COMPUTERIZATION OF PHYSICAL DEVELOPMENT OPERATIONS
A CASE STUDY OF
ILORIN TOWN PLANNING AUTHORITY

By

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CERTIFICATION

This project is certified to have been carried out by Mr. William Rotimi Olayemi (PGD/MCS/111/96) and presented to the Department of Mathematics and Computer Science of the Federal University of Technology, Minna in partial fulfillment of the requirements for the Award of Post-Graduate Diploma in Computer Science.

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<u>DEDICATION</u>

UNTO MY PRECIOUS GLORY, ELIZABETH FUNSHO OLAYEMI I
DEDICATE THIS PROJECT.

ACKNOWLEDGMENT

I, acknowledge the invisible Throne that brought me to existence and gave me the opportunity of being computer literate. My thanks also go to the panel of "high integrity" that thought it wise to make computer training a possibility in Federal University of Technology Minna.

The effective and mature handling of this project is a product of the competence of my supervisor in person of Mr. Audu Isah. This department operates under the able leadership of Dr. K. R. Adeboye hence my gratitude is null and void without the recognition of his input to my success.

I can not but mention the Godly support of Prince R. Badmus who served as the motivating force and presented a voice of courage. God bless you my lecturers.

You are too visible to be invisible for thanks and appreciation my dear wife - Mrs Eyitayo Olajide. I also extend this regards to Brother Noah and Brother Paul and a host of others who contributed to the success of this project.

Lastly but solidly, the whole of my family I say thanks, under the motherly care of my dear wife Funsho Olayemi. I love you all.

ABSTRACT

This project was embarked upon with the view of presenting the possibility of computerizing land use physical development operation in Town Planning Authority, Ilorin. This is as a result of the fact that the manual operation, hitherto employed, has numerous disadvantages when the compared with computerized system. Hence in identifying some of the problems, interviews were conducted with the staff of Town Planning Authority, Ilorin. Review of related magazines, consultation with text books, journals were made. Observations also formed a part of the general methodology adapted in this project works.

The identified problems were analyzed and a new system design was carried out. This introduced us to the use of computer for land use physical development operation. Database IV language was used, while the program was presented in a 1.44 megabyte, 3.5 high density floppy diskette. The recommended system is a 586 Pentium PC with 16 megabyte RAM and a hard disk capacity of 2.8 megabyte.

The designated program produces two main menu. One shows the general introduction of the program, while the other contains the actual program with the computed records and results of the processed data. In the program output, the

total area of the schemed areas, the comparative results of government and private allocated and developed plots are indicated. It also highlighted rates of three years periodical development and land use specifications. The program manipulates various results such as plot sizes, plot areas, plot land use ratio, revocable plots, percentage of government allocated plots to total schemed plots.

The conclusion highlighted some advantages derivable from the use of computer for land use physical development operations.

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CHAPTER ONE

1.1 WHAT IS COMPUTERIZATION?

To create a system, keep intact and functioning, generation or production of information is necessary. Such information could be to determine the viability of a project, cost implication, site requirement, the design of various essential structures, operating machineries, production process, types of management, marketing strategies and system continuity plans, to limit enumeration of possibilities to a few facts. However, production of information is by no means an easy task. It entails among other things, data collection, data sorting, data storing and retrieving, data analysis, data presentation, data transformation towards the required retrievable and storable information.

The above task could be achieved in two ways, manually and mechanically. One of the mechanical ways involve the use of computer, which is the paramount concern of this project. At this juncture, it is essential to know what a computer is. This will help explain what computerization is all about.
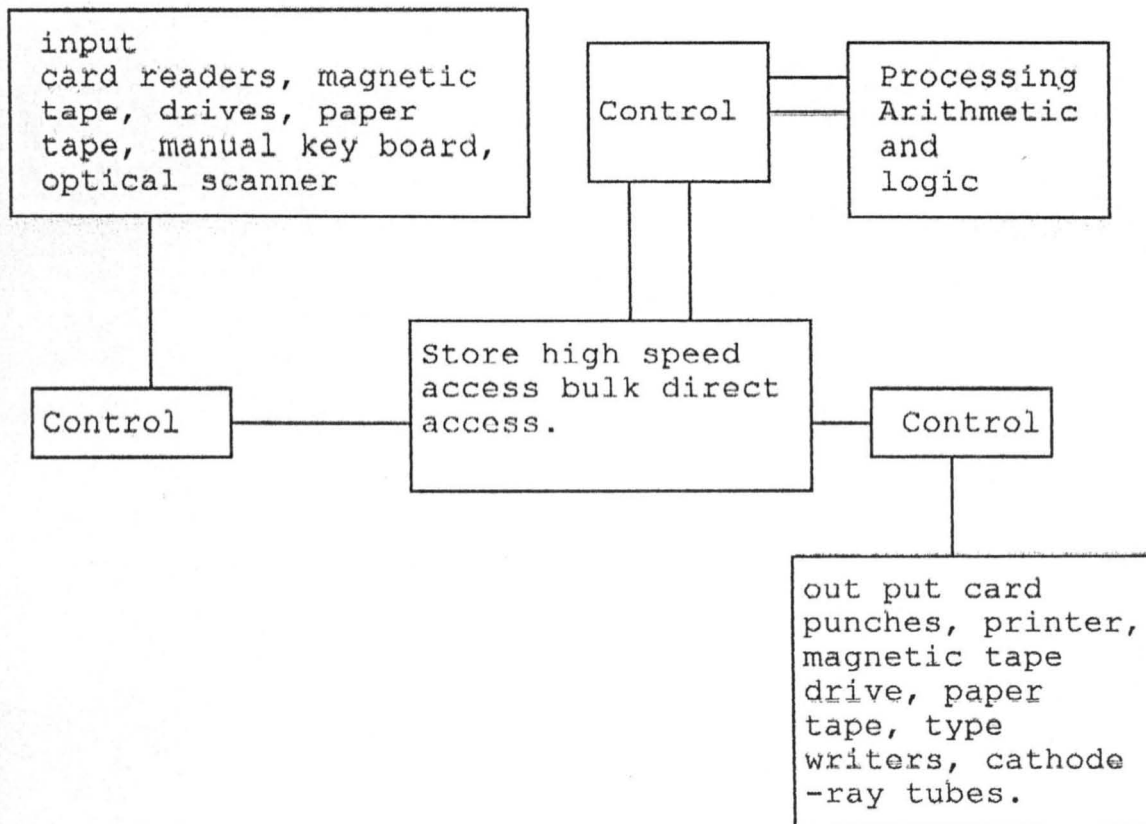
A Computer

C. K. Ayo (1994) defines a computer as follows:- "A computer is an electronic device which accepts and processes data by following a set of instructions (PROGRAM) to produce

an accurate and efficient result (INFORMATION)".

In another description of what a computer is, page 1045 of Encyclopedia Britannica Volume 4, states that, computer is an automatic electronic machine that performs calculations. It is capable of accepting data, performing operations according to instructions (Programs), and providing the results of the operation.

Fig. 1 shows the Basic Computer Functions.

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┌─────────────────────────────┐        ┌──────────┐    ┌──────────────┐
│ input                       │        │          │    │ Processing   │
│ card readers, magnetic      │        │ Control  │════│ Arithmetic   │
│ tape, drives, paper         │        │          │    │ and          │
│ tape, manual key board,     │        │          │    │ logic        │
│ optical scanner             │        └──────────┘    └──────────────┘
└─────────────────────────────┘             │
              │                             │
              │              ┌──────────────────────────┐
              │              │ Store high speed         │
  ┌──────────┐│              │ access bulk direct       │  ┌──────────┐
  │ Control  │───────────────│ access.                  │──│ Control  │
  └──────────┘               └──────────────────────────┘  └──────────┘
                                                                 │
                                                     ┌──────────────────┐
                                                     │ out put card     │
                                                     │ punches, printer,│
                                                     │ magnetic tape    │
                                                     │ drive, paper     │
                                                     │ tape, type       │
                                                     │ writers, cathode │
                                                     │ -ray tubes.      │
                                                     └──────────────────┘
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There are basically three types of computers;

1. <u>Analogue Computer:</u> Which represents the value of variables or numbers by physical quantities - for instance, angular positions or voltages, the magnitudes of which are made directly proportional to the variables or to suitable function of the variables.

2. <u>Digital Computer:</u> These count specifically or discretely, never varying or responding in degrees but only to exact signals (flip-flops) that exists or do not exist. Data are represented by means of characters, numbers and symbols i.e. for instance, the designation of one out of a finite number of alternatives.

3. While a digital computer basically counts (like an abacus) and an analogue computer measures, a third type, the hybrid computer, derives its power from a combination of two types of operations as specifically designed for simulations, process control, signal processing and psychological model building. (Table 1).

