

ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES  
SCHOOL OF INFORMATION STUDIES FOR AFRICA



POPULATION INFORMATION SUPPORT SYSTEM WITH PARTICULAR  
REFERENCE TO THE REQUIREMENTS, OF URBAN-REGIONAL PLANNING

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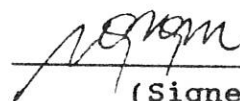
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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.



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DEDICATION

To W/ro Yewoubdar Eshete, my grandmother and guardian

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## ABSTRACT

In developing countries the demand for reliable and adequate information in general and population information in particular has increased more than ever for purposes of development planning, and for formulating and monitoring population policies and programmes. Ethiopia is no exception.

From the surveys and interviews carried out for this study, it became evident that establishment of a national population information support system that can collect, organize and process such information to meet users requirements had become crucial to development planning in the country.

An attempt has been made to assess users of population information (their information needs, the sources they used, their information seeking behaviour, etc.) and the existing support facilities. Interviews, onsite study, reviewing of relevant documents and questionnaire survey were the methods employed for the purpose of data and fact collection.

The results of the survey generally indicated that users have problems in timely access to reliable, and adequate

population information, and the support facilities are deficient in meeting their requirements.

To provide a conceptual and structural framework for the establishment of a population information support system, the study proposes and elaborates a population information network (POPINET) to be established, providing a better foundation for the information support system. Use of GIS in population activities and population projection support system with special emphasis on urban-regional planning and the development of related databases are proposed and discussed.

Recommendations to enhance the level of population information support and recommendations specific to the population information network (POPINET) are presented.

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#### LIST OF ABBREVIATIONS

AAU	Addis Ababa University
CSA	Central Statistical Authority
FGAE	Family Guidance Association of Ethiopia
DTRC	Demographic Training and Research Centre
IDR	Institute of Development Research
IEC	Information, Education and Communication
MOE	Ministry of Education
MOH	Ministry of Health
MOLSA	Ministry of Labour and Social Affairs
MOPED	Ministry of Planning and Economic Development
MWUD	Ministry of Works and Urban Development
NGO	Non-Governmental Organization
NSTIDC	National Scientific and Technological Information and Documentation Centre
NUPI	National Urban Planning Institute
RRC	Relief and Rehabilitation Commission

## CHAPTER ONE

### INTRODUCTION

#### 1.1 STATEMENT OF THE PROBLEM AND JUSTIFICATION FOR THE STUDY.

##### 1.1.1 Background Information

##### 1.1.1.1 Need for Systems Approach to Population Study

Population problems increasingly attract the attention of scientists in different fields, politicians, international organizations and the entire world community. This interest is due above all to the existing acute demographic situation in most of the developing countries of the world which has become one of the most urgent global developmental problems affecting humanity in one way or another. Today the social prestige of demography as a science depends on how successful it is in dealing with urgent population problems and elaborating an effective population policy (UNFPA 1986).

The need for a systems approach to the study of population is necessitated by at least two other reasons. First, without structuralizing the flow of new facts

demographic science would simply be unable to make use of the snowballing information concerning population; and second a synthesis of results and coordination of interdisciplinary studies are impossible (UNFPA 1986).

#### 1.1.1.2 The Role of Information

It is universally accepted that present day societies are becoming increasingly dependent on information to cope with societal changes. Information is seen as vital to almost every aspect of society's activities in general and our personal and working lives in particular. Researchers, planners, policy makers, executives, decision makers, and people at large demand information to accomplish their tasks in any socio-economic development endeavour contributing to the prosperity of a nation (Rahel 1992).

Information is needed for identifying the areas which are economically stagnating; comparing and contrasting the performance of different sectors of the economy; and identifying the fields which are likely to yield the highest dividends at the quickest pace. The relevance of information to sectoral and project evaluation is acknowledged as is its role in enabling planners to look afresh at development alternatives. Information has,

therefore, to be harnessed like any other national resource, to the task of nation building (Yaker 1992).

The role that information plays in any socio-economic endeavour has been heralded as the pervasive motor for a long term economic upswing. Information being intersectoral, there is no sector or economic activity that can effectively function without accurate; appropriate and timely information. The list of human activities that depend on information certainly are long and daunting (NSTIDC 1991). Information has a contribution to make at practically every stage of the development process. Planning at both micro and macro levels requires large inputs of information (Yaker 1992).

An important component of such information is population information.

#### 1.1.1.3 Population Information and its Use

Population information "includes the technical and statistical information that is used to create awareness of population issues among governments, non-governmental organizations (NGOs), communities, families and individuals " (Nigussie 1990; Opubor 1989). Population information, therefore, covers a range of activities

involving the creation, processing and dissemination of population related content destined for a variety of target audiences (users) (Opubor 1989).

Population data/information can be used to describe the distribution of population in space, its density, and degree of concentration, the fluctuations in its rate of growth, its movements from one area to another and the force of natality, nuptiality and mortality within it. These population data have many and increasingly varied applications, including in public health, local planning for land use, school and hospital siting, public utilities etc, marketing; manpower analysis; family planning programs; land settlement; immigration and emigration policy formulation, and others. An analysis of current demographic levels and past trend is the necessary first step in the construction of population forecasts that underpin national plans for socio-economic development and other programs, including explicit population policies in some cases (Shryock and Siegel 1976).

#### 1.1.1.4 Population Statistics in Africa

Statistical data are essential for, among other things, planning and monitoring socio-economic programmes. As



regards particularly population statistics, relevant, timely and reliable data are necessary for the formulation of strategies to address such issues as the persistently high population growth rate and also the generally high mortality rate, especially the high levels of infant, child and maternal mortality in order to improve the quality of life of the African people. Urbanization, role of women in development, etc. are other issues of current concern which need to be tackled on the basis of adequate population statistics (Yaker 1992).

Most countries in Africa are currently under severe economic, political and social stresses. During this period of change, the need for relevant and reliable statistical information for monitoring and evaluation of the process of change is greater than ever (Yaker 1992).

African states have long recognized that information is a resource that, when organized and used in the proper manner, contributes substantially to socio-economic development. They have also recognized that a rational approach to development can not be formulated unless relevant information is available and used during the planning and programming stages. Yet indications are that statistical systems in Africa have yet to develop the

necessary institutional capabilities to provide a sustainable service (Yaker 1992).

#### 1.1.1.5 Level of Information Utilization in Africa

Information becomes a powerful force in the development of a society when it is reliably collected, processed and made easily available to users upon request and in anticipation of need. Information systems could thus support national development in African countries by providing policy and decision makers access to research reports, statistical data, maps and other information sources. But in many instances information systems in Africa are not fully developed and the systems that do exist are under used (Nyang 1983).

Even though, African states for sometime recognized that the situation with regard to documentation and information for socio-economic development in the region is far from satisfactory. Many countries still do not have mechanisms for keeping track of published and unpublished information in the context of the activities of the planners, economists, scientists, and others who have responsibility for implementing national development plans. These countries often lack access to relevant information. Consequently and very often, planning and

programming are done in ignorance of vital documented facts (Yaker 1992).

### 1.1.2 Justification

#### 1.1.2.1 Population Information and Development Planning

Development planning is a continuous and complex process involving, *inter alia*, decisions on the allocation of scarce resources in a way which is considered best possible under given circumstances (Merssie 1988). If development planning is to be successful, it must be based on both current demographic trends and projections; and it must recognize the interactions between demographic process and socio-economic factors as they affect all sectors of the society and the economy (Robinson 1975). Improved demographic projections are basic requirements for integrating demographic factors with the development planning process (Mitik 1990).

It is becoming increasingly recognized that population benefits from socio-economic development programmes, and population should be the centre and *raison d'etre* of all planning (Arowolo and Ekanem 1989). Demographic data, especially those relating to the dynamics and structure of a nation's population, are of primary importance in

sound development planning. Unless programmes aimed at raising the living standards of the population of a nation are firmly grounded in these basic demographic facts, progress in the desired direction may be impossible (Gebremariam 1989).

#### 1.1.2.2 Ethiopian Scenario

Ever since development planning exercise started in Ethiopia, even as early as 1960's, the advancement of the material and cultural life of the people remained the cardinal stated objective of all development plans launched (Mitik 1990).

The promotion of economic development towards well defined objectives, and the improvement of the standards of living and the quality of life of any society require interdisciplinary approach to development planning. This calls for an understanding of the interactions between various social, economic and political factors; in particular the interrelationships between development objectives and population dynamics (Mitik 1990). In order to achieve the development objectives there is therefore the need to integrate population issues into the development programmes as a substantive instrument of action (Gebremariam 1989; Mitik 1990).

One of the major obstacles that planners in Ethiopia face in integrating population variables into the planning process is the lack of accurate and appropriate population data at all levels (stages) of the planning exercise (Arowolo and Ekanem 1989; Mitik 1990).

There are a variety of users and generators of population information in Ethiopia. The various government ministries and departments, non-government organizations, research institutions, regional and international organizations are among them. Urban planning requires population information relatively more than in most other planning activities as it covers almost the whole of human experience.

However, the aforementioned variety of users have problems in accessing information and the information they get does not adequately meet their requirements. As a result sufficient attention and resources will have to be given in the future to improve the quality and adequacy of population data generated (Mitik 1990). Therefore, need arises to develop an information support system which can collect, organize and process population data to provide population experts and other interested groups a range of information on and data dealing with, population issues.

Additional reasons for developing a population information support system include:

- Governmental and non-governmental organizations other than the Central Statistical Authority (CSA) make surveys on the demographic situations of a specific area to support their plans or achieve their objectives. However, there might exist redundancy of data collection by the different organizations due to lack of coordination among them. Moreover due to the redundancy of data collection, there exist unnecessary information processing, and research outputs can also be repeated. Avoiding such problems can contribute to:

- savings in the economy of the country, and
- saving the time of experts in collecting data and producing reports.

- In general, population information users involved in development planning activities need to be aware of the current demographic levels, trends, and relationships. They should generally be provided with an inventory of available information which would include the identification of the source of the information, organizations responsible for collecting, processing, and disseminating, when the

information was collected, its current location, as well as profiles of experts dealing with population problems.

- Most developing countries face problems in providing planners, researchers, policy makers, etc. easy access to information sources. This is due to the many existing limitations of the national information infrastructure in these countries. Therefore, identifying existing problems in accessing the demographic information would help to find ways and means of tackling or resolving the difficulties.

## 1.2 OBJECTIVES OF THE STUDY

### 1.2.1 General objective

The general objective of this thesis is to propose plans and make recommendations for establishing a population information support system for Ethiopia which would enable the different categories of users to get and use population information effectively and efficiently.

### 1.2.2 Specific objectives

The specific objectives derivable from the general objective are:

- To identify potential users of population information, their categories and functions.
- To assess the information needs of the different categories of users.
- To identify sources and systems of population information and assess the extent of their use.
- To identify the major problems in accessing population information in Ethiopia and recommend appropriate solutions.
- To propose the design of a population information network system in order to improve the flow of population information among the identified population information users.
- To identify types of databases to be established to generate information services and products to support population information users.

- To propose and demonstrate the application of GIS in urban-regional planning in using population information.
- To create prototype databases to facilitate population information storage and retrieval from the identified types of databases.
- To propose a population projection support system for urban regional planning.

### 1.3 SIGNIFICANCE OF THE STUDY

As indicated in the statement of the general objective, the study is mainly concerned about meeting the requirements of users of population information. As mentioned in section 1.1.2.2, population information can be used by population experts and other interested groups to integrate it in the socio-economic planning activities so as to bring about the required national development. Since the significance of population information in development planning is high, such a study will be an important contribution to activities that contribute to national development.

The survey made for this study is considered to be important because after analysis and interpretation of the results it would make substantive recommendations with regard to:

- **Requirement specifications:** The fact that there exists a well defined advance specification of needs imply collection of relevant data. This would serve as a reference framework for users and generators and in so doing it eliminates the problem of incompatible presentations.
- The various problems encountered in the information gathering, transmitting, and utilizing processes would be illuminated so that the management (the concerned bodies) can give them the necessary attention and find possible solutions.
- The study will also reveal the possibility of information exchange among the different categories of users through the population information network system.

#### 1.4 LIMITATIONS OF THE STUDY

The population field while overlapping on many other

disciplines still remains a highly specialized area requiring specialized documentation techniques, etc. if the fullest use is to be made of the resources available to it (ECA 1986).

The "public" (users) which this special field serves is therefore a mixed one involving professional demographers, statisticians, human geographers, medical doctors and paramedical staff (involved in family planning delivery services), researchers, teachers, I.E.C<sup>1</sup> specialists, policy makers and planners, and the general public. For each of these groups, population information requirements are different and discrete and the information scientist /documentalist/ librarian has to be very much aware of these differences in requirements in order to be able to serve them efficiently (ECA 1986). Therefore, care has to be taken, lest in attempting to cover all subjects of concern to potential users we end up developing a database of unmanageable volume and scope. The problem of knowing where to draw the line remains a very real one (ECA 1986).

Hence, the scope of this study is confined to the general assessment of the population information users in

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<sup>1</sup> Information, Education and Communication

Ethiopia and the support facilities, to come up with plans and recommendations, giving more emphasis to the detailed requirements of population information of the users involved in the urban-regional planning activities.

## 1.5 METHODOLOGY

### 1.5.1 Data Collection

In order to achieve the general and specific objectives of this study, the methods employed for the collection of the data include: Conducting interviews, onsite study, reviewing relevant documents, and questionnaire survey.

#### 1.5.1.1 Interviews

Interviews were organized with potential population information users as well as personnel at population information service units.

The users interviewed include:

. Those in the different organizations visited while distributing the questionnaire. The discussions were related to the problems they face in accessing the required population information.

. Some of the population information users at institutions dealing with urban planning activities specifically with the physical planners and architects concerning the use of population information for mapping purposes.

#### 1.5.1.2 Onsite Study

Personal site visits were also made to selected population information systems and services to study their organization and the extent of their use.

#### 1.5.1.3 Reviewing Relevant Documents

Documents pertinent to this study were reviewed to obtain greater insight into the subject and to get information on the existing population information systems and services in Ethiopia.

Documents on population related activities in Ethiopia were also studied. Further, other available materials dealing with networking and GIS were examined.

#### 1.5.1.4 Questionnaire Survey

Three types of questionnaires were prepared and

distributed.

The first questionnaire was used to survey the individual users of population information at different institutions to assess their use of internal and external information systems and services, identification of most needed information sources and information seeking behaviour of individual users in those organizations (see Annex 1).

The second questionnaire was used for studying selected population information systems and services in Ethiopia with the view to proposing plans and recommendations for enhancing information flow and data exchange within and among them. This questionnaire was to be completed by different groups of personnel in the organization. The questionnaire was also used for the creation of prototype databases on institutional and project profiles (see Annex 2).

The third questionnaire distributed was used to gather information for the preparation of a prototype databases of expert profiles (see Annex 3).

## 1.5.2 Scope of the Questionnaire Survey

### 1.5.2.1 Sample

Before administering the first questionnaire, it was anticipated that almost every ministry and government and non-government organization, international organization and the public, both within and outside of Addis Ababa need population information. However, for lack of time and other reasons, the survey was confined to the assessment of individual users in those organizations located in Addis Ababa which the CSA has listed as users of population information in Ethiopia.

Sampling is used where there is a constraint. Time and finance were the constraints in this study. Therefore, purposive sampling was used. Accordingly, 130 population information user samples were considered.

Thus in order to distribute these questionnaires to the population information users of the identified institutions, an arbitrary grouping of the population information users in an organization depending on estimated total number of users was employed as follows: (1 - 2, 1; 3 - 4, 2; 5 - 8, 4; 9 - 12, 6; 13 - 16, 8; 17 - 20, 10; 21 - 24, 12; 25 - 30, 14; >30, 16).

(For a list of organizations surveyed see Annex 4).

#### 1.5.2.2 Response from the Respondents

Out of the 130 questionnaires distributed to the individual users of population information 95 completed ones, that is 73 percent were returned. At some of the institutions respondents were reluctant to fill the questionnaire, and some misplaced the questionnaire necessitating the provision of other copies. For this and other reasons, several visits were necessary to have the questionnaire completed by the respondents.

Generally the collection of a large amount of data can help to make good generalizations without loosing the level of accuracy. However, a small number of questionnaires were distributed and collected because of time and other constraints.

Along with filling the questionnaires some of the respondents listed some of the problems encountered in accessing population information in the country. Besides they were requested to make suitable suggestions and recommendations to improve information/data access.

The second questionnaire was distributed to selected 7

government and non-government institutions which are believed to be users and generators of population information and who at the same time are involved in information service activities (see in Annex 5). Apart from completing the questionnaire, some of the respondents attached the sample questionnaires which were used by the respective institution for collecting demographic data. The questionnaire was also given to the Population Division at ECA. However, it was not completed, but I was permitted to interview selected personnel in the division.

The third questionnaire was provided to demographers and those dealing with population issues. Most of these respondents completed the questionnaire.

### 1.5.3 Data Analysis

In order to obtain the essential results the data collected through the mentioned methods, specially of the questionnaires were analyzed for frequency distribution. The open ended questions were also summarized to make sense out of the responses. Thus the generalization so reached could be applicable to the total population.

## 1.6 DEFINITION OF TERMS

In this study the following terms are defined as follows:

Data: is defined as a non-evaluated fact collected by surveys or administrative record which when processed gives meaningful information.

Information: is defined as evaluated data against a purpose or the meaning assigned to data.

Organization/Institution: both terms are used interchangeably to mean ministries; commissions, authorities; etc.

## 1.7 ORGANIZATION OF THE THESIS

The next chapter of this thesis presents an overview of population information sources and activities in Africa in general and Ethiopia in particular.

The survey findings on population information users and the support facilities are discussed in chapter three. Tables of computed frequencies as well as their interpretations, population data/information requirements of users involved in urban-regional planning activities.

the current status of population information systems and services, problems encountered by population information users, and the discussion on the findings are presented.

Chapter four deals with networking. An overview on networking and the proposed population information network (POPINET) are discussed.

The application of GIS in the use of population information is discussed in chapter five, while the sixth chapter presents a discussion on a population projection support system. The seventh chapter deals with the prototype databases of POPINET.

The last chapter, chapter eight summarizes and concludes the major findings and puts forward appropriate recommendations that can follow.

## CHAPTER TWO

### POPULATION INFORMATION SOURCES AND ACTIVITIES

#### 2.1 SOURCES OF DEMOGRAPHIC DATA

##### 2.1.1 General

Generally speaking the major sources of demographic data are population censuses, sample surveys and vital registration systems. Also, population registers and other governmental and private administrative records serve as important sources of demographic data (Nam 1968; Shryock and Siegel 1976; Mitik 1989).

