COMPUTER APPLICATION TO STOCK CONTROL ON AGRO-CHEMICAL PRODUCTS

(A CASE STUDY OF NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT, MINNA)

BY

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CERTIFICATION

I, Amosa A. Abdul-lateef, did not claim original in totality of this project because I used other people,s work in my own word to give more insight into the whole research. This will make it adequate in scope and quality for the award of Post-Graduate diploma in Computer Science of the Federal University of Technology, Minna.

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DEDICATION

This project is dedicated to the Allah, my parents, Alhaji Rasheed O. Hassan and all the people who contributed to the sucess of my educational carrier in life.

TABLE OF CONTENT

CHAPTER FOUR

CHAPTER FIVE

ABSTRACT

Agro-chemical products are very essential in Agricultural activities. They are used to either control diseases or to improve the fertility and yields of Agricultural products.

This project shows clearly how computer can be applied to inventory planning of Agro-chemical products interms of what to store, what best sources of good procurement are required etc.

In addition, the designs a particular software package that will reduce, if not eliminate, all the observed problems usually encountered in the course of inflow and outflow of transactions.

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CHAPTER ONE

1.0 INTRODUCTION

Computer, a useful electronic device, was known to be used in many human endearvours. But presently, most companies, industries and organizations rely solely on the fast resources of computer for solving almost all their problems.

1.1 NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT (NSADP) AN OVERVIEW

Generally in Nigeria, the Agricultural Development Project concept was adopted in the 1970's. The idea developed from past experience in dealing with crop programs that failed because some closely related development components were absent. By 1985, every state of the federation except Lagos State was served by an Agricultural Development Project.

As a result of this, Niger State Agricultural Development Project startd in 1980 as an offshoof of Bida Agricultural Development Project. In 1988, Niger state Government published an Edict that made it a parastatal of the state. This led to its State-wide coverage interms of operations. Its operations since then have been based on the combinations of factors such as the right technology, effective extension, access to physical inputs like improved variety of crops/seeds, Chemicals etc, adequate market for farm products and other infrastructure facilities like good roads, dams, etc that are essential to improve agricultural productivity and the living standard of small scale farmers.

1.2 **IT STRATEGIES INCLUDE:**

a. Integrated approach to the supply of farm inputs and infrastructures
b. Construction and rehabilitation of rural roads
c. Small dams provision in the hinterland
d. Establishment of farm centres in the Local Government Areas of the State.
e. Seed multiplication processes
f. Farm input distribution to farmers at subsidy rate
g. Collection, analysis and reporting of Agro-related data for use in planning Agricultural programs.

The funding (loan) of all Agricultural projects nation-wide was a tripartion between the Federal Government which provided 20%, State Government provided 14% and World Bank provided the 66% of the project cost. The loan was appraised by Multi-State Agricultural Development Project II (MSADP II) comprising Kwara/Niger/Gongola States. But later in 1991, the number of State increased to five i.e due to creation of new States. Between 1988-1992 there was a break due to non-availability of loan to redesign the whole project. For this reason, implementation of the loan repayment which was scheduled to end in 1993 was extended till 1995.

The initial loan was $23.630m (or ₦148.869m) or 63.7%, of this, $18.173m (₦114.4836m) was to be borne by World Bank; while $2.04m (₦12.852m) was to be borne by the Federal Government of Nigeria and the remaining $24.3m (or ₦153,09m) was to be borne by the Niger State Government following the extension of the loan repayment twice during the implementation period, about $23.630m (or ₦148.869m) of the total project cost as at the end of project life increased to about $28.993m (or ₦183.6559m).

It should be noted that Niger State Agricultural Development Project Management does not engaged in direct crop production, except seed production, rather they provide services which motivate the millions of farm families to improve the production techniques to achieve a higher productivity.

1.3 ACHIEVEMENTS OF NIGER STATE AGRICULTURAL PROJECT (NSADP)

From the inception, the following are some of the achievements recorded by ADP.

a. Development of over 25,000 hectares of small scale Fadama and maintained 1,460 hectares of large scale schemes at Badeggi.
b. Sales of farm inputs --- over 200,000 metric tonnes of fertilizers, 170,000 litres and 8,600kg of Agro-Chemical products etc to farmers at the various farm centres in the state.
c. Extension services was provided to farmers in areas like:- Crops, Livestocks, Agro-forestry, Women-in-Agriculture as well as Fisheries and land use management have been carried out and unified.
d. The planning and research department of the organisation carried out a number of researches on crops such as rice, yam etc which have resulted in the production of an improved variety of such crops. This have been adopted to increase production of crops. So also, it provided information on fertilizer application on crops and row planting system.
All these led to increases in crop production in the state and has improved the income and living standard of the farmers and society at large.

1.4 OBJECTIVE OF THE PROJECT

The aim and objective of this project is to solve the problems usually encountered in the course of inflow and outflow of transactions of Agro-Chemical products being carried out in

the organisation. This involves taking care of the items on the receipts as at when issued and later make provision for daily sales record. This is used to monitor how such goods are being executed right from the beginning to the end including Agro-Chemical products.

It will be advantageous using a computerised system, since among others, this is more effective than adopting manual labour. It saves time and labour efforts compared with when the job is carried out manually.
The computer programme should be able to work in such a way that the organisation of any other establishment may upgrade or adjust and or adopt the programme to suit a related purpose in a different dimension.

1.5 SCOPE AND LIMITATIONS OF THE PROJECT

At Niger State Agricultural Development project, very many projects are being carried out daily. But this project will be limited to Agro-Chemical Products, e.g.
FERTILIZERS i.e Compound, Urea and single and others like
HERBICIDES:- e.g Lasso-Altrazine, Primextra, AltrazineDual, Calex E.D etc.
INSECTICIDE:- e.g Salute, Utracide, Sherpa-plus, Basudine, Cymbush, Supper E.D. Delis etc.

This project was contrained on the part of the management to release certain vital information necessary for detailed analysis of the subject matter. Since the release of all information has to pass through the management for approval. For this reason, Collection of information was restricted only to the main office in Minna.
This study was also constrained by the limited time available i.e. the time frame allowed for the submission of the project was short and the researcher was faced with the problem of how

to allocate the limited time between the study. There was also financial contraint because the researcher's meager salary is inadequate to cover all the expences involved in this study as well as meeting other personal needs.

1.5 ADVANTAGES OF COMPUTERIZATION

Some of the advantages of using computer to control Agro-Chemical products are:-

a. It will allow reduction of labour force

b. It will give room for efficiency since the staff time using the operation is no more wasted compared to the existing system.

c. It makes employee's work lively and lead to economic buoyancy of the organisation through individual created interest in computer usage.

d. It is a useful means for keeping daily records on their various Agro-Chemical Projects activities (which will lead to efficiency and accuracy) because files and customer's records are kept tidy and retrieval is always at easy. This will be use to generate daily report for the organisation on sales and stock of goods.

e. It will encourage training of some staff as computer personnel.

1.7 DEFINITION OF TERMS

PURCHASES COSTS:- This is the amount expended on the inventory item during purchase.

CARRYING COSTS:- These are costs related to the carrying of inventories in stock. This include interest charges on investment, storage costs such as rent, heat, insurance, taxes, obsolescence and spoilage costs - expenses in holding products in and out of stock.

LEAD TIME:- This refers to the time elapsed between the act of ordering and actual receiving of materials.

RE-ORDER POINT:- A term used to describe the stock quantity declining and when a new order for specified size of goods must be issued if the stock drop below minimum stock level.

SAFETY STOCK:- This refers to extra inventory held to serve as a buffer against possible stock-out situation.

LOT SIZE:- The size of the order that will be purchased to replenish inventory.

INVENTORY POLICY:- An organisation stock holding policy represents a series of rules which determine how and when certain decisions concerning the holding of stock should be made.

MINIMUM STOCK LEVEL:- The level below which stock should not be allowed to drop.

MAXIMUM STOCK LEVEL:- The level above which stock should not be allowed to drop

CYCLIC ORDERING SYSTEM:- A time based system which involves scheduled periodic reviews of the stock level of all inventory items.

PERPETUAL INVENTORY RECORD:- An inventory record which is maintained perpetually up-to-date by recording all transactions which affect the inventory, recording the new balances after each transaction. It also involve regular and systematic checking of the record against the physical stock items.

FIXED ORDER QUANTITY SYSTEM:- A system in which the quantity is the same on each time an order is placed but the interval between the placing of orders varies.

HOLDING COST:- These are the costs that increase in direct proportion to increases in inventory and the time for which stocks are held, e.g. the cost of invested capital (this is an interest charge) which is strictly proportional to stock level and time. In addition to capital costs, one must consider record keeping and administrive charges. The follow are some of the costs:

i. HANDLING COST:-This include the cost of labour to move stock, i.e overhead cranes, forklift, trucks and other equipments used for the purpose of moving stock from one depot to other depot.

ii. STORAGE COSTS:- Cost on rents of space or interest and depreciation of owned space.

iii. DEPRECIATION, DETERIORATION AND OBSOLESCENCE COSTS:- These are particularly relevant for items that changes chemically during storage e.g. food, vegetable etc.
All such costs require investigation but with possible exception of items with limited shelve life span. The cost of storage may depend on the amount of space being used and hence may be constant.

iv. SHORTAGE OR PENALTY COST- This is the cost that arise when an item that is requested is not available in stock.

v. COSTS DUE TO CHANGE IN PRODUCTION RATE- This include set-up costs that result from changing the production rate from Zero to some positive amount. In the case of purchase, they involve

fixed administrative costs of placing an oder. Others are costs of hiring and training additional labour (personnel).

vi. PURCHASES PRICES OR DIRECT PRODUCTION COSTS:- The unit cost of purchased items may depend on the quantity purchased because of "Price breaks" or quantity discounts. In direct production, the cost may also be lower, because of greater efficiency of men and or machines in a long continuous production runs.

DEMAND:- The amount of items required per period (not necessarily amount sold because some demands may go unfilled due to shortages.

AMOUNT DELIVERED:- If a quantity "Q" is ordered for purchases, the amount delivered may vary around 'Q' with known probability density function. The effect of such an uncertainity is the same as the effect of certainity relative to demand or leadtime.

ECONOMIC ORDER QUANTITY:- This refers to the most economic lot size the firm should order when replenishing inventory. There are certain advantages to be gained from buying goods in large quantities. Therefore, a compromise is sought between too small or too large a batch and that may minimize the total costs involved.

CHAPTER TWO

LITERATURE REVIEW

2.1 NATURE OF INVENTORIES

The American institute of Accountants defines inventory as:- "The aggregate of those items or tangible property which:

1 are held for sale in the ordinary course of business
2. are in the process of production for such sales or,
3. are to be currently consumed in the production of goods or services to be available for sale"

It has also been broadly defined as "the quantity of goods, commodities or other economic resources that are stored at any given point in time in response to a demand process which operates to increase it"

Inventory can be classified in a number of ways and the following are the most common ones:-

1. Raw materials that have been purchased for use in the operation of the business.
2. Semi-finished parts or partly processed raw materials awaiting further processing
3. Finished products that are in transit or awaiting distribution to customers in the warehouses at the production site or at some locations distance from it.
4. Also maintenance, repair and operating supplies which are consumed in the production process (e.g Lubricating Oil, Soap, Machine repair parts) are usually included.