Table 1

Spectrum of Digital - Analogue Computers	
Range	**Examples**
Pure Digital Computer	General-purpose digital computers.
Digital computer with analogue concepts	Digital differential analyzer or digital computer with analogue-type languages.
Digital computer with analogue systems (hybrid) hardware	Analogue arithmetic elements or analogue subroutines.
Linked digital - analogue systems (hybrid)	True hybrid systems - digital computer and analogue computer play equal roles.
Analogue computer with digital hardware	Logical interconnection devices and small digital computer for input - output.
Analogue computer with digital techniques pure analogue computer	Iterative differential analyzers. General purpose analogue computer.

From the above explanation and definition of a computer, it is obvious that the end result of computer operations is regarded as INFORMATION. For any system to therefore function well, information management is highly crucial. Hence the use of computer infiltrates any information management field advantageously.

Computerization is therefore, the engagement of a computer in information management.

1.2 INTRODUCTION TO ILORIN TOWN PLANNING AUTHORITY

Ilorin Town Planning Authority is an establishment of Kwara State Government. It is instituted through an edict which came to effect in 2nd July, 1984. It has its headquarters located at Offa Road, Ilorin with a subsidiary office in each local government area.

Administratively, Ilorin Town Planning Authority is headed by a secretary who usually is a professional Town Planner of considerable number of years of professional experience. The authority consists of a chairman, appointed by the executive head of the state and the following are the members:-

i. The Director General, Ministry of Works, Lands and Surveys.

ii. The Chief Town Planning Officer or his representative not

below the rank of Senior Town Planning Officer.

iii. The Chief Architect or his representative not below the rank of Senior Architect.

iv. The Chief Civil Engineer of his representative not below the rank of Senior Civil Engineer.

v. The Surveyor-General or his representative not below the rank of Senior Surveyor.

vi. The Chief Lands Officer or his representative not below the rank of Senior Lands Officer.

vii. A representative of the Ministry of Local Government and Rural Development not below the rank of Senior Community Development Officer.

viii A representative of the Office of the Secretary to the State Government not below the rank of Senior Assistant Secretary.

ix. The Chief Health Superintendent or his representative

x. A representative of the Ministry of Justice not below the rank of Senior State Counsel.

xi. A representative of Kwara State Water Corporation not below the rank of Senior Water Engineer.

xii. A representative of National Electric Power Authority not below the rank of Senior Electrical Engineer.

xiii A representative of the Armed Forces not below the rank of Captain or its equivalent.

xiv. A representative of the Nigeria Police not below the rank

of Deputy Superintendent of Police.

xv. Three members of the Public, one of whom shall be a woman, to be appointed by the State Governor, and

xvi. The Secretary to the Authority.

In terms of the functional schedule, the Authority is stated for the following activities.

a. To plan, promote and secure the physical and environmental improvement of the state through orderly control over the development and use of land in the State;

b. To frame, publish and approve within such period as may be specified by the commissioner, a planning scheme for any Town or Village within the State;

c. To formulate, monitor, control and co-ordinate physical and other development policies, plans and activities;

d. To secure and maintain proper sanitary conditions, amenities and conveniences;

e. To preserve buildings, objects and other places of architectural, historical, artistic or natural interest and beauty;

f. To provide, maintain and construct roads and other proper infrastructures for urban development; and

g. To carry out such activities as are conducive to the discharge of its functions under Edict No. 7 of 1984.

1.3 AIMS AND OBJECTIVES OF THE PROJECT

To engage computer to achieving; how?

1. Better and easy access to information to enhance good time management, less energy consumption and manual running cost economy management.

2. Space economy for neat working environment and space management.

3. Data integration for comprehensive and coherent system data assessment.

4. Increasing the general functional efficiency for better work output.

5. Safe materials and labour cost in manner of operations as part of the system cost saving measure.

6. Creation of faster speed of job execution as to expand the system functional scope.

7. The elimination of movement of bulky information documents

8. The establishment of secured and safe information back-up incase of rain storm or fire hazards.

1.4 JUSTIFICATION

When one considers the under listed facts, beyond any reasonable doubt, the justification for embarking on a project like this is glaringly confirmed. That;

a. Computerizing the system will create ease of work.

b. More volume of information would be stored contrary to the existing situation.

c. The risk of total destruction of the system's information is eliminated through computerization back up system.

d. More office space will be made available for other functions because the use of computer brings about space economy.

e. There will be room for expansion of the system's scope of work.

f. Easy reach to information is obvious.

g. It will have the advantage of flexibility in information distribution through departmental network computer arrangement.

h. Engaging computer in Ilorin Town planning Authority, the revenue yielding drive will be intensified.

CHAPTER TWO

2.0 <u>SCOPE AND LIMITATION</u>

Physical operations are too wide in scope than being narrowed down to instant and absolute computerization without sectional experimentation. Hence, this project will concentrate on land use information requirements in terms of allocation, monitoring and censuring of existing land use and the proposed structural developments. It integrates within item C below (controlling Physical Development Activities). This aspect is just a fraction out of the numerous activities scheduled as physical development operations which includes, among other,

a. Provision of master plan.

b. Mapping of land use developments.

c. Controlling physical development activities within the master plan.

d. Ensuring maintenance of good sanitation.

e. Orderly control of services network.

f. Preservation of objects or particular architectural or historical reference.

Limitation exists in the nature of none availability of fund to actualize the proposed system design for work-ability testing. Nevertheless, efforts are being made to go a little

beyond academic exercise.

2.1 METHODOLOGY

The first approach to the development of this subject is the general survey of the needs of computerization in solving physical development operations based on observations. This led to the gathering of relevant data through journals, magazines, text books and write-ups. Discussion were held to sample opinions of the workers directly involved in Town Planning Authority programmes. Consultations were made with lecturers in the field of computer science and urban and regional planning for professional advice. To buttress the various points raised, tables, figures, diagrams and likes were produced. The end result of the write-up generated the production of a program output that is submitted along with this project.

2.2 INTRODUCTION TO PHYSICAL DEVELOPMENT OPERATIONS

Several theories backed up the growth and development of Urban amd Regional Areas. Such theories include, concentric ring theory of Buigress (1945), the sector theory of Hoyt (1939) and the polynuclear theory of Harris and Ullman (1945). But whatsoever theory is considered satisfactory will depend on the nature of circumstances fro the commencement of

urbanization growth in a particular Urban centre.

Peculiar in its nature, the commencement of Ilorin metropolis picked root in the historical Yoruba throne strive faction dispersal and city war break up. This necessitated resettlements of only Oyo on a virgin land with subsequent trade, religions, war and administrative immigrants settlements tolerance on the part of the indigenous Oyo settlements. This explains the Ilorin settlement growth pattern. Nevertheless, whatever could be said to be the cause or causes for urbanization have been favourably tackled through the urbanization planning principles of Kwara State Government when Ilorin Town Planning Authority was established.

It then becomes imperative to program the whole state physical development along some governmental policies. Hence, the need to produce model plans. Availability of such plans will attract peoples adherence to the various plans, of course, with some considerable flexibilities in terms of changes in government policies from time to time. This control has to come to play. As new structures infiltrate the old settlement, virginal lands also accommodate new housing programmes with associated industrial, religions, commercial, recreational, administrative, health, educational service structures and such like facilities and their amenities. While the virgin land provides land opportunities for free expansion

practices of physical development, it becomes very chaotic to introduce services lines and to horizontally spread structures within traditionally developed areas. These and many other challenges are being faced by the Town Planning Authority. For example, many developed areas have the problems of structural cross ventilation, poor lavoratory sanitation, non clear access route, clumsy water pipelines, bad or none existence of refuse disposal system, none serially numbered houses, weak structural building components, none neighbourhood schools, post office, police post, fire station, standard market are found within reasonable proximity and so on. Nevertheless the whole land area has to be plarsued and replanned to conform with governments taste within the needs of her people. Hence physical development operations have to take place and a body should account for its success. Physical development operations can therefore be seen, in this respect, as the execution of government policies on environmental physical development issues.

2.3 THE FRAGMENTS

Physical development operations fragment into the following:

a. Policies

b. Models

c.   Regulations

d.   Taxes and levy

e.   Implementation

a.   <u>POLICIES</u>

What serves as backing authority to a successful implementation of physical development programs is the related formulated polices. Such polices take into consideration the wholesome necessities for an environment that is peaceful, comfortable, healthy, beautiful, orderly, stable, accessible, serviceable, preservable, peculiar and so on, to mention but a few considerations. Some of these policies include:

a.   Land ownership laws

b.   Building or construction permit

c.   Land use specifications

d.   Taxes

e.   Building standards

f.   Environmental pollution control

Some policies in physical development operations generates the Town Planning Laws. These are being transformed into physical development controlling bye laws. These policies are the means to an end and not the end itself. They lead to the provision of models as reference points, that dictates the pattern of wants based on observable or standardized solutions.

b.   MODELS

Andreas Faludi (1987) defines models as, "Models are representation of the object - system. They help analyse and stimulate its behaviour under a variety of conditions. They thus promise to increase the system control at the same time".