While censuses and vital registrations are the main stays of demographic data system, other sources especially the sample surveys, are increasingly being used to supplement them. In addition, particularly for areas where traditional sources of population data are lacking or of poor quality, demographers and others who are involved in activities on population issues "create" population information through estimation techniques (Nam 1968).

### 2.1.2 Population Census

A census has been defined as "the total process of collecting, compiling and publishing demographic data pertaining to a particular (specified) time, to all persons in a defined (delineated) territory" (Clarke 1968; Un 1950 quoted in Ginn and Kammer 1986; Nam 1968; Mitik 1989).

In the United Nations manual (1954:1) as quoted by Peterson ([1969] 1975) a census is defined as "the simultaneous recording of demographic data by the government, at a particular territory".

Population censuses were among the forms of national statistical activity and some form of "counting of people" has been conducted from very ancient times. They are primary source of basic national population data for administration and for many aspects of economic and social planning. The census provides a base or reference point for current statistics and statistical frame for sample surveys and studies (Nam 1968).

Although the economic and social development of a country requires the strengthening of the entire range of statistics, it is recognized that the population census

is one of the important methods of collecting basic data required for many national planning purposes. The original and perhaps fundamental purpose of the census is to provide the facts essential as a basis for governmental policy and administration (Nam 1968).

Activities which are often dependent upon population counts are many: national electoral distribution and certain aspects of the legal or administrative status of provinces and cities, legislative consolidation of questions of economic and social development, employment, migration, housing, public health and welfare, and numerous other governmental activities are facilitated if accurate facts about the population and their conditions of living are known. Besides the population census provides indispensable data for scientific analysis and appraisal of the composition, distribution and growth of population (Nam 1968).

### **2.1.3 Sample Surveys**

Demographic data can also be obtained from sample surveys. As the name implies, sample surveys cover only a small portion of a population, as opposed to a census which covers an entire population. The value of sample in the collection of population data is well known. Sample

surveys are less expensive and relatively easy to conduct. Detailed and reliable demographic data can be obtained through sample surveys provided that sample selection is made in accordance with strict scientific procedures. They are used increasingly in national enumerations (Nam 1968; Mitik 1989).

#### 2.1.4 Registration of Vital Events

Registration of vital events is an input source of demographic data with the registration of vital events such as births, deaths, still births, marriages, divorces, adoptions, annulments, and separations (Nam 1968; Mitik 1989).

The census method of collection of birth and death dates is not satisfactory because it is not a continuous process, and reports by respondents to questionnaires are inaccurate as to dates. Far more satisfactory is vital registration, which is the continuous, compulsory, and legal records of the above mentioned vital events. On the whole, vital registration data tend to be more precise than those of censuses (Clarke 1968).

### 2.1.5 Population Registers

Population registers also serve as sources of demographic data. It is a continuous registration of every individual in a population including vital events and population movements (Mitik 1989).

Population registers are extremely useful sources of demographic data when they are comprehensive, universal (covering the entire population) and up to date. The demographic value of a population register can be seen most clearly in the area of migration research (Ginn and Kammeyer 1986).

### 2.1.6 Other Sources

There are many other sources of demographic data. These are administrative records held by various government and non-government agencies. Examples are the records of hospitals and educational institutions, taxation records, employment statistics, social service records about pensions and child endowments, etc.

### 2.1.7 The Case of Ethiopia

Until the first population census in the history of

Ethiopia was taken in 1984, population information users in this country largely depended on demographic data on sample surveys conducted at relatively irregular intervals. The registration of vital events such as marriage, birth and death is not a traditionally accepted practice. Even when attempts are made to introduce the practice they are, subtly if not overtly, resisted (Seyoum 1988). Each type of source of demographic data collection in the Ethiopian case will be discussed in section 2.4.

## 2.2 POPULATION INFORMATION ACTIVITIES IN AFRICA

### 2.2.1 The Emergence of Kilimanjaro Programme of Action

African governments were, in the 1960's, more preoccupied with the decolonization process and the transformation of the inherited colonial structures and policies rather than with population issues. They, however, were in dire need of population data/information for their socio-economic development plans. But over time, there has been a remarkable increase in the perception of population factors in development issues (ECA 1992).

The increased activities in data collection, analysis and

evaluation, with the support of the African Regional Population Programme (1961), The African Regional Advisory Services in Demographic Analysis Project (1969) and the African Census Programme (1971), contributed to the growing awareness of the implications of population growth for the welfare of the societies in Africa. The first African Population Conference was convened in 1971, when African governments still regarded population as exogenous to development. Its thrust was to generate awareness of problems resulting from the demographic situation in the region. It highlighted the close interrelationships between population trends and socio-economic development efforts and the need for training personnel for the collection of basic demographic data, their analysis and utilization in the formulation and implementation of national development plans (ECA 1992).

In the light of this analysis the second African Population Conference held in January 1984 in Arusha adopted the Kilimanjaro Programme of Action on population and sustainable development heralding a new era of increased awareness of population issues in Africa, and stressing the importance of striking a balance between socio-economic and demographic objectives (ECA [1984] 1992).

To date, the Kilimanjaro Programme of Action remains a valid and a crucial framework in dealing with population issues in Africa.

Among the recommendations of Kilimanjaro Programme of Action those relating to population information are:

- Countries should develop appropriate mechanisms for disseminating available demographic data to researchers, policy makers, project officers and the general public. Countries should ensure that available demographic data are summarized and presented in forms that are easily understood by all sections of the population. Countries should strive to set up population information networks which provide an empirical base for project formulation.

- Countries should give priority attention to training experts in population information and dissemination; population dissemination activities should use all channels of communication available to reach a majority of the population effectively.

- Countries should ensure adequate and prompt dissemination of results of population research

undertaken in each country.

- Governments are urged to establish appropriate machinery for sex education and information dissemination programmes.

## 2.2.2 The Population Network in Africa (POPIN-Africa)

### 2.2.2.1 General

The World Population Plan of Action (WPPA) adopted in 1974 in Bucharest, Romania, indicated that measures should be undertaken to promote the knowledge of interrelationships between population and development. The plan further invited governments to consider the distribution of population information as a means of creating awareness of population issues in socio-economic development planning (ECA 1984).

Although concern about population problems in Africa has been growing steadily among some governments and researchers it is felt that more effort is required to bring about greater awareness of the relationship between population issues and socio-economic development. In recognition of this fact, Resolution 366(XIV) adopted by the Fifth Conference of ECA ministers in Rabat (Morocco

in 1979) requested, among other things, to expand and improve the activities of the secretariat in the field of population information and documentation. This was reinforced by Resolution 400(XV) adopted in Freetown (Sierra Leone, 1981) on priorities of population programmes of the ECA, requesting the ECA secretary to intensify the commission's activities in the field of population information dissemination and documentation (ECA 1982).

#### 2.2.2.2 Population Division's Population Information Activities at ECA.

The need for the collection, treatment and dissemination of population information required for socio-economic development planning has been one of the main activities of the Population Division of ECA. Since its inception in 1970, the Population Programme Centre which later became the substantive ECA Population Division, always dealt with population information and clearing house activities. These activities have been carried out by the information and clearing house unit of the Population Division. This unit was and continues to be involved in collection and dissemination of population information for socio-economic development planning as a means of creating greater awareness among African

countries of population issues affecting development efforts in the region (ECA 1982).

Publications of the ECA Population Division are:

- The African Population Newsletter
- The African Population Studies Series
- The Demographic Handbook for Africa
- The African Directory of Demographers
- Case Studies
- ECA Clearing House Activities

The Division could only meet partly the attainment of the objectives of the collection, processing and dissemination of population information due to inadequacy of staff and financial resources. Consequently ECA submitted to UNFPA a project for the expansion of the population information and clearing house unit in 1974 and 1979 as well. The request included addition of manpower. UNFPA provided funds for consultants to undertake the revision of the project. But it was later felt that instead of engaging consultants, it would be better to convene a Consultative Meeting involving various experts working on information activities in the region to exchange views on the proposals on the development of population information network at ECA (ECA

1982).

### 2.2.2.3 Background and History of POPIN-Africa

Inaugurated in January 1984, POPIN-Africa is a decentralized regional network comprising institutions and organizations connected with, and/or dealing with population information generation, collection, documentation and dissemination in/and on Africa. It has been established to provide a vehicle through which African policy makers, planners, researchers etc. can be assisted with population information resources to enable them better integrate population variables into their socio-economic policy formulation and implementation. It also constitutes a concrete mechanism for the realization of some of the major guidelines provided in the Kilimanjaro Programme of Action regarding the provision and dissemination of population information for the African region (The recommendations given in section 2.2.1).

POPIN-Africa is cast within a global effort aimed at "furthering the exchange among countries of information and policy experiences in the field of population and consumption". Thus jointly with other regional networks and systems based at the other UN regional commissions

and elsewhere, it collaborates in this overall effort to improve the flow of population information throughout the world. It is the African regional component of the global Population Information Network (POPIN) based at the UN headquarters in New York. Its database also constitutes a sectoral complementary file on population for the Pan African Development Information System (PADIS) forming part of the PADIS-COM file, to ensure adequate coverage of information and data on African population issue (ECA 1886;1989).

#### **2.2.2.4 Objectives of POPIN-Africa**

The objectives of POPIN-Africa may be summarized as follows:

- To assist in the formulation of sound population policies and programmes by providing access to population information;
- To provide and establish better ways of improving the flow of population information among institutions and organizations dealing with population information and related activities in Africa;

- To develop common norms and standards to ensure compatible systems and services for population information flow in ECA Member States;
- To assist in developing appropriate population information infrastructure in ECA Member States through advisory services including the training of librarians and documentalists for the collection, processing and dissemination of population information;
- To develop mechanisms for the continuous monitoring and evaluation of population information and documentation activities in Africa to ensure the effectiveness of the network;
- To establish a POPIN-Africa 'referral file' on population projects, statistics, research findings and bibliographies;
- To collaborate with members of the International Population Information Network (POPIN) in order to strengthen the operations of POPIN-Africa and to participate in a global effort to improve the flow of population information, world wide.

#### 2.2.2.5 Outputs and services of POPIN-Africa

Among the major outputs and services of POPIN-AFRICA are the following:

i) Publications

- African Population Newsletter
- POPINDEX AFRICA - a bibliographic index of population related documents.
- Special Country Bibliographies
- Sourcebook
- African Directory of Demographers

ii) Document Backup Delivery Services

iii) Training

iv) Referral File Services

v) User Promotion and Sensitization

POPIN-Africa, along with PADIS, was a big challenge to this region (Africa) in the way and manner in which it can successfully harness existing population information resources to provide the user groups with their information requirements within reasonable costs in order to promote effective planning, programming and implementation. However, because of limited funds made available by supporting bodies and for other reasons, the

POPIN-Africa even now is not in a position to continue providing services. It is the PADIS that took over the responsibilities of the POPIN-Africa's activities. POPIN-Africa will continue to function under PADIS when funds are approved by the supporting bodies.

### 2.3 POPULATION SITUATION OF ETHIOPIA

The facts about the size and growth rate of the population of Ethiopia were not firmly established until the results of the 1984 census of population and housing became available. Estimates from various sources put the population at about 10.0 million in 1930, 16 - 18 million in 1950 and 31 million in 1980 (Arowolo 1990).

The first comprehensive census of population in Ethiopia was conducted in 1984, the result of which showed a total population of about 42.0 million. The results of the census have been used as a basis to project up to the year 1995 and beyond (Nigussie 1990).

In July 1990, the population of Ethiopia was estimated to have reached 51.0 million, and if it continues to grow at the observed rate of growth, it is expected to reach about 58,060,800 and 67 million in 1995 and by the turn

of this century respectively (CSA 1988; 1990).

From all accounts it is evident that Ethiopia's base population is quite large, the third largest in Africa. The trend also shows a rapidly increasing population over time; from an annual growth rate of less than 1.0% at the beginning of this century to a peak of about 3.0% at the beginning of 1990. Projections show that the upward trend in the growth rate of the population is most likely to continue for quite sometime to come (Arowolo 1990).

## 2.4 HISTORY OF DEMOGRAPHIC DATA AVAILABILITY AND COLLECTION IN ETHIOPIA

### 2.4.1 Availability

Although Ethiopia is an ancient state with a long recorded history of independence, available information on the size of its population could be traced only as far back as the 1930's. But population estimates of some important towns, like Axum, Lalibela and Debre Berhan were available from the 16<sup>th</sup> century onwards. Most of the estimates were made by early foreign travellers who travelled extensively or covered limited territories of the country methodologically (Pankhurst 1965; Mitik 1987).

The population size for the whole country was approximated for the first time by the Italian colonial administration in 1930. In the 1930's various estimates on population size were given by Italians and other sources; however, these estimates were not reliable (Mitik 1989). In 1956, the Ministry of Interior attempted an estimate of the Ethiopian population for the purpose of determining the approximate size of the population eligible for participating in the first parliamentary election of 1957. This reporting covered only 87% of the total population and the remaining 13% was independently estimated.

#### 2.4.2 Data Collection

Demographic data collection in Ethiopia began with the establishment of the Central Statistical Office (CSO)<sup>2</sup> in 1960. The first ever involvement of CSO in the collection of sociological and demographic data was the population and housing census of Addis Ababa and Asmara cities in 1961 and 1963 respectively. In these operations, basic demographic data on fertility, mortality and migration have been collected (CSA 1993).

Following the two operations the National Sample Survey

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<sup>2</sup> Currently Central Statistical Authority

First Round was the first scientific attempt at collecting demographic data in Ethiopia and was carried out from 1964 to 1967. Data on basic population characteristics, fertility, mortality and economic activity were collected. It covered the settled rural population in all the regions and 91 major urban centres (CSA 1993; Mitik 1987).

In 1976 CSO carried out a Manpower and Housing survey in Addis Ababa. Similar surveys were conducted by the office in 17 other major urban centres and a demographic survey of the capital city, Addis Ababa in 1978. These surveys collected basic demographic data including data on fertility, mortality and migration (CSA 1993; Mitik 1987).

In 1980 CSO conceived a National Integrated Household Survey programme to collect socio-economic data on a continuous basis, among which one was demographic, to meet the great need for statistical information for the preparation of socio-economic plans and for monitoring and evaluation of development programmes and the increased demand for data for the launching of the national socio-economic development campaigns and the preparation of the medium and long term development plans for the country (CSA 1993).

In order to fulfil the demand for sociological and demographic data particularly the latter, the government through CSO made the necessary preparations to carry out the first ever National Population and Housing Census. This was carried out in 1984 with May 9<sup>th</sup> serving as the "census night".

The analysis of the results of the census was presented in a preliminary report produced in 1984 and various regional analytical reports. The analytical report at national level was produced in 1991 and presents the size and characteristics of the population which include age and sex distribution, ethnic and religious distribution, fertility, mortality, housing characteristics and population projection (CSA 1993).

After the 1984 census the office (CSA) carried out a number of socio-economic surveys one of which is the 1986/87 Rural Labour Force Survey. This survey was carried out on a quarterly basis for a period of one year.

The census and the demographic surveys conducted so far revealed that as in most of the other developing countries, fertility and mortality levels in Ethiopia were high. The rate of population growth in the country

was estimated to be 3.0%.

## 2.5 NATIONAL POPULATION POLICY OF ETHIOPIA

### 2.5.1 General

The National Population Policy of Ethiopia has been recently formulated. Among other things, the policy considers, population research, data collection, analysis, and dissemination as major areas of population activities requiring priority attention.

The policy has for its major goal the harmonization of the rate of population growth and the capacity of the country for the development and rational utilization of natural resources in such manner that the level of welfare of the population is maximized over time.

The population policy is aimed at pursuing the following general objectives:

- (a) Closing the gap between high population growth and low economic productivity through planned reduction of population growth and increasing economic returns;

(b) Expediting economic and social development processes through logistic integrated development programmes designed to expedite the structural differentiation of employment;

(c) Reducing the rate of rural to urban migration;

(d) Maintaining/improving the carrying capacity of the environment by implementing appropriate environmental protection/conservation measures;

(e) Raising the economic and social status of women by freeing them from the restrictions and drudgeries of traditional life and making it possible for them to participate productively in the larger community;

(f) Significantly improving the social and economic status of vulnerable groups (women, youth, children and the elderly).

Success in the implementation of the policy will depend on a number of factors. Among the important factors one will be the use of information on population aspects. This calls for collection, generation and dissemination of the required information at the right time to the

right people in conveniently usable forms.

#### 2.5.2 Population Research, Data Collection, Analysis and Dissemination

Among the major areas of population activities to be given priority attention in programme development and implementation processes is improving and strengthening domestic capacity for generating, analyzing and disseminating demographic and population-related information by making more domestic and external funds available to institutions engaged in demographic and population related research and training. In addition, collaboration with foreign research and academic institutions will be actively sought. Further, research activities will focus attention on the study of the complex interrelationship between population factors and development variables. The information thus generated will represent critical inputs in development planning process and provide relatively more accurate bases for forecasting probabilities and trends of development. Work in this area will be considerably facilitated by:

- (i) Enhancing laws/regulations making the registration of vital events (marriage, birth and

death) compulsory;

(ii) Providing existing research institutions (Population Analysis and Studies Centre (PASC), the Demographic Training and Research Centre (DTRC), etc.) with the necessary technical and material support, to enable them to process and disseminate data generated by censuses, sample surveys (inter-censal surveys, demographic and health surveys, household consumption surveys, labour force surveys, etc.).

## CHAPTER THREE

### POPULATION INFORMATION USERS AND SUPPORT FACILITIES: FINDINGS OF SURVEY

#### 3.1 FINDINGS

##### 3.1.1 Introduction

To propose a plan for a population information support system, assessment on the characteristics of users of population information, their requirements, and the existing population information systems and services is a prerequisite.

For this reason, as mentioned in section 1.5 of chapter one, questionnaire survey, interviews, onsite study, and reviewing of relevant documents were undertaken in relation to population information users as well as information systems and services.

The collected data were computed, and in this section the findings of the surveys are presented under various headings.

The response to the questionnaires as well as to the

interviews were generally fair, although some difficulties were encountered in conducting the surveys as indicated earlier in section 1.5.1.4 of chapter one.

### **3.1.2 Experiential Background of the Respondents**

The study involved, among other things, assessing as much as possible the information utilization habits of population information users involved in development planning activities in Ethiopia. The result from the questionnaire on the educational background of the respondents shows that, 50.5% had bachelors degree, 30.5% masters, 4.2% doctorate, 3.2% diploma, and 11.6% did not state their qualification.

The survey also revealed that 14.7% of the respondents had served between one to three years in their current organization, 25.2% four to five years, 30.5% six to ten years, 17.9% more than ten years, and 11.6% did not respond to this question.

