

**APPLICATION OF DATA BASE  
MANAGEMENT SYSTEM TO THE AGRICULTURAL  
MARKET INFORMATION SYSTEM PROJECT  
OF THE FEDERAL MINISTRY OF AGRICULTURE AND  
RURAL DEVELOPMENT**

BY

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## **APPROVAL PAGE**

This project has been read and approved for the award of Post Graduate Diploma in Computer Science of the Federal University of Technology, Minna, Niger State, Nigeria.

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## **DEDICATION**

This project is dedicated to God the Father, God the Son and God the Holy Spirit.



## ACKNOWLEDGEMENT

I am most grateful to the Almighty God who has opened my eyes to see the need to undertake this course. I am also very grateful to Him for the protection and courage He has given me to finish the course. May His Name be glorified forever and ever in Jesus Name, Amen.

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## ABSTRACT

The goal of this project is to solve the existing problem associated with data input, analysis, summarization and presentation relating to the Agricultural Market Information System Project at the Federal Ministry of Agriculture and Rural Development, Abuja.

As a way of achieving this, a survey of the current manual system being used is carried out using a number of techniques and all the respondents consented to the fact that the current manual system in operation should be changed to computerized system based on a number of reasons.

In view of the above, a computer software called **DATABASE MANAGEMENT SYSTEM (DBMS)** using Dbase IV is developed as a substitute to the existing system. The software, no doubt, will go a long way in ensuring the high standard of the output of Agricultural Market Information System Project both in content and in scope.

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# CHAPTER ONE

## 1.0 INTRODUCTION

1.1 The Federal Ministry of Agriculture and Rural Development came into existence in the year 1966. It was created to play a leading role in the national agriculture policy formulation and general development and It was then known as Federal Ministry of Agriculture and Natural Resources with five operational Departments which are Fisheries, Agriculture, Produce inspection, Forestry, Agricultural Research and Veterinary Research. The Ministry was so much directly involved in the agricultural activities between 1970 and 1984 to the extent that it created so much special programmes and launched so many special projects during the period. However, with effect from 1985, it's role has been reduced from direct food production to policy formulation, provision of infrastructures and creating enabling environment for farming activities. The Federal Government policy on disengagement from direct food production is therefore aimed at self-reliance and self – sufficiency in food and Agricultural production. In this regard, agriculture, been essentially a private sector affair, will rely more on the private sector for food production, intra – and inter – seasonal stabilization of food stocks and prices through appropriate storage structures well managed. The Government is thus left to play stimulatory and policy



formulation role while ensuring a conducive environment for investment. This will assist tremendously towards achieving national food security level. Today, the Ministry has twelve Departments which are:

- i Department of Agriculture;
- ii Department of Livestock and Pest Control Services
- iii Department of Fisheries;
- iv Department of Agricultural Land Resources;
- v Department of Agricultural Sciences
- vi Department of Cooperatives
- vii Department of Strategic Grains Reserve
- viii Department of Fertilizer;
- ix Department of Planning, Research and Statistics;
- xi Department of Finance & Accounts
- xii Departments of Administration;

It also has some other functional Institutions which compliment the role of the twelve operational Departments mentioned above. These are:

- i. The Nigerian Agricultural Cooperatives and Rural Development Bank (NACRDB);
- ii. Nigerian Agricultural Insurance Corporation (NAIC)
- iii. Agricultural and Rural Management Training Institute (ARMTI), Ilorin;

- iv. National Centre for Agricultural Mechanization (NCAM), Ilorin;
- v. 15 Agricultural Research Institute.

## 1.2 **MARKET INFORMATION SYSTEM (MIS)**

The catastrophic famines in Africa in the 1980's has resulted in an international response in terms of food aid, relief programmes and projects rehabilitation. There had also been a corresponding interest in the gathering of data on food supply to provide a background for early warning systems which would alert governments, international agencies and food donors to a potential emergency situation. It was these circumstances that opened the eyes of the Governments to the fact that accurate and above all, timely information on food supply is critical for policy formulation as well as emergency planning. It was in view of this that the Commonwealth Secretariat was specifically requested by the Commonwealth Heads of Government meeting in Vancouver in 1987 to strengthen its assistance programmes in the areas of food security and information systems in Africa. This consequently led to the evolution of Market Information System Project in the Federal Ministry of Agriculture in 1988. It involves the following:



- (a) Periodic collection of prices of selected food items;
- (b) Determination of market arrivals;
- (c) Estimation of planting materials, their quality/extent of deterioration, etc
- (d) Estimation of stock at farm, state and national levels for food security system;
- (e) Timely collection of current information market prices at various locations (both rural and urban).

The initial take-off of the project was from five pilot states. The number of states covered was later increased to 14 and then to 21 and finally to the 36 states of the Federation including the Federal Capital Territory.

The Food Market Information Dissemination Service was developed to assist in the National Food Security and Storage System aimed at creating 1,000,000 tonnes of storage capacity. The service is to provide routine information on inventories and stocks, market trends, spots and future prices of basic staples for purpose of inter- and intra- seasonal stabilization of food stocks and prices. In addition it is to assist in the free flow of farm produce from surplus producing areas to food deficit states on the assumption that there is one Nigerian food market with no barrier to entry or free flow of food stuff across the states boundaries, hence reducing food wastages to the

barest minimum.

Market Information System (MIS) refers to fact-finding exercise which is necessary, because:-

- i. It provides a catalogue of information on agriculture that will be subsequently useful for planning purposes.
- ii. It enhances the creation of more market facilities in the area with high food production;
- iii. It affords the Government the opportunity to periodically review and study prices and production costs of various agricultural commodities to serve as a realistic basis for monitoring their trends relative to non-agricultural commodities;
- iv. It is an avenue for dissemination of up-to-date information on general development in the agricultural sector;
- v. It is a medium for comparing the general trends of prices of agricultural commodities, monthly and on inter – state bases as the case may be;
- vi. It is an essential component of Crop Monitoring, Early Warning and Food Security Systems.



### 1.3 **METHODOLOGY OF MIS PROJECT**

Periodic collection of prices of some food items is being undertaken by officers of the Field Projects Monitoring Units (FPMUs), Projects Coordinating Units (PCU), Agricultural Development Projects (ADP), Federal Department of Fisheries and Federal Department of Livestock and Pest control Services. These information are usually transmitted to the Department of Planning, Research and Statistics of Federal Ministry of Agriculture and Rural Development. Data so transmitted to the Department include names of agricultural commodities, unit of measurement of each crop/product i.e 1 Kilogram, or the standard measure (1litre) of palm oil and groundnut oil retail price of each crop/product from Rural and Urban markets of each state as well as markets surveyed.

For good representation, each Field Projects Monitoring Unit collects the relevant data from a minimum of four different markets (two rural and two urban).

Each Field Project Monitoring Unit (FPMU) has been requested to "radio in" or turn in data set (Prices/unit) of each of the selected food items to the Planning, Research and Statistics Department through either Radio messages or post offices. The radio operator is given pre-printed forms on which the "radio-



in" information is recorded. This is the fastest mode of price data collection from the states. This system piles up to sampling frame for continuous flow of data (price trends) for major agricultural commodities in terms of:

(a) Consumer Crops

- i. - Retail prices
- ii. - Market Prices
- iii. Farm gate prices

(b) **Export crops**

No attention is paid to this as at now. Crops in this class may be included in our sampling frame as time goes on. This exercise however focuses on price trends of major food commodities in the country. This is to determine the effects of price increase on the general well being of the populace with a view to advising the Government. Hence, the emphasis is on basic food staples.

#### 1.4 **MARKETING EFFICIENCY ANALYSIS**

The scope for government intervention in marketing is determined by the efficiency and costs of performing the basic marketing functions. If high cost exist, Government interventions can lower them. If serious inefficiency exists,

Government policies might improve competitiveness or provide direct competitive standards. Either way, the first task for analysis is to identify empirically the high costs or inefficiencies.