Thus in order to justify the practicability of policies on physical development, the policy makers are compelled to provide design guard samples. There samples come in the manner of city, town and regional master plans, land use ·maps, topographical maps, geological survey maps and several other maps relating to physical development operations. Modelling could be viewed from another perspective, it could be the establishment of approved professional bodies in the field relevant to both environment. Such fields are architecture, engineering, horticulture, town planning, survey, estate management and so on. These fields produce trained practitioners competent to handle physical development issues in their various fields.

c.   REGULATIONS

Usually these regulations are produced by Town Planning Authority and they build on all physical developmental steps in conjunction with the model controls. Regulations specify in detail building component parts that are approved for various designs and also go into standardizing construction works among other things.

d. TAXES

The state government derives some financial benefits in physical development operations. These came up in terms of charges for the allocated hand, fees for approval of drawings, rent charges for rental structures, various levy for various land uses especially the industrial and commercial plots. Numerous penalty charges and charges in application forms also exist to mention the least.

e. IMPLEMENTATION

Below is the list of government functionaries that are directly involved in physical development operations;

a. State Ministry of Lands and Survey

b. State Ministry of Works

c. Town Planning Authority

d. Property Development Authority

e. Utility Board

f. National Electric Authority (among others)

The actual control and policy implementation is the responsibility of Town Planning Authority. The Authority performs its duty of implementation through a system. This system is divided into administration, implementation, finance and maintenance. This will be fully discussed in chapter three.

2.4 OPERATIONAL AIMS

Physical development operations do aim at having a total control on the manner by which the environment is being used. All human activities are comprehensively organised on land such that there is orderliness in land use. This is achieved through master planning every human land use activities. Physical development operations see into the safety and security of lives by insisting on structural stability, fire safety precussions, easy accessibility, storm proof measures of each building erected. Control is also made on general environmental pollution issues. For example, a section of I.T.P.A building regulations says;

"efficient means for disposal of domestic effluent shall be by suitable measures to the satisfaction of the public health officer, of the Authority."

One can summarily say that physical development operations achieve making the whole environment, accommodating, relaxing, less congested valuable, measurable, controllable, peculiar, preservable, serviceable, accessible, orderly, safe, healthy, comfortable, peaceful, beautiful and so on with the recognition of the fact that the society is dynamic in nature.

CHAPTER THREE

3.1 <u>ILORIN TOWN PLANNING AUTHORITY AT A GLANCE</u>

Figure 2 shows the organization chart of I.T.P.A. The authority is autonomous in nature, hence it is answerable directly to the state executive Governor. The whole system is annually audited apart from the internal auditing. There is an appointed board that functions at directorate capacity in conjunction with the Director General in charge of the Authority.

Generally, and Executive Secretary administratively heads the Authority having five departments attached. Those departments are; Area office, Personnel / Maintenance, Finance and Supply, Physical Planning, Works and Health. Each of the departments is serviced with division under them. These divisions reflect the various activities that go on in the authority. Such activities include Pest control, Plan inspection, Architectural works, Quantity survey and engineering works, Patrol under public complaint, Cartolito scheme services, Plan production, Finance and supply, Transport and Personnel beautification and street naming, litigation and control area offices.

3.2 SYSTEM DEFINITION

The system definition leads to the understanding of the internal structures of the whole system. That is, the input specifications, the procedural specifications, the output specifications and such arrangements that support the general functions of the authority. In other words, the general data inputs, data processes, data representation, data collation, data retrieval and data output (information) Fig 3. refers
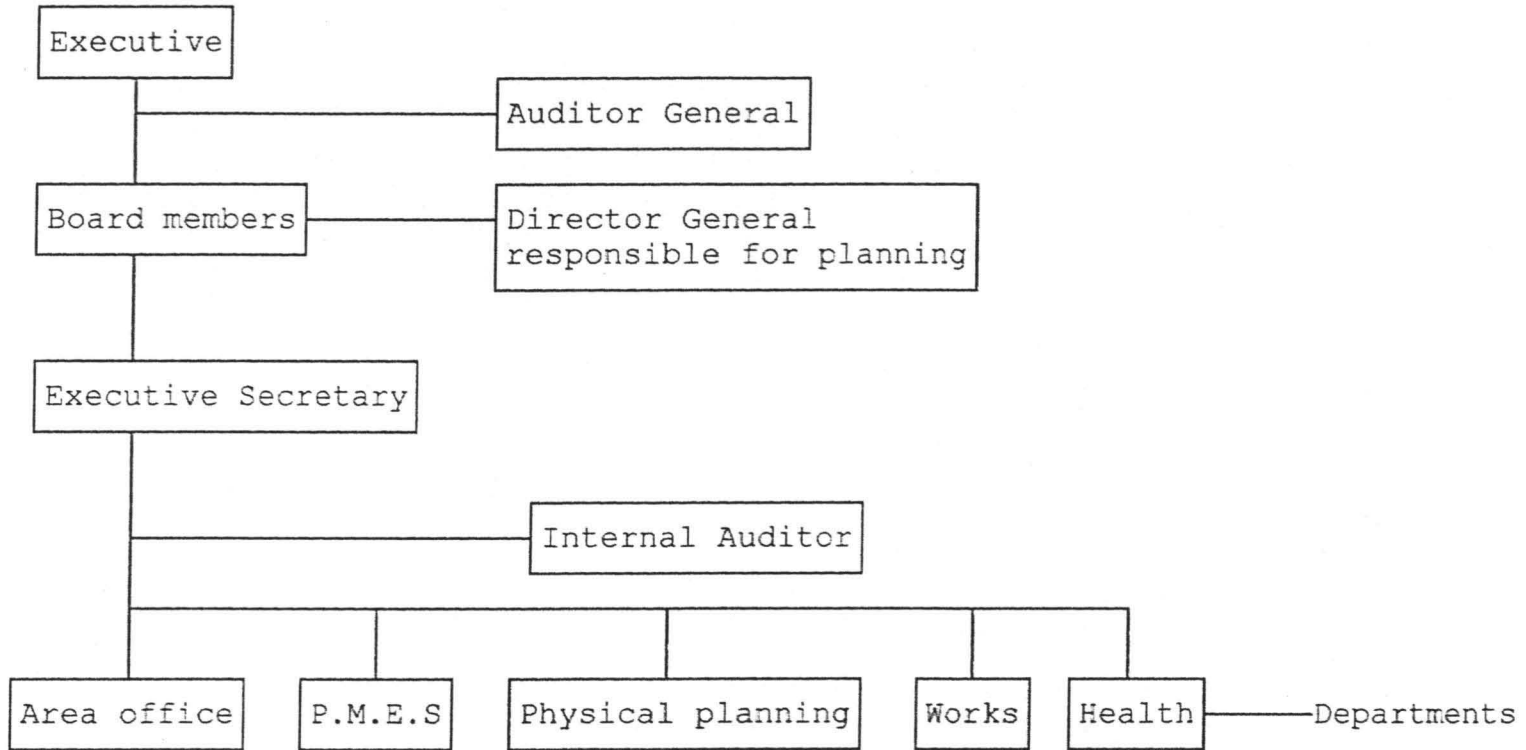
3.2.1 Input Specification (Manual Operations

The overall input in the system could be categorized into the following, as shown in Fig. 3;

1. Physical development documents inputs

2. Personnel records input/system feed backs

3. Finance inputs

4. Plants, equipments and accommodation inputs

ILORIN TOWN PLANNING AUTHORITY

ORGANIZATIONAL CHART

```
┌───────────┐
│ Executive │
└───────────┘
      │                        ┌──────────────────┐
      ├────────────────────────│ Auditor General  │
      │                        └──────────────────┘
┌───────────────┐              ┌────────────────────────────┐
│ Board members │──────────────│ Director General           │
└───────────────┘              │ responsible for planning   │
      │                        └────────────────────────────┘
┌─────────────────────┐
│ Executive Secretary │
└─────────────────────┘
      │                        ┌──────────────────┐
      ├────────────────────────│ Internal Auditor │
      │                        └──────────────────┘
```

| Area office | P.M.E.S | Physical planning | Works | Health |———Departments

Divisions

Area office and litigation	Beautifi cation and street naming	Personne l	Transport	Pub. Rel.	Fin. and Supply	Plan production	Carto Scheme Patrol & Pub. Complaint	Eng.	Q. S.	Arch.	Plan produc- tion	Pest control