### **3.1.3 Purpose of Utilization of Population**

#### **Data/Information**

As mentioned earlier in section 1.1.3 of chapter one population information is required for a variety of

purposes in accomplishing the various tasks towards achieving the required national development. Respondents were requested to indicate the purpose for which they utilized population information. They were also encouraged to mark their response more than once and rank them if necessary. However only a few of them cared to rank the options according to their preference.

Table 1 Purpose of Utilization of Population  
Data/Information

Purpose	Users	%
Research and Development	65	25.6
Planning	72	28.3
Decision Making	22	8.7
Policy Making	26	10.2
Product Promotion	5	2.0
Keeping Updated about		
Population change	29	11.4
General Awareness	27	10.6
Others	8	3.2
Frequency	254	100.0
Surveyed Users	95	

Among the listed purposes in table 1, planning and research development are the most frequent ones sharing 28.3% and 25.6% respectively indicating that these are the most important activities requiring population information. Significant number of users (11.4%) and (10.6%) also use population information for keeping updated about population change, and general awareness respectively. Others (3.2%), not listed in the table, include project appraisal, and producing (generating) population information to make available to other users.

#### **3.1.4 Population Data/Information Sources**

There are different types of information sources and it is necessary to identify the more frequently used sources so as to secure users accessibility to them.

##### **3.1.4.1 Methodologies Used to Collect Population Data/Information**

From the response of the surveyed groups of users (Table 2), it may be seen that most of the users obtain population information from documents (50.4%). This source is followed by questionnaire survey (20.8%) and interviews (16.8%) respectively. Even, observation for collecting population data/information is also used.

which is seen to have equal extent of use as participating in seminars and conferences (6%).

**Table 2 Methodologies used to Collect Population Data/Information**

Methodologies	Users	%
Observation	9	6.0
Questionnaire Survey	31	20.8
Interviews	25	16.8
Collecting from Documents	75	50.4
Participating in Seminars and Conferences	9	6.0
Frequency	149	100.0
Surveyed Users	95	

Thus, on the whole users make use of all the stated methodologies and sources except observation and participating in seminars and conferences.

#### 3.1.4.2 Documentary Sources of Population

##### Data/Information

Documents are the most frequently utilized source of

population data/information (Table 2). The next table (Table 3) shows the frequency of use of the different types of documentary sources.

Here, respondents were encouraged to rank according to their preference. However, most of the users did not care to do so.

Statistical abstracts/reviews are the most widely used major sources of population information constituting 34.6% of the total frequency. Reports are the next most frequently used documentary sources (25.3%) followed by periodicals/journals (14.0%). Databases, books and conference proceedings are the least used.

Table 3 Use of Documentary Sources of Population  
Data/Information

Sources	Users	%
Books	20	9.2
Periodicals/Journals	32	14.7
Statistical Abstracts/Reviews	75	34.6
Reports	55	25.3
Databases	21	9.7
Conference Proceedings	14	6.5
Frequency	217	100.0
Surveyed Users	95	

3.1.4.3 Use of Institutional Sources of Population  
Data/Information

3.1.4.3.1 *Local Institutions*

Users were requested to list the names of the organizations in Ethiopia from which they get the required population information. The result is shown in Table 4. Totally twenty one different organizations were listed by the respondents. Organizations with only one frequency are grouped under others in the table.

Table 4 Local Institutions Used as Sources of Population Data/Information

Institution	Users	%
Central Statistical Authority	79	41.8
Economic Commission for Africa	11	5.8
Ministry of Planning and Economic Development	13	6.9
Ministry of Labour and Social Affairs	7	3.7
Ministry of Health	14	7.4
Ministry of Education	11	5.8
National Urban Planning Institute	8	4.2
Addis Ababa University (Institute of Development Research)	13	6.9
Ministry of Works and Urban Development	5	2.7
Family Guidance Association of Ethiopia	4	2.1
Relief and Rehabilitation Commission	5	2.7
Municipality of Addis Ababa	7	3.7
Kebele Offices	2	1.1
UNFPA	3	1.6
Others	7	3.7
Frequency	189	100.0
Surveyed Users	95	

The Central Statistics Authority (CSA) is the most frequently used (41.8%). When computed in terms of the 95 respondents 82.2% (79 users) find their population data/information from the CSA. The other organizations.

the Ministry of Planning and Economic Development, Ministry of Health, Institute of Development Research at Addis Ababa University, Ministry of Education are also frequently used.

#### 3.1.4.3.2 *External (Abroad) Institutions*

Users were requested to list organizations with location outside of Ethiopia from which they get population information. The responses are presented in Table 5. Organizations with frequency of one are grouped under others.

Table 5 Institutional Sources (Located) Out side of  
Ethiopia

Institution	Users	%
United Nations (USA)	9	19.1
World Bank (USA)	7	8.5
Population Council (USA)	5	14.9
WHO Regional Offices	4	10.6
IPPF (UK)	3	8.5
Population Information Programme (The John Hopkins University, Baltimore)	4	8.5
RIPS	2	4.3
Comitato Italiano per la Studio, (Italy)	2	4.3
Others	7	14.9
Frequency	47	100.0
Surveyed Users	95	

Even though, only some respondents indicted use of organizations located abroad and as the frequency of use is much less than that of the local ones, the documents produced by some of these organizations are of considerable importance as source of population information.

### 3.1.5 Population Data/Information: Generation and Importance

#### 3.1.5.1 Generation

Of the total users surveyed, 53.7% responded that they generated population information. Among the generators of such information, 50.0% did so for their own use, 34.8% for distribution to others, and 15.2% for both purposes (Table 6).

Table 6 Purpose of Generating Population Information

Purpose	Users	%
Own use	33	50.0
Distributing to Others	23	34.8
Both	10	15.2
Frequency	66	100.0
No. of Generators	46	

#### 3.1.5.2 Importance

Users were requested to indicate whether they actually accessed to externally generated information. The

response rate shows 83.3% did access external sources. Furthermore, they were asked to indicate the importance of the information (external and internal) to their work. The result as shown in Table 7 indicates that both internally and externally information are deemed to be of about equal usefulness.

**Table 7 Importance of Generated Population Information**

	Users	%
Internally generated	29	30.5
Externally generated	21	22.2
Both equally important	45	47.4
Frequency	95	100.0

### 3.1.6 Population Data/Information Requirements

#### 3.1.6.1 Type of Population Data/Information Required

Size of population and age distribution, were indicated to be the most used types of population information. Sex composition, house-hold size, and economic activity were also indicated to be of value by more than half of the users surveyed. The other categories of population information, as listed in Table 8, are also seen to be

required by significant numbers of users. Respondents were requested to list requirements other than the listed in the questionnaire, however, only a few users attempted to do so, and health status and nuptiality were among the listed ones.

Table 8 Population Data/Information Requirements

Type of Data/Information	Users	%
Size of population	86	12.2
Age distribution	70	9.9
Sex composition	61	8.6
Fertility aspect	42	5.9
Mortality aspect	42	5.9
Migration aspect	50	7.0
Employment status	56	7.9
Ethnicity	39	5.5
Marital condition	39	5.5
House hold size	64	9.0
Religion	41	5.8
Educational status	55	7.7
Economic activity	63	8.9
Frequency	708	100.0
Surveyed Users	95	

3.1.6.2 Form of Presentation of Population Data/Information

Users were requested to respond to the form of presentation of population data/information they frequently require, and a large number of respondents (54.5%) indicated preference to statistical population information, followed by qualitative information (17.7%). Maps, graphs, and charts were also used by some constituting 9.5%, 10.1% and 8.2% respectively.

Table 9 Frequently Required Form of Presentation

	Users	%
Statistical	86	54.5
Qualitative	28	17.7
Maps	15	9.5
Graphs	16	10.1
Charts	13	8.2
Frequency	158	100.0
Surveyed Users	95	

3.1.6.3 Requirements at Spatial Level

An attempt was made to list the spatial levels according

to the country's administrative set up as shown in Table 11, and respondents were requested to indicate their choice.

The result shows that no significant difference in the utilization of population information at most of the spatial levels indicated. However, information at regional level is the most frequently required, more than double that of the keftegna, followed by urban, country and wereda respectively.

**Table 10 Spatial Level of Population Information Requirements**

Spatial Level	Users	%
Kebele	44	14.9
Keftegna	29	9.8
Urban	56	18.9
Wereda	49	16.5
Regional	68	23.0
Country	50	16.9
Frequency	296	100.0
Surveyed Users	95	

### 3.1.7 Demographic Analysis

Among demographic analysis of population aspects, users were asked to indicate the parameters/indicators such as, population change indicators, fertility, mortality, and migration which are frequently adopted. The result shows that, almost equal number of the users surveyed do the analysis on the three different parameters. Twenty one users indicated to make analysis on all three of the indicators at the same time.

**Table 11 Analysis on Population Change Indicators**

	Users	%
Fertility	30	34.8
Mortality	28	32.5
Migration	28	32.6
Frequency	86	100.0
Surveyed Users	95	

Asked whether they used special software packages for demographic analysis, 31.8% replied that they make use of such software packages.

### 3.1.8 Users' Experience on Utilization of Population Data/Information

#### 3.1.8.1 Adequacy and Timeliness

Of the 95 respondents 24.2% indicated that they generally obtained adequate and timely population information, 38.9% sometimes, 23.2% rarely and 13.7% not at all (Table 12).

Those who indicated rarely and not at all, were asked to indicate the reason with regard to the service they were offered. The responses indicated poor collection (41.5%), poor staffing (17.0%) and lack of organization of the services (22.0%), (Table 13). Others (19.5%), included, lack of well organized data, lack of computer facilities, lack of reprographic services, and feeling of reluctance on the part of information professionals to share the data/information.

#### 3.1.8.2 Availability of Time Series Population Data/Information

Time series population information is useful in assessing trends in the past, in the present situation, and forecasting the future trend of the population. Its

availability as viewed from the users responses is as follows.

Of the 95 users surveyed 12.6% indicated that they obtained time series population information most of the time, 44.2% some times, 36.9% rarely and 6.3% not at all (Table 15).

### 3.1.8.3 Types of Population Information Services offered to Users

Users were asked to indicate the type of service they get from their own organization's information service unit and service units of other organizations. Eleven and seventeen did not indicate having any of the listed services at all from internal and external sources respectively. One reason for the situation might be that the users did not understand the options listed in the questionnaire.

Document delivery and periodical reports are the most widely used services both from internal and external information service units (Table 15 and 16). Literature search is relatively more frequently used service compared to others.

#### 3.1.8.4 Awareness about Local Publications

Table 17 shows the awareness of users about locally published materials. About 17.9% of 95 respondents reported that they were kept informed of new reports and other publications on population and related areas produced by other local organizations, while 60.0% indicated that they were not so well informed of such publications, and 22.1% reported they were not even aware of these publications. Those who indicated being well informed were further requested to mention any problems they faced in actually getting or accessing the publications. Over 70 percent indicated that they had such problems.

#### 3.1.8.5 Communication Means Used by Users

Among the communication means used to get population information from other organizations, personal visit (55.5%) is the most used followed by post (22.9%). Population information was also obtained through other persons (17.1%) and by telephone (9.5%) (Table 18).

**Table 12 Finding Adequacy and Timely of Population Data/Information**

	Users	%
Most of the time	23	24.2
Sometimes	37	38.9
Rarely	22	23.2
Not at all	13	13.7
Surveyed Users	95	100.0

**Table 13 Users' Opinion on not Getting Adequate and Timely Population Data/Information**

	Users	%
Poor Collection	17	41.5
Poor Staffing	7	17.0
Lack of Organization	9	22.0
Others	8	19.5
Surveyed Users	41	100.0

Table 14 Availability of Time Series Population  
Data/Information

	Users	%
Most of the time	12	12.6
Sometimes	42	44.2
Rarely	35	36.9
Not at all	6	6.9
Surveyed Users	95	100.0

Table 15 Users Response on Services Given within  
Their Own Institutions

Type of service	Users	%
Literature Search	20	15.4
Database Search	11	8.5
Document Delivery	42	32.3
Reprography	-	-
Current Awareness periodical Reports	7	5.4
Not Stated	39	30.0
Frequency	11	8.5
Frequency	130	100.0
Surveyed Users	95	

Table 16 Users Response on Services Given by Other Institutions

Type of service	Users	%
Literature Search	22	17.1
Database Search	7	5.4
Document Delivery	32	24.8
Reprography	-	-
Current Awareness	4	3.1
periodical Reports	47	36.4
Not Stated	17	13.2
Frequency	129	100.0
Surveyed Users	95	

Table 17 Users' Awareness of Local Publications

	Users	%
Well Informed	17	17.9
Not Much	57	60.0
Not at all	21	22.1
Surveyed Users	95	100.0

Table 18 Communication Means Used by Users

	Users	%
Personal Visit	53	50.5
Telephone	10	9.5
Post	24	22.9
Through Other Persons	18	17.1
Frequency	105	100.0
Surveyed Users	95	100.0

### 3.2 POPULATION INFORMATION REQUIREMENTS OF USERS INVOLVED IN URBAN-REGIONAL PLANNING ACTIVITIES

#### 3.2.1 Introduction

As pointed out earlier in section 1.4 of chapter one the study is confined to the general assessment of population information users in Ethiopia and detailed requirements of the users involved in urban regional planning activities at institutions dealing with the production of urban development plans.

An attempt was made at a general assessment of users in section 3.1.1 through 3.1.8. Population information

requirements of the concerned institutions will now be discussed.

Urban planning is an integral part of the more comprehensive socio-economic development planning. It encompasses all aspects of planning in general, its domain and area of influence being urban area (metropolitan, suburbs, etc.) (Neelameghan 1993).

In urban planning it is not sufficient to deal with physical design and spatial analysis (such as land use patterns and allocations) only, but also should take into account the various economic activities undertaken and planned in the region, the population dynamics including in/out migration, the social amenities and facilities, and the multitude of socio-economic infrastructures of urban centre. Data about them need to be collected, analyzed, processed and made available to the planners in conveniently usable forms and formats. The integration and interaction of the urban centre with its environs (metropolitan region and rural areas) must also be incorporated into the urban plan preparation (Neelameghan 1993).

Likewise urban-regional planning in the Ethiopian case is inconceivable without having prior studies on the

demographic and socio-economic aspects of a given space, urban or rural areas. Hence, need for population information in this regard.

In the light of the above statement, population information requirements at each stage of the planning process will be presented in the next sub-sections. Fig 1, Fig 2, Fig 3 show the existing schema of population information flow in urban-regional planning activities in Ethiopia at institutions dealing with such tasks located in Addis Ababa. These institutions are the National Urban Planning Institute, Ministry of Works and Urban Development and Municipality of Addis Ababa (currently Region 14 Bureau of Works and Urban Development). Fig 4 shows the general schema for the flow of population information in urban-regional plan preparation.

The National Urban Planning Institute has the task of carrying out appropriate study and research as shown in Fig 1 for the preparation of plans for regional urbanization, metropolitan areas and urban centres. The Ministry of Works and Urban Development is responsible for the preparation of development plans for small towns on a regular basis (Fig 2), and the Municipality is currently dealing with the detailed study of the Addis Ababa master plan (Fig 3).

Fig 1. Population Information Flow at the National Urban Planning Institute

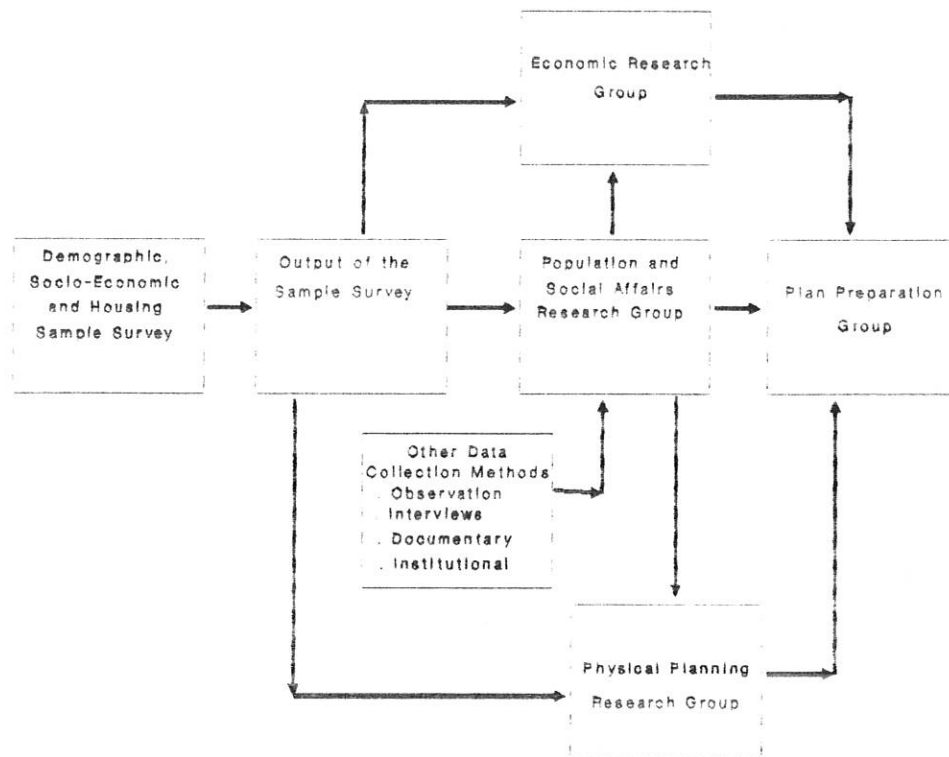


Fig 2. Population Information Flow at the Ministry of Works and Urban Development

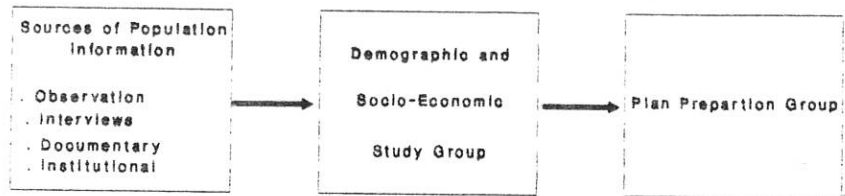


Fig 3. Population Information Flow at Municipality of Addis Ababa

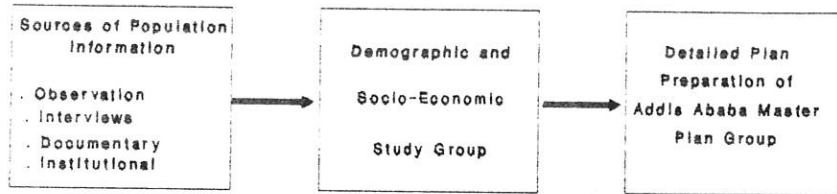
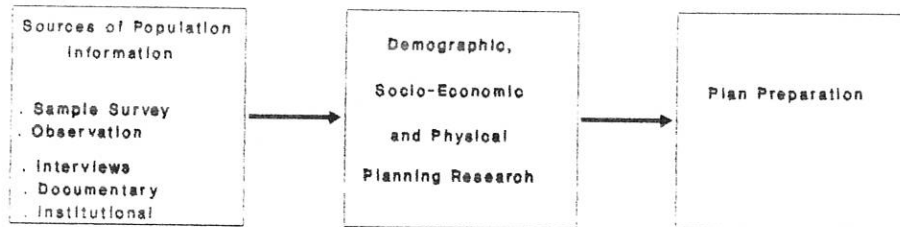


Fig 4. General Schema for the flow of Population Information in Urban-Regional Plan Preparation



The types of population information requirements at each stage of the schema given in the preceding figures will be as follows:

### 3.2.2 Population Information Requirements at the National Urban Planning Institute

#### 3.2.2.1 The Sample Questionnaire

The Institute carries out demographic, socio-economic and housing sample survey in order to fill the gap on demographic and socio-economic aspects of the population for its master and development plan preparation.