The basic function performed by inventory whether they are raw materials work-in-process, or finished goods is to decouple. This allows the successive stages in the purchasing, manufacturing and distribution process to operate independently of one another. The decouping functions may be performed in at least four ways:-

i. When the demand for an item is known to be variable or seasonal, it may be more economical for a firm to absorb some of the flunctuation by permitting its inventories rather than its level of production to Oscillate.

ii. Large inventory where some units are purchased or manufactured. They are needed present in order to realize economy of scale.

iii. Fluctuations in inventory may be required if an adequate supply of items is to be available for the consumer when he wants then and stock out are to be minimised.

iv. Process and movement inventories sometimes called pipeline stock, are necessary where significant amount of time are required to transport goods from one location to another.

The fundamental concern of management in developing inventory policies that will minimise the total operating costs of the firm are two basic inventory decisions:

a. The quantity of goods to order at one time and

b. When to order this quantity.

In practice, every industrial concern or public organisation finds it necessary to keep stock for one or more of the following reason:-

i. Delivery cannot be exactly matched with usage on day by day of production

ii. Discount or improved prices for bulk purchas may be more than offesting the cost of storage

iii. Operational risks of possible changes in program or production that require the holding of stock as a precaution against serious breakdown or interruption of production or other activities.

iv. The cost of storage is outweighed by stocking production quantities as in the case of parts, i.e production in economic batches.

v. When a completely balanced production flow is unpracticable
vi. For finished products where the holding of a buffer stock between the manufacturer and consumer is essential.
vii. Owing to fluctuations in the price of a commodity, it is considered desirable to stock in when prices are low some items appreciate in value during the time of storage.

It is noteworthy, however, that the weight to be given to each of these factors depend upon the circumstance of individual business.

The factors affecting the cost of storage are as follows:-

1. Interest on value of goods in stock (i.e Loss of interest on capital tied up in this way)
2. Operating expenses of storehouses, including wages, depreciation or rent rates, repairs, heating, lighting etc.
3. Deterioration of goods in stcok
4. Obsolescence
5. Stocking checking
6. Insurance
7. Recording and accounting

The cost a firm incurs as a result of established stock policies are of three types:-

1. **ORDERING COSTS OR ACQUISITION COSTS**

These are cost of getting an item into the organisation inventory (acquisition costs) and those incurred each time an order is placed.

2. **INVENTORY CARRYING COSTS**

These are costs incurred because the firm has decided to maintain an inventories. These are foregone opportunities between the benefits to be derived and out of pocket expenses.

3. OUTAGE COST

This exist but there are no definitive rules for computing them. Outages result where there is decreased in customer service level, inefficient production operations and high costs resulting from cash procurement of stock goods. The cost of outage is difficult to quantity, but their significance is not in doubt. Because of the cost of holding inventories and the fact that inventory decisions are investment decisions, management has to consider the minimum rate of return that will result from gievn investment in inventory below which it is not prepared to invest at all.

The investment of a firm resources in inventory prevents the business from using them in some other activities and decisions taken by a firm should be those that will result in the greatest benefit to the firm.

2.2 INVENTORY PLANNING

A good management of inventory involves, planning and control of the inventories. Inventory management is not an isolated factor but essential bound to the purpose of the business which is most likely to the production or sales. It is also related to the nature of the customers as well as the market it serves.

For proper planning of inventory, decision as to what to store or produce, what best sources of goods procurement are, what suitable transportation arrangement are put in place etc. The main objective of inventory planning is to maintain the lowest possible level of investment in inventories, that will satisfy the production, sales and financial requirement of the enterprise.

In planning for inventory, it is necessary to decide on choice of a vendor. Considering factors such as the quality, price, credit facilities and discount, the other thing is to decide on the likely demand for the various inventory types the organization has and, this is likely to involve forcasting the demand pattern.

FORECASTING:- A prediction of what is going to happen in future, especially if it is based on some kind of knowledge is known as forecasting. A forecaste can be a simple statement such as "the demand as at next month will be equal to the demand based as at last month" or it may be an estimate of demand based on a complete study of the economy, the industry, customer preferences and other factors.

Many useful forecasting techniques exist, although some are better than others in specific situations. Forecasting is involved in almost all facts of executive decision-making concerning activities of business from inception to winding up. No matter what form of inventory is being view, from raw materials to finished products- a forecast is necessary to decide the quantity and timing and also balance the seasonal flunctuation in demand and obtain level production.

Over the time, there have evolved several forecasting techniques to handle the variety of complete managerial problems that exist, with each technique having its owned special applications. It is noteworthy, that any one selected should be suitable for the purpose for which it is intended.

In selecting any forecast system, factors such as the context of the forecast, the relevance and availability of historical date, the degree of accuracy desirable, the time period for the forecast, the cost/benefit of the forecast to the business

and the available time for making the analysis should be put into consideration. It is necessary, though, for the above listed factor to be weighed constantly and at a variety of levels.

2.3 INVENTORY CONTROL

Inventory control can be define as "the science based act to ensure that just enough inventory (stock) is held in an organization to meet its internal demand commitments economically.

The main aim of inventory control is to strike a balance between the costs of holding too little or too much inventories inorder to minimise costs. Other reasons include the need to maximise profit, avoid stockouts or overstock, keep inventories within available storage capacity, control capital investments, minimise human efforts and maximise sales or share of the market.

2.4 FUNCTIONS OF INVENTORY/STOCK CONTROL

The basic function of inventory whether the raw material, work-in-progress, or finished goods is that of decoupling the operations involved and converting inputs into outputs. This allows the successive stages in purchasing, manufacturing and distribution process to operate independently of one another without complete reliance on the schedule of output of prior activities in the production processes.

Furthermore, the decouping functions allows both time and spatial seperation between production and consumption of products in the operating system.

Lastly, inventories can also be used for other purpose from decouping function. For example when inventories are

displayed, they serve as promotional investment. Raw materials and finished product inventories are frequently accumulated to hedge against price rises, infaltion and strikes. Inventories also serves to smooth irregularites in supply.

In essence, inventories act to decouple organizational activities, thereby achieving lower cost of operations. Inventories act to reduce procurement cost, provide good customer service and smooth production flow by providing one time delivery avoiding costly stock shortages. Inventories ordered in large quantities can result in lower freight hand, inventory require tyding up capital that would otherwise being idle and such cost as insurance, spillage and taxes must be incurred as a result of maintaining inventory.

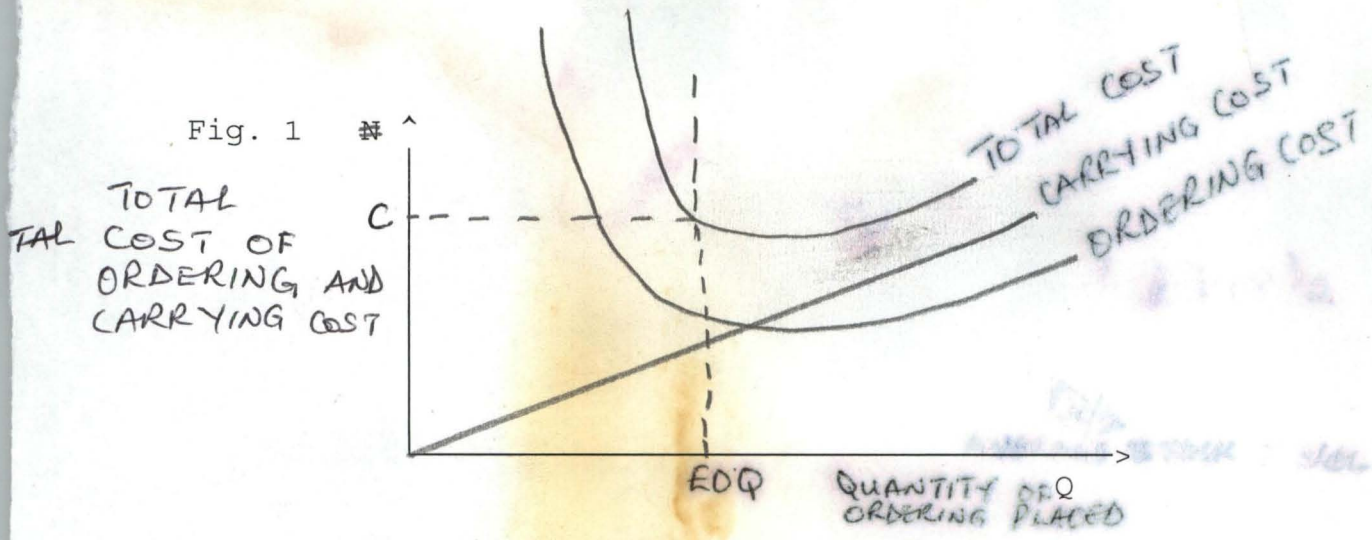
INVENTORY MODELS

There are basically two main categories of inventory model techniques (a) the deterministic and (b) the probabilistic (stockastic) models.

A. **THE DETERMINISTIC MODEL**: These are models that are based on the assumption that both demand and lead time are known with certainity. An example of this is Economic Order Quantity Model (shortage not permitted) which attempts to arrive at a cost which equates the cost of orering with the cost of storage of inventory stock. In this case, the cost of placing order decreases with the size of inventories increases with order size. The total cost of ordering and holding inventories is thus least at that carrying inventory and the quantity at that point is the ECONOMIC ORDER QUANTITY.

This is illustrated graphically below:

Fig. 1



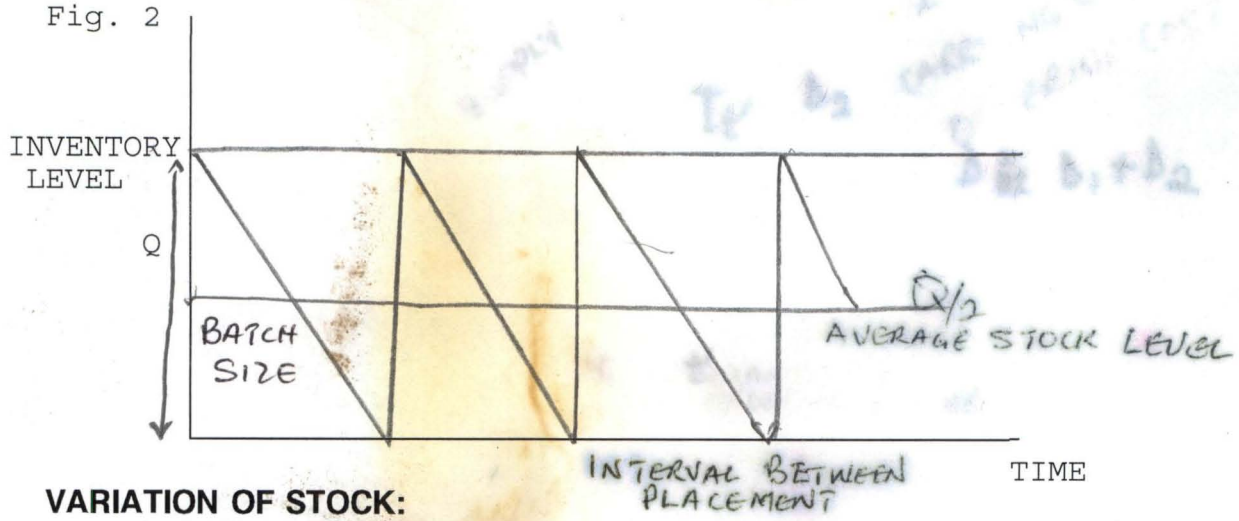
SOURCE: Essentials of managerial finance (1979) by J.F.Weston and E.F. Brigham.