Fig. 2
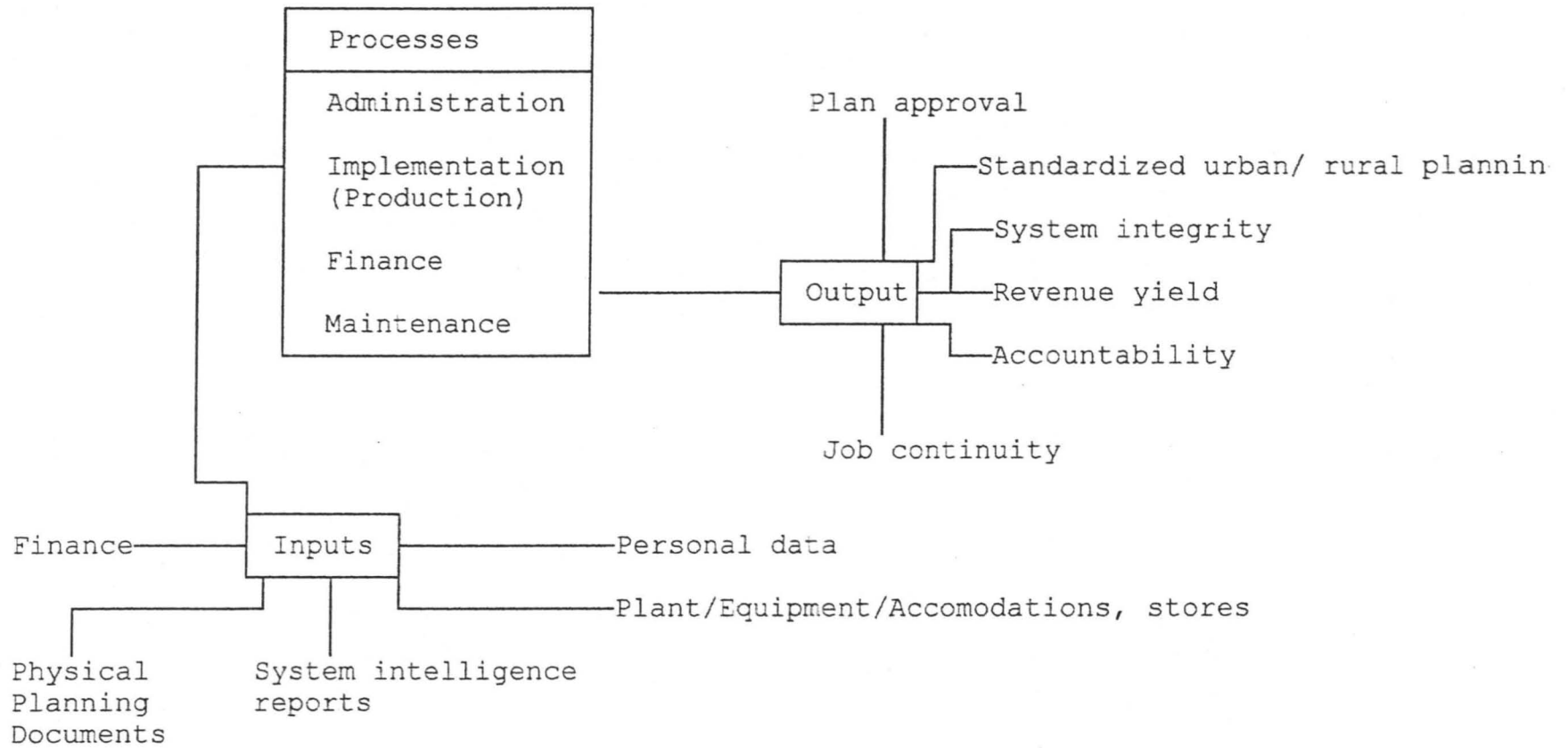
SYSTEM FLOW CHART DIAGRAM

Fig. 3

3.2.2   Procedural Specifications (Manual Operations)

1.   Physical development implementations

    a.   Building plan assessment

    b.   Construction supervision

    c.   General patrol

    d.   Beautification and street naming

    e.   Pest control

    f.   Plan production and cartolito

    g.   Scheming

    h.   Construction works

    i.   Rental services

2.   Administration

    a.   Personnel management

    b.   Works scheduling

    c.   Works approval

    d.   Budgetary control

    e.   Policies formulation

    f.   General report

    g.   Documentation

3.   Accounting

    a.   Internal auditing

    b.   Payment of salaries, allowances e.t.c.

    c.   Settlement of bills

    d.   Acceptance of charges, taxes and levies

4.   Plants, Equipment and Accommodation

   a.   Plant operation

   b.   General maintenance

   c.   Accommodation allocations

   d.   Storage

3.2.3   Output Specification (Manual Operations)

   a.   Building plan approval

   b.   Production of architectural drawings

   c.   Standard urban planning

   d.   Job efficiency

   e.   Revenue yield

   f.   Structural assets acquisition

   g.   Job continuity

   h.   Accountability

   i.   Items durability and security

3.3   SYSTEM DATA ANALYSIS

The entire data system could be analyzed from four operational viewing points. These are administration, implementation, finance and maintenance.

3.3.1   Administration

The paramount god of administration is to create job

continuity, job efficiency and accountability in addition to other vital objectives. These are achieved through engagement of professional in various relevant fields. Nevertheless, the welfare of these personnel has to be considered with their records put in order. Such records include;

Name

Date of Birth

Place of Birth

Marital Status

Nationality

Religion

Sex

Educational qualification as at 1st appointment

Date of 1st appointment

Present rank

Salary or Grade level

Acquired qualifications

Work input

Loan obtained

Payment up to date

Present station

The above data could be considered as personal record input specification. These could be used for output specification like;

General staff strength

Promotion

Length of service

Pension

Gratuity

Work performance rating

Financial situation

Local government employment quota

Rating of entitlements

Similar list could be drawn for each procedural specification, section 3.2.2 under administration.

3.3.2   **Implementation**

The authority is set up primarily to take care of physical development operations. These activities are summerised in section 3.2.2 (1) physical development implementations. These are purposed towards land use final results such as controls on the type of buildings built in the environment, production of architectural drawings, standardized and regulated urban growth, revenue yield and any other desire of the authorities. These functions require such records as given below;

Building owner

Type of building

Location site

Plot size

Land area built up

Name of control officer

Date construction started

Building designed by

Building supervised by

Date of completion

Habitability state

Street name

House No.

Date application for approval was received

Attachment documents

Approval situation

- Surveyor

- Estate officer

- Town planner

- Architect

- Civil engineer

- Health officer

- Area officer

- Secretary

Fees paid.

The above data input specification are relevant in determining output specifications such as;

Building ownership censor

Building type neighbourhood relationship

Housing quantity

Population density zoning

Regulations conformity

Construction situation

Progress of works under supervision

The designer

Legal control

Habitability

Accessibility

Identification

Approval records

3.3.3   Finance

The authority derives its source of finance from two sectors. The first sector is through the state governments budgetary allocation. The second source is through commercialization by the authority. These two sources serve as the only financial inlet for the authority. From these all the financial needs are as available under section 3.2.2 (2) "Accounting". Data specification input and output could also be itemised when computer system is introduced.

3.3.4   Maintenance

Serviceability of items in use, safe keeping of materials and supply of implements for various office use, fall within maintenance. This department achieves functional usability of the system assets. The activities under maintenance could also be programmed for computation if so desired.

3.4   PROBLEM IDENTIFICATION

Some of the problems that could be identified include;

- Poor data storage

- Uneasy accessibility to data

- Difficulties in data up-date

- Inadequate security for stored data

- Existence of work fatigue

- Lack of data organization

- None availability of physical development data representation

- Difficulty in land use data / office communications

- Lack of housing quantity data

- Availability of bulky stored data materials

- None easy flow of data from departments to departments

3.5 AREA OF FOCUS

Out of the four areas considered operational in the whole system, the area of concentration is land matters of physical development operational implementation. It deals with "Land use Data Organization and Information Management".

This is an aspect where existing land use situation is adequately documented and the required information extracted from such documented data.

These embrace;

1. Land matters:- Type of land ownership, location, plot sizes, type of land specification, rate of periodical development e.t.c.

2. Buildings:-   Type of structure, stage of development, housing standards e.t.c

3. Services:-   Toilets, sewage system, access roads, electricity, water e.t.c.

3.6 PROBLEMS ANALYSIS

Having expatiated on the system data analysis, it could generally be observed that the whole system requires a lot of data organization and processes to avoid mix up and repetition of information. Hence the obvious problems could be analyzed within the following points as earlier identified;

*   <u>Storage</u>

Since the whole record documentation takes manual nature through file, drawers and cabinets storage system, a large storage area is installed. This creates uneconomic space usage, additional construction cost for the reinforced floor required to bear the superimposed loads.

*   <u>Accessibility</u>

To easily reach some long documented data is quite impossible. This is because such records would have been grouped under closed files. These bulks closed files are usually piled on top of each other and are not easily accessible.

*   <u>Data Update</u>

Up dating data under manual system is not an easy task. When ever such is attempted, it brings about re-numbering of document pages. This involves removal of these documents one by one, to locate the correct position for the update. Where considerable number of files are to be updated, the ease to do this is absent.

*   <u>Security</u>

The present data storage system is prone to hazards without combating measures, comparable with what the computer will give through backup.

*   <u>Work Fatigue</u>

The energy sapping nature of manual file ransack normally develops fatigue. Continuity of this can cause lack of job interest in the mind of the employee.