Marketing efficiency can be analysed by comparing seasonal price rises with costs of storage and by correlating market prices in different locations. More extensive analysis focuses on the full marketing margin between farmers and consumers. Seasonal price analysis tests the effectiveness of arbitrage overtime. Prices of food crops typically follow a seasonal pattern, falling immediately after harvest and rising thereafter until the next harvest as farmers and traders store some supplies to meet consumer demand throughout the year. In a competitive market, the seasonal price rise should just cover the costs of storage, which consists of interest charges on working capital tied up in the form of store commodities, provision for commodity losses, the costs of labour and facilities used in storage, and normal profits (including risk – bearing).

By comparing monthly price rises with monthly costs of storage, analysis can test whether there are excess profits in the storage functions. The monthly price rises are derived from an index of wholesales prices, which are usually calculated by the average monthly percentage of a twelve – month moving



average. This version of price analysis seeks to identify excess profits in the storage cost portion of the marketing margin. Even if data or storage costs are not available, much insight into the time dimensions of the food marketing system can be gained by contrasting seasonal price indexes for the main food crops.

Intermarket price correlations can also provide insights into price movements. Correlations of wholesale price can be calculated between pairs of markets to test market integration. A coefficient of 1.00 would indicate identical price movements in the two markets. A simple correlation coefficients of 0.90, for example, would mean that a very high percent of the variation in one price series is correlated with variations in the other price series. Because correlation coefficient are influenced by inflation and by very large seasonal price movements, it is best to choose periods for analysis in which inflation was moderate or to correct for the effects of inflation by correlating price changes rather than actual prices. The price changes are found by subtracting each monthly observation from the one preceding it to obtain first differences. The real purpose of intermarket price correlation analysis is to demonstrate that a domestic marketing system really does exist and that it serves to correct the food markets of various markets and towns.



To supplement such analysis, marketing margin analysis can also be investigated . Marketing margin is calculated as the difference between the retail price and the farm-gate prices. This calculation however assumes that the commodity is actually being marketed through the entire chain from farmer to retail consumer. This may be the right assumption during part of the year for several months after harvest, for instance. During other parts of the year, however, no commodities may be flowing from farmers to urban/market centres.

#### 1.5 **INTERNATIONAL PRICE ANALYSIS**

Marketing analyst can not be content when they understand how their domestic food markets work. Nearly all countries are connected either directly or indirectly to international food markets as well. These connections influence domestic price formation. International prices are also integral components of the social profitability analysis mentioned earlier.

Although, these prices are highly unstable and difficult to predict, information from forward contractors from major supplies can give some sense of how market participants view price trends for the near future. For planning horizons of a year or so, these futures and forward markets provide the best

information available on likely price trends. For the longer run, even future market are of little help to planners trying to determine the opportunity costs of investments to raise food production or to lower losses in storage or processing. When investments have payoffs several years in future, some sense of longer – run price trends in international markets is needed. One way of achieving this is simply to plot over time, the real prices of the commodity, averaged over a five or ten year period to eliminate year – to – year variations and see whether the trend is up or down. An alternative to such a simple approach, but one that must ultimately be consistent with the trends generated in the markets is to look at the basic supply and demand factors which generate equilibrium prices in world markets. It must be recognised when taking a supply – demand perspective that world markets for grains in particular, do not reflect world supply and demand conditions in total, but rather, the economic forces that clear a residual market after internal supply has been balanced against demand inside most countries borders.

The important questions that remains is whether international (border) price should be used as a standard of reference for social profitability analysis or for analysis of various price and trade policies. There will be different answers to this question



depending primarily on the time frame of analysis, and an important issue is how to distinguish short – run price fluctuations from long-run trends. For countries actively trading in international commodity markets, the question has a day – to – day immediate answer. Short – run international price fluctuations can be buffered to provide a more stable decision – making environment for domestic producers and consumers. But such buffering, whether done through physical storage of grain or trade policy and subsidies, is extremely expensive if domestic prices remain out of line with international prices for very long. At some point and the point depends on financial and logistical flexibility, domestic price policy faces strong pressures to conform to the opportunity costs of outside world.

To follow international market trends as an element of domestic food price policy, three components must be distinguished. These are:

- a. The short – run trends over several months that influence import purchases;
- b. The medium – run trends that affect consumer and producer prices;
- c. The long – run trends that affect government

investment decisions with regard to agricultural infrastructure and research.

Analysts can identify these trends by plotting moving averages of real (deflated) prices for the relevant period for decisions. Three – month, two – year, and five – or ten – year moving averages can provide simple and mechanical, yet persistent reminders that the long – run is made up of a sequence of short – runs.

These three trends reflect the different time horizons of government decisions that are closely tied to the world price. Whether to use grain from a buffer stock rather than to import grain is a relevant decision over a two – or three – month period, but probably not for a six – month period and almost certainly not for twelve or eighteen months. Similarly, consumer and producer prices can be stabilized for a year or perhaps two by using budgets subsidies or import duties to contract movements in world prices, but the budget costs mount and the distortions begin to get locked into the production and consumption patterns before very long. Long run government investment decisions therefore need a long – run perspective. Flexible financing arrangements and a carefully



managed buffer stock permit these multiple links between domestic and international prices to serve national food policy objectives.

To further these objectives, two types of analysis are needed. The first will look at the costs and benefits of price policies that use trade barriers or budget subsidies, or both, to place a wedge (or even an iron door) between domestic and international prices. The second is an analysis of policies aimed at narrowing marketing margins, especially, dampening seasonal movements in prices and reducing geographical differences. These policies are often implemented with government – operated buffer stocks supplemented by imports, if need be. Consequently, an understanding of efforts made to narrow marketing margins also provides insights into the potential usefulness of links between domestic and international prices. The second is an analysis of policies aimed at narrowing marketing margins, especially dampening seasonal movements in prices and reducing geographical differences. These policies are often implemented with government – operated buffer stocks supplemented by imports, if need be. Consequently, an understanding of efforts made to narrow marketing margins also provides insights into the

potential usefulness of links between domestic and international prices.

In summary, it is pertinent to say that food systems are complicated, and also that food policy is dependent on powerful macro-economic policies and on the international economy. The chances of choosing the wrong path are great because no invisible hand guides the policy makers, and good intentions are not guarantee of good results. Painful experience shows that uniformed policy making usually makes matters worse.

Very efficient and appropriate marketing analysis is therefore needed to improve the performance of government policy in this regard.



## **CHAPTER TWO**

### **2.0 DATA BASE MANAGEMENT SYSTEM**

#### **2.1 INTRODUCTION**

The terms information and data represent different things. So also, there is a difference between data and information models. Data elements represent unstructured facts while the information system will transform the data and present these facts accurately in a way relevant to the appropriate recipient, in the correct level of detail and when required.

#### **2.2 CONCEPT OF A DATA BASE**

A Database is an organised and integrated collection of data. For an example, a large collection of books owned by the local council is not yet a library until when, among other things, the books have been catalogued and cross-referenced so that they can be found easily and used for many purposes and by many readers. In the same way, a database is also expected to be used by a number of users very easily in a number of ways. It therefore has the following characteristics:

- i. It is a single collection of all data used by an organisation;
- ii. It is organised and structured in other than ordinary multiple-file form;

- iii. Its organisation permits access to any or all data quantities by all applications with equal ease;
- iv. Its organisation is such that duplication is minimized if not eliminated entirely;
- v. It involves the concept of separating the data definition from the applications programs and including it as part of the database;
- vi. It provides for the definition of logical relationships, which exist between various records in the database.

### **2.3 THE HISTORICAL DEVELOPMENT OF DATABASE**

The main store of early database management software was **COBOL**. The implementation was found to need a number of additions in the control of a report writer. A report writer is a program that provides facilities for editing totally and formatting and performing other related tasks. In addition, there were needs for powerful sort packages. A search for this led to the development of such packages and report writers which were handed in program report generation.