The data elements from the sample questionnaire related to population aspect are

#### I. Socio-Demographic Variables

- Name of house-hold member
- relationship with the head of the house hold
- Sex
- Age (completed years)
- Marital status
- Ethnic group
- Religion

- Birth Place
  - . Urban (town)
  - . Rural (Awraja)
  - . Abroad (Country)
- Length of continuous residence
- Reason for coming
- Educational status

## II. Fertility (for woman aged ten years and over)

- Age at first marriage
- Duration of Current Marriage
- Children Ever Born
  - . Living with
    - .. Male
    - .. Female
  - . Living out
    - .. Male
    - .. Female
  - . Deceased
    - .. Male
    - .. Female
- Birth in the last 12 months
  - . Alive
    - .. Male
    - .. Female

. Dead

.. Male

.. Female

### III. Employment (for anyone aged ten years and over)

- Engagement in most of last 12 months
- If no, reason for not working
- If yes, type
- No. of days worked last month
- Type of job
- Gross income earned last working month (Birr)
- Occupational status
- Sector
- Economic activity
- Work place
- Residence/Work place distance (km)
- Means of transport
- Commuting

### IV. Out migration

- Name of the out migrant
- relationship to head of house hold
- Sex
- Age of moving

- Reason for moving
- Education before leaving
- Destination
  - . Urban (Town)
  - . Rural (Awraja)
  - . Abroad (Country)
- Marital Status

#### V. Mortality

- Name of deceased
- Relationship to the head of house hold
- Sex
- Age

#### 3.2.2.2 The Output Derived from the Sample Questionnaire to be Used for Population and Social Affairs Research

##### 1. Socio-Demographic Output

(X refers to crossed between)

- Relation to the head of house hold X sex
- Age X Sex
- Marital status X Sex
- Ethnic composition X Sex

- Birth Place X Sex
- Educational status X Sex
- Reason for coming X Sex

## 2. Output for Fertility computation

- Age at first marriage X Children ever born
- Women ten years and over X Children ever born alive
- Women ten years and over X Children ever born deceased
- Women ten years and over X Child born alive
- Women ten years and over X Child born dead

## 3. Output for Migration Computation

- Age X Sex X Length of continuous residence
- Out migrant's age X Sex
- Out migrant's Destination X Sex
- Out migrant's educational level X sex

## 4. Output for Mortality computation

- Deceased age X Sex

3.2.2.3 The Output Derived from the Sample  
Questionnaire to be Used for Economic  
Research

- Reason for unemployed X Sex
- Job type X Sex
- Sectors X Sex
- Economic activity X Sex
- Income group X Sex

3.2.2.4 The Output Derived from the Sample  
Questionnaire to be Used for Physical  
Planning Research

- Age X Sex
- Ethnic composition
- Birth place
- Unemployment
- Economic activity
- Income level

3.2.2.5 Output of Population and Social Affairs  
Research to be used by the Other Groups of  
Users

Projected population at different spatial levels for the

planning years. Population projections constitute an indispensable part of the statistical basis for planning socio-economic development as well as the plan preparation.

Moreover fertility, mortality, migration and other different aspects of the population are produced for use as an input for the other groups of users.

3.2.2.6 Output of the Physical Planning Research to be used by Planners for the preparation of the different development plans

Since the physical planners are dealing with displaying or mapping the population related information, the outputs to be presented to the town planners are as follows:

- Population density maps
- population per housing map
- Employment distribution map
- Income level distribution map
- Economic activity distribution map

### 3.2.2.7 Outputs of the Economic Research Groups to the Planners

- Labour supply by age, sex and educational level
- Means of transport used by employed people
- Distance from house to work place
- Distribution of employment by different sectors

### 3.2.3 Population Information Requirements at Ministry of Works and Urban Development and Municipality of Addis Ababa

All the types of population information requirements listed in table 8 are used by these two departments at different spatial levels. The main outputs of the demographic and socio-economic study group of these institutions for the plan preparation is projected population.

Generally speaking all the three institutions dealing with preparation of urban-regional plans make use of almost all aspects of population information at the different spatial levels.

### 3.3 RESULTS OF THE SECOND QUESTIONNAIRE

As has been mentioned in chapter one, a second questionnaire was administered to seven selected institutions. The results of the survey are presented hereunder:

#### 3.3.1 Comparison of Sample survey Questionnaires of Different Organizations

In response to a request to attach sample questionnaires that they used in conducting surveys, three organizations only have attached sample questionnaires. These are;

1. National Urban Planning Institute: DEMOGRAPHIC, SOCIO-ECONOMIC AND HOUSING SAMPLE SURVEY IN SELECTED TOWNS.
2. Central Statistics Authority: POPULATION AND HOUSING CENSUS
3. Ministry of Health: CENSUS

BASELINE DATA FOR HEALTH PROGRAMME  
BIRTH NOTIFICATION REGISTER  
EMIGRATION FORM  
IMMIGRATION FORM  
DEATH NOTIFICATION REGISTER

Generally, the different questionnaires are designed by the respective organizations for their own particular purposes. Though these questionnaires are not completely similar (have similar variables), there are several common variables, specially between those used by the Central Statistical Authority and the National Urban Planning Institute. The Ministry of Health's questionnaire also contains some variables similar to those found in the other questionnaires. Therefore, findings lead to the conclusion that data is being collected on the same variables by more than one institute. Although it may be inexpedient to continue collection of data by one organization only, collaborative effort will have a positive effect on the effort and resources used in the collection of data and it may create a ground for better communication and data exchange.

### 3.3.2. Current Status of Information Systems and Services

#### 3.3.2.1 Publications

Among the organizations surveyed (see Annex 7) six of them produce survey reports on population and related areas, except the Ministry of Planning and Economic

Development, and research reports are issued by all organizations. Two organizations issue annual reports on population related areas: Ministry of Labour and Social Affairs and Family Guidance Association of Ethiopia. Conference proceedings are issued by Family Guidance Association of Ethiopia, Ministry of Planning and Economic Development and Institute of Development Research at the Addis Ababa University. Statistical bulletins/abstracts are also issued by the Ministry of Labour and Social Affairs and the Central Statistical Authority.

#### 3.3.2.2 Population Information Services

Data on the type of services and number of organizations who offer the services are presented in Table 21. Selective Dissemination of Information (SDI) on population issues is non-existent, and only one organization is providing reprography service. Reference, circulation to own users and interlibrary loan service are offered by most of the institution followed by database search and current awareness service (other than SDI).

Table 19 Types of Service Offered on Population  
Information

Type of service	Organizations
Reference	5
Database Search	3
Document Delivery	3
Reprography	1
Current Awareness	3
Selective Dissemination of Information	-
Circulation to Own Users	6
Interlibrary Loan	6
Surveyed Organizations	7

### 3.3.3 *Computer Facilities*

#### 3.3.3.1 Hardware

All organizations surveyed have micro computer facilities and two organizations have additionally, Mainframe computers. Mainframe computers are used only at Central Statistical Authority and National Urban Planning

Institute. All the micro-computers have a storage capacity of less than or equal to 120 MB.

The computers are mostly used for word processing, data processing and statistical analysis, and financial management. Only one organization uses computer for map processing (National Urban Planning Institute). No computers are being used for library database management systems in the Libraries/Documentation/ Information Centres of the organizations surveyed. However, the National Urban Planning Institute, Ministry of Labour and Social Affairs, Ministry of Health and Central Statistical Authority, have computerized statistical population information. Except the Central Statistical Authority, no other organization provides computer generated services to external users.

#### 3.3.3.2 Software

All organizations use the MS-DOS for micro computers. As for application software, only three organizations have responded to the question. The following are among the listed software facilities:

- DBASE III Plus and DBASE IV for database management

- Lotus 123 for mathematical and statistical computation
- SPSS PC+ for statistical analysis
- Micro-ISIS for database management
- PC-Edit for data entry management
- etc.

### 3.4 MAJOR PROBLEMS ENCOUNTERED BY USERS IN OBTAINING THE REQUIRED POPULATION INFORMATION

In sections 1.5.1.1, 1.5.1.2., 1.5.2.2 of chapter one, interviews, onsite study and the response from the respondents were mentioned. The results are summarized hereunder:

- . Population data, especially surveys, are often limited to Addis Ababa, and some other urban centres, and its environs. Rural areas are almost never touched.
- . No data can be found on nomadic population.
- . A good proportion of the required population is yet to be collected.
- . There are problems of getting adequate time

were possible, there are administrative problems to be overcome.

. Shortage of well trained personnel to collect and provide the information on request.

. Certain information on population issues disseminated on TV and Radio are not often available in the libraries in printed form.

### 3.5 DISCUSSION ON THE FINDINGS

#### 3.5.1 Findings

The following conclusions may be drawn from the findings:

The use of observation for collecting population data appears to have arisen because of the non-availability of the information or of difficulties to access the required information, even if available.

The relatively high frequency of use of statistical abstracts/bulletins indicates the importance of such data in the type of work in which the users are involved. Users' needs can be adequately met through provision of better access to statistical data. Other forms of

population information presentation, such as qualitative information, maps, graphs and charts should also be given due consideration as the survey findings indicate.

The large difference between the number of users who indicated Central Statistical Authority as their source of population information and of those who indicated other organizations, might be because many users may not be aware of the existence or of the potential of population information sources at other organizations. The use of other organizations is not insignificant.

There is need to promote better cooperation and coordination among different institutions so as to facilitate users communication and exchange of data specific to their requirements.

Users should be provided with detailed type of population information at different spatial levels.

Demographic analysis is frequently made on selected aspects or indicators relating to population, for example, change indicators like fertility, mortality, and migration, and therefore adequate provision should be made for users access to such information and data.

Timely access to relevant and reliable information appears to be not available to a good proportion of the users surveyed. The existing obstacles should be examined and appropriate measures, at policy administrative and service levels, should be instituted to create conditions conducive to better, more efficient and effective population information service. In this regard, accessing time series population information should receive particular attention.

Service such as reprography and Selective Dissemination of Information should be available in all the institution.

Information about local publications on population related areas should be more widely disseminated. Information and data handling equipment and software should be installed where they do not exist at present and strengthen as necessary at other institutions. The necessary complement of trained information handling personnel should also ensure provision of such information at frequent basis.

The existence of duplication in population data collection observed in the different organizations can be reduced through coordination of the activities.

### 3.5.2 Proposal for a Population Information Support System

In general, population information users, at different institutions, described in the preceding section, need information to support the various activities they are involved in. They also generate such information that need to be recorded, stored, processed and disseminated. However, the various problems mentioned hamper the timely and easy availability, access, awareness about and use of the information.

It is important that information as to who produces, what information is being produced, where help can be obtained, etc. should be available. Information storage and retrieval of population information in map forms and efficient provision of population projection to different users in general and to urban plan preparation groups in particular are essential. The low level of the existing population information services, lack of qualified trained personnel, and other problems mentioned require to be alleviated and eventually overcome.

This study proposes the establishment of information networks which can help in overcoming the various problems mentioned, and laying a better foundation for an

effective and efficient population information system in Ethiopia. Development of network can help in minimizing duplication of effort and enhance productivity of the individuals and institutions concerned.

This study also proposes, the use of GIS in population information activities, specially in urban development plan preparation. The development of population projection support system and databases are also proposed.

The next succeeding chapters will discuss networking, demonstration of the application of GIS in using population information for map production purposes, population projection support system for urban-regional planning and prototype databases.

## CHAPTER FOUR

### NETWORKING

#### 4.1 NETWORKING: AN OVERVIEW

##### 4.1.1 Definitions

A network is any arrangement for facilitating access to and exchange or sharing of information and data and for providing mutual assistance between two or more people, organizations, or countries with a view to supporting national socio-economic development plans, programmes and activities. A network may be operated totally manually or use information technology partially or fully (Neelameghan 1992).

According to Kamaruddin (1991) as cited by Gashaw, network is defined as the coming together of institutions or individuals with common interest for mutual benefit with possibility of regular communication and exchange of information to further the progress of their objectives.

Information networks are comprised of group of individuals or organizations that exchange information in various forms but on a regular and organized basis

(Guinchat and Menou 1983).

#### 4.1.2 Need for Networking

There are many factors necessitating the establishment of information networks. These include:

1. As cited by Gashaw, (Mishra 1986, De Gennaro 1979, Bhargava 1986) one of the factors, considered to be the primary according to many, is the growth of recorded knowledge at a rate that libraries and information centres can no more keep pace with or manage it effectively and efficiently.
2. The scarcity of information resources is another factor for information networking. It has become very difficult even for well endowed institutions in developed countries to generate or acquire all the necessary information in all the subjects of their interest (Nega 1991).
3. The growing interest among the different groups of users to pool their resources for optimal use, because of their wide scattering, financial problems, etc. make it necessary to develop a means to share their resources.

4. Libraries/documentation/information centres can not be self sufficient individually neither can they work in isolation. Exchange of information, ideas, research results and experiences facilitate constructive evaluation of research efforts (Nxumalo 1991).

5. The necessity to avoid the greater chances of duplication of effort in the collection and generation of information by different individuals or organizations.

Thus, mainly in response to the changing problems of information provision and to increasing user demands, cooperative approach (networking) is seen as a means of improving services and reduce costs (Gashaw 1991).

#### 4.1.3 Objectives of Networking

The principal objectives of networking include:

1. To meet increasing expectations of users in terms of satisfying their needs in a society that is becoming increasingly more information-intensive.

2. To provide enterprise-wide interoperability and access to all resources for which there is a need to know:

3. To ease the burden of each participant (member), share tasks and pool resources.
4. To undertake joint projects and minimize duplication of effort;
5. To identify and improve all resources, new developments and applications among participating bodies (countries, institutions, individuals);
6. To provide communications network facility among the participating entities;
7. To increase the number and range of services to the users.

#### 4.1.4 Key Factors for Networking

The key elements that should be present for successful networking include:

- the idea of an association of institutions and/or individuals;
- the sharing of a common interest in a particular subject area by such institutions and/or individuals;

- the acceptance of the need for mutual collaboration and a willingness to communicate with one another;
- a commitment to shared activities; and
- the concept of a partnership of equals allowing, however, for the existence of a "lead institute/individual" to assume responsibility for coordination and resource mobilization.

(Adapted from Ramani and Shams 1989).

In addition to the above items, availability of adequate funding, skilled personnel, infrastructure and technology is equally important for successful information network (Gashaw 1991).

#### 4.1.5 Network Architecture

Networks are special types of information systems which involve managing of human and non-human resources. The management concern is for both the overall network and within participating members of the network. The network architecture is an important specification because it offers the communication channels and the flow pattern of messages (information) (Nega 1991).

There are a number of network configurations:

1. **Point to Point:** two participating entities are directly interconnected. They were the earliest alternatives to permanently connecting two resources. The simplicity of the network produces reliable means of communication. Unless the interchange between the participating entities is very heavy, permanent connection is uneconomical. The system is totally dependent on the single connection for its viability, if it fails it will bring the system down.

2. **Star Networks (Centralized Networks):** Several participants are arranged around a central facility like a star enabling the participants to communicate through a central coordinating member (focal point). The focal point is a participating member where the major portion of the resources and processing activities are concentrated (Gashaw 1991; Nega 1991; Adams 1990; Guinchat and Menou 1983). This form of network is easy to control since all transmissions take place across/through the centre node (participating member), however, the work load can be heavy and a major failure there will bring the whole system down.

### 3. Decentralized Network (Distributed or Multi Connected Network)

In such a structure, resources and major activities are distributed among participating members (nodes), with no specific focal point. All nodes are connected to more than one other node in the system. In this way failure of even several parts of the communication system may not cause the network to stop functioning, since alternative routes can be found. The service is relatively more reliable and can be increased easily where needed by added connections. However, management of this type of network architecture is more difficult.

4. Hierarchical Network: In an hierarchical network participants are configured to have multiple levels. They are grouped in a hierarchical order of increasing capabilities in information sources, expertise, equipments, etc, such that each unmet requirement of the members will be passed over to the next higher level. Although a failure at the centre (the root) will result in communication across network ceasing, some contact between participants on the same part of the network can still be made. If however one branch of the network fails it may cut several sub-branches off from the system centre.

5. **Ring Network:** This architecture attaches a number of participants (nodes) in a circular connected form. This formation is more resilient than a single network link between participants, since one failure in the communication link can be overcome by passing signals the other way round the ring. Two failures will however cause the network to crash.

In addition, combinations of the above types of configuration can be employed.

#### 4.1.6 Benefits of Networking

Benefits derivable through networking include:

- Networking fosters human communications by providing facilities which enable economic and efficient interaction among participants.
- Reports and drafts of results for comment can be circulated quickly using file transfer capabilities enabling each contributor to add his/her own comment or make amendments with little effort.
- The exchange of solutions of problems is a heavily used facility on many networks.

- Networking provides interconnectivity and interoperability mechanisms to allow a variety of resources to be shared across a network. These resources include computing power, peripheral devices, skilled personnel, programs, and data in printed forms as well as in the form of files and databases.
  
- Networks also provide an economic, easy to use and reliable alternative to other communication systems for access to remote databases.

## 4.2 POPULATION INFORMATION NETWORK FOR ETHIOPIA (POPINET)

### 4.2.1 Establishment

The surveys and other studies and their findings described in chapter three definitely establishes the need for a population information network in Ethiopia to facilitate and enhance access to population information and data.