*   <u>Data Organization</u>

Data organization is lacking in the present system, hence the same data requirement are being asked for in some of the departments whose functions interwove in other words, data flow is poor.

*   <u>Physical Development Data Representation</u>

In some instances, data representation of existing physical development situation conflicts with office data. It is therefore necessary for office data to tally with land use practice.

*   <u>Easy Land Use Data Communication</u>

Easy land use data communication is presently not available, this makes, on the spot assessment of land use a compulsion for lack of data co-ordination that will reflect and physical development stages for immediate information requirement. This amounts to wastage of resources.

*   <u>Population Census Data Aids</u>

Housing   quantity   data,   if   made   obtainable   at   Town
Planning Authority would aid population census exercises.

Solutions to the analyzed problems form part of chapter
four.

CHAPTER FOUR

4.0 THE SYSTEM

Feasibility studies formed the bed rock of the proposed system's take off.

Feasibility Study

The essence of feasibility study is to establish the viability of this system in terms of workability, economic advantages, functional benefits, maintenance possibilities and so on.

a. Workability:

It is now a new trend for establishments, both private and government, to engage computer in their functions, especially the Nigeria of today. One can therefore say that more people are becoming computer literate. However there is still numerous establishments that are not computerized yet. Such establishment is Kwara State Town Planning Authority, Ilorin.

The survey carried out, in the nature of interview and observation, has revealed the possibilities of computer workability in this system. The present manual data management system could, most especially, be transformed into computer data management system. Computer training facilities are available in Nigeria, computer component parts are within

reach. Cost of purchasing and installing computers are not outrageous. Computer scientists, system analysts, programmers, engineers do exist in reasonable number, making workability of the proposed system feasible.

   b.   Economic Advantages:

Without controversy a lot of cost benefits advantageously characterized this proposed system. Some of these benefits are already high lighted as derived from the conducted feasibility study. They include, construction space cost advantage, reduced labour cost, minimised lithography expenses, speed efficiency cost realization, to mention but a few cost benefits.

   c.   Functional Objectives:

The functional objectives of the old system is found to be achieved in a slow, tedious, conflicting, resources wasting and faulty output manner. This is obvious in the nature of frequent site visits, uneasy file sorting, accessing, duplication of functions duties, running cost, inadequately generated information output.

4.1   SYSTEM ANALYSIS

The proposed system consists of humanware, software and hardware.

a.   Humanware:

In respect of the proposed system, humanware stands as the generator of every activities. It is subjected to the establishments policy, systems goals and objectives, and code of professional practices. Required data for the system is originated, co-ordinated, organised and fed into the computer by humanware. It has to be trained and motivated before it can perform adequately.

b.   Software:

Hitherto, software are available in three forms. These are;

1.   Application Software

2.   Translation Software

3.   Operating ware

Translation and operating software will not be discussed here but application software.

Application Software

A 3.5, high density diskette was bought. This was formatted into 1.44 megabytes, after ensuring that it is virus free. The completed written program in C drive was therefore copied to A drive.

Program Output Design

1.   Total land area of schemed zone.

2.   Ratio of specified land use to the total allocated land.

3.   Percentage of government allocated plots to total schemed

land area.

4. Percentage of private allocated plots to total schemed land area.

5. Ratio of developed plots in government allocated plots to total government allocated plots per period of three years.

6. Ration of periodical developed plots in private allocated plots to the private allocated plots.

7. Total area of revocable plots end of year 1990, 93, 96.

8. Total area of undeveloped private allocated plots

9. Exit

4.2 SYSTEM DESIGN

In this system design, the adapted language is Database IV. It is an advanced version of Dbase that provides a full relational database environment to users. Through the control centre and without the use of command language, one can design databases, manipulate and edit records and files, generate reports, perform database query, design labels and browse database. Data fields can be specified with default value as well as valid ranges. Data can be verified automatically as they are entered into field.

Up to 255 fields can be specified per record, and a database can be related to more than two other databases.

Programs and procedures can also be compiled and saved as object codes for faster execution. Pop-up menus and windows can be designed. It is also has a large number of memory variables, user definable functions, up to 99 files can be opened at one time. There is also improved indexing, a larger command line butter, an improved command line editor, improvement printer handling capabilities and faster execution. A query-by-example function is also provided.

Database IV organises data into a database file. A database file is a collection of related records. It is in the form of a two dimensional table consisting of a number of rows and columns. Each row represents a field in the database file, and each column represents a field in the record of a database file. Therefore, a database file is made up of some components which are record and field. A record is all the information about a single item, while a field is a unit of information within each record of a database file.

Database Files

Eleven database files are created in the program. These include;

1.   GAA.AKAN; This stands for the schemed Gaa-Akanbi zones. It has the under listed specification.

Code	Length	Breadth	Number	Plot size	Plot area
A	15	15	2,084	225	468,900
B	15	30	28,000	450	12,600,000
C	30	30	9,550	900	8,595,000
D	30	45	11,100	1,350	14,985,000
E	90	90	25	8,100	202,500

2. ALLO-GOV; This means allocated government plots in 1988 to 1996. It contains the following data;

    1. Residential - B 6000, C 7548, D 6120

    2. Commercial - A 384, E 3

    3. Recreational - D 3

    4. Educational - D 9, E 3

    5. Health - E 6

    6. Industrial - E 3

    7. Agricultural - 0

    8. Religions - D 3, E 3

    9. Administrative - E 3

3. ALLO.PLO; The total allocated plots within the schemed area is thus coded. The following data belongs to this file.

    1. Residential - B 28,000, C 9550, D 11075

    2. Commercial - A 2084, E 4

3. Recreational - D 5, E 1

4. Educational - D 10, E 4

5. Health - E 6

6. Industrial - E 3

7. Agricultural - 0

8. Religions - D 10, E 4

9. Administrative - E 3

4. GOV.DEV. (88 - 90). In this data file, government allocated plots, developed within 91 and 93 are presented. It is given below

1. Residential - B 1,000, C 2050, D 2,000

2. Commercial - A 90, E 1

3. Recreational - D 1

4. Educational - D 3, E 1

5. Health - E 2

6. Industrial - E 1

7. Agricultural - 0

8. Religions - D 1, E 1

9. Administrative - E 1

5. GOV1.DEV. (91 - 93). Government allocated plots that have been developed within the stipulated years are presented in this data file.

It contains the under-listed data;

1. Residential - B 1,200, C 2,500, D 2,000

2. Commercial - A 60

3.   Recreational - D 1

4.   Educational - D 2

5.   Health - 0

6.   Industrial - 0

7.   Agricultural - 0

8.   Religions - D 1

9.   Administrative - E 1

6.   GOV2.DEV. (94 - 96). Within the period of three years (94 - 96) some government allocated plots were developed and recorded as below;

1.   Residential - B 300, C 2,300, D 2,000

2.   Commercial - A 92

3.   Recreational - 0

4.   Educational - D 2, E 1

5.   Health - 0

6.   Industrial - 0

7.   Agricultural - 0

8.   Religions - D 1

9.   Administrative - 0

7.   PRIOWN. This file stands for private allocated total plots. The under-listed data are contained in the same.

1.   Residential - B 22,000, C 2,002, D 4,955

2.   Commercial - A 1,700, E 1

3.   Recreational - D 1, E 1

4.   Educational - D 2, E 1

5.   Health - 0

6.   Industrial - 0

7.   Agricultural - 0

8.   Religions - D 7, E 1

9.   Administrative - 0

8.   PRIV-DEV (1988 - 90). Records of plots that were developed with 1988 and 1990 are found in this data file. The records are the ones given below;

1.   Residential - B 600, C 700, D 1,000

2.   Commercial - A 310, E 1

3.   Recreational - 0

4.   Educational - D 1

5.   Health - 0

6.   Industrial - 0

7.   Agricultural - 0

8.   Religions - D 2

9.   Administrative - 0

9.   PRIV-DEV (1991 - 93). This code is the private allocated but developed plots of the three years alloted period. It has the following data;

1.   Residential - B 750, C 300, D 800

2.   Commercial - A 200

3.   Recreational - 0

4.   Educational - E 1

5.   Health - 0

6.   Industrial - 0

7.   Agricultural - 0

8.   Religions - D 1, E 1

9.   Administrative - 0

10.   PRIVE-DEV (1994 - 96). The data for developed private allocated plots is contained in this data file for the mentioned period. The data is as given below;

1.   Residential - B 400, C 225, D 700

2.   Commercial - A 110

3.   Recreational - 0

4.   Educational - D 1

5.   Health - 0

6.   Industrial - 0

7.   Agricultural - 0

8.   Religions - D 1

9.   Administrative - 0

11.   Zone. The file that bears "Zone" has the records of the total schemed areas for selected zones in Ilorin urban areas - (Zone A - H Ilorin).