By late 1960s and early 1970s there was an improvement in data management as high level languages with file organisation merging to alleviate the mismerge between the increasing complex multitask into a retrieval system. The solution to the



problem of basic access method on operating system via sequential, direct, index sequential methods was developed. Data dependence became serious as well as increases in the problem relating records.

As a result of this, a file management system evolved. In file processing, environment data of the same type are grouped together into files with each file having its own application for processing of the data. With this kind of set-up, files and records are designed in such a way as to satisfy individual operational needs, thus, imposing an organisation barrier with regards to the data.

#### **2.4 DATABASE MANAGEMENT SYSTEMS (DBMS)**

A Database management system could be defined as the software package which manage large and complex file structures. It is the software that links integrated data of different types through a logical relationship. This software will store the data and the data relationships on the backing storage devices. It will also provide an effective means of retrieval of data when the applications require it. Efficient data retrieval may be accomplished by computer programs written in conventional programming languages such as **COBOL** and



**FORTRAN.** It can also be accomplished through the use of a query language which is designed for use by people who are not computer experts.

**DATABASE MANAGEMENT SYSTEM (DBMS)** make database available to a large number of users and the sharing of data can reduce the average cost of data access as well as avoiding duplicate and therefore possible inconsistent and irreconcilable data. Databases hold large amount of data and operations required on them are complex. Correspondingly, **DATABASE MANAGEMENT SYSTEM (DBMS)** are large, complex pieces of software. Users of databases do not directly access the database. Instead, they access DBMS which interprets the data requirements into accesses to the database, makes the accesses required, and returns the results to the user in the form that the user requires.

As earlier mentioned, data may be accessed using user-friendly query languages on VDUs or through user programs written in a conventional programming language such as COBOL or PL/1 which act as host languages. The subset of the host language, which is used to access the database, is usually called the

#### **DATA MANIPULATION LANGUAGE.**

These host languages are procedural and the programmer has



to know the set of logical procedures required to fulfil a particular request. This requires an in-depth knowledge of the language, but if the knowledge of the language, has been acquired, the request for database access need not be complicated. Query languages are usually non procedural and are usually suitable for untrained computer users and for adhoc enquiries in the database.

A useful distinction between programming languages and query languages is to look at the former as concerned with the **"How"** of an operation and the latter as being concerned with the **"What"**. One area of possible confusion is that query languages are badly named in that they do usually offer ways of updating the data as well as accessing it in the form of a query.

There are a number of formats for the interface between query languages and the user. Many use special commands, which are easily learnt. Others require the user to choose between options in a series of menus. These clearly make available the choices open to the untrained user, although they are consequently less flexible than some alternative ways of specifying user requirements.

Perhaps the user-friendly are those, which use a near natural language interface. However, there are a lots of "**false friends**" as natural language is ambiguous and computers require unambiguous input. Such systems presently require long and tedious clarification dialogues. Although, query languages can be easy to use and are usually geared towards fast response, they can be less flexible, perhaps rather limited and usually less efficient than conventional programming languages.

Many of the better DBMS provide a number of ways of access. This is surely a good thing as there are many types of users. Users can be untrained and intermittent in their use of the system. These casual users should not be required to be familiar with the system and usually do not want to be trained in its use. They should be encouraged by its ease of use. Skilled users may make daily use of the database and are usually willing to learn, simple syntax, though they are mainly concerned with the information that computers can give them, rather than the computer professionals who will apply their long experience as computer and database users, and be concerned about efficiency.



## 2.5 ADVANTAGES OF DATABASES

The database provides the data resource for the organization.

The DATABASE MANAGEMENT SYSTEM (DBMS) is the software, which manages this resource. In the 1970s, a number of large firms with mainframe computers adopted the database approach. There were a number of reasons for example to: -

Reduce data duplication and inconsistency and consequently increase its share ability.

Increase the speed in implementing systems.

Ease file access by programmers.

Increase the integrity of the data.

Improve the standards of the systems developers

Increase data independence.

Provide a management view of the organization.

1. **REDUCE DATA DUPLICATION:-** Large organizations, such as insurance companies, banks, local councils, and manufacturing companies, had for some time been putting large amounts of data onto the computer systems. Frequently the same data was being collected, validated, stored and accessed separately for a number of purposes. This data redundancy is costly and can be avoided, or at least reduced, by the use of a DBMS. (In fact, some data redundancy is reasonable in a database environment but should be

controlled). If the data is collected only once, and verified only once, there is little chance of inconsistency, with conventional files, the data is often collected at different times and validated by different validation routines, and therefore the output produced by different systems could well be inconsistent. With reduced data duplication, data can be shared but it is essential that good integrity and security features operate in such systems. Furthermore, each application should run unaware of the existence of others using the database. The computer system must therefore be powerful enough that performance is good even when there are a large number of users concurrently accessing the database.

## **2. INCREASE SPEED OF IMPLEMENTING SYSTEMS:-**

Systems ought to be implemented in less time, since systems development staff can largely concentrate on the process involved in the application rather than on the collection, validation, sorting, and storage of data. Much of the data required for a new application may already be held on the database, put there for another purpose. Accessing the data will also be easier because this will be handled by the data manipulation features of the DBMS.



- 3. EASE FILE ACCESS BY PROGRAMMERS:** - Early DBMS used well-known programming languages such as COBOL and FORTRAN as the language, which was used to access the database. COBOL, for example, was extended to include new instructions, which were used when it was necessary to access data on the database. These "host language" extensions were not difficult for experienced computer programmers to learn and to use.
  
- 4. INCREASE DATA INTEGRITY:** - In a shared environment, it is important for the success of the database system to control the creation, deletion and update of data and to ensure its correctness. Furthermore, with so many users accessing the database, there must be some control to prevent failed transactions leaving the database in an inconsistent state. Also, there must be proper mechanisms to control access by unauthorized users. Although these aspects represent challenges, they also represent an opportunity to increase data integrity and security significantly. These requirements will be easier to effect in a database environment than one where each application sets up its own files, because of the possibilities of central administration. Standards need only be agreed and set up once for all users.



**5. PROVIDE A MANAGEMENT VIEW:** - With conventional systems, management is not getting the benefits from the expensive computing resource that it has sanctioned. At the same time, managers were becoming aware of the need for a corporate view of their organization. Such a view requires data from a number of departments, divisions, and sometimes companies in a larger organisation. This corporate view cannot be gained if files are established on an application basis and not integrated as in a database, with decision-support systems using the database, it becomes possible that problems previously considered solvable only by intuition and judgment can be solved with an added ingredient, that of information. Some of this information can be provided on a regular basis whilst some will be of a one of nature. Database systems should also respond to this type of request.

**6. IMPROVE STANDARDS:** - In traditional systems development, duplications are implemented by different project teams of systems analysts and programmers and it is difficult to apply standards and conventions to run for all applications. Computer people are reputed to dislike following the norms of the firm, and it is difficult to impose standards where applications are developed piecemeal. With a central database,



it is possible to impose standards for file access and update and to impose good privacy and security features.

- 7. INCREASE DATA INDEPENDENCE:-** Data independence is the ability to change the format of the data or the medium on which the data is held or the data structures without having to change the programs, which use the data. Conversely, it also means that it is possible to change the logic of the programs without having to change files. This separation of the issues concerning processes from the issues concerning data is a key reason for data processing departments opting for the database solution. It makes changes much easier to effect, and therefore provides for far greater flexibility.

## **2.6 DATABASE ADMINISTRATOR (DBA)**

An important human intermediary will be the database administrator (DBA) who will be responsible for the design of the overall data structure (schema) and ensuring that the required levels of privacy, security and integrity of the database are maintained. The DBA could be said to be the manager of the database and, because the design of the database involves trade-offs, he will have to balance these conflicting requirements and make decisions on behalf of the whole

organisation, rather than on behalf of any particular user or departmental objective.