The establishment of the population information network requires the gathering, compiling, storing, processing, and disseminating of large volumes of population information. The basic purpose of the network is to

create a conducive environment for users to have better accessibility to relevant, timely and adequate population information at the desired speed and through most convenient medium to enable them to integrate the information with development planning they are involved in.

Since development planning is a dynamic process, the proposed network should be framed in such a way that it is possible to adjust to continuously changing information requirements engendered by societal changes. Access to population information by the concerned institutions and other users is of central importance.

The tasks to be carried out for the establishment of population information network for Ethiopia (POPINET) will include the following:

- . The identification, study and analysis of the population information requirements of the users (individuals and organizations);
- . Tracing and gathering the relevant information on population and continuously updating this information.

- . Standardization and harmonization of information on population. This task is of central importance in the context of the scattered data files and unharmonized classification and coding systems in use.
  
- . Development of formal procedures to regulate the flow of population information from different sources.
  
- . Developing a model for adequate and necessary population information storage and retrieval.

#### 4.2.2 Proposed Network Architecture

Since information networking is of considerable value to information users, its accessibility to the widest possible audience (users) is a central issue. Hence what information is available and where must be known to users to facilitate speedy delivery of information and to create an environment conducive to positive feedback from both users and suppliers (Taddesse 1989).

Knowing the organizations which provide population information to users for development planning and execution being critical, the growing competence of such

information generating institutions need be identified.

As seen from the users' response on institutional sources of population information, the Central Statistical Authority (CSA) is the most important. This together with the greater population information generation capacity of CSA through conducting a population census all over the country, will help to propose the type of network architecture.

It is proposed that a centralized population information network be established, taking the CSA as the focal point with the functions of coordinating body, (phase 1) to accomplish the major functions mentioned in section 4.2.1. The existing informal communications among different organizations will continue.

In phase one, the following major tasks should be accomplished by the coordinating body:

1. Identification of the types, forms of presentation, spatial levels, sources and services, etc. of population information of the participating organizations so as to avoid duplication, and to improve the systems and services.

2. Standardization of the form of presentation of the information of the different organizations for the processing and provision of population information.
3. Identification of groups of organizations with similar interests in population information and examining if it would be viable to establish population information communication (exchange) between them, ie. one another.
4. Preparing integrated databases by compiling lists of relevant sources of population information and offering appropriate referral services to network members as well as other interested groups.
5. Creating compatibility with relevant international information systems such as POPIN-Africa, PADIS, POPIN, etc. on the basis of agreed upon norms, standards and practices of information handling.
6. Laying a foundation for the establishment of decentralized network system (phase 2) by proposing the idea of establishing network between the identified institutions (in number 3) which are likely to have good coordination among them.

### 4.2.3 Steps in Organizing the Proposed Network System

#### 4.2.3.1 Organizing the First Phase

At the outset of the establishment of the network, the CSA, specially the Population Analysis and Studies Centre which has been newly established under CSA, may take the initiative actions such as the following:

- Identify the organizations which are major users and producers of population information, for example (Ministry of Planning and Economic Development (MOPED), National Urban Planning Institute (NUPI), Ministry of Labour and Social Affairs (MOLSA), Institute of Development Research (IDR) at the Addis Ababa University (AAU), etc.
- Bring the identified organizations together and explain the importance of population information support by developing a cooperative network so that the required population information can be accessed and shared among them in their daily activities, saving effort and resources in the process.
- Identify the technical assistance, the feasible areas of cooperation between the organizations and the CSA.

Finally the first phase of the network may then be established.

#### 4.2.3.2 Organizing the Second Phase

After the centralized network commences operating successfully, establishing the second phase may begin.

The coordinating body shall convene the organizations willing to participate and discuss the viability of a decentralized population information network system, and present a proposal to be approved by the different organizations expected to participate in the network.

Then the participating organizations will determine the types of cooperative activities to be established among them, through identification of the feasible areas of cooperation between one another.

At this stage, the management of the network as expressed in the previous section, is relatively more difficult than the centralized one. However, the coordinating body should attempt to bring about a successful management by sharing its tasks with the other participants.

#### 4.2.4 Skeleton Model of the Proposed Networks

A population information network system is basically designed to provide ease of access to such information needed in development planning. The following diagrams show the proposed structure of the population information network system in Ethiopia at Phase 1 and Phase 2 respectively.

Fig 5. Proposed Skeleton Model of the Network During Phase 1

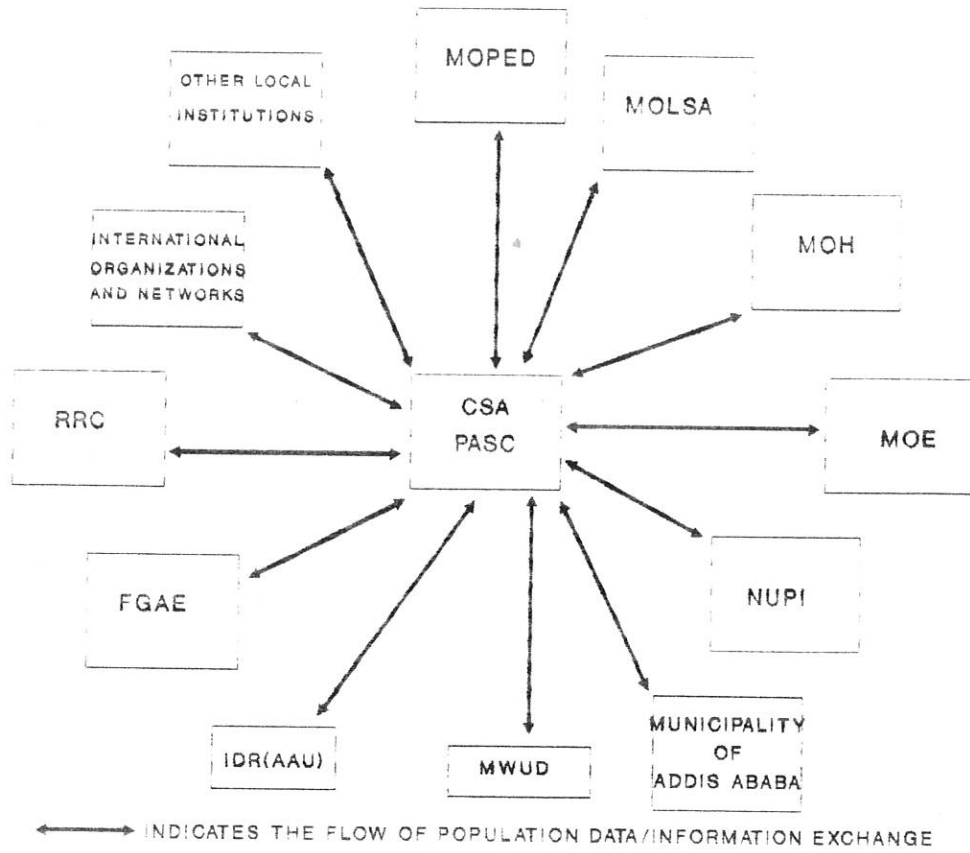
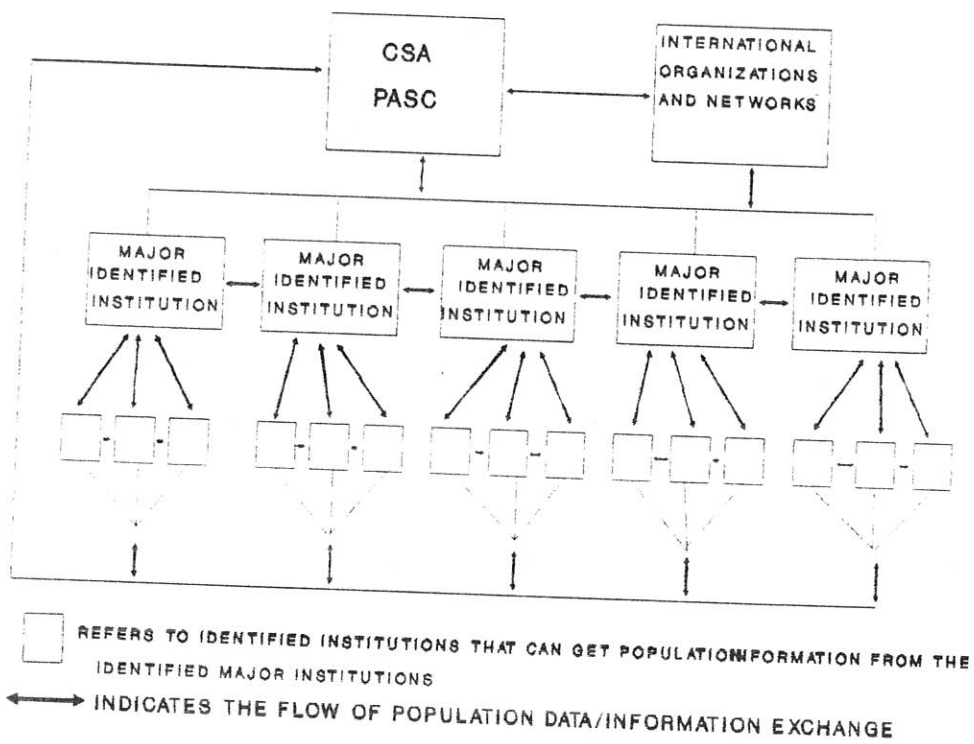


Fig 6. Proposed Skeleton Model of the Network During Phase 2



#### 4.2.5 Services of POPINET

This section discusses the population information services to be provided to users in the first phase and second phase of the network function of the focal point as well as in the second phase by the different participating organizations.

##### 4.2.5.1 Services Provided by the Focal Point (CSA)

1. **Formulation of Standards:** Agreements to use standardized codes for facilitating information/data exchange.
2. **Publications:** the focal point prepares publications on the overall function of the network as well as information products.
3. **User Sensitization:** Problems of users in becoming aware of and accessing population information and their sources can be overcome by the focal point arranging seminars and meetings for user sensitization and orientation.
4. **Referral Services:** to create a link between the users and sources of population information. Such services play

an important role. To realize such services the focal point should develop databases. The database to be constructed will include bibliographic databases covering all types of documents in population and related areas, profiles of experts and institutions dealing with population issues, profiles of population information systems and services, profiles of on going projects on population related matters, and statistical population data/information.

#### 4.2.5.2 Services of the Participant Organizations During the Decentralized Network Phase

The following are the types of services to be offered by the participating organizations to their respective users:

1. **Reference Service:** each participating node (member) is required to provide such service by, among other things, building necessary collections on population and related areas. This will be of much importance to users for finding the required population information.
2. **Current Awareness Service:** to keep users abreast of newly produced information or documents on population related areas. It plays a vital role in updating the

knowledge of the users relating to the availability of population information.

3. **Selective Dissemination of Information:** it is a procedure for supplying each user or group of users with current bibliographic references to documents relating to their subject interest, ie. on population aspect, selected from among the descriptions of all the documents received during a specific period.

4. **Statistical Data Service:** this service is required to provide users with statistical and factual population information either from existing statistical databases if any, or that has been extracted from documents.

Additionally referral service, common services like reprographic and document delivery service, and specialized services, such as, population projection service are suggested to be offered by the participating organizations.

## CHAPTER FIVE

### APPLICATION OF GIS IN URBAN-REGIONAL PLANNING USING POPULATION INFORMATION

#### 5.1 INTRODUCTION

The type and mode of use of information can be diverse depending on the kind of application and planning requirement, for example demographers, national resource management planning, and urban planning, may require the same information presented in different formats.

The urban planning process requires the collection and integration of large amounts of geo-referenced data, such as land use, network of roads, population density, etc..

The real world is spatial in nature and we have to deal routinely with complex spatial interactions. Thus, to make correct decisions about various spatial aspects, efficient methods of collecting, storing, displaying and retrieving information about the complex spatial relationships are required.

The statement of (Scholten and Stilwell 1990) as

described by Sisay (1991) indicates that researchers and practitioners in geography as well as in other disciplines have dealt for many years with problems relating to the analysis and manipulation of entities which exist within a specific space time framework. The most common medium for storing and displaying such coordinate-based information has traditionally been the analog map document. The first of them was apparently created before the first alphabet, so it is perhaps that we have been working with these analog storing and displaying devices for spatial data over a long period of time.

Significant developments in technology have created the means of handling analog map in digital form for simultaneous storage, processing and analysis of spatial data. A major problem of analog map data storage, updating and overlay of maps by transparency has been solved through the developments of computer technology.

The rapid growth of automation, methodology and tools in the planning process has indeed led to a considerable improvement of the quality in spatial planning in terms of data storage, analysis, retrieval and quality graphic presentation. More advanced techniques and larger data input have added to the analytical power through the use

of GIS software and complex models.

Application of computer aided design (CAD) and multi media systems have led to an increase of design efficiency and presentation quality. Until recently mapping systems could not by themselves maximize the benefits of use of extensively and expensively collected digital geo-data. Therefore, geographical information focused on analysis mapping systems are helpful in this regard (Girma 1991).

Burrough (1990) defines GIS as "a powerful set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from the real world." It is natural, therefore, that physical planners utilize GIS in solving the conflicts from the increasing demand for space from different sector of the economy (industry, agriculture, housing, services, etc.).

In the urban planning context where quite many decisions are made at different levels, the application of automation in supporting the decision making process is considerable and efficient. What distinguishes GIS from other mapping systems is the ability to provide analytical and reporting capabilities. The current practice shows that they are considered as part of the

back bone of management (EGIS 1991), as cited by (Girma 1991).

The present trend and perspective in the global market scene shows a substantial decline of cost of computer hardware and software, points to the spread of automation. It is evident that in the near future the traditional ways of working with analog maps and storage and processing methods will be replaced by new integrated and efficient automated systems. Though there are some marginal constraints remaining people are optimistic that the developing world could benefit significantly from GIS applications (Girma 1991).

Though there are diverse applications of GIS. However, this study is largely on the use of GIS in supporting planning and decision making processes in urban planning, specifically in the use of population information. The software UDMS (Urban Data Management Software of UNCHS (HABITAT), Nairobi, Kenya) is used for demonstration purpose.

## 5.2 BACKGROUND OF THE MAP OF THE DEMONSTRATION AREA

Addis Ababa is the capital city of Ethiopia with population size estimated to be more than three million

and the centre of political administrative and economic activities of the country.

All the master plans of the city of Addis Ababa previously prepared were narrower in scope and simple in nature so to speak. In all cases they have underestimated the dynamics of population growth and hence the bases of resources and the social infrastructures which accompany population growth. Moreover, they did neither analyze nor integrate the urban-regional socio-economic and physical relations. Hence, from the need for directing and controlling the growth of the capital city of Ethiopia and largest urban centres in accordance with the guidelines of the National Economy and the new strategies of regional development, the decision was taken by the government to have a new master plan for Addis Ababa studied. It was completed in 1987, and this has to be approved by the concerned bodies. A demonstration was held in the presence of the government and other officials. However, the master plan was implemented only recently.

For the demonstration in this study the map of Addis Ababa is used. On the map, the town is divided into 5 zones and 25 keftegnas (highers). The demonstration concentrates on the zonal division.

### 5.3 OBJECTIVE

The overall objective of this part of the study is to demonstrate the feasibility of application of GIS for urban-regional planning. The UDMS capabilities of thematic cartography for producing thematic maps which give a graphic presentation of physical or demographic variables of a given area/region has been applied to the map of Addis Ababa.

### 5.4 LIMITATIONS

The study is made using only the boundary map of Addis Ababa divided both into 5 zones to overlay population related variables.

The software UDMS has limited facilities and unable to show legends along side (either at the top right corner or at the right bottom corner of the screen. However, it can provide the legend on a different screen/sheet.

### 5.5 DATA COLLECTION

. The map of Addis Ababa was collected from the National Urban Planning Institute.

. Information on population aspects was collected from CSA 1984 population census report as it gives information at zonal level.

. Interviews with physical planners and architects were conducted to identify the type of population information they need and how they would like to display the information on the map (mentioned in chapter one).

## 5.6 OVERVIEW OF COMPUTER-BASED SPATIAL INFORMATION SYSTEMS

The collection of spatial data, the determination of location within a standard coordinate system and the subsequent storage and portrayal of spatial data on maps are common functions in all modern societies (Donna and Dunne 1990).

As mentioned in the introductory part of this chapter; the hand drawn map has been the traditional and time honoured medium for storing and displaying geo-based information. The hand compilation and subsequent manual interpretation of map data has had inherent speed and volume limitations. The rapidly growing use of computers for handling geographical data has been part of a more recent reflection of the overall trend in society towards

a rapidly increasing reliance on the computer as a data handling and data analysis tool.

In the area of geographic data handling, this trend has been driven by both 'push' and 'pull' factors. The primary push away from the limitations of manual techniques and pull toward the use of computers is two fold. First; extremely large and complex data set can be both compactly stored and rapidly retrieved with mechanical accuracy. The use of automated techniques developed in the earth sciences, transport planning, urban planning, and natural resource management, among others, are limited in their practical application without the capacity and very rapid data processing that computers provide to deal with the large volumes of observational data required by these techniques. At the same time, there has been a complementary pull toward using digital tools as increasing amounts of data became available directly in digital form. This growing supply of ready made digital data has resulted from a parallel revolution in digital data capture techniques such as those seen in global positioning, attribute measurement and some remote sensor imagery (Donna and Dunne 1990).

### 5.6.1 Computer Assisted Mapping and Map Analysis

During the 1960's and 1970's new trends were seen in the ways in which mapped data were being used for resource assessment, evaluation, and planning. Owing to the realization that the different aspects of the earth's surface did not function independently of each other, people began to want to evaluate them in an integrated, multidisciplinary way (Burrough, 1990).

So cartographers had begun to adopt computer techniques in the 1960's, but these were, until recently, largely limited to aids for the automated drafting and preparation of masters for printed maps.

However, the experience of using computers in map making has advanced to a significant extent (Burrough 1990), that Rhind (1977) was able to present the following cogent list of reasons for using computers in cartography.

1. To make maps more quickly
2. To make maps more cheaply
3. To make maps for specific user needs
4. To make map production possible in situations where skilled staff are unavailable.

5. To allow experimentation with different graphical representations of the same data.
6. To facilitate map making and updating when the data are already in digital form.
7. To facilitate analysis of data that demand interaction between statistical analysis and mapping.
8. To minimize the use of the printed map as a data store and thereby minimize the effects of classification and generalization on the quality of the data.
9. To create maps that are difficult to make by hand
10. To create maps in which selection and generalization procedures are explicitly defined and consistently executed.
11. Introduction of automation can lead to a review of the whole map making process, which can also lead to savings and improvements.

