time, a reference material for the implementation of RTEP and other similar projects in the State.
Outcome of the appraisal

The exercise developed a set of data that would guide the implementation of 2010 Extension and OFAR activities. The information generated from the participants of the PRA reflects to a large extent the situation of the State with reference to the listed items.

Farmers generally claimed that weather situation in terms of rainfall pattern, sunshine intensity and other parameters was considered normal in year 2009 and since then, there has been a distinctive ‘August break’ during the year. Farmers’ expectation for 2010 is that the weather would also be conducive for agricultural activities.

In addition, land available for farming in the State is still decreasing at an alarming rate as there is continuous increase for non-agricultural uses in almost all the LGAs of the State. The predominantly agrarian LGAs such as Ipe, Badagry, Ibeju-Lekki and Ikorodu are not immune to this problem. Stakeholders in all agricultural sectors (crops, fisheries, processing and livestock) feel the negative impact of the prevailing land use trend. Hence, farming activities suggested for promotion in the state in year 2010 should take into consideration conservation of the existing forest and minimal disturbance of the soil. Agricultural production and processing options that have minimal demand for land should be addressed, and given prominence.

Specifically, highlighted in the Tables 1 to 4 below are the details of the outcome on sectorial basis.
<table>
<thead>
<tr>
<th>Objectif d'implémentation de la planification de l'ensemble de la formation</th>
<th>Information sur l'implémentation de la planification de l'ensemble de la formation</th>
<th>Lien entre l'information sur l'implémentation et le planification de l'ensemble de la formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Élaboration et organisation de la planification de l'ensemble de la formation</td>
<td>Différentes étapes d'élaboration et organisation de la planification de l'ensemble de la formation</td>
<td>Liaison entre les différentes étapes et la planification de l'ensemble de la formation</td>
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<td>Liaison entre les différentes étapes et la planification de l'ensemble de la formation</td>
</tr>
<tr>
<td>Objective/Question</td>
<td>Methodology/Action 1</td>
<td>Methodology/Action 2</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>Effectiveness of the policy</td>
<td>1. Conduct a survey to assess the impact</td>
<td>2. Analyze data collected from the survey</td>
</tr>
<tr>
<td>Efficiency of the policy</td>
<td>1. Compare the cost of implementation</td>
<td>2. Measure the time taken to implement the policy</td>
</tr>
<tr>
<td>Equitability of the policy</td>
<td>1. Conduct a demographic analysis</td>
<td>2. Review feedback from affected communities</td>
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</table>

**Table 2: Phases**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
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<tbody>
<tr>
<td>Design</td>
<td>Define the objectives and methods</td>
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<tr>
<td>Development</td>
<td>Implement and test the policy</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Assess the policy's impact</td>
</tr>
<tr>
<td>Implementation</td>
<td>Put the policy into practice</td>
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**Table 3: Summary**

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategories</th>
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<tbody>
<tr>
<td>Economic</td>
<td>1. Cost-benefit analysis</td>
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<tr>
<td>Social</td>
<td>2. Impact on community welfare</td>
</tr>
<tr>
<td>Environmental</td>
<td>3. Impact on the environment</td>
</tr>
</tbody>
</table>

**Diagram 1: Flowchart**

- Step 1: Identify the problem
- Step 2: Define the objectives
- Step 3: Design the policy
- Step 4: Develop the policy
- Step 5: Implement the policy
- Step 6: Evaluate the policy
- Step 7: Adjust the policy as necessary
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<tr>
<th>Table: Livestock Production</th>
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<td><strong>Factors</strong></td>
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<td>Genotype</td>
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<td>Management</td>
</tr>
<tr>
<td>Nutrition</td>
</tr>
<tr>
<td>Health</td>
</tr>
<tr>
<td>Environment</td>
</tr>
<tr>
<td><strong>Recommendations</strong></td>
</tr>
<tr>
<td>Improve genetic selection</td>
</tr>
<tr>
<td>Enhance management practices</td>
</tr>
<tr>
<td>Optimize nutrition</td>
</tr>
<tr>
<td>Maintain good health</td>
</tr>
<tr>
<td>Ensure optimal environment</td>
</tr>
<tr>
<td>Concept</td>
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<td>------------------</td>
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<tr>
<td>4th Column</td>
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<tr>
<td>5th Column</td>
</tr>
</tbody>
</table>

**Note:** The text in the table is not legible and requires further clarification to provide a meaningful natural text representation.