## **2.7 THE ROLE OF THE DATABASE ADMINISTRATOR**

The role of the database administrator (DBA) is very important to the success of the database and the computer application using it. The DBA should be involved in the planning of the organisation's data resource and in setting up the database. Indeed the DBA ought to be involved in the evaluation of the basic hardware of the systems planning team. Therefore, the roles of the DBA include the following: -

1. One of the objectives of the database approach is to facilitate the sharing of data between many users. But users may resist both the DBA taking control of their data and other users having access to it. This may lead to conflict. It is the duty of the DBA to resolve such conflicts. He can achieve this by facilitating communication between departments rather than by rule of law.
2. In practice, the DBA function needs to be carried out by a team. The director of this team needs to have sufficient standing in the organisation to remain independent of pressure groups of database users.



The DBA is expected to be a good communicator and has to discuss aspects of data use and storage with managers, user staff, operations staff and applications developers.

3. DBA's role is that of the "public relations officer" for database. The problems relating to conventional systems need to be pointed out along with a description of the ways in which a database environment might solve some of these problems.
4. One of the main tasks of the DBA is to load the initial database, and this uses up considerable processor (and people) time. It also requires audit procedures, which will be used to verify its success.
5. The logical data structures will need to be changed over time according to the changing needs of the users. The DBA could be looked upon as a forward planner, as the database can be expanded or be reorganized according to future needs and this has to be done with a little disruption to the activities of the present users as possible. It may be necessary to change the way in which the data is physically stored on the database. In this case, the DBA will be involved so that the changes are made efficiently.

6. Efficiency, of the database is not a simple matter. There may be a number of criteria, which may conflict. Speed of access may conflict with efficient use of storage space. It is the duty of the DBA to work towards satisfying on a wide range of criteria rather than optimizing on any one criterion, in other words ensure that the performance of the database on a wide range of issues is satisfactory.
  
7. Evaluating the performance of a database is also difficult: Is speed of access good and backing storage requirements reasonable? A DBMS should help the DBA in this work by providing detail of disk activity, memory utilization, data usage, and response times, and it should identify attempts at breaches of security, program crashes, and the use of any restart/recovery routines.
  
8. The protection of data on the database is purely the responsibility of the DBA. On liaising with the user, the DBA may implement privacy locks at the logical file, record or item level. This should ensure that unauthorized users do not access data. The DBA is regarded as the custodian of personal data as required by government legislation relating to privacy



9. and databases. Privacy locks may also be included to protect the organization from unwarranted access of the database by competitors.

It is the duty of a DBA to set standards for copying files. Rapid recovery from failure is essential where a number of users need access to the database. Recovery from system breakdown can be affected in a number of ways. Before changes are made to data, a copy can be taken which will remain until changes has been successfully executed (i) a complete dump (ii) a log (or journal file) giving details of any changes made since the dump was made.

10. It is the duty of a DBA to set standards for data validation, which will help to maintain the integrity of the database. This is reasonable because data created by one user may be used by others. Without the DBA, there will, be no incentives, or security net, to ensure that data is correctly validated.
11. DBA documents information about the database, the data dictionary and the activities of their users. It is essential he does the documentation, and it should be done well. It must

be up-to-date, so that changes are reflected in the documentation. Some documentations will be aimed at the users department, others at the programmers and others at the Database administrator's team.

## **2.8 SURVEY OF DATABASE MANAGEMENT SYSTEM**

### **(a) DBASE 3+**

Dbase3+ (plus) from Ashton-Tate is one of the leading database program. Dbase3 plus can create simple database applications, such as keeping names and address or inventory records. It can also be used to create complex applications such as general ledger, account receivable, account payable, payroll and so on. Because Dbase3+ is a relational database file it is organized in the form of a table made up of rows, which are records. The records of a database file must have the same fields and the corresponding fields must have the same structure and must contain the same type of information.

A Dbase3+ database can be made up of database files, which as many as ten can be active at any one time. A database file can have up to one billion records or two billion characters. A record can have up to 128 fields and can contain up to 4,000 characters of information.



You can use Dbase3+ in a very simple manner using a menu facility called the **ASSISTANT**. You can also use Dbase commands (called dot command) directly without using menu facilities provided by the Assistant. Dbase3+, offers a large number of commands for you to create and manage your database files.

Dbase 3+ offers a programming language that enables you to construct your own database applications. A large number of built-in structures are provided including mathematical functions, string manipulating functions. The programming language includes command to perform additional branching, looping calculation, sort records, format, input screen, output report, etc.

A screen design facilities is provided for you to custom your input and output screen and to perform error checking and editing on input Multiple database files can also be linked (joined) to form a larger database. Dbase3+ also provided a local area network operating mode, permitting multi-users to access the same database on a local network system. Dbase3+ can be used either for basic filling or to construct quite complex application. Its versatility is perhaps one reason why it is so popular. Dbase3+ requires a mini-of 25kbytes of memory and

2- disc drives. However, it would be used on computer with more than, 256bytes of memory and a hard disc is recommended.

b. **DBASEIV**

Dbase IV is an advance version of Dbase that provides a full relational database environment to users. While many users found the **ASSISTANT** mode in base3+ too restrictive, they will find the control center of Dbase IV a significant improvement. Through the control center and without the use of command language you can design database, manipulate and edit records and files generate reports, perform database query, design labels and browse database. Data field can be specified with the fourth default values as well as valid ranges. Data can be verified automatically as they are entered into field. Furthermore, up to 255 fields can now be specified per record a database can be related to more than two other databases. Programs and procedures can also be compiled and saved as object code for faster execution. Top – up menus and windows can be designed. Other improvement over Dbase 3+ includes a large number of memory variables, users designable functions up to 99 files can be opened at a time. There is also improved indexing, a larger command line buffers and improved line editor, improved printer handling capabilities and



faster execution. A query by example function is also provided. Perhaps, the most significant improvement of Dbase IV over Dbase3+ is the full relational database capabilities using SQL (structured query language) that is compatible with IBM machines. Database can be built through the SQL facilities as relational databases. Database queries and update can be performed using the SQL command language. The SQL command language is far more powerful than Dbase command language can provide, relational database capabilities that far exceed those offered in Dbase3+. For example, using the SQL , it is possible to perform queries on relationship that span several databases without using the large number of commands.

c. **ORACLE**

Oracle relational database management from the corporations is one of the most advanced dbase programs in the market for PC, DOS. There are actually two versions of oracle. Professional oracle, which runs on stand alone microcomputer and network station oracle which is designed to run on computer network, with the oracle dbase software stored on another machine on the network.

As a relational Dbase system, Oracle keeps information in table (also known as flat file). A Dbase is made up of menu tables. A Dbase contains rows and columns and each column represent a field in a Dbase. Each row contains information for a particular record. A record in a Dbase is made up of corresponding rows in all the table. Access to a Dbase constructed using oracle is achieved using an English – like query language i.e. structural query language ( SQL).

Using SQL, you can enter, retrieve, update, and delete records, and add new tables into a Dbase. You can use SQL interactively or in batch mode instead of learning to use the actual language.

Oracle SQL was originally designed for large IBM system, but has been modified to run microcomputers. It is compatible with SQL/Ds and DB2, which are BM Dbase system that run on large IBM computers. It is made up of several programs including oracle relational database management system (RLBMS), oracle utilities, SQL plus, SQL calculators, SQL forms, SQL reports, SQL Net, Pro C, and pro COBOL. Unlike many Dbase programs such as Dbase3+, oracle required more rigorous operating procedures. For example, a Dbase administrator is required to handle the Dbase administration tasks such as the backing up



and restoring the Dbase creating users expanding the Dbase when oracle runs out of room, fine tuning system parameter to improve performance, setting auditing and security requirement, and managing the data dictionary.

Oracle provides an extensive audit trail and facilities to audit Dbase operation. It provides multiple level of access control using a combination of passwords and user privileged setting. The administrator can specify change, passwords and users privilege.