The derivation of the Economic Order Quantity (EOQ) depends on the following assumption:

1. Inventory is replenished when inventory is exactly equal to zero (no shortages)
2. Usage rate is known and constant
3. Oredering of the product has no relationship with orering other products.
4. Carrying cost is linear as throughout the entire inventories range and varies with average inventory
5. Lead time is known and constant
6. Price is independent of quantity of product purchased.

It is noteworthy that though most of the assumptions listed above are not adhered to in practise, the model is not totally render invalid rather, expansion is made to accomodate exceptions to the above which occur in actual practice.

Fig. 2



VARIATION OF STOCK:

SOURCE: Scientific inventory management by J. Burchan et al

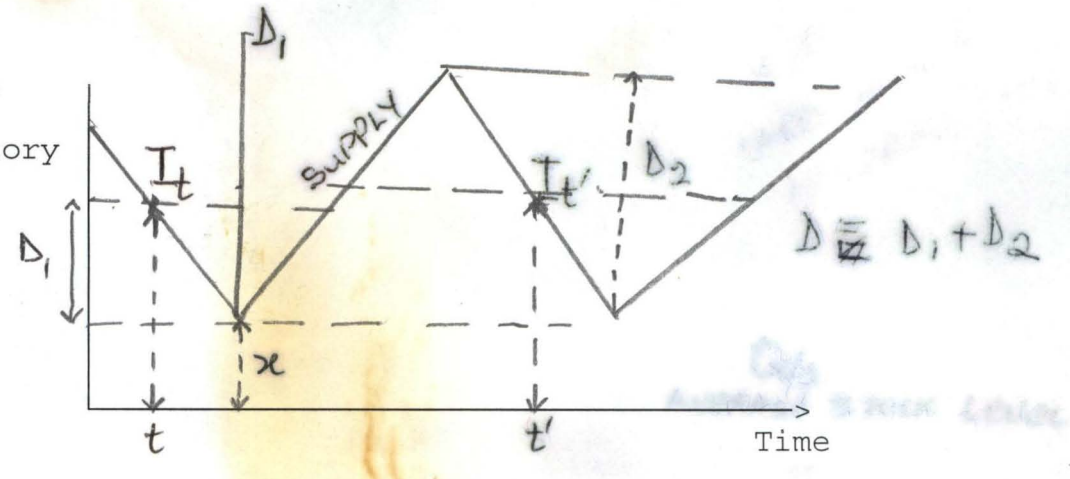
The graph above illustrate the variation of the inventory level over time for the classic EOQ model. From the assumptions made earlier, the downward sloping curve indicates that the inventory level is being reduced at a constant rate over time. 'Q' units of goods are ordered when inventory level reaches the re-order point level. order is renewed when inventories level is reduced to zero during the lead time. This raises the inventory to 'Q' units and the cycle is repeated.

2.5 **THE STRUCTURE OF INVENTORY SYSTEM**: An inventory system has a balanced equation that relates stock at time t, to those at later time t'. For example, let Ij be the stock at time internal t and 'S' quantity added to the inventory in the time interval t' and D the demend. The physical stock at time t' is given by.

$I_t' = I_t + S - D$ ----------(i)

provided that the quantity is positive. If however, the demand exceeded supply, the physical stock will be zero.

Fig. 3



STRUCTURE OF A TYPICAL INVENTORY PROBLEM

For book-keeping purposes, two possible situations arise from the above diagram. Excess demand is back ordered and is filled as soon as regular supplies become available; It is possible to think of the back orders as negative inventory. Therefore, equation (I) holds for all values of It', S and D.

On the other hand, if excess demand is lost or met in special way (e.g emergency procurement or expedited production) excess demand has no effect on inventory and $I_t'=0$, whenever $(I_t +S-D)$ is negative.

Since $S = I_t' + D^2 - X$ $\quad S = I_t + D^2 - X$

$I_t = D^1 + X \Rightarrow X = I_t - D1$

$I_t' = S + X - D^2 = S + I_t - D^1 - D^2$ Where $D^1 - D^2 = D$

$= S + I_t - D = I_t'$ as in the equation (I) above.

The two principal functions of stock control are:-

i. To enable the product to be produced or procured in econmic quantity.

ii. To act as a buffer against an unpredictably high rate of used stocks. It also perform other function of price - i.e the cost of holding stock.

The objectives of stock control is to ensure a correct balance between the cost of stock-holding.

There are certain advantages to be derived from buying goods in large quantities. It is however, possible to make the size of batch so large such that further economic advantages can be achieved in a way that a compromise is sort between too small or too large a batch. That compromise which minimises the total costs involved is the Economic Batch Quantity (EBQ).

In deriving mathematical formular for Economic Batch Quantity, we also assumed that

i. Demand rate is constant
ii. The time between placing a replenishment order and receiving the items into stock (i.e the lead time) is zero.
iii. No stock-out are allowed.

When the demand rate is constant and the lead-time is zero for contigencies (by definition, these do not arise), therefore, the stock should be replenished immediately but not before demand falls to zero. Hence, the amount of stock on hand will vary between zero (just before a replenishment arives) and the batch size (just after a replenishment) as in fig. 2 above.

For this reason, the average stock is equal to half of the batch size.

The mathematical formular of EBQ is as follows:-
Let

d = annual demand for production
q = size or batch
t = time interval between replenishment order (in year)
p = cost price per items

h = stock-holding cost per annual (Expressed as a fraction or percentage of stock value)

c = delivery cost per batch

Then, price = $\frac{PQ}{2}$

t = Q/d

But average stock = Q/2

The stock-holding cost per item per annum = hp

:. Total annual stock holding cost = h% of $\frac{PQ}{2}$ or $\frac{hpQ}{2}$

Number of delivery per annum = d/Q

:. Annual delivery cost = CD/Q

=> Total variable cost, $T = \frac{hpQ}{2} + \frac{CD}{Q}$

To minimise this, we differenciate T with respect to Q i.e $\frac{dt}{dQ} = \frac{hp}{2} - \frac{cd}{Q^2} = 0$, at turning point

:. $\frac{hp}{2} = \frac{cd}{Q^2}$

=> $Q^2 = \frac{2cd}{hp}$ => $Q = \sqrt{\frac{2cd}{hp}}$

The reorder point (R) is simply lead time multiply by utilisation per day. The above equation represent a situation where the stock holder is not the stockist.

If otherwise, that is the stock-holder is both the producer and stockist of the product. This will be the case when a manufacturing company supplies customers from a finished product. In this case, the ordering or delivery cost is replaced by cost of setting up machinery to make the product.

The only difference between the two situations is that whilst in the former, replenishment of stock is instataneous, in the later case, stock is replenished continously over a period of time. Some of the batch may be sold whilst the remainder is still being produced.

The mathematical formular for later can be derived as follows.

Let r = production rate

then, the time for the production of Q quantity is,

$tQ = Q/r$

Then,

Maximum stock = $Q - dQ/r = Q(1-d/r)$

$\therefore$ Average stock = $Q/2\ (1 - d/r)$

But C = the set-up cost per batch

Then stock-holding + set-up = $hpQ/2\ (1-d/r) + cd/Q = 1$

Hence $dt/dQ = hp/2\ (1-d/r) - cd/Q2 = O$, at turning point

$\therefore\ cd/Q2 = hp/2\ (1-d/r)$

$$\Rightarrow\ Q = \sqrt{\frac{2cd}{hp(1-d/r)}}$$

B. **THE PROBABILISTIC INVENTORY MODEL**: These are models in which one or more components of the problem being considered must be described with probabilistic distribution. The model assume that demand and lead time are uncertain, back orders are permitted (Stockouts are penalised but not lost) and unit price, ordering costs, unit inventory carrying costs, unit stockouts are constant. Determination of the EOQ and reorder point is thus more complex under this system. The estimates of cost of being out of stock must therefore be fed into the probabilistic inventory model.

2.6 THE ROLE OF ELECTRONIC DATA PROCESSING

Inventory management becomes a 'natural area' for the application of mechanised data processing, once quantitative decision rules are developed. A computer can be used for reviewing the inventory status of each item, performing calculations quickly and accurately and taking action (such as providing a reorder notice) only when action is required. It can be of great aid in monitoring the current activity to determine when decision rules should be redefined. For example recomputing reorder points when there is change in sales trends or adjusting buffer stock when there is change in the pattern of sales variation. It can also be used for forecasting. It can generate reports, summarising the activity and current status of the inventory. In setting up a computer based inventory control system, three set of decisions are necessary namely: the total size of inventory which the business is currently able to support, the rules to be used in determining order quantities and the level of customer service required for each item.

Computerised inventory control comprise three main components:

A. **INVENTORY COUNTING:** When inventories are processed by computer, it is easier to ensure their reliability and continuous stock taking becomes easy. This is achieved by any of the following methods:

1. The stock is counted and the details of the physical balances are inputed. The computer does the computation using any of the following methods:

i The computer calculates any differences between the physical and book inventory. In some cases the differences of a specific amount is reported.

ii The stock is counted and compared with the most recent print out of the balances in the file after adjusting for

outstanding issues and receipt. The adjustment could be achieved manually or by the computer. Differences are processed by the input of an adjustment and a manual record is also kept of items to be counted.

B **INVENTORY RECORDING:** This is the method which involves recording of inventories according to their types into master files and these quantities are authomatically adjusted after every transaction.

C **INVENTORY VALUES:** The computer is programmed to give periodic report on information relevant to the value of inventory. Depending on the system, this may include information as to excess stock, obsolete stock and slow moving stock.

2.7 SYSTEM OF INVENTORY CONTROL AND MANAGEMENT

An inventory control system is a frame work for integrating the necessary information and data for the purpose of minimising total inventory system, the following are important:

a. **FIXED ORDER QUANTITY SYSTEM:** This is frequently referred to as the Wilson Formation, the inventory reorder quantity is fixed, and a reorder is placed for this fixed quantity whenever the inventory on hand drops to a particular level referred to as the reorder point. For effective usage of this system, it is necessary to determine the economic order quantity that will minimise the total variable cost of holding inventory and determine the order point.

b. **CYCLICAL ORDERING SYSTEM:** This is also referred to as the replenishment or fixed period system. This is a time based system which involves scheduled periodic review of the stock level of all items. The time between reorders remains the same, while the quantity reordered is allowed to fluctuate. The replenishment level usually directed at keeping inventory at the minimum level. Consistent with maintaining some particular protection against stock-out and some schedule of periodic review and reorder.

c. **OPTIONAL REPLENISHMENT SYSTEM:** This is in effect a replenishment system which is modified to place a lower limit on the size of the variables i.e reorder quantity. This system combines the reorder point features of the order quantity system with the fixed order quantity system and the variable order quantity of the basic replenishment system. This system over look the effect of cost in determining lead time, but it places a lower limit on the size of an order and, in effect, gives recognition to the fact that there is cost associated with placing an order.

CHAPTER THREE

3.0 SYSTEM ANALYSIS AND DESIGN

3.1 INTRODUCTION

Computerization in an organization involves the process of converting the obejective of the management as far as data are concerned into solutions (Methods) amendable to processing by computer. This serves the link between the management, software and Hardware of the computer. System analysis involves collecting and analysing facts with regard to the existing operational procedure, so as to be able to review the appreciation of the current system.