Zone	Area Name	Area Code	Area Address
A	Gaa-Akanbi	C1	Ilorin South
B	Tanke	C2	– do –
C	Fate	C3	– do –
D	Govt. Reserved Area	C4	– do –
E	Pakata	C5	Ilorin West
F	Saw Mill	C6	– do –
G	Taiwo Oke	C7	– do –
H	Adewole	C8	– do –

4.3 THE MENU STRUCTURE

The menu structure comprises of;

1. Menu

2. Gaa Akan.

Under Gaa Akan are these sub menu

a. TOT PLOT

b. RLUSE

c. PGALLO

d. POP

e. GOVDEV

f. PRVDEV

g. REVOC

MENU:

The menu structure called MENU actually denotes the personal introduction to the program. Here the project title, the case study, the student's identity and the year of project reflects

GAA-AKAN:

Identification of the schemed area code, name, locational address and the zone are clearly structured here.

TOT PLOT:

This menu brings out the computerization of the total plot number and the total schemed zone, total land area.

RLUSE:

The ration of land use to the total allocated land is programmed and the result puts residential plot as having the highest ratio, followed respectively by commercial, health, education and religious, administration while agriculture ends the list.

PGALLO:

From the menu comes the results of the percentage of government allocated land to the total schemed zone in consideration. This gives 48.93%.

POP:

The percentage of private allocated land to the total land under the schemed area is verified here and found to be

51.0%.

4.4 IMPLEMENTATION

To change over to computer application in a place where computer is being introduced for the first time demands a gradual facing out of the old system. This is because personnel training has to be considered first. Apart from staff training, the new system as explained earlier focuses on an integrated part of the old system and not on the whole old system. This implies the adaptation of pilot method of change over procedure. This is selected out of the other two possibilities namely parallel and direct or one for one change. The old system is discontinued wholly and the new one substituted immediately. In the parallel change both the old and new are run concurrently.

GOVDEV:

The ratio of government allocated plots to government developed plots under the three periodical years are computed. The highest number of development took place in 1991 - 93. In 1994 - 96 is the lowest level of development.

PRVDEV:

Ratio of developed plots to the total private allocated comes under assessment here

The output is:

0.12 (1988 - 90)

0.09 (1991 - 93)

0.07 (1994 - 96)

<u>REVOC:</u>

The periodical revocable plots shows numbers of each plot size revocable under each specified land use. From this result, the total land area revocable in each specified land use can be calculated.

<u>PRVUNDEV:</u>

Total land area underdeveloped out of the total private allocated land for the nine year period is as given below.

* Total area of private allocated plots = 18819450.

* Total area of private allocated developed plots = 5436900.

* Total area of undeveloped private allocated = 13382550.

CHAPTER FIVE

5.0 INTRODUCTION

Conclusively it is considerably important to highlight the relevance and the scope of this project. This will enable some of the advantages come vividly. Not only that, but some recommendation will also emerge as a means of ensuring continuity of system objectives and up dates.

5.1 HIGHLIGHT

The recommended system is to make the flow of input data easy for physical development operation.

It also creates the possibility of fast and accurate record storing and retrieving.

The system is capable of benefiting the government economically in terms of reduction of wasteful and strenuous manual input operation time.

Among other things, records obtained from outputs will be good enough for multiple information management.

Accessibility to data is controllable to the taste of the establishment as data could be coded with passwords.

Furthermore, the portability of stored data is guaranteed. The portability also makes data backup possible which also offers system information security.

In terms of maintenance, computer engineers, analysts and programmers are within reach and the system installation does not go outside available technology.

5.2 CONCLUSION

In view of the above highlighted facts, I do strongly recommend a change over to computer system in Town Planning Authority of Kwara State. Not Kwara State alone but this consideration should extend nation-wide.

Nevertheless some valuable suggestions are hereby made.

5.3 SUGGESTIONS

In view of the rapid technological advancement that makes available application packages that are upper friendly, there is the tendency for abuse and lack of co-ordination among computer professionals and non professionals. There is the need therefore to have government control over the use of computer. This will also give the boundary as to the nature and type of information private establishments can process.

Links should be made with countries that are vast in computer technology and application, to avoid system obsolence, and hold system integrity.

The old system should gradually be faced out as sectional parts are being computerized. This ensures monitoring of the

efficiency of the computerized section. The successful implementation of such sectional part will be an encouragement and a parameter to changing the rest of the old system.