In summary, ORACLE is a Top-up-the-line Dbase program that provides many advanced Dbase capabilities. However, because of its technical complexity, it is not commended for invoices. Any one trying to use ORACLE to construct application must be properly trained on relational database design concept, Dbase administration function as well as the use of SQL.

d. **CLIPPER (Compiler)**

Clipper is a software development system that provides all the facilities necessary to create component. Clipper was originally designed as compiler for dbase language, but has since greatly been the basis for command set and capability. Clipper allow dbase instruction to be executed much more quickly since a

Clipper compiler converts text based instruction into instructions close to the machine language. In other word, clipper is a tool to dbase programmer to speed up dbase program.

However, clipper has expanded upon the original dbase instruction set to include many powerful commands that only the clipper compiler recognizes it. Clipper came with a single text editor P.E. EXE (P. E stand for program editor) for entry program instruction, however, other alternatives can be considered since PE has limited features. The alternative, which could be used includes the edit command in DOS mode. A word processor could also be used provided the program can be saved as ASCII text and not formatted. There are other executable files that come with clipper compiler as ABU.EXE, CLIPPER . EXE. and RTLING.EXE AND CLD . EXE. The CLD.EXE is a Dbase utility used to create and manipulate database file. The CLIPPER . EXE is the Clipper compiler. It is the program that translates the source program and produces the object program. RTLING.EXE is the Clipper linking. Linking is the process connecting the entire program required to run all the programs. The RTLING . EXE takes the exe file created by compiler and margins that contains in the library files and build them into the executable file. The CLD.EXE is the Clipper debugger used to watch the software program as the program



runs. It allows for line-by-line control of software program code and makes problem easier to find. One major advantage of Clipper over Dbase is the ability of Clipper to generate the executable file (with extension . EXE.). This allows the executable file to be executed from DOS prompt. As regard to Dbase, the translator needed to be purchased by the end – user before the program can be executed. This increase the over all software packages.

e. **FOXPRO**

FoxPro is a dbase software developed by Fox software. It is a dbase software that offers a host of features along the speed and ease that the end-user demands. Foxpro is a living package invention, power and speed. The presentation of menu and command is completely simplified in this package. The handy end – on – screen calculator and even the ASCII chart complement the standard menu. One. Important feature of Foxpro is its inter-phase with windowing application.

**INTRODUCTION**

**DBASE IV** is designed for the user and the developer with most if not all of the feature of the menu competing dbase products and the wide range of products that has been developed as add-ons for the dbaseIII and dbase3+. It is said to be one of the most popular (and powerful DBMS )available for PC. Dbase IV organizes data to database file. A database file is a collection of data. It is a form of two-dimensional table consisting of a number of rows and columns. Each row represents a record in the database file and each column represent the description of the records. Therefore , a database file is made of some components, which are records and files. A record is all the information about a single particular entity while a file is a unit of information within each record of the database file. When applied to personal record, the data base file can be set up to keep the record of employees. This is done such that each employee information such as employee, Number, Name, Age, Sex, Dept., Rank, date of his appointment, type of appointment, etc. Will be regarded as a field in a database file while the collective information of all these fields of an employee is referred to as a record.



## **2.10 METHOD OF PROCESSING DATA IN DBASE IV**

Dbase IV provides two different methods of processing data stored in its dbase IV file. This means interactive processing mode. In the interactive processing method, two options are available which are:-

1. Control center mode.
2. Dot prompt mode.

In the control center mode, commands are supplied to Dbase IV by the selection of option available in the menu provided by the control center.

In dot prompt mode, the user supplies commands by typing them from the keyboard. In each, the command are interpreted and executed by Dbase IV to produce result. For the batch processing method, the commands are stored in the form of a program and executed in a group. This method is also called programming language mode.

## CHAPTER THREE

### 3.0 SYSTEM ANALYSIS

#### 3.1 FEASIBILITY STUDY

The principal objective of this feasibility study is to critically and objectively evaluate the performances of the manual system currently in application at the Federal Ministry of Agriculture and Rural Development with respect to Agricultural Market Information System Project and see whether it is effective and reliable or not. The findings from this study will determine whether the current system should be overhauled or a new system will be evolved entirely.

#### 3.2 METHODOLOGY

The following methodologies were employed in the following feasibility study:

- (a) Oral interview
  - (b) Questionnaire
  - (c) Direct observation
- (a) **Oral Interview:** This is a process whereby users of the present manual system were asked directly through an oral conversation about their views on the current manual system.
- (b) **Questionnaire:** This involves the use of a pre-printed



set of questions which were given to the users of the present system which they filled and returned accordingly. It is an effective method of information gathering as the relevant users were able to express themselves freely without any hindrance.

- (c) **Direct Observation:** This is a method of practically studying the current system and writing one's report about it with or without the users taking note of it. It is about the best method of information gathering as the investigator or the researcher is able to collect every relevant information needed directly on his own without giving any allowance to the respondents to add their own exaggerations.

### 3.3 OPERATION OF THE CURRENT SYSTEM

Under the current system, data from the various local and urban markets are just entered into pre-printed sheets (forms) from the thirty – six states of the Federation and the Federal Capital Territory (FCT) and forwarded to the Ministry's Headquarters, at Abuja on monthly basis. The clerical officers enter the data from various states into already prepared ruled sheets and pass same to the statisticians for analysis. The statisticians in turn undertake the analytical works to be done using table and pocket calculators. Thereafter, their

observations, comments and summary emanating from the various analyses are put together in a written form and given to typists to type using either electric or manual typewriters. These are being forwarded to the Presidency, National Assembly, National Planning Commission, Central Bank, Federal Office of Statistics, Food and Agricultural Organisation (FAO), United Nations Development projects (UNDP), National Agricultural, Rural Development and Cooperative Bank (NARDCB).

### 3.4 PROBLEMS OF THE CURRENT SYSTEM

The problems emanating from the current system are multivariate in nature. These include:

- (a) Very low speed
- (b) Improper data storage facilities
- (c) Difficulty of data retrieval
- (d) Difficulty of data updating
- (e) Less accuracy
- (f) Insufficient analysis
- (g) Fatigue on the part of the current users
- (h) Out of fashion presentation

- (a) **Very Low Speed:** It takes both the clerical officers and the statisticians a lot of time to manually enter the data from the various states on the tabulated ruled sheets and even to analyse and summarize. Hence, in most cases, the information



released to the public through the system always become stale and less relevant as they are too belated.

- (b) **Improper data storage facilities:** Data so far generated are always put in files. These become too bulky over time and do easily get lost especially, when moving from one office to another.
- (c) **Difficulty of data retrieval:** Because of improper storage device, data retrieval always become a big problem whenever it is requested for.
- (d) **Difficulty of data updating:** With the current system in the Ministry, data are very difficult to update. Since everything is done manually, any additional data that comes after the analysis is more or less a waste product.
- (e) **Less Accuracy:** There is a limit to the degree of accuracy of the present system as a lot of errors may be committed in the process of data entry and analysis most especially, if the users of the present system do not concentrate enough or when fatigue might have entered.
- (f) **Insufficient analysis:** Since everything including the various analyses are done manually, there is a limit to the amount and volume of analysis that could be done within a set time frame.
- (g) **Fatigue:** Since it is the same thing that is being done every now and then, there is no doubt that users of the current system will definitely get fed up over time as there is no room

for challenges and further development.

- (h) **Out of fashion presentation:** In this present computer age, there is no doubt that analyses done by hand and presented to the public using biro and papers or manual typewriter is totally out of fashion. Users of this type of system will not even feel proud about it.

### **3.5 THE PROPOSED DATA BASE MANAGEMENT SYSTEM (DBMS) TO THE AGRICULTURAL MARKET INFORMATION SYSTEM PROJECT**

The proposed **DATA BASE MANAGEMENT SYSTEM (DBMS)** to the Agricultural Market Information System Project is aimed at providing a software package which will facilitate easy input, analysis, summary and presentation of data with respect to the project. Hence, it is going to consist of a number of phases which will be integrated one after the other as times goes on. This software, no doubt will go a long way in turning the whole output of Agricultural Market Information System Project around for better.