#### 5.6.2 Geographic Information Systems

During the 1960's and 1970's there were two discernible trends in the application of computer methods to mapping: one was the automation of the tasks then in use with emphasis on cartographic accuracy and visual quality, and the other emphasizing spatial analysis but at the expense of good graphical results (Neelameghan 1993).

The history of use of computers indicates that there have been parallel developments in automated data capture, data analysis and presentation in several broadly related fields including rural and urban planning and utility network mapping. As a result, there have been duplication of effort and generation of multiplicity of discipline-specific jargon for the same or different applications in different countries. Eventually it has led to possibilities of linking different kinds of spatial data processing applied to separate but closely related fields into a general purpose geographical information system (GIS) as the technical and conceptual problems were overcome. In all the different application areas the attempts have essentially been to develop powerful tools for capturing, storing, retrieving, transforming, and displaying spatial data from the real world for a particular purpose. This set of tools makes up a GIS (Neelameghan 1993).

Cited by Mary (1991), Anderson (1989) says, a Geographic Information System for planning provides methods and techniques to mobilize the data required in a relatively easy way for a better understanding of the urban spatial phenomena, and more important is that it enables manipulation and adjustments to the needs of the planning process.

#### 5.6.2.1 Some Applications of GIS

Some of the applications of GIS are mentioned here:

- GIS enables the combination of several thematic maps in an overlay process in order to produce a new map which will have the values of the original ones.
- It is possible to retrieve only the information that is needed for specific purposes.
- Updating maps, both, locational and attribute data is quite easy.

GIS also helps

- to visualize large amount of information in a small space
- in identification of underutilized development potential
- in superimposition of indicators like population aspect
- in representation of qualitative information
- locating areas of concern
- etc.

### 5.6.2.2 Components of GIS

GIS have three important components: computer hardware, sets of application modules and a proper organizational context. These three components need to be in balance if the system is to function satisfactorily.

1. The major hardware components are indicated in Fig 7.
2. The software package for a GIS: It consists of five basic technical modules (See Fig 8)

The basic modules are subsystems for

- a) Data input and verification;
- b) Data storage and Database Management;
- c) Data output and presentation;
- d) Data transformation; and
- e) Interaction with the user.

### 3. The organizational aspects of GIS

The five technical sub systems of GIS govern the way in which geographical information can be processed but they do not of themselves guarantee that any particular GIS will be used effectively. In order to be used effectively the GIS needs to be placed in an appropriate

organizational context (see Fig 9). It is simply not sufficient for an organization to purchase a computer and some software and to hire and retrain one or two enthusiastic individuals and then to expect instant success.

Fig 7. Computer Hardware

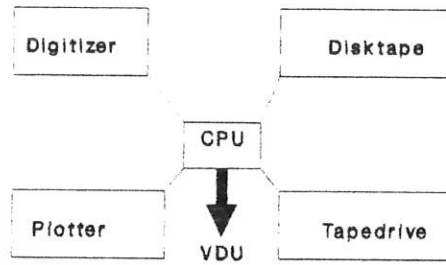
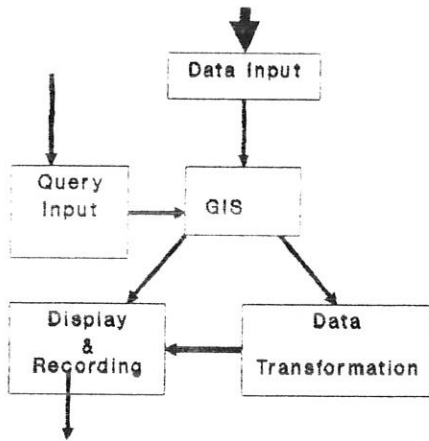
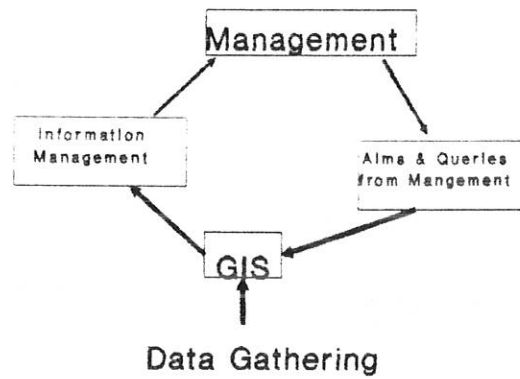


Fig 8. The Main Software Components of GIS



Source: Burrough, 1990

Fig 9. Organizational Aspect of GIS



plain ASCII data file (\*.DAT) containing the coordinates of the map.

**Step 2** Run UDMS and select Menu option 1.1 (Prepare Map Data file for UDMS) to convert the \*.DAT file into the form that UDMS requires, ie. \*.COO file.

**Step 3** Select any other options from Menu option 1, such as 1.2 to define regions, 1.3 to define variables, 1.4 to define points and 1.5 to define networks.

**Step 4** Run other Menu options as required, for mapping, calculating distances, searching for points, locating facilities and so on.

Source: UDMS manual

## 5.8 DEMONSTRATION

This section will discuss the work done to demonstrate the application of GIS for urban regional planning purposes. Here UDMS is used in overlaying population variables on the map of Addis Ababa.

## 5.8.1 Data Input

### 5.8.1.1 Spatial and Non-Spatial Data Input

Data input is the operation of encoding the data and writing them to the database. The creation of a clean digital database is the most important and complex task upon which the usefulness of the GIS depends (Burrough 1990).

Two aspects of the data need to be considered separately for geographical information system: first the geographical data necessary to define where the graphic or cartographic features occur, and second the associated attributes that record what the cartographic features represent. It is this ability to process the cartographic features in terms of their spatial and non-spatial attributes that is the main distinguishing feature between automated cartography ( where the non spatial data relate mainly to colour, line type, symbolism, etc.) and geographical information processing (where the non spatial data may record land use, soil properties, ownership, vegetation type, diseases and so on).

Data input to a GIS can be best described under three headings:

- a) entering the spatial data (digitizing)
- b) entering the non-spatial associated attributes, and
- c) linking the spatial to the non-spatial data.

At each stage there should be necessary and proper data verification and checking procedures to ensure that the resultant database is as free as possible of error.

There is no single method of entering the spatial data to a GIS. Rather there are several mutually compatible methods that can be used singly or in combination. The choice of method is governed largely by the application, the available budget, and the type of data being input. The types of data include existing maps including field sheets, hand drawn documents, areal photographs, remotely sensed data from satellite or airborne scanners, point sample data (eg. soil profiles), and data from censuses and other surveys in which the spatial nature of the data is more implicit than explicit. The different inputting methods and devices include: manual input to a vector system, manual input to a grid system, digitizing; and automated scanning.

As regards entering the non-spatial associated attributes (sometimes called feature codes), ie. the properties of a spatial entity to be handled in the geographic information system, can be effectively stored and processed apart from the spatial data.

UDMS has no facility of digitizing, therefore the method employed in entering the spatial data for this study follows the following steps.

- 1) redrawing the map on a graphic paper
- 2) dividing the map into appropriate points
- 3) picking the coordinates of these points by assigning an identifier to each coordinate
- 4) Inputting the data using a word processor and saving in Dos text (ASCII form) i.e. putting in \*.DAT file.

As for the non-spatial data it is simply entered into variable definition file for each region at zonal levels.

#### 5.8.1.2 Conversion of \*.DAT File to \*.COO File

The data entered in \*.DAT file which is in plain ASCII form containing coordinates of map perimeter and boundaries of the divided regions will be converted into \*.COO file which is a UDMS file containing map

coordinates and other information.

Next, regions can be defined i.e. \*.REG file will be created. It is a region definition file for \*.COO.

#### 5.8.1.3 Updating

Data as a whole, spatial or attribute (non-spatial) are liable to change with time. Attribute (variable) data unlike the spatial data is liable to change more frequently and their updating is relatively important. Therefore, data can be updated according to changes on both spatial and non-spatial databases.

#### 5.8.2 Overview of Processing

In this study some processing is performed to draw the map and overlay the variables on the map. In addition UDMS has limited capability to make some analytical process like area, centroid and statistical computations.

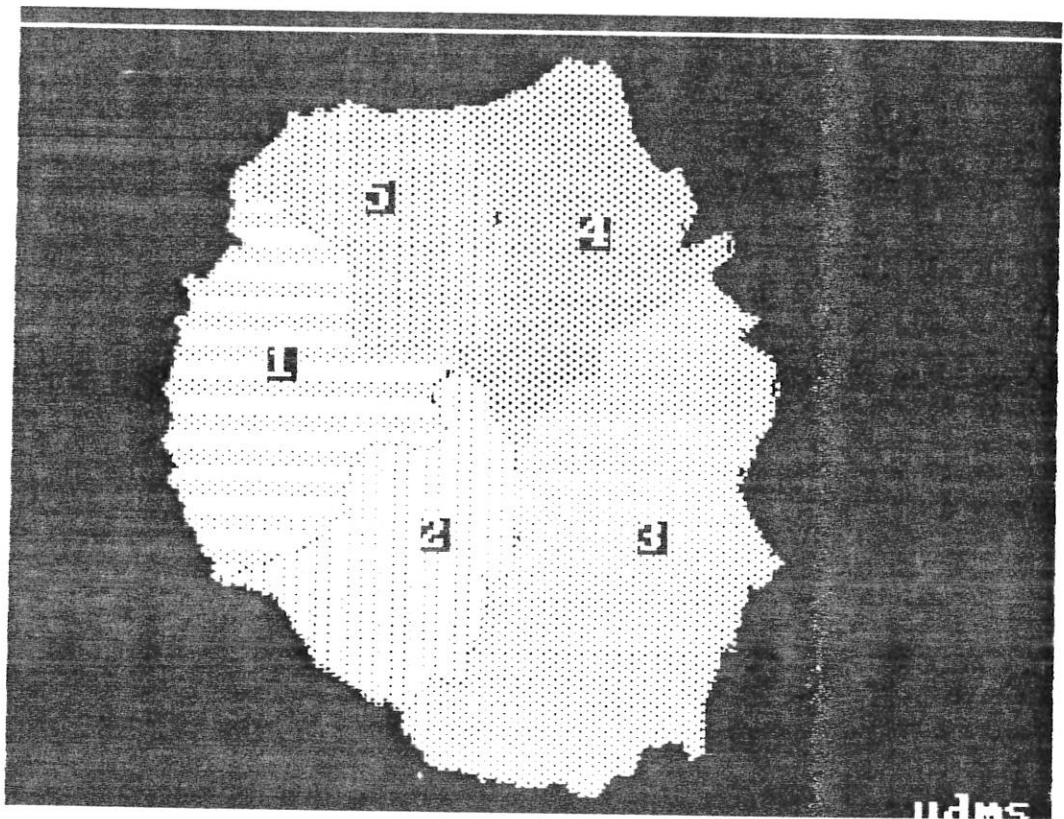
#### 5.8.4 Data Output

Data output is the operation of presenting the results of data manipulation in a form that is understandable to a user or in a form that allows data transfer to another

computer system. People-compatible outputs are maps, graphs and tables; computer compatible output may be in the form of magnetic tapes that can be read into another system (Burrough 1990).

One aim of this study is to produce people-compatible, outputs in the form of maps and tables that are important for users to make decisions or certain conclusions. The outputs that can be generated may contain varied information of population related conditions of the study area, above all they present graphical outputs of certain selected population variable to indicate the relationship between the variable and the area under consideration. Two outputs produced are shown in Fig 10a and 10b.

Fig 10a. Population Distribution Map of Addis Ababa



**Variable Legend: Total Population**







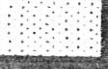

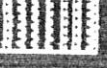
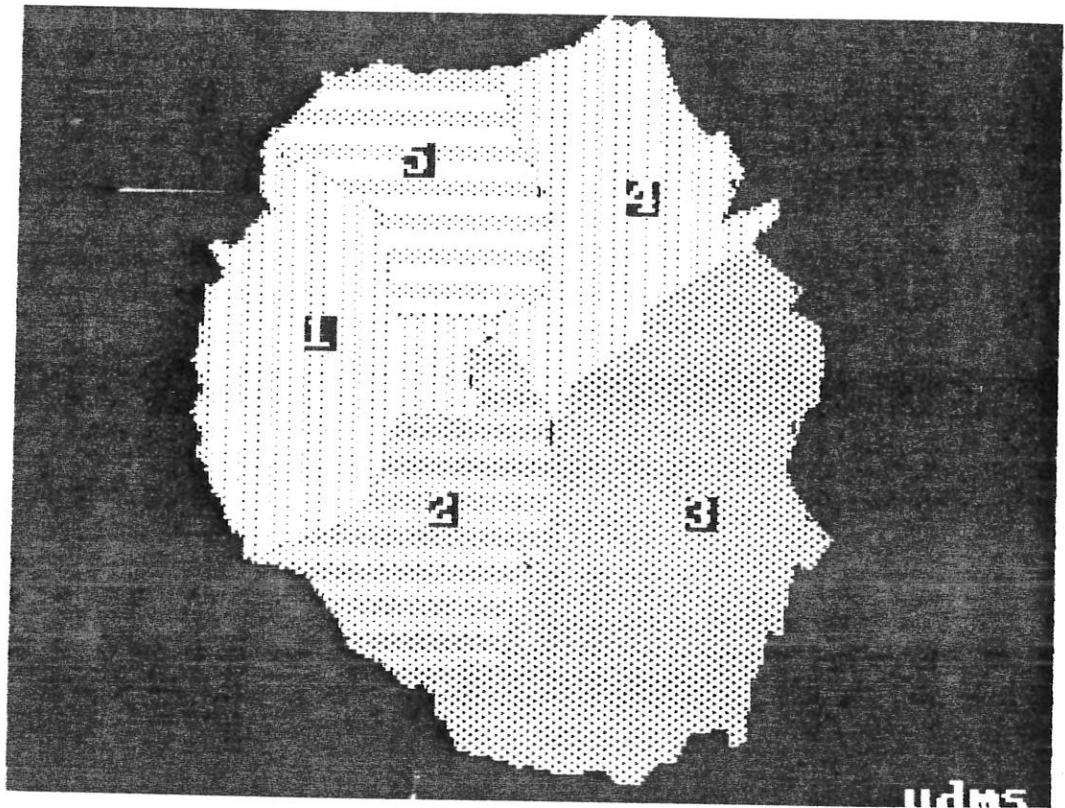
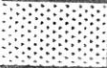








	>= 257,608 < 264,485		>= 291,991 < 298,868
	>= 264,485 < 271,361		>= 298,868 < 305,745
	>= 271,361 < 278,238		>= 305,745 < 312,621
	>= 278,238 < 285,115		>= 312,621 < 319,499
	>= 285,115 < 291,991		

Fig 10b. Population Density Distribution Map of Addis Ababa



**Variable Legend: Population Density**

	>= 3,410 < 4,054		>= 6,631 < 7,275
	>= 4,054 < 4,698		>= 7,275 < 7,919
	>= 4,698 < 5,342		>= 7,919 < 8,563
	>= 5,342 < 5,986		>= 8,563 < 9,208
	>= 5,986 < 6,631		

## 5.9 CONCLUSION

The above output indicates that it is also possible to produce other population aspect overlaid maps (thematic maps) which can support planners and decision makers with necessary information to accomplish their task depending upon the information they can read from the maps.

For example Planners and Decision makers can

- 1) assess profile of the different services that are required in a certain area.
- 2) assess resettlement aspects taking the population variable together with other variable maps like housing density.
- 3) Other functions like suitability studies can also be done efficiently and effectively using automated systems like GIS.

Automated systems are far more efficient and effective than manual systems. The use of GIS for population information production, presentation and provision for different groups of users in general and for those dealing with urban regional planning activities in

particular can be valuable. It was also attempted to show how UDMS is capable of producing maps taking population variables.

These maps can support planners and decision makers with the necessary population related information for immediate use. In addition to this it is also possible to produce other maps by using the overlaying system, ie. overlaying the population related thematic map over similar maps done on different aspects so as to come up with the desired plans (maps).

## CHAPTER SIX

### POPULATION PROJECTION SUPPORT SYSTEM

#### 6.1 INTRODUCTION

In chapter one attention was drawn to the uses of population data/information. Mention was made of the link between improved demographic/population projection and development planning. In reference to the importance of population projections for development planning, this chapter discusses the need for a population projection support system.

Population projections are procedures whereby the calculations of future population sizes and their growth rates can be estimated (ECA 1985). Population projection is perhaps the single most important population study for planning purposes (McLoughlin [1965]; 1978).

Population projections may be prepared for the total population of nations, their principal geographic subdivisions, or specific location within them. Projections may also be prepared for residential classes, such as urban and rural population and size of locality classes.

The principal characteristics for which projections need to be made are age and sex. Projections may also be made for various social and economic sub-groups of the population and for other demographic aggregates. The most frequently required and produced are projections of the population in terms of (i) educational characteristics, ie. enrolment and attainment, (ii) economic characteristics, ie. economically active population, employment distributed by occupation, (iii) social aggregates like house-holds and families (Shryock and Siegel 1976).

There are three types of projections based on time span: the short (under five years), the medium (5 to 20 years) and the long term (over twenty years). The time spans for the different types of projections should be chosen with respect to the uses to which the projections will be put (Kpedekpo 1982).

The present chapter also discusses the principal methods that have been used to develop population estimates for (i) the years between censuses, or inter-censal estimates; (ii) the current years following the latest complete census, or post censal estimates; and (iii) the future years, or population projections. These estimates are made for the country as a whole and also for

communities or other geographic areas within the country.

## 6.2 NEED FOR POPULATION PROJECTION SUPPORT SYSTEM

In developed countries, the necessity of planning for the achievement of public goals is recognized and population projections are used in planning activities and investments in the private as well as the public sectors. Whereas, among the developing countries the extent to which population projections are applied in planning varies with the degree of the government's involvement in centrally planned development programmes as well as with the availability of demographic data and other resources for preparing projections (ECA 1985).

Ethiopia is not an exception. This factor together with the findings in chapter three, ie. 87.4% of the users surveyed, most of the time, do not get time series population data/information and the problem of making crude projections in the absence of reliable, timely and adequate population data/information calls for a support system that can help in providing users with either reliable projected population data/information or the basic data/information requirements to enable them to make the necessary projections on their own, so as to integrate it with development planning.

### 6.3 USES OF POPULATION PROJECTIONS

1. Population projections constitute an indispensable part of the statistical basis for planning socio-economic development and other governmental programmes. Without indications of the future population of a country and its constituent areas, the prospective increase of labour resources, changes in numbers of pre-school and school age children, persons of pensionable age, etc., it is impossible to plan correctly the volume of production and national income, the distribution of products, the construction of housing and other facilities, the development of the educational system and provisions for public health and other social services.