The information used was gathered from the senior Management staff of Niger State Agricultural Development Project because the organisation has a policy of guarding and monitoring the type of information given out for research.

For this reason, the researcher has to rely solely on information obtained unofficial through interview of the personnel of the organisation and observation of thier various system of operations being carried out at all time (including the records been kept). The information gathered were used for analysis of the documented and undocumented materials of inventory. Infact, the researcher was given access to some confidential information that gives insight into their inventory Management policy on the understanding that such Materials should not be refered to directly in this work.

3.2 PROBLEM IDENTIFICATION AND DEFINITION

Inventory records are frequently inadequate thereby causing shortages to the Management at all time. Variances in cost of

goods sold or quantity of goods on hand and the actual physical goods do not always agree. These differences cause major problems. There is usually objections when cost becomes excessive and complaints when book-keeping records are out of agreement with what is actually on-hand. All these cause serious monitoring problem for effective inventory management.

To resolve these, there is need to authomate receiving, withdrawal and posting of inventory records to eliminate arithmetic errors. Computer application to these problems will help to cut down if not eliminate these arithematic errors and also provide quick information as at when required.

3.3 FEASIBILITY STUDY

This involves preminary investigation embarked upon to proof the fact that the proposed computerization is desirable and of benefit. The objectives acommplished by working on the project feasibility includes the following:-

The project requirement was classified and well understood and detailed explanation was made to the management team of the organization. i.e. What is actually being done in the computerization, things require and the importance of computerisation of the inventory.

Also the scope of the project was detemined. This is necessary so as to allow estimation of the finances and human resources required to developed the new system.

The cost analysis of the proposed system and staff training (end users) was assessed, while the benefits to be derived from it was analysised.

3.4 TESTING PROJECT FEASIBILITY

This is intended to be achieved by the following ways:-

a. OPERATIONAL FEASIBILITY - This relates to the workability of the proposed system when developed and installed.

b. TECHNICAL FEASIBILITY - This clarifies the fact that, the proposed system would be compartible with the suggested hardware, software requirement and well trained personnel.

c. ECONOMIC FEASIBILITY:- This would be undertaken to assess the cost of implementing the proposed system alongside the benefits to be derived in implementing the system.

3.5 ANALYSIS OF CURRENT SYSTEM

Generally, transaction of Agro-Chemical products at NIger State Agricultural Development project, Minna has not being fully computerised. The system is said to achieve it aims for records of sales and stock control by considering the following records being use:-

1. Stock received
2. Stock transfer
3. Sales

a. **STOCK RECEIVED** - All information related to the goods received or supplied from their source, usually manufacturer representatives in Nigeria or from appointed contractors to the Headquarters are recorded here. This is treated under the heading "RECEIPT".

b. **STOCK TRANSAFERED** - All the zones and sub-zones under the Headquarters work hand in hand i.e the zone having excess will supply the zones in short of it. Such activities are recorded in transfer file. This will be treated as goods transfered in the record. The transfer of stocks from one zone to another will be followed with the following documents

1. Stock Transfer Order
2. Stock Transfer Note
3. Goods Received Note

1. **STOCK TRANSFER ORDER** - When there is need for product in a paricular zone, the sales manager of the needy zone will issue this note, usually abbrevated as S.T.O. to the manager of the zone having excess, stating the quantity needed, the current unit price and total price.

2. **STOCK TRANSFER NOTE** - This is issued by the sales manager having excess along with the goods on transfer. This is in response to the previous stock transfer order that have been received earlier. These are in triplicate. Two copies goes with the goods in transit.

3. **GOOD RECEIVED NOTE** - For the sending centre to agree with them (transporter) that the goods have been delivered, the receiving centre usually in their response send back to their sender a note, i.e Good Received Note abbrevated as G.R.N., signifying that the goods are received.

4. **SALES** - In each zone, the amount sold and the number of receipt issued out to customers are noted using the refrence number on the receipts issued. At the end of the day, the sales made are entered into the main reord of the respective items under the heading "SALES"

At the zonal level, the following records are being kept to update all other records at the headquarters.

1. Opening Balance
2. Receipt
3. Total

4. Cash Sakes
5. Transfer
6. Closing Balance

OPENING BALANCE: This record at each zone shows the stock at hand prior to transaction activities for each of the item.

RECEIPT: This record contains the quantity of goods received into the zone in each case of the items.

TOTAL: Tells us the total amount of stocks got in each case of the item.

CASH SALES: This record shows only the total sales made per item in each zone.

TRANSFER : The quantity of goods or stocks transfered to another zone are recorded here.

CLOSING BALANCE: This column ascertain only the goods or stocks that remain in the zone after every deductions of transaction have been made.

MATHEMATICALLY : Closing Balance can be represented as:Closing Balance (C/B) = Total - (Cash sales + transfer)

3.6 PROBLEMS OF EXISTING SYSTEM

The computer does the compilation of data from the receipts together with other documents(Stock transfer record and goods received record). Mathematical computation of some parts of the information have some defects in its working which has necessitated the use of an improved computer software in its processing.

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1. **IMPROPER OPENING BALANCE** - There is no proper proof of previous closing balance inform of brought forward and also it did not show whether the opening balance is as a result of transfer or directly supplied from the headquarters.

2. No provision for possible move of a centre to another area or state or total move of Local Government Area having a zone or centre in it to another state. If this happen, it will affect the headquarters reports.

3. Transfer from one zone to the other does not take note of reduction from the excess zone and addition to the receiving zone. This should have indicated the demand as at request time.

4. The report did not show the reorder point for any of the product both at the zone(s) and at the headquarters. The provision of this will aid quick transfer or supply of goods.

5. To forsatall fraud, records and particulars of authorised officer must be kept in detail.

3.7 REQUIREMENT SPECIFICATION FOR THE PROPOSED SYSTEM

A. HARDWARE AND ACCESSORIES

The following hardware accessories are necessary in the computerisation of Agro-Chemical products

Processor - 486DD x 33MHZ (IBM Compartible)
Random Access Memory (RAM) (8 mega Byte)
Monitor - EGA
Mass Storage (option) - 1.44MB or 3.5" Diskette
Hard disk - 540MB
Output Device - HP Laser Jet 5L
UPS - Uninterrupted Power Supply

B. **SOFTWARE REQUIREMENT**

a. Disk Operating System (DOS) of version 6.2

b. Because of the powerful function of Data Base IV, So it is appropriate to use if for this purpose

c. Wordperfect version 6.0 or Microft word

COST AND BENEFIT ANALYSIS OF THE NEW SYSTEM

A. **DEVELOPMENT COST**

	₦ K
System Analysis (Analyst for 2 weeks)	50,000.00
Software Installation	20,000.00
IBM PC with Monitor	70,000.00
HP Laser Jet Printer	40,000.00
Uninterrupted Power Supply	50,000.00
Paper/Stationary	25,000.00
Miscellanous	20,000.00
TOTAL	₦275,000.00

B. **OPERATING COST**

	N K
Maintanance (incase of emergency)	50,000.00
Training of 8 staff (for 8 weeks)	120,000.00
5 system operators (for 2 months) at	50,000.00
TOTAL	₦220,000,00
GRAND TOTAL	₦495,000.00

information display system layout sheets are used as the output design and aids for the computerization system. The output can either be through the printer or screen. The print carter shows the content and location of all lines of character that are to be printed.

3.9 ELEMENTS OF DESIGN

To design the inventory transaction system, a main menu known as MENU OF COMMAND FILES have been produced to enable the user select the function to carry out.
Computerisation of Agro-Chemical products intend to reduce if not eliminate all inventory problems. The output produced can either be in hard copies or kept in the storage medium by the organisation for record purpose and decision making. The hard copies can be issued to the customer for personal use or for further transaction.

INPUT - Is the process of obtaining or capturing original data and placing it into the data processing system. In the proposed system, the user will work with a screen based data entry form. Since it is menu driven, the computer will ask questions for the user to respond to. This is influenced by the needs of output taking into consideration the types of input media needed, data collection method used, volume of input documents needed.

OUTPUT - It is necessary to consider what is required from the system before deciding how to set about producing it. Since the output will be required mostly in printed form (or hard copies) both within and outside the organisation.

FILES - This element is very much linked to input and output. Input is processed against the files to produce the necessary output. Consideration have been given to the following:

a) STORAGE MEDIA- Here, the new system needed a 540MB Hard-disk and mass storage 3.5" floppy diskette.

b) FILE ORGANIZATION AND ACCESS - Because of large records and data involved, the file will be organised and accessed randomly using database management system.

c) SECURITY OF THE FILE - Because of the importance of the various file of the proposed system, a user's password will be needed to aviod unnecessary entry and to protect the secret of the organisation.

d) RECORD LAYOUTS - Provision are made for the database structure so that similar records can be distinguished and access easily.

PROCEDURES - They are the steps which unify the whole process, and which link everything together to produce the desired output. These will involve both computer and clerical procedure. These will start with the origination with the sources document and end with the output document being distributed.

CHAPTER FOUR

4.0 SOFTWARE DEVELOPMENT

4.1 INTRODUCTION

Since the late 1960's users have been investing in a mechanism that provides facilities for successful organisation and accessing of data. The mechanism is known as a Database system, a term that has come to mean both the organisation of data and the Software that is needed in order to manage those data.

Therefore database can be defined as a mechanised shared and centrally controlled collection of data used in an organisation. It is any collection of useful information organised in a systematic and consistent manner. A database can also be regarded as an organised databank where data are stored.

However, in most information systems, it is desirable to have the software that have the ability to jump over the individual operational need barriers and access data right across the organisation. Thus, the integrated data of different types are linked by logical relationships through a complex software system known as Database Management system.

4.2 CHOICE OF LANGUAGE

The new system is intended to be a complete database system which is a collection of data, usually files. The arrangement of the files are in such a way that it is independent of any particular application and data redundancy is totally eliminated.

Access to the files is provided by a database management system (DBMS) which can be defined as a complex software system which uses logical relationships to link integrated data of different types. As such, the overall objective in the development of database technology has been to treat data as an organisational resources and as an integrated whole.

The benefits of database sytem are as follows:

1. MAINTANABILITY: It is easier to maintain one database than maintaining many similar files. It should be noted that, database software can protect data from access by unauthorised users thereby imposing centralized control system over its operational data.

a. ACCESSING THE REQUIRED DATABASE
It is easy to assess the existing database so that records could be added, deleted, modified e.t.c.

b. It can work with more than one file at a time thereby allow transfer of one file to another e.g sorting, indexing e.t.c.

c. Information retrieval from a pull of data collection is easier and quicker than other software.

d. Report generation which is a summary of processed information can be generated according to our needs or desire from a database.

4.3 FEATURES OF LANGUAGE CHOSEN

Database system has a lot of features which makes for easy usage. These include:

1. **DATA SECURITY:** Data will be protected from unauthorised persons or users.
2. **DATA INTEGRATION:** Information from several files can be coordinated, accessed and operated upon as though it is a single file. This allows users to link compartible data across the organisation.
3. **DATA REDUNDANCY:** This occurs in a file processing system when data can not be arranged to suit all the application programms accessing these data. Thus, the same data appears in more than one file and hence leads to wastage of storage space and duplication of effort during data entry.