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APPENDIX 1

```
SET TALK OFF
SET SAFETY OFF
SET ECHO OFF
SET CATA OFF
SET DBTR OFF
SET SCORE OFF
SET STAT OFF

*-------- PERSONAL INTRODUCTION
@1,4 TO 22,76 DOUB COLOR RB+
@3,18 SAY 'TOPIC :- PHYSICAL DEVELOPMENT OPERATION'
@5,8 SAY 'CASE STUDY:- KWARA STATE TOWN PLANNING AUTHORITY
ILORIN.'
@7,38 SAY 'BY'
@9,28 SAY 'WILLIAM ROTIMI OLAYEMI'
@10,32 SAY 'PGD/MCS/111/96'
@12,12 SAY 'THIS PROJECT WORK IS SUBMITTED TO THE DEPARTMENT OF'
@14,22 SAY 'MATHEMATICS AND COMPUTER SCIENCE'
@16,13 SAY 'IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE'
@18,13 SAY 'AWARD OF POST GRADUATE DIPLOMA IN COMPUTER SCIENCE'
@20,35 SAY 'MARCH 1997'
@23,25 SAY 'PRESS ANY KEY TO CONTINUE'
WAIT""
DO MENU1
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
*SCHEMED AREA
DO WHILE .T.
@1,1 TO 22,70 DOUB COLO GR+
@3,15 SAY "SCHEMED URBAN AREAS(ZONE A-H ILORIN)"
@4,15 TO 4,50
@6,13 SAY "TASK CODE"
@6,34 SAY "TASK"
@7,13 TO 7,21
@7,34 TO 7,37
@8,15 SAY "A" +SPACE(15) +"GAA-AKANBI"
@9,15 SAY "B" +SPACE(15) +"TANKE"
@10,15 SAY "C" +SPACE(15) +"FATE"
@11,15 SAY "D" +SPACE(15) +"GOVERNMENT RESERVED AREA"
@12,15 SAY "E" +SPACE(15) +"PAKATA"
@13,15 SAY "F" +SPACE(15) +"SAW MAIL"
@14,15 SAY "G" +SPACE(15) +"TAIWO OKE"
@15,15 SAY "II" +SPACE(15) +"ADEWOLE"
@16,15 SAY "Q" +SPACE(15) +"EXIT"
OP=SPACE(1)
@18,22 SAY "ENTER TASK CODE [ABCDEFGHQ]" GET OP PICT "!"
READ
DO CASE
   CASE OP="A" .
   DO GAA_AKAN
   CASE OP="Q"
   EXIT
ENDCASE
ENDDO
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
*SCHEMED AREA - GAA-AKANBI
DO WHILE .T.
@1,0 TO 22,79 DOUB COLO GR+
@3,15 SAY "PARTICULARS OF SCHEMED AREA(ZONE C1 - GAA-AKANBI)"
@4,15 TO 4,63
@6,3 SAY "TASK CODE"
@6,34 SAY "TASK"
@7,3 TO 7,11
@7,34 TO 7,37
@9,6 SAY "1" +SPACE(4) +"TOTAL ALLOCATED LAND"
@10,6 SAY "2" +SPACE(4) +"RATIO OF LAND USE TO THE TOTAL ALLOCATED
LAND"
@11,6 SAY "3" +SPACE(4) +"PERCENTAGE OF GOVT ALLOCATED PLOTS TO TOTA
LAND ALLOCATED"
@12,6 SAY "4" +SPACE(4) +"PERCENTAGE OF PRIVATE ALLOCATED PLOTS TO
TOTAL LAND ALLOCATED"
@13,6 SAY "5" +SPACE(4) +"RATIO OF DEVELOPED GOVT ALLO PLOTS TO TOTA
GOVT ALLOCATED PLOTS"
@14,6 SAY "6" +SPACE(4) +"RATIO OF DEVELOPED PRIVATE ALLO PLOTS TO
TOTAL PRIVATE ALLO PLOTS"
@15,6 SAY "7" +SPACE(4) +"AREA OF REVOCABLE PLOTS END OF THE YEAR
1990,1993 AND 1996"
@16,6 SAY "8" +SPACE(4) +"AREA OF UNDEVELOPED PRIVATE PLOTS FOR
1988-96"
@17,6 SAY "Q" +SPACE(4) +"EXIT"
OP=SPACE(1)
@19,22 SAY "ENTER TASK CODE [12345678Q]" GET OP PICT "!"
READ
DO CASE
    CASE OP="1"
    DO TOT_PLOT
    CASE OP="2"
    DO RLUSE
    CASE OP="3"
    DO PGALLO
    CASE OP="4"
    DO POP
    CASE OP="5"
    DO GOVDEV
    CASE OP="6"
    DO PRVDEV
    CASE OP="7"
    DO REVOC
    CASE OP="8"
    DO PRVUNDEV
    CASE OP="Q"
    EXIT
```

```
ENDCASE
ENDDO
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO P_SIZE,P_AREA,TNP,TPA
@1,1 TO 20,70 DOUB COLO GB+
@3,6 SAY "GAA-AKANBI LAND SCHEMED AREA FOR BOTH PRIVATE AND
GOVERNMENT"
@4,6 SAY
"------------------------------------------------------------"
@6,4 SAY "CODE"
@6,12 SAY "LENGTH"
@6,19 SAY "BREADTH"
@6,30 SAY "PLOT_SIZE"
@6,40 SAY "NUM_PLOT"
@6,50 SAY "PLOT_AREA"
USE GAA_AKAN
R=7
DO WHILE .NOT. EOF()
DO WHILE .T.
STORE 0 TO P_SIZE, P_AREA
P_SIZE=LENGTH*BREADTH
P_AREA=NUM_PLOT*P_SIZE
@R,6 SAY CODE
@R,14 SAY LENGTH PICT "99"
@R,21 SAY BREADTH PICT "99"
@R,30 SAY P_SIZE  PICT "9999"
@R,40 SAY NUM_PLOT PICT "99999"
@R,50 SAY P_AREA PICT "99999999"
TNP=TNP+NUM_PLOT
TPA=TPA+P_AREA
SKIP
IF R>11 .OR. EOF()
   EXIT
   SET FIELD TO
ENDIF
R=R+1
ENDDO
ENDDO
@12,33 SAY REPL("-",12)
@12,50 SAY REPL("-",8)
@13,40 SAY TNP PICT "99999"
@13,50 SAY TPA PICT "99999999"
@14,33 SAY REPL("-",12)
@14,50 SAY REPL("-",8)
@17,20 SAY "PRESS ANY KEY TO CONTINUE"
```

```
WAIT""
CLOSE ALL
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO P,S,Q,X,T,Y,Z,P1,S1,Q1,X1,T1,Y1,Z1,P2,S2,Q2,X2,T2,Y2,Z2,A:
@1,1 TO 18,78 DOUB COLO GB+
@3,5 SAY "RATIO OF DEVELOPED PLOTS IN GOVT_ALLO PLOTS TO TOTAL
GOVT_ALLO PLOTS"
@4,5 SAY
"-------------------------------------------------------------------
A1=15*15
B1=15*30
C1=30*30
D1=30*45
E1=90*90
A2=6010650
STORE 0 TO P,S,Q,X,T,Y,Z
USE GOVT_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P=A1*A
S=B1*B
Q=C1*C
X=D1*D
T=E1*E
Y=Y+P+S+Q+X+T
SKIP
ENDDO
STORE 0 TO P1,S1,Q1,X1,T1,Y1,Z1
USE GOV1_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P1=A1*A
S1=B1*B
Q1=C1*C
X1=D1*D
T1=E1*E
Y1=Y1+P1+S1+Q1+X1+T1
SKIP
ENDDO
STORE 0 TO P2,S2,Q2,X2,T2,Y2,Z2
USE GOV2_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P2=A1*A
```

```
S2=B1*B
Q2=C1*C
X2=D1*D
T2=E1*E
Y2=Y2+P2+S2+Q2+X2+T2
SKIP
ENDDO
@7,10 SAY "TOTAL GOVT DEVELOPED PLOTS FOR 1988-1990 = "
Y0=Y/A2
@7,51 SAY Y0
@9,10 SAY "TOTAL GOVT DEVELOPED PLOTS FOR 1991-1993 = "
Y3=Y1/A2
@9,51 SAY Y3
@11,10 SAY "TOTAL GOVT DEVELOPED PLOTS FOR 1994-1996 = "
Y4=Y2/A2
@11,51 SAY Y4
@14,20 SAY "PRESS ANY KEY TO CONTINUE"
WAIT""
CLOSE ALL
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO P,S,Q,X,T,Y,Z,TOT_PLOT
@1,1 TO 22,75 DOUB COLO GB+
@3,5 SAY "PERCENTAGE OF GOVERNMENT ALLOCATED PLOT TO TOTAL ALLOCATED
LAND"
@4,5 SAY
"-----------------------------------------------------------------"
@6,3 SAY "LAND_USE"
@6,21 SAY "A"
@6,31 SAY "B"
@6,42 SAY "C"
@6,51 SAY "D"
@6,60 SAY "E"
A1=15*15
B1=15*30
C1=30*30
D1=30*45
E1=90*90
TOT_PLOT=36851400
K=100
R=7
USE ALLO_GOV
DO WHILE .NOT. EOF()
DO WHILE .T.
SET FIELD TO LAND_USE,A,B,C,D,E
@R,3 SAY LAND_USE PICT "@!"
P=A1*A
@R,17 SAY P PICT "99999999"
S=B1*B
@R,27 SAY S PICT "99999999"
Q=C1*C
@R,38 SAY Q PICT "99999999"
X=D1*D
@R,48 SAY X PICT "99999999"
T=E1*E
@R,56 SAY T PICT "99999999"
Y=Y+P+S+Q+X+T
SKIP
IF R>16 .OR. EOF()
   EXIT
   SET FIELD TO
ENDIF
```

```
R=R+1
ENDDO
ENDDO
@17,15 SAY "TOTAL GOVT PLOT = "
@17,33 SAY Y PICT "99999999"
Z=Y/TOT_PLOT*K
@18,15 SAY "PERCENTAGE = "
@18,28 SAY Z PICT "99.99"
@18,33 SAY "%"
@20,20 SAY "PRESS ANY KEY TO CONTINUE"
WAIT""
CLOSE ALL
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO P,S,Q,X,T,Y,Z,TOT_PLOT
@1,1 TO 22,75 DOUB COLO GB+
@3,5 SAY "PERCENTAGE OF PRIVATE OWNED PLOTS TO TOTAL ALLOCATED LAND"
@4,5 SAY "--------------------------------------------------------------".
@6,3 SAY "PRIVATE"
@6,21 SAY "A"
@6,31 SAY "B"
@6,42 SAY "C"
@6,51 SAY "D"
@6,60 SAY "E"
A1=15*15
B1=15*30
C1=30*30
D1=30*45
E1=90*90
TOT_PLOT=36851400
K=100
R=7
USE PRIOWN
DO WHILE .NOT. EOF()
DO WHILE .T.
SET FIELD TO PRIVATE,A,B,C,D,E
@R,3 SAY PRIVATE PICT "@!"
P=A1*A
@R,17 SAY P PICT "99999999"
S=B1*B
@R,27 SAY S PICT "99999999"
Q=C1*C
@R,38 SAY Q PICT "99999999"
X=D1*D
@R,48 SAY X PICT "99999999"
T=E1*E
@R,56 SAY T PICT "99999999"
Y=Y+P+S+Q+X+T
SKIP
IF R>16 .OR. EOF()
   EXIT
   SET FIELD TO
ENDIF
R=R+1
ENDDO
ENDDO
```

```
@17,15 SAY "TOTAL PRIVATE PLOTS = "
@17,37 SAY Y PICT "99999999"
Z=Y/TOT_PLOT*K
@18,15 SAY "PERCENTAGE = "
@18,28 SAY Z PICT "99.99"
@18,32 SAY "%"
@20,20 SAY "PRESS ANY KEY TO CONTINUE"
WAIT""
CLOSE ALL
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO
P,S,Q,X,T,Y,Z,P1,S1,Q1,X1,T1,Y1,Z1,P2,S2,Q2,X2,T2,Y2,Z2,A2,A3
@1,1 TO 18,78 DOUB COLO GB+
@3,3 SAY "RATIO OF DEV. PLOTS IN PRIVATE OWNED PLOT TO THE TOTAL
PRIVATE ALLO_PLOT"
@4,3 SAY
"----------------------------------------------------------------
--"
A1=15*15
B1=15*30
C1=30*30
D1=30*45
E1=90*90
USE PRIOWN
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P=A1*A
S=B1*B
Q=C1*C
X=D1*D
T=E1*E
Y=Y+P+S+Q+X+T
SKIP
ENDDO
STORE 0 TO P1,S1,Q1,X1,T1,Y1,Z1
USE PRV_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P1=A1*A
S1=B1*B
Q1=C1*C
X1=D1*D
T1=E1*E
Y1=Y1+P1+S1+Q1+X1+T1
SKIP
ENDDO
STORE 0 TO P2,S2,Q2,X2,T2,Y2,Z2
USE PRV1_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P2=A1*A
S2=B1*B
```

```
Q2=C1*C
X2=D1*D
T2=E1*E
Y2=Y2+P2+S2+Q2+X2+T2
SKIP
ENDDO
STORE 0 TO P3,S3,Q3,X3,T3,Y3,Z3
USE PRV2_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P3=A1*A
S3=B1*B
Q3=C1*C
X3=D1*D
T3=E1*E
Y3=Y3+P3+S3+Q3+X3+T3
SKIP
ENDDO
@7,10 SAY "TOTAL PRIVATE OWNED AREA = "
@7,37 SAY Y PICT "99999999"
@9,10 SAY "TOTAL PRIVATE OWNED DEVELOPED PLOTS FOR 1988-1990 = "
Y0=Y1/Y
@9,61 SAY Y0 PICT "99.99"
@11,10 SAY "TOTAL PRIVATE OWNED DEVELOPED PLOTS FOR 1991-1993 = "
A2=Y2/Y
@11,61 SAY A2 PICT "99.99"
@13,10 SAY "TOTAL PRIVATE OWNED DEVELOPED PLOTS FOR 1994-1996 = "
A3=Y3/Y
@13,61 SAY A3 PICT "99.99"
@16,20 SAY "PRESS ANY KEY TO CONTINUE"
WAIT""
CLOSE ALL
CLEAR
RETURN
```