2. Population projections have obvious relevance to decisions on questions of national population policy. They are also useful in defining demographic targets and programmes of action and formulating such plans for action. Projections may thus serve to evaluate the realism of proposed demographic targets and adequacy of proposed measures for attaining them. Demographers also use projections as aids in evaluating and correcting demographic data and for experimenting with methods of projections.

3. Population projections are sometimes designed not only as forecasts but also as analytical instruments to study the influences of mortality, fertility and migration on population growth and structure; to assess the effects of demographic factors on economics and social development; to estimate the impact of policy measures on fertility and population growth.

#### 6.4 METHODS OF POPULATION PROJECTION

Planning activities must be based on the knowledge of the make up of the population to which these plans are directed. The size, age distribution, socio-economic status, ethnic distribution, etc. of the population are essential factors in the preparation of a plan.

Of course, it is always possible to determine the existing values of these characteristics either by a census or survey research methods. However, plans are by nature oriented toward the future. Thus, estimates of the composition of a given population at a future date will be necessary (Oppenheim 1980).

Two methods of population projections are discussed below: Mathematical projection and Component method.

#### 6.4.1 Mathematical Projection Methods

Mathematical projections are usually based on the extrapolation of past trends into the future. If the population size is available at two or more time points, it is a relatively simple exercise to fit some mathematical curve to the data and on the basis of this curve, obtain estimates of the total population at other dates.

There are a number of mathematical models that can be used for such purpose. The following are some of the most widely used mathematical techniques used in population estimation/projection (Assefa 1993; Oppenheim 1980).

1. **Linear Extrapolation:** A straight line is fitted to population data which may be used for estimating the population between two censuses or two periods.

$$P_t = P_0 + at$$

$P_0$  and  $P_n$  are the population sizes at time 0 and  $n$  respectively, where  $n$  is the number of years,  $a$  the growth constant and  $P_t$  is the required future population size. This model is graphically represented by a straight line in Fig 11.

Example: Population size of Addis Ababa was 1,167,315 in 1978 and 1,423,111 in 1984 (source CSA). If one needs the population in the future assuming the population grows linearly in the same manner as it grew from the year 1978 to 1984, then projection can be done taking the size in the year 1978 as a base population.

**2. Geometric or Exponential Method:** A method of population projection commonly used assuming the population is growing continuously at a constant rate of  $r$  percent per year. Then the population at time  $t$  can be estimated using the equation:

$$P_t = P_0 (1+r)^t$$

$$P_t = P_0 e^{rt}$$

$P_0$  and  $P_t$  represent population at time zero (the initial period) and at  $t$  (future time) respectively,  $e$  is a mathematical constant and  $r$  is the rate of population growth (see the graphic model in Fig 12).

There are also other mathematical methods for population projections. The main disadvantage of the mathematical

Fig 11. Linear Population Growth Model

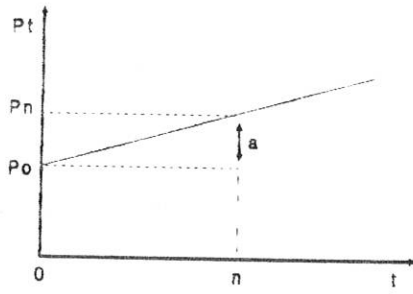
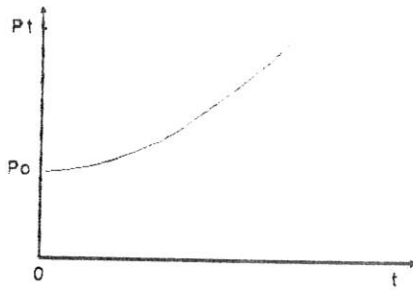


Fig 12. Exponential Population Growth Model



methods of population projection (estimate) is that they do not provide the age distribution but the total population size only. However, age distribution can be obtained from past age structure of the population assuming that it remained unaffected during the projection period.

#### 6.4.2 Component Methods

Originally attention was given to the mathematical methods in the belief that it might be possible to find some relatively simple law of population growth. However subsequent changes in the birth and death rates showed that such methods were quite unsatisfactory (Assefa 1993). Even though they have by no means been abandoned component methods have been displacing the mathematical methods (Shryock and Siegel 1976).

The simple projection models presented in the preceding sections treat the population as an aggregate, i.e., without distinguishing among various age groups or differentiating with respect to the demographic characteristics, such as sex or ethnic origin.

Planners need to know the present and future composition of these characteristics because various groups in the

community have various needs, interests, etc. Therefore, the aggregate level of a given population might not be, in some cases a sufficient basis for planning (Oppenheim 1980).

The method that will be presented in this section will be the cohort-survival method.

The cohort-survival method, according to Chapin (1965) as cited by McLoughlin ([1965]; 1978) is the standard method of population projection used by official (government) agencies in most of the advanced countries. It is not a rigid method, and can be adapted in a variety of ways to suit the data available or the needs of the analyst whilst at the same time retaining its underlying logic. It is an analytical method which allows births, deaths, and migration to be handled separately; it gives results for any pattern of age groups; it can handle male and female elements separately or together and it can be disaggregated in ethnic or racial groups (with different biological characteristics) if necessary to attempt at greater accuracy (McLoughlin [1965]; 1978).

The general form of the cohort-survival method is as follows:

Males and females by single year age groups are tabulated separately, the figures being extracted from the latest available census or sample surveys. Next the nett migratory change for the first year is allowed for by the addition (or subtraction) of the assumed change for each age group of males and females. Then the appropriate age-specific birth rates are applied successively to each group of women in the child bearing range (usually 15-49) the resultant births are divided into males and females, adjusted for mortality in the first year and entered in the next column, first row of the male and female tables. Finally, age specific mortality rates or survival rates are applied to each age group of males and females to estimate the numbers who will survive to the next year (i.e. of their life and of the projection) (McLoughlin [1965]; 1978).

This sequence is repeated until the projection date is reached. Here the analyst has complete control over the projection at all stages and can introduce special adjustments to births, deaths and migratory changes at any point in the process.

A very common simplification is to work with five year (quinary) age groups 0-4, 5-9, 10-14, etc. and to project by quinquennial periods. Slightly different data are

needed. for example, five year fertility ratios to estimate births and, of course, the pattern of migration assumed must be expressed in five-year periods.

The male table is identical except that there is no 'births' element. At each cycle of the projection the new baby boys are transferred from the female table to the appropriate '0-4' row in the next time period in the males table. The figures entered in both tables will have been adjusted to take account of mortality rates up to the fifth birth day.

The projection is started with a population structure derived from the latest census. If quinquennial steps are to be used then obviously the projection will yield results for 5, 10, 15, etc. years from the census date (see Fig 13).

The major advantages of the component method are:

1. It enables one to appreciate the effect of each of the separate assumptions about fertility, mortality and migration.
2. Unlike the mathematical curve fitting, it provides the age-sex structure of the projected population.

Fig 13. Cohort-Survival: Female table, first quinquennium

Age Group	Fem. Pop. at y=0	Net Mig. of Fem. Y=0-5	Tot. X Fem. Pop. at Y=0	Fert. Rates Y=0-5	Live Births Y=0-5	X Surv. Rates Y=0-5	= Survivors	X Male Fem. Ratio	= Fem. (0-4) Male (0-4) at Y=5	Tot. X Fem. Pop. at Y=0	Surv. Rates Y=0-5	= Fem. Pop. at Y=5
0 - 4	....	....	3180						3180			3440
5 - 9	....	....	3173						3173			3174
10-14	....	....	2681						2681			3169
15-19	....	....	2512	X F4					2512			2678
20-25	....	....	2826	X F5					2826			2508
25-29	....	....	2361	X F6					2361			2820
30-34	....	....	2332	X F7	.... X ....				2332			2354
35-39	....	....	2152	X F8					2152			2322
40-44	....	....	2271	X F9					2271			2138
45-49	....	....	2393	X F10					2393			2245
50-54	....	....	2145						2145			2349
55-59	....	....	2248						2248			2086
60-64	....	....	2179						2179			2145
65-69	....	....	1947						1947			2013
70-74	....	....	1597						1597			1698
75-79	....	....	1117						1117			1248
80-84	....	....	662						662			734
85-89	....	....	301						301			323
>=90	....	....	104						104			116

<div style="border: 1px solid black; padding: 2px; display: inline-block;">3440</div> Females 0-4	↓ To males table	↓ Males 0-4
---	------------------------	-------------------

$\dots \times \dots = \dots \times \frac{fF}{fM}$	↓ To males table
---	------------------------

$3180 \xrightarrow{S_{0-4 \rightarrow 5-9}} 3440$ $3173 \xrightarrow{S_{5-9 \rightarrow 10-14}} 3174$ $2681 \xrightarrow{\text{etc.}} 3169$
---

Source: McLoughlin, 1978

Repeat for second quinquennium, etc.

## 6.5 DATA REQUIREMENTS FOR POPULATION PROJECTIONS

Identifying the data and information needs of decentralized planning is one aspect of designing information support system (Neelameghan 1993).

In general, planning is an activity which refers to the future. Projections provide future estimates of population size needed by planners. Total projections as well as special projections for labour force, pupils expected to be in schools, etc. at future dates are often required. Planners engaged in such activities need to have access to projected population information as well as the basic data to be used for projections.

The following table shows the different methods of projection and the corresponding data requirements.

Table 20 Methods of Projections and Data Requirements

Methods of Projection	Data requirements
Linear Extrapolation	- Population size at two different periods
Geometric and Exponential	- Population size in a given year - Population growth rate
Component Method	- Population size by age and sex - Age specific fertility rates - Reported age specific mortality rates by sex - Age specific in-migration and out-migration by sex - Sex ratio at birth

Having assembled all the necessary input data and checked carefully, then population projection using the above methods can be employed. As far as possible, the base data should be considered in terms of referring to the same date and deriving them from the same source.

#### 6.6 POPULATION PROJECTION: A COMPUTERIZED APPROACH

Obviously population projections may be accomplished by using a simple desk calculator which would take considerable number of man-hours . However, the computation of a large number of variants is a tedious task specially in using the component method. Computers

perform the projections very quickly, the programming might not be difficult and there is also the neatly printed results, perhaps captioned and including notes on the assumptions made for each run. All groups of users in need of population projection for planning activities should have access to such a facility for the basic part of their work. The different demographic packages available are also of great help in this regard.

#### 6.7 POPULATION PROJECTION SUPPORT SPECIFIC TO URBAN-REGIONAL PLANNING

So far discussion was focused on the different types of methods of projection as well as the data requirements to employ them. In the urban-regional planning context these methods are quite helpful. The provision of projected population size at a required spatial level, as well as the data for making the projection have an important place. The different groups of users at the urban planning institutions mentioned in chapter three need to be provided with projected population information as it affects the plan to be prepared.

To make provision for such information efficiently and effectively, two approaches can be employed. The users can be provided with the information either from other

organizations specially of the focal point of the network or by developing a model, using the techniques (methods) already discussed using a computerized approach.

The different institutions can provide projected population information or the data to be used for population projections to users of such information at the urban planning institutions on an agreed upon norms and standards, in convenient forms.

As for the model to be developed for estimate of projected population, the following stages can be followed.

. Constructing a statistical database containing the names of the urban centres as well as regions or other necessary spatial levels and the corresponding population size at different periods and other necessary demographic variables that are useful for projection from both external and internal sources.

. Preparing computer programmes for the different projection methods.

. To incorporate a technique in the programme which allows users to ask 'what if' questions to the computer.

. Constructing a menu to select the method to be employed.

The computerized population projection system to be developed intended for use by a particular user or groups of users at urban-regional planning institutions for planning and decision making process can produce output in printed forms on the results of mathematical simulations. The results can also be presented on the computer screen (see Fig 14 and 15).

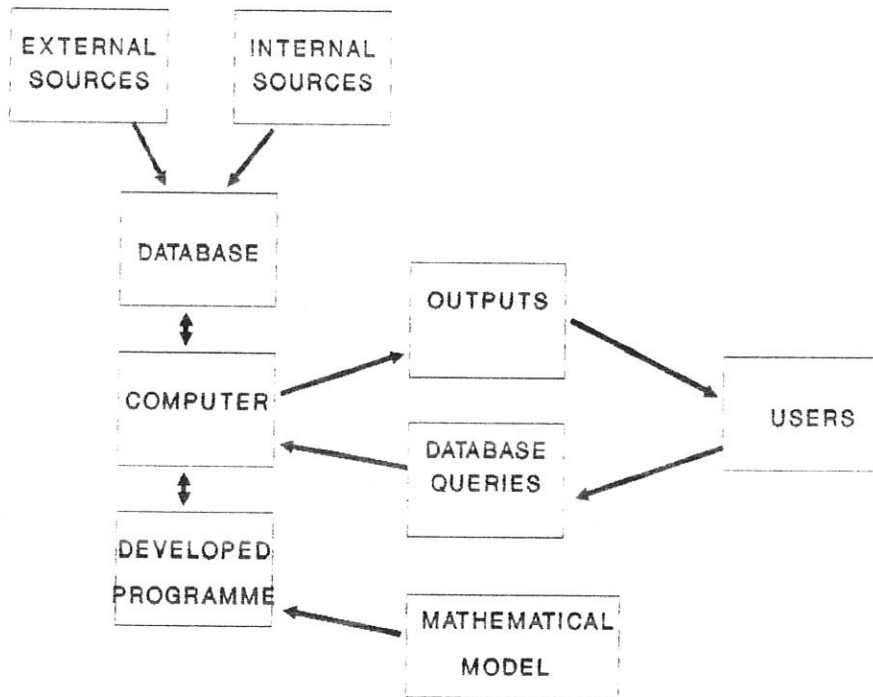
In the context of the use of the different methods, there are several advantages of using computer based population projection support systems. Computer based models aid the users by processing information quickly and effectively and facilitate the incorporation of operating results explicitly into the planning process.

The system may be used by the users directly from terminal or indirectly with the help of intermediaries like analysts with specialized expertise who frequently perform the analysis and interpretation of the results for the users.

As shown in the figure the system consists of the computer, database, developed programme (software), and

users. Both external and internal population data are stored in the database. The developed programme enables the computer to provide projected population information in the form of reports or responses on a computer screen to database queries performed by the required mathematical models.

Fig 14. Computerized Population Projection Support Model



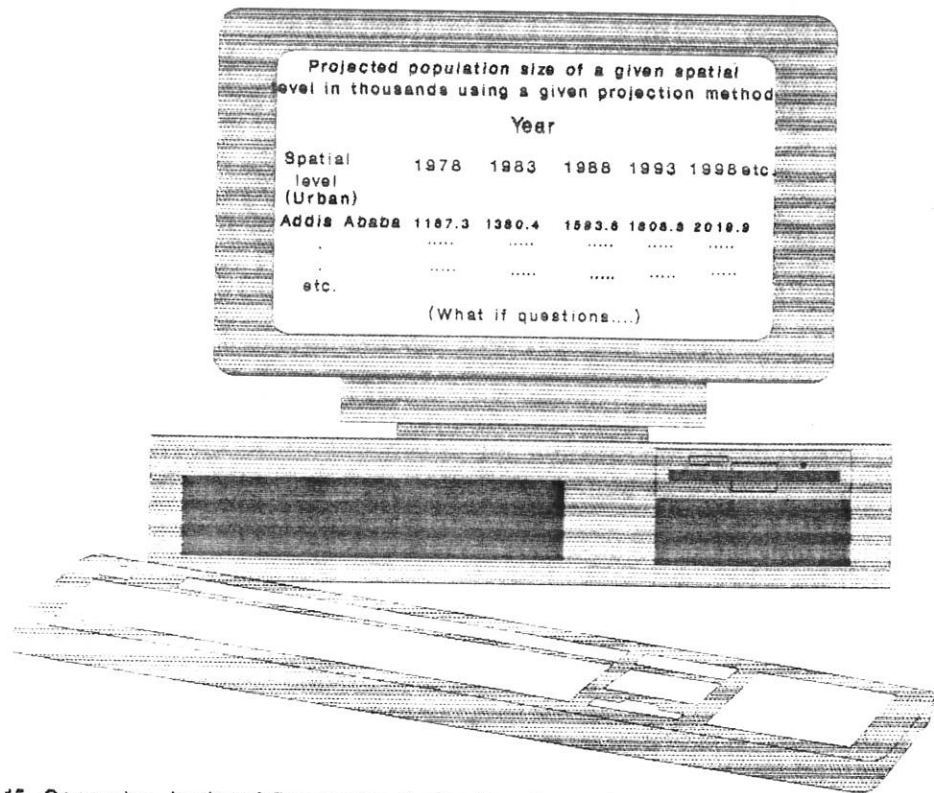


Fig 15. Computer Assisted Population Projection Support

## 6.8 CONCLUSION

Many detailed planning problems have arisen in connection with the population change at different spatial levels. As a minimum, it has become necessary to be able to estimate and project the total population at the required spatial levels in each planning activity. For many purposes there is the further need to anticipate what the sex and age composition of the population of a given geographical area will be, as these factors affect greatly such things as the need for schools and services for children, jobs, housing, medical facilities and many other important necessities of various age groups.

In this context it would often be sufficient to make projection by identifying the age group division and the spatial levels.

It is noticeable that projections are often prepared crudely, according to the users problem mentioned in chapter three. Therefore, the need for creating an environment conducive to support users with information related to population projection is unquestionable. In this regard, detailed presentation of projected population by age group and sex at different spatial levels as well as provision of the required data to be used for population projection purpose may solve the

problem. This task can be accomplished largely by the focal point of the network where large amount of population data/information can be collected, analyzed and stored as well as by other institutions who are also making such projections.

## CHAPTER SEVEN

### POPINET PROTOTYPE DATABASES

#### 7.1 SCOPE

Chapter four discussed a proposed network system for population information network (POPINET) to be established in phases. In addition, the types of services to be provided by POPINET participants both at the national focal point and other member nodes were discussed.

This section will deal with the referral and statistical population data/information services to be provided by the focal point of POPINET as well as other participating members. In order to provide such services there is the need to develop databases appropriate for the provision of different types of population information service.

#### 7.2 THE DATABASE APPROACH

A database is a mechanized, formally defined, centrally controlled collection of data in an organization. The data records are physically organized and stored so as to promote shareability, availability, evolvability, and

integrity. The database approach is made operational by a database management system or DBMS, a software system which performs the functions of defining, creating, revising and controlling the database. It provides facilities for retrieving data, generating reports, revising data definitions, updating data and building applications (Davis and Olson 1985).

Database systems are designed to manage large volumes of information. The management of data involves both the definition of structures for the storage of information and the provision of mechanisms for the manipulation of information. In addition, the database system must provide for the security of information stored in the database, despite system crashes or attempts at unauthorized access. If data is to be shared among several users, the system must avoid anomalous results (Korth and Silberscartz 1985).