4. **DATA INDEPENDENCE:** Any changes or modifications to the data are accomodated by changes to the database management system without any changes to the aplication programm being necessary.

5. **DATA INTEGRITY CAN BE MAINTAINED.** This means that one update is usually sufficient to achieve a new record status for all applications which uses it without necessarily opening other files.

6. **DATA ARE CENTRALLY CONTROLLED:** This is a way of securing data without leaking out secret information and this can lead to better data management by enforcing standards for all database users.

4.4 WORKSTATION REQUIREMENTS

The workstation for this project will be personal computer. This is because of its simplicity, availability and its worldwide usage both at home and many other organisations. It also has expanded memory of 16MB micro-processors as against 32 bit micro-processors associated with some other micro-computers.

Like main-frame, it is easily connected to computer network. It has good graphic resolution. The spare parts are easily available in the market e.g hardware components.

HARDWARE REQUIREMENTS

They include:

a. An IBM compartible personal computer
b. Hard disk of 16MB
c. Disk drive(s) for 3.5" and 5.25" diskettes
d. Main memory of 1.44MB CD RAM
e. Screen Display Unit (monochrome/colour)
f. Printer - Laser jet HP 5L

4.5 SOFTWARE DEVELOPMENT AND TESTING

Here, emphasis will be on data structure for the database management files, a simple chart of modular programms, the programms e.t.c.

A. **DATA STRUCTURE:** Here both the input data and output information are kept in files.

To create any file in a database management system, there is need for data structure. Data structure in database has to do with arrangement of data into fields such as field name, field type (i.e either character, numeric, logic, memo or date e.t.c), field width and decimal.

As already stated, the input files are supply. DBF, sales. DBF while the output file is Invent. DBF .

Below are the structures for the database files:

SUPPLY.DBF

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	DECIMAL
1	ITEM CODE	NUMERIC	8	
2	ITEM NAME	CHARACTER	50	
3	SEC-CODE	NUMERIC	8	
4	SEC-NAME	CHARACTER	40	
5	SUPPNAME	CHARACTER	50	
6	S.LITRE	NUMERIC	8	
7	SUPPADD	CHARACTER	55	
8	QTY-STOC	NUMERIC	10	
9	REORDER	NUMERIC	4	
10	OFF-NAME	CHARACTER	40	
11	RANK	CHARACTER	55	
12	SEX	CHARACTER	1	
13	GL	NUMERIC	4	
14	QTY-SULY	NUMERIC	10	
15	DATE	DATE	8	
16	TOTCOST	NUMERIC	10	

SALES .DBF

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	DECIMAL
1	C/NAME	CHARACTER	40	
2	C-ADD	CHARACTER	55	
3	SEC-CODE	NUMERIC	10	
4	SEC-NAME	CHARACTER	40	
5	ITEMCODE	NUMERIC	10	
6	ITEMNAME	CHARACTER	35	
7	UNITPRIC	UNIMERIC	10	
8	NO-PURC	NUMERIC	15	
9	TOTSALES	NUMERIC	15	
10	SALEBAL	NUMERIC	15	

INVENT .DBF

FIELD NO.	FIELD NAME	FIELD TYPE	FIELD WIDTH	DECIMAL
1	ICODE	NUMERIC	10	
2	ITEMNAME	CHARACTER	40	
3	SEC-CODE	NUMERIC	10	
4	SEC-NAME	CHARACTER	40	
5	QTY/STOCK	NUMERIC	10	
6	PRICE	NUMERIC	10	

NOTE:

STBAL (Stock Balance) = QTY-STOCK + QTY-SULY

= QTY/STOC - QTY-SOLD

TOTCOST = STBAL * UNITPRIC

TOTSEPRIC (Total Selling Price) = STBAL * UNITPRIC

TOTSALE = QTY/SOLD * SELPRIC

SALEBAL = TSELPRIC - TOTSALES.

4.6 IMPLEMENTATION

It includes all those activities that take place to change from an old system to a new one. In this case, the old system

is the computerization that needs an improvement while the new system is an improved inventory computerization of Agro-chemical products that takes into consideration the changes in centre, Local Government Area and transfer of goods from one centre to another centre.

Proper implementation is essential to provide a reliable system that will meet the organisation requirements. Before the implementation, staff training must have been carried out successfully. This will enable them to adopt to the new system being developed and the program tested and found to meet the requirement set out in the system specification.

4.7 CHANGE-OVER PROCEDURE

File conversion is a vital activity which is sometimes under-estimated. It involves the conversion of the old file data into the form required by the new system, and is usually a very expensive stage in the whole project. The changeover may be achieved in a number of ways. The most common methods are; Direct, Parallel running, Pilot running and staged changeover.

a. DIRECT CHANGEOVER: This method is the complete replacement of the old system by the new, in one move. It is a bold move, which should be undertaken only when everyone concerned has confidence in the new system. When a direct changeover is planned, system tests and training should be comprehensive, and the changeover itself planned in detail. This method is potentially the least expensive but the most risky.

For security reasons, the old system may be held in abeyance, including people and equipment. In the event of a major failure of the new system the organisation would revert to the old system.

b. PARALLEL RUNNING: This means processing current data by both the old and new systems to cross-check the results.

Its main attraction is that the old system is kept alive and operational until the new system has been proved for at least

one system circle, using full live data in the real operational environment of place, people, equipment and time. It allows the results of the new system to be compared with the old system before acceptance by the user, thereby promoting user confidence.

Its main disadvantage is the extra cost, the difficulty and (sometimes) the impracticability, of user staff having to carry out the different clerical operations for two systems (old and new) on the time available for one.

c. PILOT RUNNING: This is similar in concept to parallel running. Data from one or more previous records for the whole or part of the system is run on the new system after results have been obtained from the old system and the new results are compared with the old. It is not as distruptive as parallel operation, since timing is less critical. This method is more like an extended system, test, but it may be considered a more practical form of changeover for organisational reasons.

d. STAGED CHANGEOVER - This involves a series of limited size direct changeovers, the new system being introduced price-by-price. A complete part, or logical section, is committed to the new system while the remaining parts or sections are processed by the old system. Only when the selected part is operating satisfactorily is the remainder transferred.

This method reduces the risks inherent in a direct changeover of the whole system and enables the analyst and users to learn from mistakes made as the changeover progresses.

The method of system converion procedure intended is the parallel type whereby the old and the new systems are run concurrently using the same inputs. The outputs are compared and reasons for differences resolved. Outputs from the old system continue to be in use until the new system has proved satisfactory. At this point, the old system is discontinued and the new one takes its place.

4.8 STARTING THE SYSTEM

Once the user is in database environment, to assess the programm designed in order to either view or work with various modules, get to the "DOT PROMPT" and type "DO MAIN. PRG" and press key, this gives you a screen designed of Main Menu of the computerized inventory of Agro-chemical products. The Main Menu contains the Task code for each program and the program name itself as in fig 1. At this point, the computer pause for the user to choose a desired task code to be "RUN". Once this is done, another sub-menu will be opened for the user where task code and program names are also stated. If this task is accomplished, then user can therefore work on either Local Government Area (LGA. PRG), parameter (PARA. PRG), sales (sale. PRG), supply (supply PRG), stock analysis (stock PRG) or generate reports of daily sales or stock balance as at when needed.

Alternatively, each Module can be "RUN" directly from the "DOT PROMPT" by calling up the program instead of having to call the MAIN MENU.

4.8 MENU STRUCTURE

A menu of command is designed. A user simply selects the option that indicates what he/she wants to do.

They include the following:

MAIN MENU

TASK CODE	NAME
1.	LGA
2.	PARAMETER
3.	STOCK ANALYSIS
4.	REPORT GENERATION
5.	EXIT
ENTER A CHOICE:	

Fig. I

LGA

TASK CODE	NAME
1.	ADDING RECORD
2.	MODIFYING LGA
3.	DELECTING LGA
4.	VIEWING LGA
5.	EXIT
ENTER A CHOICE:	

Fig. II

PARAMETER

TASK CODE	NAME
1.	INSECTICIDE
2.	HERBCIDE
3.	FERTILIZER
4.	EXIT
ENTER A CHOICE:	

Fig. III

STOCK ANALYSIS

TASK CODE	NAME
1.	ADDING RECORD
2.	MODIFYING STOCK
3.	VIEWING STOCK
4.	DELECTING STOCK
5.	EXIT
ENTER A CHOICE:	

Fig. IV

REPORT

TASK CODE	NAME
1.	ISSUE REPORT
2.	SUPPLY REPORT
3.	INVENTORY REPORT
4.	EXIT
ENTER A CHOICE:	

Fig.V

4.9 EXIT (OR QUIT)

This Menu command file serves as the only way to quit from the system and also used to close all opened files. Each module has an "EXIT" option which when selected, takes the user back to the "OPERATING SYSTEM PROMPT".

4.10 REPORT GENERATION

If this option is selected, the next level of options appears on the screen and the choice is by selecting a corresponding code to the option needed and press enter key.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

Trading in Agro-chemical products especially in an organised set up involves huge capital investments, equipments, personnel and other facilities. But with the poor Economic situation in Nigeria which lead to high interest rates, continuous fall in the value of Naira and couple with unstable increase of prices of Agro-chemical products and variations in Government policies makes planning difficult. The cost of purchasing goods is no longer there, but that of replacement. An inventory comprise usable but idle resources. The resources may be of any type e.g men, materials, machines or money. When the resourcees involves inventory is usually referred to as "STOCK".

An inventory problem exists if the amount of the resources is subject to control and if there is at least one cost that decreases as inventory increases. Therefore, investment in inventory becomes vital to the profitable operation of Agro-chemical products. This is because cost associated with inventory holding if not properly controlled could spell doom for the business.

This work has tended to highlight the importance of inventory planning and control in the management of all business (particularly Agro-chemical products). Niger State Agricultural Development Project being one of the leading Government agency of Agricultural and Rural Development (including sales of Agro-chemical products to pesant farmers at subsidized rate). Hence, its selection as a case study with the aim of finding out to which extent do they use Scientific inventory management practice to practically solve inventory problems of the organisation.

5.2 CONCLUSION

The compuperization awareness of the society in recent time has led to the recognition of its importance and potentialities that might influence future use of computer. Therefore, this work has attempted to look into the inventory planning and control practices for Niger State ADP with a view to determining its effectiveness and also the areas that improvement can be made.

The new system is designed to provide the management with timely information and to ensure proper accountability in the management of Agro-chemical products (especially inventory) at NSADP. This enhances timely report generation for all transaction as at when necessary.

The implementation of this new system is an indication of improvement in inventory management system in terms of reliability, accuracy, effectiveness, security and privacy for the program to run and produce the desired report.

5.3 RECOMMENDATIONS

The research findings showed that the scientific methods of forecasting were not properly utilized in forecasting the sales or purchases requirement of the organisation thereby leading to loophole (i.e loss in profit and Agro-chemical products).

It was discovered that though the standard system in use to maintain inventory that will last 6 - 12 months is in place, but sometimes, this is distorted due to the late arrival of certain items. Since some of the chemical products are foreign and their supply may not be regular as they should be. Consequently, historical information, experience and instinct are used to determine order quantities rather than any Mathematical formulae. The concept of safty stock is not adequately practiced in certain centres.