### **3.6 ADVANTAGES OF THE PROPOSED SYSTEM**

This include:

- (a) **Greater Speed:** Since the whole system will be entirely computerized, data entry and subsequent analyses which take months to complete can now be completed within one week.



- (b) **High Storage Facilities:** The storage system will also change from the paper and file formats to Hard Disk and Diskette systems which are easier to manage with very long durability.
- (c) **Data retrieval:** With the new storage system, data will be retrieved more easily for further manipulation and processing.
- (d) **Data Updating:** Using the new computer storage system, it will be easier to update the data more easily than in the current manual system.
- (e) **Greater accuracy:** Since the analyses, summaries and subsequent presentations would be done using the software, one can be ensured of greater accuracy of the information released by the system.
- (f) **Increased Level of analysis:** Since the analysis will no longer be done manually, there is every tendency on the part of data analysts to always move from the simple forms of analysis such as percentage changes to more complex ones such as time series, market by market analysis and even going to the extent of comparing our local prices with some international prices. This, no doubt, will increase the image of both the project and the ministry as more timely useful information will be

released to the public which will in no small way guide them in their decision making.

- (g) **Less fatigue:** There will be less fatigue on the part of the users of the proposed system. Since the software is user's friendly, it will always expose the users to greater challenges and thereby brighten their outlooks as well as widening their horizons.
- (h) **Standard Presentation:** With the proposed system, the information or output of this project will no longer be substandard in any form. Since its standardization can be ensured both in content and scope, the users will also be able to raise their shoulders very high any where they find themselves.



## **CHAPTER FOUR**

### **4.0 DESIGN AND DEVELOPMENT OF THE PROPOSED SOFTWARE PACKAGE**

#### **4.1 INITIAL DESIGN:**

This is done with the result of the feasibility study carried out in chapter 3 in mind. It is specifically to achieve the following:

- (a) To ensure that there is high level of improvement in the general output of the project.
- (b) To ensure that the demands of the users are met accordingly.
- (c) To ensure that data manipulations is carried out with greater speed and accuracy.
- (d) To ensure that users have various choices of different operations for implementation;
- (e) To ensure that the software package could be upgraded and maintained for a long period of time.

#### **4.2 SELECTION OF LANGUAGE FOR THE PROPOSED SOFTWARE DEVELOPMENT**

Although a number of computer languages such as BASIC, FORTRAN, PASCAL, COBOL, DBASE, FOXPRO and ORACLE are available, only DBASE IV was made use of because of the following reasons:

- (a) Its commands are short, easy to coordinate and remember;
- (b) It is highly efficient in the area of data storage, retrieval and organisation;
- (c) It has some special features for identifying and removing unwanted program bugs;
- (d) Using DBASE IV software package, one may have a total control on his reports as it will be made in line with one's specification.

### 4.3 **NEW INPUT AND OUTPUT SYSTEM**

#### (a) **INPUT**

Under the new system, the entire process will be computerized. This will give allowance for the various data to be entered into the computer using the keyboard. The data to be entered will include all necessary information on all commodities covered (Such as names of markets, units of measurement, states, prices, etc). This will subsequently form the database. The new input form will always prompt the user with question or questions and await some responses before going further. This may be done by either pressing a particular key or typing in a word.



(b) **OUTPUT**

On successful response to the questions asked, the computer will prompt the operator to a menu list of options to select from. These options include add record, edit record, delete record, view record, search record, generate report or quit depending on the alternative options selected by the operator and the computer will respond to any of these options accordingly.

**4.4 FILE CREATION**

In creating files, a database structure is first created in which data items are grouped into their data name, types and width.

After this, series of programs are now written in modules to generate the required output. Elements that are highly related are kept in the same module in order to maximise cohesion. The following shows the field names, type and width and form the database files.

## DATABASE STRUCTURE

<b>FIELD NO</b>	<b>FIELD DESCRIPTION</b>	<b>FIELD NAME</b>	<b>FIELD TYPE</b>	<b>FIELD WIDTH</b>
1	Period	Period	Date	8
2	Commodities	Commodity	Character	18
3	Commodities Code	CommCode	Numeric	8
4	Market	Market	Character	14
5	Unit	Unit	Alphanumeric	6
6	Price	Price	Numeric	6
7	State	State	Character	10
8	Average	Average	Numeric	8

### 4.5 DOCUMENTATION

Adequate information will be provided here with regards to the software component. Its specification is as follows:

Author : S.A. ADEBOMI

Program : Application of Data Base Management System  
to Agricultural Market Information System

Environment : Both source and object computer

Date written : April 2002

Remarks : The program is written to enhance greater  
performance of Agricultural Market Information  
System Project



## **FUNCTIONABILITY**

The software package comes in floppy diskette and it has to be loaded into the computer memory before operation.

### **Step 1**

Insert MS-Dos diskette in drive A and close the drive. On the other hand, if MS – Dos is already installed in the hard disk (C:>) do not insert in drive A. You can then go to the next step.

### **Step 2**

Switch on power from the main socket and then switch on the computer (CPU) and the monitor to boot the system. On the other hand, if in the hard disk, the same procedure should be followed until C:> appears on the screen.

### **Step 3**

At the DOS Prompt, C:>

Type : dbase and press enter key

### **Step 4**

At the prompt, C:\dbase >

type: dbase and press enter key, again.

### **Step 5**

Press ESC key and choose 'Yes' and

Press Enter key to get you to dbase prompt.

### **Step 6**

At the dbase prompt, insert a working diskette in drive A and

set default to A. Press Enter key.

### **Step 7**

Type: do commodity and press Enter key. The User is welcome to the application of Data Base Management System to Agricultural Market Information System Package and the software will display on the screen a number of tasks to perform and then prompt you to make a choice of the subroutine to be executed.

The main menu enables the user to select within the message listed below:

- A Add Record
- E Edit Record
- D Delete Record
- V View Record
- S Search Record
- R Report Record
- Q Quit Record

On successful typing of this first letter of the option, a screen is open and this will allow the user to perform any of the tasks



listed above or return to the DOS prompt.

The programs for the various modules are stated below;

#### 4.6 **PROGRAMS**

##### 4.6.1 **MAIN PROGRAM**

SET TALK OFF

SET STATUS OFF

DO WHILE .T.

CLEAR

SET COLO TO G/B+

e1, 10 SAY 'WELCOME TO DATA BASE MANAGEMENT  
SYSTEM IN AGRICULTURAL MARKET  
INFORMATION SYSTEM'

e2, 12 SAY 'DESIGNED BY MR. S.A. ADEBOMI'

e3, 12 SAY 'MAT. NO. PGD/MCS/98/99/866'

e4, 12 SAY 'PGD IN COMPUTER SCIENCE'

e5, 12 SAY 'FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA'

e6, 12 SAY 'REMARKS:- THE PROGRAM IS WRITTEN TO  
INCREASE THE QUALITY OF THE  
OUTPUT OF AGRICULTURAL MARKET  
INFORMATION SYSTEM BOTH IN  
CONTENT AND IN SCOPE'

e7, 14 SAY 'DATE WRITTEN:- APRIL, 2002'

e8, 14 SAY 'ENTER CHOICE TO GO THROUGH THE

PROGRAM OR QUIT'

CHOICE = ' ' ' '

SET COLO TO W/B+

e 11, 12 TO 15, 60 DOUBLE'

e 12, 13 SAY 'ADD'

e 12, 14 SAY 'DELETE'

e 12, 15 SAY 'EDIT'

e 12, 17 SAY 'VIEW'

e 13, 18 SAY 'SEARCH'

e 13, 21 SAY 'REPORT'

e 13, 23 SAY 'QUIT'

SET COLO TO R+

e 12, 13 SAY 'A'

e 12, 14 SAY 'D'

e 12, 15 SAY 'E'

e 12, 17 SAY 'V'

e 13, 18 SAY 'S'

e 13, 21 SAY 'R'

e 13, 23 SAY 'Q'

SET COLO TO W/B+

CH = SPACE (1)

e 14, 38 SAY 'ENTER CHOICE'GET CHOICE PICT '!''