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO
P,S,Q,X,T,Y,Z,P1,S1,Q1,X1,T1,Y1,Z1,P2,S2,Q2,X2,T2,Y2,Z2,A2,A3
@1,0 TO 18,79 DOUB COLO GB+
@3,8 SAY "TOTAL AREA OF UNDEVELOPED PRIVIVATE ALLOCATED PLOTS FOR
1988-96"
@4,8 SAY
"-------------------------------------------------------------"
A1=15*15
B1=15*30
C1=30*30
D1=30*45
E1=90*90
USE PRIOWN
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P=A1*A
S=B1*B
Q=C1*C
X=D1*D
T=E1*E
Y=Y+P+S+Q+X+T
SKIP
ENDDO
STORE 0 TO P1,S1,Q1,X1,T1,Y1,Z1
USE PRV_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P1=A1*A
S1=B1*B
Q1=C1*C
X1=D1*D
T1=E1*E
Y1=Y1+P1+S1+Q1+X1+T1
SKIP
ENDDO
STORE 0 TO P2,S2,Q2,X2,T2,Y2,Z2
USE PRV1_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P2=A1*A
S2=B1*B
```

```
Q2=C1*C
X2=D1*D
T2=E1*E
Y2=Y2+P2+S2+Q2+X2+T2
SKIP
ENDDO
STORE 0 TO P3,S3,Q3,X3,T3,Y3,Z3
USE PRV2_DEV
DO WHILE .NOT. EOF()
SET FIELD TO A,B,C,D,E
P3=A1*A
S3=B1*B
Q3=C1*C
X3=D1*D
T3=E1*E
Y3=Y3+P3+S3+Q3+X3+T3
SKIP
ENDDO
Y4=Y1+Y2+Y3
@7,5 SAY "TOTAL AREA OF PRIVATE ALLOCATED PLOTS FOR 1988-96 = "
@7,57 SAY Y PICT "99999999"
@9,5 SAY "TOTAL AREA OF DEVELOPED PRIVATE ALLOCATED PLOTS FOR 1988-96
= "
@9,67 SAY Y4 PICT "9999999"
@11,5 SAY "TOTAL AREA OF UNDEVELOPED PRIVATE ALLOCATED PLOTS   FOR
1988-96 = "
Y5=Y-Y4
@11,70 SAY Y5 PICT "99999999"
@16,25 SAY "PRESS ANY KEY TO CONTINUE"
WAIT""
CLOSE ALL
CLEAR
RETURN
```

APPENDIX 10

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO P1,S1,Q1,X1,T1,P2,S2,Q2,X2,T2
@1,3 TO 20,75 DOUB COLO GB+
@3,15 SAY "NUMBER OF GOVERNMENT REVOCABLE PLOTS FOR 1988-1990"
@4,15 SAY "---------------------------------------------------"
@6,10 SAY "LAND_USE"
@6,29 SAY "A"
@6,38 SAY "B"
@6,46 SAY "C"
@6,54 SAY "D"
@6,62 SAY "E"
R=7
USE GOVT_DEV
DO WHILE .NOT. EOF()
DO WHILE .T.
STORE 0 TO P1,S1,Q1,X1,T1,P2,S2,Q2,X2,T2
SET FIELD TO LAND_USE,P,S,Q,X,T,A,B,C,D,E
@R,10 SAY LAND_USE PICT "@!"
P1=P/3
P2=P1-A
@R,25 SAY P2 PICT "99999"
S1=S/3
S2=S1-B
@R,34 SAY S2 PICT "99999"
Q1=Q/3
Q2=Q1-C
@R,42 SAY Q2 PICT "99999"
X1=X/3
X2=X1-D
@R,50 SAY X2 PICT "99999"
T1=T/3
T2=T1-E
@R,58 SAY T2 PICT "99999"
IF R>15 .OR. EOF()
   @18,25 SAY "PRESS ANY KEY TO CONTINUE"
   WAIT""
   EXIT
ENDIF
SKIP
R=R+1
ENDDO
ENDDO
CLEA
```

```
@1,3 TO 20,75 DOUB COLO GB+
@3,15 SAY "NUMBER OF GOVERNMENT REVOCABLE PLOTS FOR 1991-1993"
@4,15 SAY "---------------------------------------------------"
@6,10 SAY "LAND_USE"
@6,29 SAY "A"
@6,38 SAY "B"
@6,46 SAY "C"
@6,54 SAY "D"
@6,62 SAY "E"
R=7
USE GOV1_DEV
DO WHILE .NOT. EOF()
DO WHILE .T.
STORE 0 TO P1,S1,Q1,X1,T1,P2,S2,Q2,X2,T2
SET FIELD TO LAND_USE,P,S,Q,X,T,A,B,C,D,E
@R,10 SAY LAND_USE PICT "@!"
P1=P/3
P2=P1-A
@R,25 SAY P2 PICT "99999"
S1=S/3
S2=S1-B
@R,34 SAY S2 PICT "99999"
Q1=Q/3
Q2=Q1-C
@R,42 SAY Q2 PICT "99999"
X1=X/3
X2=X1-D
@R,50 SAY X2 PICT "99999"
T1=T/3
T2=T1-E
@R,58 SAY T2 PICT "99999"
IF R>15 .OR. EOF()
   @18,25 SAY "PRESS ANY KEY TO CONTINUE"
   WAIT""
   EXIT
ENDIF
SKIP
R=R+1
ENDDO
ENDDO
CLEA
@1,3 TO 20,75 DOUB COLO GB+
@3,15 SAY "NUMBER OF GOVERNMENT REVOCABLE PLOTS FOR 1994-1996"
@4,15 SAY "---------------------------------------------------"
@6,10 SAY "LAND_USE"
@6,29 SAY "A"
```

APPENDIX 10

```
@6,38 SAY "B"
@6,46 SAY "C"
@6,54 SAY "D"
@6,62 SAY "E"
R=7
USE GOV2_DEV
DO WHILE .NOT. EOF()
DO WHILE .T.
STORE 0 TO P1,S1,Q1,X1,T1,P2,S2,Q2,X2,T2
SET FIELD TO LAND_USE,P,S,Q,X,T,A,B,C,D,E
@R,10 SAY LAND_USE PICT "@!"
P1=P/3
P2=P1-A
@R,25 SAY P2 PICT "99999"
S1=S/3
S2=S1-B
@R,34 SAY S2 PICT "99999"
Q1=Q/3
Q2=Q1-C
@R,42 SAY Q2 PICT "99999"
X1=X/3
X2=X1-D
@R,50 SAY X2 PICT "99999"
T1=T/3
T2=T1-E
@R,58 SAY T2 PICT "99999"
IF R>15 .OR. EOF()
    @18,25 SAY "PRESS ANY KEY TO CONTINUE"
    WAIT""
    EXIT
ENDIF
SKIP
R=R+1
ENDDO
ENDDO
CLEAR
RETURN
```

APPENDIX 11

```
SET TALK OFF
SET SCORE OFF
SET STAT OFF
CLEAR
*PARTICULARS OF SCHEMED AREA OF GAA-AKANBI ZONE
STORE 0 TO P,S,Q,R,T,W,X,Y,Z,TOT_PLOT,A1,B1,C1,D1,E1
@1,1 TO 20,70 DOUB COLO GB+
@3,10 SAY "RATIO OF LAND USE TO THE TOTAL ALLOCATED LAND"
@4,10 SAY "------------------------------------------------"
A1=15*15
B1=15*30
C1=30*30
D1=30*45
E1=90*90
TOT_PLOT=36851400
R=6
USE ALLO_PLOT
DO WHILE .NOT. EOF()
DO WHILE .T.
SET FIELD TO PLOT_USE,A,B,C,D,E
P=(A1*A)+(B1*B)+(C1*C)+(D1*D)+(E1*E)
@R,20 SAY PLOT_USE
S=P/TOT_PLOT
@R,40 SAY S PICT "9.9999"
SKIP
IF R>14 .OR. EOF()
  EXIT
  SET FIELD TO
ENDIF
R=R+1
ENDDO
ENDDO
@17,20 SAY "PRESS ANY KEY TO CONTINUE"
WAIT""
CLOSE ALL
CLEAR
RETURN
```