The system being used did not take into consideration the

importance of stating and incorporating the reorder point in percentage. This is also related to the uncertain demand of the product and the subjective nature of the forecasting techniques.

The short and long range plans of the organisation are made using data acquired from farmers located arround the major towns and nearby villages. These are in short fall of the larger farmers who resides in the interior part of the state (rural areas).

There are many risks associated with carrying inventory, such as those of breakages and damages, pilferages, fraud and collusion which heavily eats into the profit margins of the organisation.

The following recommendations are hereby advocated for improving the inventory planning and control system of the Niger State Agricultural Development Project, Minna :

1. The use of simple inventory models should be adopted in order to minimise inventory holding and ordering costs. Mathematical techniques should be developed and adopted to the peculiarities of the organisation which should aim at solving the inventory problems of the NSADP as regards forecasting demands, ascertaining the order and reorder level e.t.c. This should replace the intuitive and unscientific methods being employed as improvements are more likely to be determined.
2. The management should pay more attention to areas of profit erosion, pilferage, fraud, preservation e.t.c and improve on their security network. Breakages and damages can be reduced by proper storage and handling of stock at all times. Losses due to expiring times can be reduce by maintaining vigil in the area of stock rotation and religiously adhere to the concept of First-in-First out (FIFO).
3. Incorporating the use of computer in such a way as to make inventory records continuously up to date and also to purchase or develop software packages that will assist in determining

such necessary information as reorder points, reorder quantities, sell-by-dates e.t.c all of which will help to improve their inventory management.

4. Staff training and retraining from time to time should be adopted. This will allow for accurate without misspelling of similar product names and codes or interchange them.
5. Adequate provision of security should be made against fire outbreak, natural disaster, environmental problem, sabotage, provision of back-up copies of files, unauthorised passwords for users, scope of access, installation security e.t.c.
6. Acqusition of IBM PC, a programmer and system analyst should be carried out.

NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT MINNA

LGA:..... SUB CENTRE:.....

REPORT ON AGRO-CHEMICAL PRODUCTS

DATE: 13/02/97

INSECTICIDES:..... FERTILIZER:..... HERBICIDES:.....

ULTRACIDES..... COMPOUND..... DUAL.....

S/NO	QTY	SALES (₦)	QTY	SALES (₦)	QTY	SALES (₦)	QTY
1	2	172	4	160	3	270	12
2	6	516	4	160	5	460	13
3	6	516	1	40	3	270	14
4	3	258	2	80	2	180	15
5	2	172	3	120	3	270	16
6	4	344	1	40	1	90	17
7	4	344	2	80	3	270	18
TT.SAL	27	2322	17	680	20	1800	
RECEIVED	60		0		50		
TRANSFD	10		11		10		
O/BALANCE	30		20		20		
C/BALANCE	53		9		40		

THE OVERALL SALES MADE IS ₦4802

KEY

TT.SAL	-	TOTAL SALES
RECEIVED	-	STOCK RECEIVED
TRANSFD	-	STOCK TRANSFERED
O/BALANCE	-	OPENING BALANCE
C/BALANCE	-	CLOSING BALANCE
QTY	-	QUANTITY

MAIN.PRE

```
Set talk off
Clear
@ 1,1 say"WELCOME TO COMPUTER APPLICATION TO STOCK CONTROL OF
          AGRO-CHAMICA"
@3,15 Says "PRODUCTS, NIGER STATE ADP, MINNA"
@5,15 say "DESIGNED AND DEVELOPED BY"
@7,18 say "AMOSA ADISA ABDUL-LATTEF"
@9,4 say "A PDG IN COMPUTER SCIENCE PROJECT SUBMITTED TO THE"
@11,10 say "DEPT., OF MATHS/COMPUTER SCI."
@13,10 say "FEDERAL UNIVERSITY OF TECH. MINNA"
@15,20 say "MARCH, 1998"
@17,8 to 65, 68 DOUBLE
@19,30 say "MAIN MENU"
@20,30 to 20,38 DOUBLE
@21,4 say "TASK CODE"
@22,8 to 22,60
@21,20 say "NAME"
@22,8 to 22,60
@24,8 say '1'+space(7) + "LGA"
@26,8 say "2" + space(7) +"SALE"
@28,8 say "3" +space(7) +"SUPPLY"
@30,8 say "4" +space(7) +"ADD LGARECORD"
@32,8 say "5" +space(7) +"MODIFY LGA RECORD"
@34,8 say "6" +space(7) +"DELETE LGA RECORD"
@36,8 say "7" +space(7) +"EDIT SALE RECORD"
@38,8 say "8" +space(7) +"DELETE SALE RECORD"
@40,8 say "9" +space(7) +"MODIFY SUPPLY RECORD"
@42,8 say "10" +space(7) +"DELETE SUPPLY RECORD"
@44,8 say "11" +space(7) +"QUIT"
Choice = space(1)
@46,4 say "ENTER A TASK CODE:" get choice pict '!'
read
Do Case
     Case choice = 1
      Do LGA
     Case choice = 2
       Do sale
     Case choice = 3
       Do Supply
     Case choice = 4
       Do AddLGA
     Case choice = 5
       Do LGAEDIT
     Case Choice = 6
       Do DeletLGA
     Case choice = 7
       Do editsale
     Case choice = 8
       Do Delesale
```

```
Case choice = 9
  Do Editsup
Case choice = 10
  Do Delesupp
Case choice = 11
  Do Exit
ENDOCASE
     ENDDO
      CLEAR
          RETURN.
```

DATA CAPTURE FOR LGA
LGA. PRG

```
Set talk off
 clear
Use LGA.DBF
@3, 4 to 20, 45 DOUBL
@4, 15 say "DATA ENTRY FOR LGA"
@5,15 to 5,33 DOUBL
     Do While .T.
     APPEND BLANK
 @6,15 say "LGA CODE:" get LG-Code
 @8, 15 say "LGA NAME:" get LG-Name
 @10,5 say "LGA HEADQUARTER:" get LG-HEADQUARTER
 @12,10 say "SUB-STATION/CENTRE:"get S-CENT
  Read
   Choice = space (1)
 @14,3 say "DO YOU WANT TO ENTER MORE LGA?(Y/N):"
 @14,42 get choice pict "@"
    Read
  If choice = "Y"
   Loop
  If choice = "N"
    Exist
     Endif
   Endif
  Repl LGCODE with LG-CODE, LGNAME with LG_NAME
  Repl LGHQTER with LG-HQTER, SCENTER with S-CENT.
   ENDDO
    RETURN.
```

DATA CAPTURE FOR LGA
LGA. PRG

```
Set talk off
 clear
Use LGA.DBF
@3, 4 to 20, 45 DOUBL
@4, 15 say "DATA ENTRY FOR LGA"
@5,15 to 5,33 DOUBL
     Do While .T.
     APPEND BLANK
 @6,15 say "LGA CODE:" get LG-Code
 @8, 15 say "LGA NAME:" get LG-Name
 @10,5 say "LGA HEADQUARTER:" get LG-HEADQUARTER
 @12,10 say "SUB-STATION/CENTRE:"get S-CENT
  Read
   Choice = space (1)
 @14,3 say "DO YOU WANT TO ENTER MORE LGA?(Y/N):"
 @14,42 get choice pict "@"
    Read
  If choice = "Y"
   Loop
  If choice = "N"
    Exist
     Endif
   Endif
  Repl LGCODE with LG-CODE, LGNAME with LG_NAME
  Repl LGHQTER with LG-HQTER, SCENTER with S-CENT.
   ENDDO
    RETURN.
```

EDITING/MODIFYING (OF) L.G.A. RECORD

LGAEDIT.PRG

```
 Use LGA
 LGCODE = LG-CODE
 LGNAME = LG-NAME
 LGHQTER = LG-HQTER
 SCENT = S-CENT
 LGCODE = SPACE (8)
   Do While .T.
   LGCODE = LG-CODE
     Do While .T.
     LGCODE = LG-CODE
  @3,5 say "ENTER LGA CODE:" get LG-CODE
     Read
LOCATE FOR LGCODE = LG-CODE
 If found()
  @5,2 say "LGA CODE:" get LG-CODE
  @7,10 say "LGANAME:" get LG-NAME
  @9,4 say "LGA HEADQUARTER:" get LG-HQTER
  @11,2 say "SUB-SATATION/CENTRE:" get S-CENT
     ELSE
  @12,2 say "RECORD NOT FOUND"
   ENDIF
  ANS = Space (1)
  @14,2 say "DO YOU WANT TO EDIT MORE RECORD?(Y/N):"
  @14,44 get ANS Pict ' '
   Read
    If ANS = 'Y'
   CLEAR
  LOOP
    ENDIF
  If ANS = 'N'
   EXIST
    ENDIF
  ENDDO
   RETURN.
```

```
SCE-NAME = Space (30)
SEC-CODE = Space (10)
I CODE = Space (10)
INAME = Space (35)
ICODE = Space (8)
DO WHILE .T.
@19,4 Say "CUSTOMER NAME: 'get C/NAME
@20,4 Say "CUSTOMER ADDRESS:" get C/ADD
READ
STORE 0 TO ITQPUR, FTQPURD,HTQPURD,FTSALES, ITSALE,HTSALE,TQPUR,TTSAL ,
DO WHILE .T.
@21,4 Say "SECTION CODE:" get SEC-CODE
@23,4 Say "SECTION NAME:" get SEC-NAME
@25,4 Say "ITEM CODE:" get ICODE
@27,4 Say "ITEM NAME:" get INAME
@28,35 Say "PRICE PER ITEM:" get IPRICE PICT "999999999"
@29,4 Say "OPENING BALANCE:" get O/BAL  PICT "999999999"
  ANS = SPACE (1)
@30,4 Say "DO YOU WANT ITEM FROM ANOTHER SECTION?(Y/N):get ANS PICT(!)
Read
 If ANS ="Y"
  LOOP
 ENDIF
 @32,4 Say "TOTAL QUALITY PURCHASED:get TQPUR PICT "99999999"
  Read
 If  ANS = "N"
 EXIT
  ENDIF
 AMOUNT = IPRICE*NO-PURC
   AMFER = AMOUNT
   AMPEST = AMOUNT
   AMHERB = AMOUNT

DO CASE
 CASE INAME = FERT .AND. INAME = PEST
 TAM = AMFERT + AMPEST
  CASE INAME = FERT .AND. INAME = HERB
 TAM=AMFER +AMHERB
 OTHERWISE
 TAM= AMPEST + AMHERB
ENDASE
 TQPUR = TQPUR + NO-PURC
 C/BAL = O/BAL - Q-SOLD
 O/BAL = Q-TRANS + Q-HAND
 TTSAL = TTSAL+SALES
 FTSALE = FTSALE+AMOUNT
 ITSALE = HSTSALE+AMOUNT
 HTSALES = HTSALE+AMOUNT
 ITQPUR = FTQPUR+NO PURC
 FTQPURC = FTQPUR+NO PURC
 HTOPUR = FTQPUR+NO PURC
   ENDDO
```