READ



```
DO CASE
CASE CHOICE = 'A'
    DO COMMADD
CASE CHOICE = 'D'
    DO COMMDEL
CASE CHOICE = 'E'
    DO COMMEDIT
CASE CHOICE = 'V'
    DO COMMVIEW
CASE CHOICE = 'S'
    DO COMMSEAR
CASE CHOICE = 'R'
    DO COMMRPT
OTHERWISE
    QUIT
ENDCASE
ENDDO
SET TALK ON
SET STATUS ON
RETURN
```

#### 4.6.2 ADD SUB – PROGRAM

SET TALK OFF

DO WHILE .T.

CLEAR

MPERIOD = CTOD ( ' | | ' )

MCOMMNAME = SPACE (12)

MSOURCE = SPACE (20)

STORE 0 MCOMMCODE, MUNIT, MPRICE

e 3, 10 TO 21, 70 DOUBLE

e 4, 10 SAY 'COMMODITY PRICES'

e 5, 15 TO 7, 47 DOUBLE

e 6, 15 SAY 'COMMCODE' GET MCOMMCODE PICT

e 6, 25 SAY 'COMMNAME' GET MCOMMNAME

e 6, 27 SAY 'COMMUNIT' GET MCOMMUNIT

e 6, 28 SAY 'COMMPRICE' GET MCOMMPRICE

e 6, 30 SAY 'SOURCE' GET MSOURCE

READ

CH = SPACE (1)

e 7, 25 SAY 'DO YOU WANT TO ADD THIS RECORD

(Y/N)?' GET CH PICT '!'

READ

IF CH = 'Y'

USE COMMDATA



APPEND BLANK

REPLACE COMMCODE WITH MCOMMCODE

REPLACE COMMNAME WITH MCOMMNAME

REPLACE COMMUNIT WITH MCOMMUNIT

REPLACE COMMPRICE WITH MCOMMPRICE

REPLACE SOURCE WITH MSOURCE

REPLACE PERIOD WITH MPERIOD

ELSE

ENDIF

ANS = SPACE (1)

e 7, 35 SAY 'DO YOU WANT TO ADD MORE RECORD

(Y/N)? GET ANS PICT '!'

READ

IF ANS = 'Y'

LOOP

ELSE

CLEAR

EXIT

ENDIF

ENDDO

SET TALK ON

RETURN

### 4.6.3 DELETE SUB-PROGRAM

SET TALK OFF

USE COMMDATA

DO WHILE .T.

GO TOP

CLEAR

MPERIOD = CTOD (|        | ')

e 3, 8 TO 25, 70 DOUBLE

e 3, 10 SAY 'COMMODITY PRICES'

e 3, 12 TO 7, 50 DOUBLE

e 4, 13 SAY 'WHICH PERIOD' GET MPERIOD

READ

LOCATE FOR PERIOD = MPERIOD

IF .NOT. FOUND ( )

e 6, 13 SAY 'RECORD NOT FOUND'

ELSE

e 6, 14 SAY 'COMM CODE:-' GET COMMCODE

e 7, 12 SAY 'COMMNAME:- ' GET COMMNAME

e 7, 13 SAY 'COMMPRICE (#): -' GET COMMPRICE

e 7, 15 SAY 'COMMUNIT(KG/LT):-' GET COMMUNIT

e 7, 21 SAY 'SOURCE:-' GET SOURCE

CLEAR GETS

CH = SPACE (1)



```
e 8, 12 SAY 'DO YOU WANT TO DELETE THIS  
RECORD (Y/N)?' GET CH PICT '!'
```

```
READ
```

```
IF CH = 'Y'
```

```
DELETE
```

```
PACK
```

```
e 8, 15 SAY 'RECORD IS DELETE'
```

```
ENDIF
```

```
ENDIF
```

```
ANS = SPACE (1)
```

```
e 9, 10 SAY 'DO YOU WANT TO DELETE RECORD (Y/N)?'  
GET ANS PICT '!'
```

```
READ
```

```
IF ANS = 'Y'
```

```
LOOP
```

```
ELSE
```

```
CLEAR
```

```
EXIT
```

```
ENDIF
```

```
ENDDO
```

```
CLOSE DATABASE
```

```
SET TALK ON
```

```
RETURN
```

#### 4.64 EDIT SUB – PROGRAM

SET TALK OFF

USE COMMDATA

DO WHILE .T.

GO TOP

CLEAR

MPERIOD = CTOD( ' | | ' )

e 2, 8 TO 21, 70 DOUBLE

e 2, 10 SAY 'COMMODITY PRICE'

e 2, 15 TO 4, 55 DOUBLE

e 3, 10 SAY 'WHICH PERIOD' GET MPERIOD

READ

LOCATE FOR PERIOD = MPERIOD

IF .NOT. FOUND ( )

e 3, 12 SAY 'RECORD NOT FOUND'

ELSE

e 3, 15 SAY 'COMMCODE:-' GET COMMCODE

e 3, 21 SAY 'COMMNAME:-' GET COMMNAME

e 3, 25 SAY 'COMMODITY PRICE (N):-' GET COMMPRICE

e 3, 28 SAY 'COMMUNIT (KG/LT):-' GET COMMUNIT

e 5, 10 SAY 'SOURCE:-' GET SOURCE

READ

END IF

ANS = SPACE (1)



e 7, 12      SAY 'DO YOU WANT TO EDIT THIS RECORD  
(Y/N)?' GET ANS PICT '!'

READ

IF CH = 'Y'

LOOP

ELSE

CLEAR

EXIT

ENDIF

ENDDO

CLOSE DATABASE

SET TALK ON

RETURN

#### **4.6.5      VIEW SUB PROGRAM**

SET TALK OFF

USE COMMDATA

DO WHILE .T.

GO TOP

CLEAR

MPERIOD = CTOD ( ' |   | ' )

e 3, 12 TO 20, 69 DOUBLE

e 3, 15 SAY 'COMMODITYPRICE'

e 3, 20 TO 5, 60 DOUBLE

```
e 5, 15 SAY 'WHICH PERIOD' GET MPERIOD
READ
LOCATE FOR PERIOD = MPERIOD
IF .NOT. FOUND ( )
e 5, 20   SAY 'RECORD NOT FOUND'
ELSE
e 5, 31   SAY 'COMMCODE:-' GET COMMCODE
e 6, 10   SAY 'COMMNAME:-' GET COMMNAME
e 6, 15   SAY 'COMMPRICE:-' GET COMMPRICE
e 7, 10   SAY 'COMMUNIT:-' GET COMMUNIT
e 7, 15   SAY 'SOURCE:-'   GET SOURCE
CLEAR GETS
END IF
ANS = SPACE (1)
e 8, 12   SAY 'DO YOU WANT TO VIEW ANOTHER
          RECORD (Y/N)?' GET ANS PICT '!'

READ
IF CH = 'Y'
LOOP
ELSE
```



#### 4.6.6 SEARCH SUB PROGRAM

SET TALK OFF

DO WHILE .T.

CLEAR

USE COMMDATA

MPERIOD = CTOD ( ' | | ' )

STORE 0 TO MCOMM CODE, MCOMM PRICE, MCOMM UNIT,  
MCOMM NAME

e 2, 10 TO 21, 60 DOUBLE

e 3, 10 SAY 'COMMODITY PRICE'

e 3, 15 TO 5, 50 DOUBLE

e 3, 21 SAY 'COMM CODE' GET MCOMM CODE

READ

LOCATE FOR COMM CODE = MCOMM CODE

IF FOUND ( )

e 5, 12 SAY 'PERIOD/YEAR' GET PERIOD

e 5, 20 SAY 'COMM NAME' GET COMM NAME

e 5, 21 SAY 'COMM PRICE (H)' GET COMM PRICE

e 5, 27 SAY 'COMM UNIT (KG/LT)' GET COMM UNIT

e 5, 31 SAY 'SOURCE' GET SOURCE

READ

ELSE

e 7, 12 SAY 'RECORD NOT FOUND'

ENDIF

CH = SPACE (1)

e 7, 15 SAY 'DO YOU WANT TO CONTINUE TO SEARCH  
MORE RECORD (Y/N)?' GET CH PICT '!'