EDITING/MODIFYING (OF) L.G.A. RECORD

LGAEDIT.PRG

```
 Use LGA
 LGCODE = LG-CODE
 LGNAME = LG-NAME
 LGHQTER = LG-HQTER
 SCENT = S-CENT
 LGCODE = SPACE (8)
   Do While .T.
   LGCODE = LG-CODE
     Do While .T.
     LGCODE = LG-CODE
  @3,5 say "ENTER LGA CODE:" get LG-CODE
     Read
LOCATE FOR LGCODE = LG-CODE
 If found()
  @5,2 say "LGA CODE:" get LG-CODE
  @7,10 say "LGANAME:" get LG-NAME
  @9,4 say "LGA HEADQUARTER:" get LG-HQTER
  @11,2 say "SUB-SATATION/CENTRE:" get S-CENT
     ELSE
  @12,2 say "RECORD NOT FOUND"
   ENDIF
  ANS = Space (1)
  @14,2 say "DO YOU WANT TO EDIT MORE RECORD?(Y/N):"
  @14,44 get ANS Pict ' '
   Read
    If ANS = 'Y'
   CLEAR
  LOOP
    ENDIF
  If ANS = 'N'
   EXIST
    ENDIF
  ENDDO
   RETURN.
```

```
DELETING OF LGA RECORD
 DELETLGA.PRG

Set talk off
Clear
Use LGA
Do WHILE .T.
   LgCODE = Space(8)
@3,5 say "L.G.A CODE:" get LG-Code
LOCATE FOR LGCODE = LG-CODE
IF .NOT. FOUND ()
@14,2 say "RECORD NOT FOUND"
@ 4,3 Say "L.G.A CODE:"get LG-CODE
@6,17 Say L.G.A NAME:" get LG-NAME
@8,3 Say "L.G.A HEADQUARTERS:" get LG-HQTER
@10,20 Say "Sub STATION/CENTRE:" get S.CENT
CLEAR GET
ANS = '  '
@12,2 Say "TO DELETE THIS RECORD? (Y/N):"get ANS PICT '@!'
Read
If ANS = "Y"
   DELETE
 @14,5 Say "RECORD IS MARKED FOR DELECTION"
 ENDIF
IF  ANS = "N"
@16,3 Say"PRESS 'D'TO COMPLETE DELETE OR 'R'TO UNMARK FOR RECORD"
ENDIF
Choice  = space (1)
@18,2 Say "ENTER YOUR CHOICE (D/R):" get choice pict '!'
Read
If choice = 'D'
 PACK
ELSE
 RECALL
ENDIF
  Choice = space(1)
@20,2 Say"DO YOU WANT TO DELETE ANOTHER RECORD?(Y/N):"get choice
pict '!'
Read
 If choice = 'y'
  Loop
 ELSE
     EXIT
  ENDIF
REPL LGCODE with LG-CODE, LGNAME with LG-NAME, SCENTER with S-CENT
 ENDDO
RETURN
```

VIEWING LGA RECORD
VIEWLGA.PRG

```
Set talk off
 Use LGA
LGCODE = LG-CODE
LGNAME = LG-NAME
LGHQTER = LG-HQTER
SCENTER = S-CENT
LGCODE = Space (8)
DO WHILE .T.
  LGODE = LG-CODE
@3,5 Say "ENTER L.G.A. CODE:" get LG-CODE
read
LOCATE FOR LGCODE = LG-CODE
IF .NOT. FOUND ()
@5,6 Say "RECORD NOT FOUND"
  ELSE
@6,24 Say "LGA CODE:" get LGCODE
@8, 4 Say "LGA NMAE:" GET LG-CODE
@10,16 Say "LGA HEADQUARTER:" get LGHQUTER
@12,3 Say "SUB STATION/CENTRE:" get SCENTRE
 READ
  ENDIF
REPL LGCODE with LG-CODE, LGNAME with LG-NAME,
REPL LGHQTER with LG-HQTER, SCENTER with S-CENT
```

PROGRAM TO CALCULATE SALES

SALE.PRG

```
Set talk off
 Clear
SELE A
 USE SALES
 USE INVENT
@2,3 Say "WELCOME TO COMPUTERISED STOCK"
@10,3 TO 35,65 DOUBLE
@12,15 Say NIGER STATE ADP"
@13,15 TO 13,29 DOUBLE
@15,17 Say "SALES FORM"
@16,45 Say "DATE:" get D to C (MDATE)
@16,17 to 16, 26 DOUBLE
@18,4 Say "SUB HEAD NUMBER OF CODE (OR 'X' TO EXIT):"get H/NO PICT"9999999"
Read
 If H/NO = "X"
   Exit
 Endif
C/NAME = Space (45)
C/ADD = Space (50)
```

```
ENDDO
   RETURN


DELIVERY /SUPPLY

SUPPLY.PRG

Set talk off
 clear
  use invent
@ 1,1 TO 50, 55 DOUBLE
@2,3 Say "WELCOME TO COMPUTER APPLICATION TO STOCK CONTROL"
@3,3 Say"ON AGRO-CHEMICAL PRODUCTS, NSADP DESIGNED AND"
@4,3 Say "DEVELOPED BY AMOSA ADISA ABDUL-LATEEF"
@5,3 Say"PRESS ANY KEY TO CONTINUE"
@7,16 Say "NIGER STATE ADP"
@8,16 TO 8,30 DOUBLE
@10,20 Say "SUPPLY/DELIVERY"
@12,30 Say "DATE:" get D TO C (MDATE)
@13,5 Say "ENTER DELIVERY CODE (OR 'X' TO EXIT):"
@13,35 get mcode pict "@!"
 Read
If mcode = 'x'
   EXIT
 ENDIF

mdate = Space (8)
Date = mdate

DO WHILE .T.
@14,5 Say "SECTION CODE:" get SEC-CODE PIC "999999999"
@16,5 Say SECTION NAME:" get SEC-NAME
@18,5 Say "ITEM CODE:" get ICODE PICT "99999999999"
@20,9 Say "ITEM NAME:" get INAME PICT "99999999999"
@22,14 Say "SUPPLIER NAME:" get SUP-NAME
@24,20 Say "QUANTITY SUPPLIED:" get QTY-SUP PICT "9999999999"
@26,5 Say "SUPPLIER ADDRESS:" get SUPP-ADD
@28,25 Say "OPENING BALANCE:" get Q-STOCK PICT "99999999"
@30,10 Say "UNIT PRICE:" get UN-PRICE PICT "999999999"
@32,30 Say"RECORDER POINT IN PERCENTAGE:" get RE-POINT PICT"999999"
@34,5 Say "RECEIVING OFFICER NAME:" get OFF-NAME
@36,4 Say "RANK:" get IRANK
@39,35 Say "SEX:" get RSEX
@40,10 Say "GRADE LEVEL:" get GL
@41,36 Say "EXPIRING DATE:" get mdate
@42,4 Say "QUANTITY SOLD:" get Q-SOLD PICT"9999999999"
Read
ST-OPEN = Q-STOCK + QTY-SUP
ST-BAL = Q-STOCK - Q-SOLD
TOT-COST = Q-STOCK * UN-PRICE
  Choice = Space (1)
```

```
@44,4 Say "IS THE PRODUCT ON TRANSFER? (Y/N):" get choice pict "@"
 If choice = "y"
@46,4 Say "FROM WHICH LGA?:" get LGNAME
@47,20 Say "HEADQUATER OF THE LGA?: get LG-HQTER
@48,6 Say "SUB-CENTRE/STATION:" get S-CENT
@49, 15 Say "QUANTITY ON TRANSFER:" get Q-TRANS pict "999999"
@49,48 Say "SECTION CODE:"get SECODE PICT "9999999"
@50,48 Say "SECTION NAME:" get SEC-NAME
@51,4 Say "ITEM CODE:" get INCODE PICT "999999999"
@51,20 Say "ITEM NAME:" get INAME
@52, 4 Say "QUANTITY AT HAND:" get Q-HAND PICT "999999999"
@53,25 Say "HOW MANY DAMAGED:" get HDAMA PICT "99999999"
@53, 5 Say "TRANSFER TO WHICH SUB CENTRE/STATION:"get LG-TRAN
 ENDIF
  IF choice  = "N"
 EXIT
  ENDIF
 RPERCENT = ST.BA/Q-STOCK * 100
  If REPERCENT = RE-POINT
@55,4 Say "YOU ARE AT RECORDER POINT:" get RE-POINT
@57,4 Say "RECORDER QUICKLY"
 ENDIF
REPL QTYTRANS WITH Q-TRANS, REOPERC WITH RPERCENT
REPL Date with mdate, Seccode with SEc-code, Sec-name with secname
REPL ITEMCODE WITH ICODE, ITEMNAME WITH NAME, SUPNAME WITH SU-NAME
REPL QTYSUP with QTY-SUP,SUPPPADD with Supp-ADD,QSTOCK with Q-STOCK
REPL UNPRICE with UN-PRICE,Repoint with Re-POINT,OFFNAME with Off-Name
REPL RANK with IRANK, SEX with RSEX, GLEVEL with GL,QSOLD with Q-SOLD
REPL STOPEN with ST-OPEN, STBAL with ST-BAL, TOTCOST with TOT-COST
REPL SCENTER with S-CENT, LGHQTER with LGHQTER, LGNAME with LG-NAME
REPL QHAND with Q-HAND, DAMAGE with HDAMA, LGTRANS with LG-TRAN
ENDDO
 RETURN.


EDIT SALE.PRG

Set talk off
Use sale
 C/NAME = Space (40)
 C/ADD = Space (50)
SEC-CODE = Space (8)
SEC-NAME = Space (30)
ICODE = Space (8)
INAME = Space (35)

DO WHILE .T.
ITEMCODE = ICODE
@3,5 Say "ENTER ITEM CODE:" get ICODE
 Read
 LOCATE FOR ITEMCODE = ICODE
```

```
  IF .NOT. FOUND ()
@5,6 Say "RECORD NOT FOUND"
ELSE
@7,10 Say "CUSTOMER NAME:get C/NAME
@9,3  Say "CUSTOMER ADDRESS: get C/ADD
@11,3 Say "SECTION NAME:" get SEC-NAME
@12,15 Say "ITEM CODE:" get SEC-CODE PICT "999999999"
@13,15 Say "ITEN NAME:" get INAME PICT "999999999"
@14, 15 Say "PRICE PER ITEM:" get IPRICE PICT "999999999"
@15, 43 Say "NUMBER PURCHASED:" get NO-PURCH PICT "99999999"
 ENDIF
 ANS = Space (1)
@16,5 Say "DO YOU WANT TO EDIT MORE RECORD? (Y/N):" get ANS PICT'!'
 Read
IF ANS = "Y"
 CLEAR
 LOOP
ENDIF
IF ANS = "N"
EXIT
IF ANS = "N"
EXIT
 ENDIF
ENDDO
 RETURN

DELESALE. PRG
Set talk off
 Clear
USE SALE
DO WHILE .T.
ITEMCODE = ICODE
@ 4,3 Say "CUSTOMER NAME:" get C/NAME
@ 6,5 Say "CUSTOMER ADDRESS:" get C/ADD
@ 8,3 Say "SECTION NAME:" get SEC-NAME
@ 11,5 Say "SECION CODE:" get SEC-CODE PICT "999999999"
@ 12,30 Say "ITEM NAME:' get INAME
@ 13,5 Say "PRICE PER ITEM:" get IPRICE PICT "9999999"
@ 14,32 Say "NUMBER PURCHASED:" get NO-PURCH PICT "9999999"
        CLEAR GE, is
       ANS = '!'
@ 16,5 Say "TO DELETE THIS RECORD?(Y/N):" get ANS PICT '@'"
read
IF ANS ="Y"
   DELETE
@ 18,5 Say "RECORD IS MARKED FOR DELETION"
  PICT '!' ENDIF
  IF ANS = 'N'
@ 20,5 Say "PRESS 'D' TO COMPLETE OR 'R' TO UNMARK THE RECORD"
ENDIF
 CHOICE = SPACE (1)
@ 22,2 Say "ENTER CHOICE (D/R):" get CHOICE PICT '!'
```

```
  READ
IF CHOICE ='D'
  PACK
ELSE
   RECALL
ENDIF
   CHOICE = SPACE (1)
@ 24,4 Say "DO YOU WANT TO DELETE ANOTHER RECORD?(Y/N):" PICT '!'
  READ
IF CHOICE = "Y"
  LOOP
ELSE
EXIT
ENDIF
REPL CUSNAME WITH C/NAME, CUSADD with C/ASS, SECNAME with SEC-NAME
REPL SECCODE with SEC-CODE,ITEMCODE with ICODE, ITEMNAME with INAME
REPL ITEMPRICE with IPRICE, QTYPUR with NO-PURC.
ENDDO
RETURN.
```

```
     EDITSUP. PRG.
Set talk off
Use supply
DO WHILE- T
 ITEMCODE = ICODE
@ 3,5 Say " ENTER ITEMCODE:" get ICODE
 READ
LOCATE FOR ITEMCODE = ICODE
IF FOUND
@ 5,3 Say "SECTION CODE =" get SEC-CODE PICT "9999999"
@ 5,35 say "SECTION NAME:" get SEC-NAME
@ 7,5  Say "ITEM CODE:"    get I CODE PICT "9999999"
@ 7,30 Say "ITEM NAME:"   get INAME
@ 8,3  Say "SUPPLIER NAME:" get Sup-NAME
@ 9,3  Say "QUANTIY SUPPLIED:" get QTY-SUP PICT "9999999"
@ 9,35 Say "OPENING BALNCE:"  get Q-STOCK PICT "9999999"
@ 10,5 Say "SUPPLIER ADDRESS:" get SUPP-ADD
@ 11,5 Sy  "QUANTITY SOLD:" get Q-SOLD PICT "9999999"
@11,35 Say "UNIT PRICE:" get UN-PRICE PICT "9999999"
@ 12,3 Say "RECIEVING OFFICER NAME:" get OFF-NAME
@ 13,5 Say "RANK:" get IRANK
@ 13,40 Say "SEX:" get RSEX
@ 14,3  SAY "GRADE LEVEL:" get GL PICT "9999999"
@ 14,30 Say "EXPIRING DATE:" get mdate
@ 15,4  Say "QUANTITY TRANSFERED:" get Q-TRANS PICT "9999999"
@ 15,30 Say "FROM WHICH LGA?:" get LG-NAME
@ 16,3  Say "HEADQUARTER OF SUCH LGA:" get LG-HQTER
@ 16,3  Say "SUBCENTRE/STATION:" get S-CENT
@ 18,3 Say "TRANSFER SECTION CODE:" get SEC-CODE PICT "9999999"
@ 18,32 Say "SECTION NAME:" bet SEC-NAME
@ 19,3  Say "TRANSFER ITEM CODE:" get ICODE PICT "9999999"
@ 19,35 Say "TRANSFER ITEM NAME:" get INAME
@ 20,3 Say "QUANTITY AT HAND:" get Q-HAND PICT "9999999"
@ 21,3 Say "DAMAGE OF QUANTITY TRANSFER:" get HDAMA PICT "9999999"
@ 22,3 Say "TRANSFER TO WHICH CENTRE:" get LG-TRAN
  READ
ELSE
@ 24,3 Say "RECORD NOT FOUND"
   ENDIF
  CHOICE = SPACE (1)
@ 26,3 Say "DO YOU WANT TO EDIT MORE?(Y/N):" get choice PICT '!'
  read
IF CHOICE ='Y'
   CLEAR
   LOOP
ENDIF
IF CHOICE = "N"
   EXIT
ENDIF
REPL QTYTRANS WITH Q-TRANS, REOPERC WITH RPERCENT,
REPL Date with mdate, SECCODE with SEC-CODE,
```

```
REPL SECNMAE with SEC-NAME,ITEMCODE with ICODE, ITEMNAME with INAME
REPL SUPNAME with SUO-NAME, QTYSUP with QTY-SUP
REPL SUPPADD with SUPP-ADD,QSTOCK with Q-STOCK,UNPRICE with UN-PRICE
REPL REPOINT with RE-POINT, OFFNAME with OFF-NAME, RANK with IRANK,
REPL SEX with RSEX,GLEVEL with GL,QSOLD with Q-SOLD, STOPEN with ST-OPEN,
REPL STBAL with ST-BAL, TOTCOST with TOT-COST, SCENTER with S-CENT
REPL LGHQTER with LG-HQTER, LGNAME, QHAND with Q-HAND,
REPL DAMAGE with HDAMA, LGTRANS with LG-TRAN.
ENDDO
RETURN


    DELESUPP. PRG.
      Set talk off
      Clear
     USE SUPPLY
     DO WHILE 'T'
 ITEMCODE =ICODE
@ 5,3 Say "SECTION CODE:" get SEC-CODE PICT "9999999"
@ 5,35 Say "SECTION CODE:" get SEC-NAME
@ 7,5  Say "ITEM CODE:" get ICODE PICT "9999999"
@ 7,30 Say "ITEM NAME:" get INAME
@ 8,3  Say "SUPPLER NAME:" get SUPP-NAME
@ 9,3  Say "SUPPLIER ADDRESS:" get SUPP-ADD
@ 10,3 Say "QUANTITY SUPPLIED:" get QTY-SUPP PICT "9999999"
@ 10,35 Say "OPENING BALANCE:" get Q-STOCK PICT "9999999"
@ 11,3  Say "QUANTITY SOLD:" get Q-SOLD PICT "9999999"
@ 11,35 Say "UNIT PRICE:" get UN-PRICE PICT "9999999"
@ 12,3  Say "RECEIVING OFFICER:" get OFF-NAME
@ 13,3  Say "RANK:" get IRANK
@ 13,45 Say "SEX:' get RSEX
@ 14,3  Say "GRADE LEVEL:" get GL PICT "9999999"
@ 14,30 Say "EXPIRING DATE:" get mdate
@ 15,3  Say "QUANTITY TRANSFER:" get Q-TRANS PICT "9999999"
@ 15,35 Say "FROM WHICH LGA:" get LG-NAME
@ 16,3  Say "SUB CENTRE/STATION:" get S-CENT
@ 17,3  Say "TRANSFER SECTION CODE:" get SEC-CODE PICT "9999999"
@ 17,35 Say "SECTION NAME:" get SEC-NAME
@ 18,3  Say "TRANSFER ITEM CODE:" get ICODE PICT "9999999"
@ 18,35 Say "TRANSFER ITEM NAME:" get INAME
@ 19,3  Say "QUANTITY AT HAND:" get Q-HAND PICT "9999999"
@ 19,35 Say "DAMAGE OF QUANT. TRANSFER:" get HDAMA PICT "9999999"
@ 20,3  Say "TRANSFER TO WHICH LGA?:" get LG-TRANS
        CLEAR GETS.
        ANS = '!'
@ 23,5  Say "TO DELETE THIS RECORD?(Y/N): get ANS PICT "@!"
        READ
        IF ANS = "Y"
        DELETE
@ 25,3 Say "RECORD IS MARKED FOR DELETION"
       ENDIF
       IF ANS = "N"
```

```
@ 27,3 Say "PRESS'D' TO COMPLETE DELETION OR "R" TO UNMARK THE REC
ENDIF
@ 29,3 Say "ENTER CHOICE (D/R):" get choice PICT '1'
       READ
       IF CHOICE = 'D'
          PACK
       ELSE
         RECAL
       ENDIF
       CHOICE = SPACE (1)
@ 31,3 Say "DO YOU TO DELETE ANOTHER RECORD?(Y/N):" PICT '!'
       READ
       IF CHOICE ='Y'
        LOOP
      ELSE
         EXIT
ENDIF
ENDDO
RETURN.


SALES REPORT
SALEREPT. PRG.

SET TALK OFF
SAY CLEAR
USE
SALE
@ 1,1 Say "WELCOME TO COMPUTER APPLICATION STOCK CONTROL ON AGRO-
CHEMICAL PRODUCTS"
@ 2,1 Say "NIGER STATE ADP, MINNA. DESIGNED AND DEVELOPED BY"
@ 3,20 Say "AMOSA A. ABDUL-LATEEF"
@ 4,3 Say "A PGD COMPUTER PROJECT SUBMITTED TO THE DEPT. OF
MATHS/COMPUTER SCE, F.U.T MINNA"
@ 5,35 Say "MARCH, 1998.
@ 8,3 Say "NIGER STATE AGRICULTURAL DEVELOPMENT PROJECT, MINNA
@ 10,17 Say "REPORT ON AGRO-CHEMICAL PRODUCTS.
@ 11,17 TO 11,48 DOUBLE.
@ 12,3 Say "ZONE:.........................."
@ 13,40 Say "Date ........................." get mdate.
@ 15,8 Say "INSECTICIDES"
@ 15,25 Say "FERTILIZER"
@ 15,35 Say "HERBICIDES"
@ 15,8 TO 15,45 DOUBLE
@ 16,10 Say "ULTRACIDES"
@ 16,27 Say "COMPOUND"
@ 16,37 Say "DUAL"
@ 18,10 Say "S/NO"
@ 18,15 Say "QNT"
@ 18,22 Say "SALES(₦)"
@ 18,30 SAY "QNT"
@ 18,35 Say "SALES (₦)"
```

```
@ 18,50 Say "QNT"
@ 18,56 Say "SALES (₦)"
@ 18,66 Say "itemcode"
@ 18,7  REPLICATE ("**",56)
    S/NO =0
    R = 21
 DO WHILE NOT. EOF ( )
    S/NO = S/NO +1
ITEMCODE = ICODE
SECNAME = SEC-NAME.
SECCODE = SEC-CODE


@ R, 12 Say S/NO PICT "9999"
@ R, 16 Say NOPURC PICT "99999"
@ R, 24 Say AMOUNT PICT "999999"
@ R, 32 Say NO PURC PICT "999999"
@ R, 37 Say AMOUNT PICT "9999999"
@ R, 53 Say NOPURC PICT "9999999"
@ R, 68 Say ITEMCODE PICT "999999"
     R= R+1
  IF S/NO = 30
@ 19,1 CLEAR TO 29,68
@ R, 3 Say "TOTAL SALE"
@ R,16 Say I TQP UR
@ R,24 Say ITSALE
@ R,32 Say FTQPUR
@ R,37 Say FTSALE
@ R,53 SAY HTQPUR
@ R,58 Say HTSALE
  ENDIF
  IF S/NO = 57
@ R,1 Say "RECEIVED"
@ R,16 Say IQTYSUP
@ R,32 Say FQTYSUP
@ R,53 Say HQTYSUP
@ R,1 Say "TRANSFERED"
@ R,16 Say IQTRAN
@ R,32 Say FQTRAN
@ R,53 Say HQTRAN
  ENDIF
  ENDDO
  RETURN.
```