READ

IF CH = 'Y'

LOOP

ELSE

CLEAR

EXIT

END IF

END DO

CLEAR

EXIT

ENDIF

ENDDO

CLOSE DATABASE

SET TALK ON

RETURN

#### 4.7 **COST ANALYSIS**

The following is the estimated cost of implementation of the newly designed package:-

- (a) Hardware with the following components:
  - (i) 486 micro – processor (VGA)



- (ii) 4 MB RAM
- (iii) 540 MB hard disk
- (iv) 1.2 MB 5.25" floppy disk drive
- (v) 1.44 MB 3.5" floppy disk drive = ₦150,000.00

- (b) (I) Installation ₦15,000.00
- (ii) Maintenance ₦10,000.00
- (iii) Dot matrix printer ₦45,000.00
- (iv) Stationery ₦10,000.00
- (v) Uninterrupted Power Supply (UPS) ₦35,000.00

(c) Training ₦100,000.00

**TOTAL** ₦365,000.00

## CHAPTER FIVE

### 5.0 IMPLEMENTATION OF THE NEW SYSTEM

For the new system to be fully implemented, the following has to be executed:

#### (A) ACQUISITION OF COMPUTER HARDWARES

This refers to the physical units or machines which make up the computer configuration and it has two main divisions which are:

- (a) The Central Processing Unit (CPU) or processor and
- (b) The Peripheral Units.

The Central Processing Unit is the heart of the computer system. It consists of three hardware sections which are:

- ( i ) The main memory
- (ii) The control unit
- (iii) The Arithmetic and logical unit (ALU)

The peripheral unit can also be subdivided into three units which are:

- (i) Input device
- (ii) Output device
- (iii) Auxiliary storage device

Other physical components needed by the system include

- (i) 3.5" and 5.25" floppy drive and floppy diskettes



- (ii) Stationeries
- (iii) Laser and Dotmatrix printers
- (iv) Uninterrupted power supply (UPS)

## **B TRAINING**

The users of the new system have to be properly trained on the use of computer and more importantly, on DATABASE MANAGEMENT SYSTEM Software (DBASE IV in particular). In addition, they should be highly encouraged to get more familiar with the system and a DataBase Administrator (DBA) should also be appointed for them to oversee their activities.

## **C SYSTEM CHANGEOVER**

This is the process of changing from the old system to the new system. In view of the similarity between the two systems, it is advisable that a parallel conversion (i.e. a situation whereby the two systems will continue to run side by side for a period of time) be embarked upon. By this method, the old system will be phased out slowly. It will also afford the users the opportunity of comparing the output of the old system with the new system.

## **5.1 RECOMMENDATION**

It is highly recommended that the newly designed DataBase

Management software (Dbase IV) for Agricultural Market Information System Project be implemented by the Federal Ministry of Agriculture and Rural Development as soon as possible. In addition to the benefits of the new design that has been clearly spelt out in Chapter three (Paragraph 3.6), the new system will in no small way enhance the greater performance of the project both in content and in scope.

## 5.2 **CONCLUSION**

The goal of this research work is to develop a computer software that will generally enhance the performance of the Agricultural Market Information System Project (which is a sub component of Crop Monitoring and Early Warning System Project) both in content and in scope. The software package, if put into proper use will no doubt reduce the various problems associated with data input, data storage, data retrieval, updating, accuracy, low level of analysis, fatigue and low level presentation of the project's output.

The computer language used in developing this software is called "DBASE IV" and it is chosen among others because of its enormous advantages as stated in Chapter two (Paragraphs 2.8(b) and 2.9). With this software, many files are created and several programs are written in modules to perform different functions in the database. This software has also been



designed in such a way that it can perform so many operations like addition, editing, deleting, viewing, searching, etc. It also has the facilities that will give the user the opportunity to customize his report and also gives him a choice to either quit finally or return to the DOS prompt.

### **5.3 LIMITATION AND SUGGESTION FOR FURTHER RESEARCH WORK**

The software developed as a result of this research work could only be applied to data which are forwarded to the Federal Ministry of Agriculture and Rural Development Headquarters at Abuja with respect to Agricultural Market Information System Project. Hence other data which might have been laying fallow in the outstations might not be of any relevance as they could not be accessed. It is therefore suggested that another research work be conducted on how to link these various outstations using Internet and E-Mail Services.

## **REFERENCES**

1. Davis, G.B. (1974); **Management Information System; Conceptual Foundation, Structure and Development, McGraw Hill, London.**
  
2. Hamza Yusuf & Ige Olowu (1993); **Methods of Writing Programs Using Dbase Iv, Malle Printing Press, Kano.**
  
3. Federal Ministry of Agriculture and Rural Development, PRSD (March 2001), **Market Information Dissemination, Bulletin volume 19.**
  
4. Statistical Office of the European Communities, Luxembourg, (July 1989), **Food Supply Information Systems in Africa.**



## APPENDIX

### PROGRAM OUTPUT

WELCOME TO DATA BASE MANAGEMENT SYSTEM

IN AGRICULTURAL MARKET INFORMATION SYSTEM

DESIGNED BY MR. S.A. ADEBOMI

MAT NO. PGD/ MCS/ 98/99/ 866

POST – GRADUATE DIPOLMA IN COMPUTER SCIENCE

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGER STATE

REMARKS:- THE PROGRAM IS WRITTEN TO INCREASE  
THE QUALITY OF THE OUTPUT OF  
AGRICULTURAL MARKET INFORMATION SYSTEM  
BOTH IN CONTENT AND IN SCOPE

DATE WRITTEN:- APRIL, 2002

ENTER CHOICE TO GO THROUGH THE PROGRAM OR QUIT

ADD DELETE EDIT VIEW SEARCH REPORT QUIT

ENTER CHOICE

## COMMODITY PRICES

COMMODITY CODE:- 007 COMMODITY NAME:- LOCAL RICE

COMMODITY UNIT(KG):- 100 PERIOD:- JANUARY 2001

COMMODITY PRICE(₦):- 5051

SOURCE:- FEDERAL MINISTRY OF AGRICULTURE AND RURAL  
DEVELOPMENT

DO YOU WANT TO ADD THIS RECORD (Y/N)?

## COMMODITY PRICES

PERIOD:- JANUARY 2001

COMMODITY CODE:- 011 COMMODITY NAME:- SORGHUM

COMMODITY PRICE (₦):- 2600

COMMODITY UNIT (KG):- 100

SOURCE:- FEDERAL MINISTRY OF AGRICULTURE AND RURAL  
DEVELOPMENT

DO YOU WANT TO DELETE MORE RECORD (Y/N)?



**COMMODITY PRICE**

PERIOD: JANUARY 2001

COMMODITY CODE: 022 COMMODITY NAME: PALM OIL

COMMODITY PRICE (₦):- 9874

COMMODITY UNIT (LT):- 100

SOURCE:- FEDERAL MINISTRY OF AGRICULTURE AND RURAL  
DEVELOPMENT

DO YOU WANT TO VIEW ANOTHER RECORD (Y/N)?

**COMMODITY PRICE**

COMMODITY CODE:- 025

COMMODITY NAME:- BEEF PERIOD:- JANUARY 2001

COMMODITY UNIT (₦):- 25017

COMMODITY UNIT (KG):- 100

SOURCE:- FEDERAL MINISTRY OF AGRICULTURE AND RURAL  
DEVELOPMENT.

DO YOU WANT TO CONTINUE TO SEARCH MORE RECORD (Y/N)?