Many different end users and a variety of application programs can access the database and it is desirable to have an organizational function to exercise control over the database. This function is known as database administration (David and Olson 1985)

### 7.3 DATABASE REQUIREMENTS

Database requirements arise both from applications and ad hoc queries. The process of obtaining and organizing more detailed database requirements can be divided into defining data requirements as perceived by the users (programmed and ad hoc queries) and defining requirements for physical design of the databases. User requirements are referred to as conceptual or logical requirements because users views of data are separated from the organization of data in physical storage. User requirements may be derived from existing applications or by data modelling. The requirements for physical data base design are derived from the conceptual requirements, the hardware and software environments, and specifications related to use of the database (David and Olson 1985).

In order to provide referral services and create access mechanisms, it is important to organize information about the different population information sources in the form of databases.

### 7.4 PROTOTYPE DATABASES

The prototype databases to be presented are developed

using Micro CDS/ISIS version 3.03. The databases are intended to be adapted and enhanced primarily by the focal point of POPINET and expanded further by the different institutions. The databases include statistical data, bibliographic references, profiles of experts who are dealing with population issues, profiles of institutions involved in population activities, profiles of population information systems or services, and surveys or projects on population related areas.

#### 7.4.1 Pop. Stat Database

Pop. Stat is a database population statistics. The statistical database can be constructed using the data collected through censuses, sample surveys, vital registration, population registers, etc. Many different formats of presentation can be devised to construct the outputs of such databases. The basic ones which most users make use of are population size by age group and sex. Besides other statistical population variables such as ethnicity, religion, economic group, educational and employment status, etc. are also needed. Some prototype databases have been developed to serve as prototypes. Sample output is presented in Annex 6.

#### 7.4.2 ABNCD Database

ABNCD is a prototype database for an integrated information storage and retrieval system. The ABNCD database has been adopted to create the profiles of information sources.

ABNCD is an acronym derived from the names of those who are closely associated with ABNCD Prototype database model development database project (Abebe Rorissa et al 1992).

The ABNCD database can accommodate the following types of records.

- Documents (i.e. bibliographical records of various types: books, reports, conference proceedings, analytics of monographs, analytics of serials);
- Profiles of corporate bodies (institutions);
- Profiles of research projects (project);
- Profiles of information systems and services (systems);

- Profiles of persons (person).

The data elements (fields) necessary to record information i.e. to describe the entities mentioned above are defined in a single Field Definition Table (ABNCD.FDT).

The sample outputs of the prototype databases constructed based on ABNCD are presented in Annex 7.

## CHAPTER EIGHT

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 8.1 SUMMARY AND CONCLUSION

Population and development are interrelated: economic and social development can be affected either positively or negatively by demographic changes.

It is recognized that information is essential to support socio-economic development planning. Population information is an important component. There has been an increasing awareness by developing countries to integrate population variables into national development plans. It is also being realized that population data/information are central to the development process itself as planning will not be optimal if it does not take into consideration the impact of demographic trends in economic and social development.

However, users of population information in Ethiopia have problems in accessing such information. Even if they get information, it may not adequately meet their requirements. This calls for the establishment of a population information support system which can collect,

organize and process such information so that the different groups of users can have efficient and effective access to the required information.

Bearing the above in mind, a survey was conducted to assess the current situation of the users of population information as well as the support facilities to come up with plans and recommendations for the establishment of a population information support system.

The major findings of the surveys may be summarized as follows:

Population data/information are greatly in demand by users for planning and research and development activities. It is also of importance for other activities, such as decision making, policy making, keeping updated about population change, etc.

A larger proportion of users collect population data/information from documents of which statistical abstracts/reviews and reports are the most widely used. Even observation is employed to collect such data/information. Statistical population data/information is the most frequently required. Also, population information presented qualitatively, in graphs, maps and

charts are frequently used by a good proportion of users. A good percentage of the users surveyed required different types of population data/information, size of population and age distribution being the most frequently demanded. Users also sought the information at the different spatial levels.

Users find the required population data/information from local institutions as well as external sources abroad, the Central Statistical Authority being the most extensively used. Generally, users give equal importance to both internally (within one's institution) and externally (outside of one's institution) generated population information.

Among the communication means used to get population data/information, personal visit is more frequent. However, telephone and post are also used for such purposes.

Other findings include:

Relevant, reliable, timely and adequate population data/information are, in general, not easily accessible to users.

- . There are inadequacies in the available population data/information. The collection of such information, through surveys for example is limited to certain geographical areas. Furthermore, finding population data/information presented at different spatial levels, in time series form, etc. is a more difficult task such that users have to depend on inadequate sources and make crude/rough projections.
  
- . There is a low level of awareness on the part of users of existing local publications on population and related issues. Comprehensive bibliographic control of population materials is essential.
  
- . Duplication of effort, in general, exists among the different institutions in the collection, recording, analysis, etc. of population data/information.
  
- . Lack of administrative support, budget, trained personnel in information services. Inadequate consideration given to statistical population data/information by higher bodies and a lack of willingness to share information that exists aggravates the problem of availability of and

accessibility to, the required information.

. There are limited services to support users: decision makers, planners, executives, etc. And the documentation systems in general for population information and research, are weak.

In view of the above situations the study has proposed the establishment of a network, the use of GIS, population projection support system and databases.

## 8.2 RECOMMENDATIONS

### 8.2.1 General Recommendations

The following recommendations, if implemented by participating members of POPINET guided by the coordinating body having the support from the government, would enhance the level of population information support.

. Strengthening the existing population data/information services at the different institutions which collect, organize and disseminate such information.

- . Collection of basic population information sources, such as statistical abstracts/reviews, reports, books, journals, etc. should be supported in the libraries/documentation/information centres associated with institution involved in population matters.
  
- . Local publications on population and related areas and research findings should be collected and disseminated regularly by concerned institutions to enable users to become aware of and have access to the information.
  
- . Enhancing the support to population data/information collection activities to undertake censuses, sample surveys at regular intervals by giving attention to all preparatory censuses and sample survey activities so as to avoid problems of controversy over the results.
  
- . Support should also be given to other sources of population data/information, for example by improving the existing vital registration system at appropriate places so as to ensure total coverage of the population in the shortest time possible.

- . Greater effort towards more timely processing, analysis and interpretation of census and survey data collected to provide users timely and reliable population data/information for economic and social development planning should be made by providing adequate financial and material support to substantive units involved in the collection, analysis and dissemination of such information.
  
- . Periodic training workshops on the collection, analysis and dissemination of population data/information should be organized.
  
- . Mechanisms should be established for periodic assessment and feedback on the need for population data/information, such as, through review of available data sources, data producers and users and means of access to population data/information so as to improve population data/information provision. The specific requirements for each institution should be documented which would serve as a reference framework for developing information services appropriate to the needs of the respective clientele.

. Adoption of appropriate documentation and information norms and standards and guidelines will facilitate better bibliographic control and data exchange.

. Promoting strong cooperation among the institutions to improve communication, standardization, sharing of experiences and coordination of efforts is the basis for networking.

. Adoption of an overall policy to coordinate information activities and development of population information infrastructures to support population related activities within the framework of a national information system.

. Provision of population data/information in specialized form to meet specific specialized needs should be facilitated. Such information includes maps, charts and graphic forms; and population projection data/information appropriately computed using the different methods mentioned in chapter six.

. The usefulness of GIS should be appreciated and its applications encouraged in the planning institution

because apart from its use for urban-regional planning, GIS can be employed for census, sample surveys and other related activities. POPMAP and other similar GIS software can be used for such purposes.

#### 8.2.2 Recommendations Specific to POPINET

Chapter four discussed the need for and steps in establishing a population information network with the view to supporting users with relevant, timely and adequate population data/information.

Success in the establishment and operation of the population information network will depend on a number of factors. Among these, a strong and sustained commitment of the management is critical.

The following specific recommendations relate to the establishment of POPINET:

- . The continuing interest and active support of institutions and individuals who are in a position to influence the attainment of the objectives of network should be ensured.

- . The network to be developed should have well defined objectives based on a clear understanding of the information needs of different categories of potential users, information infrastructure and feasible and viable cooperative approaches (chapter four).
  
- . The establishment of the network should be preceded by a thorough preparation on technical issues (chapter four), verifying the availability of enough support facilities.
  
- . Efficiency of the management of the establishment and operation of the network should be ensured by employing appropriate expert staff with necessary infrastructural support. Effective planning, design, implementation and monitoring of the network lie at the heart of successful management. To ensure proper coordination of the different components, elements, processes and tasks in the establishment and operation of the network a national coordinating body should be formed with representatives at a high level, of the institutions involved. The body may be advised by experts in specialized areas, e.g GIS. The coordinating body may be placed under the authority

of the Central Statistical Authority (chapter four).

Apart from the functions of the coordinating body stated in chapter four, it will have responsibilities to:

- . formulate well defined objectives by determining the scope of POPINET and provide appropriate legislative basis for the network.
- . Promote the formulation of standards, norms and common formats to facilitate data exchange (chapter four).
- . Support the development of guidelines for uniform collection and analysis of data and information to minimize duplication of activities and ensure compatibility.
- . Coordination of network activities, and providing administrative and technical guidance.
- . Review in detail the available data/information in existing sources to determine the level of adequacy of the information, and user requirements to have documented requirement specification of users of

different institutions.

- . Ensure allocation of sufficient funds to population information activities.
- . Identify the different problems that the network encounters and find appropriate solutions.
- . Ensure the conditions and support for further expansion of the network.

### 8.2.3 Recommended Media for Population Data/Information Exchange

- . Primarily the communication means to be utilized by the network participants should be developed according to their interests and capabilities. Telephone and post can be employed and those who have computers can exchange using computer generated information products.
- . Secondly, in the future by enhancing the level of information exchange and service, the employment of technology based communication ie. computerized systems and computer-mediated communication (e.g. e-mail) will become viable.

Annex 1

QUESTIONNAIRE TO SURVEY INDIVIDUAL POPULATION INFORMATION  
USERS.

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA (SISA)

Mark " X " against your choices

(Marking on more than one choice is possible if  
necessary)

1. Position of the respondent .....  
(Job title)  
Institution you are working in .....  
Academic qualification .....  
Area of specialization .....  
Years with the institution .....
2. Why do you need population data/information for (if  
more than one choice please rank them )  
 Research and development  
 Planning  
 Decision Making  
 Policy Making  
 Product promotion  
 Keeping updated about population change  
 general awareness  
 Others (Please specify) .....

3. Do you generate population data/information?  
 Yes  No
4. If Yes, is the information generated for  
 own use  
 distributing to other users  
 Others (please specify) .....
5. Do you have access to externally generated population data/information?  
 Yes  No
6. What type of population data/information do you consider more important?  
 internally generated  
 externally generated  
 both equally important
7. The form of presentation of population data/information you frequently need is  
 statistical/quantitative/figurative  
 qualitative/textual  
 Maps  
 graphs  
 charts  
 others (please specify) .....
8. The data you use at present is  
 raw data  
 processed data

9. You need population data/information on

- size of population
- age distribution
- sex composition
- fertility aspect
- mortality aspect
- migration aspect
- employment status/condition
- ethnicity
- marital condition
- house hold size
- religion
- educational status
- economic activity
- Others (Please specify) .....
- .....
- .....
- .....

10. Do you make demographic analysis on population change indicators? If Yes, on which aspects?

- Fertility
- Mortality
- Migration
- Others (please specify) .....

11. At what level do you need population data/information?
- Kebele
  - Kefteгна
  - Urban
  - Wereda
  - Awraja
  - Regional
  - Country
  - Others (please specify)
12. How do you get population data/information?
- Observation
  - Questionnaire survey ( please attach sample questionnaire)
  - Interviews
  - collection from documents
  - Participating in seminars and conferences
  - Others (Please specify) .....
13. Which are the major documentary sources of population data/information? (if more than one choice please rank them)
- Books
  - Periodicals / journals
  - Statistical abstracts/ reviews
  - Reports
  - Databases

- Conference proceedings
  - Others (please specify) .....
14. Where do you get the required population data/information from?
- Organization's library/ Documentation/Information centre
  - Other library/ Documentation/Information centre
  - Others (please specify) .....
15. Do you get timely and adequate population data/information?
- Most of the time
  - Sometimes
  - Rarely
  - Not at all
16. If rarely or not at all, What in your opinion is the reason?
- poor collection
  - poor staffing
  - lack of organization
  - Others (please specify) .....
17. Do you get time series population data/information?
- Most of the time
  - Sometimes
  - Rarely
  - Not at all

18. Do you use special software packages for demographic analysis purpose?

Yes

No

19. What types of information services do you get for population data/information?

a) from internal information service system

Literature search

Database search

Document delivery

Reprography

Current Awareness Service

Periodical reports/publications

Others (please specify) .....

b) from external information service systems if you use any

Literature search

Database search

Document delivery

Reprography

Current Awareness Service

Periodical reports/publications

Others (please specify) .....

20. Are you kept informed of new reports and other publications on population and related areas produced by other local institutions?

Well informed

Not much

Not at all

21. If well informed, Do you have problems in actually getting or accessing the publications?

Yes

No

22.

a) Name six organizations in Ethiopia from which you get population data/information, if any.

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....

b) Name six Organizations (with location) outside of Ethiopia from which you get population data/information, if any.

1. ....
2. ....
3. ....
4. ....

5. ....

6. ....

23. What means of communication do you use to get population data/information from other organizations?

- Personal visit
- Telephone
- Post
- Through other persons
- Others (Please specify)

24. Have you used the POPLINE CD-ROM database?

- Yes
- No

25. If Yes where do you get such services from? please list them

.....  
.....  
.....

Any additional remarks or comments concerning your population information requirements, problems in obtaining the required information, the forms in which useful information should be presented, etc. you may attach additional sheet if necessary.

Annex 2

QUESTIONNAIRE TO SURVEY INFORMATION SYSTEMS AND SERVICES

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA (SISA)

PART I GENERAL INFORMATION.

1. Name of the institution .....
- Parent organization if any .....
- Date of establishment .....
- General objective .....
- .....
- .....
- Address P.O.Box. ....
- Telephone.....
- Telex .....
- Fax .....

Mark " X " where appropriate.

(marking on more than one choice is possible if necessary)

2. Type of institution

- Government
- Parastatal
- Private
- International
- Others (please specify) .....



Title of Project	Objective	Period	Funding Sources	Collaborative Institutions

8. which type of publications on population and related areas are issued by the organization?

annual reports

research reports

survey reports

conference proceedings

others (please list if possible).....

.....

9. Does the institution have any computer facilities? (if Yes, please provide details in Part III)

Yes

No

10. Does the institution have GIS (Geographical Information Systems) software?

Yes

No

11. If Yes please list the names

.....

.....

.....

PART II ON THE INFORMATION SERVICE SYSTEM OF THE  
INSTITUTION

12. Type of the information service system

Library

Documentation centre

Information Centre

Others (specify) .....

13. Name of Library/Documentation/information Centre

.....

No. of Staff      Professional .....

                    Para professional .....

                    Support staff .....

                    External consultants .....

                    Others (specify) .....

14. Does your Library/Documentation/Information Centre  
give population information service to internal or  
external users?

Yes

No

15. If Yes the type of service it offers

Reference

Database search

Reprography

Current Awareness

Selective Dissemination of Information

Circulation to own users

Interlibrary loan

Others (specify) .....

16. Does the Library/Documentation/Information centre have databases of (bibliographic or profiles of experts and institutions) on population and related areas?

Yes  No

If Yes, please indicate

Subject	Frequency of Updating	Period Covered
---------	--------------------------	-------------------

.....	.....	.....
.....	.....	.....

### PART III COMPUTER FACILITIES

17. Location of the computer facilities

Library/Documentation/Information centre

Computer centre

Other Departments (Please specify) .....

18. If computer is used in the

Library/Documentation/Information centre, then it is used for

On line Catalogue

On line database search (including bibliographic)

Circulation

Acquisition

CD-ROM search

others (please specify) .....

19. Describe the computer facilities in the spaces below.

Type of computer	Number	Total Storage capacity in MB	Operating System
Micro computers	.....	.....	.....
Mini Computers	.....	.....	.....
Main Frame computers	.....	.....	.....

20. Are the computers in the institution

Stand alone

Networked

Both

21. If stand alone does the organization have plans to network them?

Yes

No

22. The computers are used for

Word processing

Financial management

Map processing

Statistical analysis

Library/Information system Database management

others (Please specify) .....

23. What application Software are there in the organization? (list them)

Application Software	Purpose
.....	.....
.....	.....
.....	.....

.....  
.....  
.....

24. List peripheral devices like printers and scanners,  
if any

Peripheral devices	Purpose
.....	.....
.....	.....
.....	.....

25. Do you have CD-ROM drive ?

Yes  No

26. Do you use CD-ROM databases? if Yes please list them

.....  
.....  
.....  
.....  
.....

27. Are there any computerized statistical population  
data/information database in the organization?

Yes  No

28. If Yes who are the users?

internal users

external users

29. If external, in what form do you provide computer generated services to the users?

- Computer print out
- Diskettes
- Magnetic tapes
- On line access
- Others (specify) .....

30. Are there problems in using computers in your organizations?

Please list the major problems

Equipment related

Computers .....

Peripheral devices .....

Software related .....

Personnel related .....

Others (Please specify) .....

Annex 3

QUESTIONNAIRE FOR EXPERTS DEALING WITH POPULATION AND  
RELATED ASPECT

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA (SISA)

I. BACK GROUND INFORMATION

1. Name ..... Sex .....  
Year of birth ..... Nationality .....

2. Affiliation

Name of employer .....

Title of post .....

Address Town .....

P.O.Box. ....

Telephone: Residence .....

Office .....

Telex .....

Fax. ....

II. ACADEMIC QUALIFICATION

1. DEGREE	FIELD OF STUDY	YEAR OBTAINED	INSTITUTION
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

2. Main fields of specialization .....

.....

.....

3. Total number of years of service in the field .....

.....

.....

III. MAIN CONTRIBUTIONS.

1. Publications/Reports, etc. produced by you during the  
Past 3 years.

Title of document	Year produced	Affiliation
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

2. Projects/surveys you participated in during the past  
3 years.

Title/Description of the project/survey	Period from - to
.....	.....
.....	.....
.....	.....

IV. EMPLOYMENT HISTORY (Last employer)

ORGANIZATION	TITLE OF POST	PERIOD
		FROM - TO
.....	.....	.....

V. MAIN CONSULTANCY OR EXPERT ENGAGEMENT IN THE LAST THREE YEARS.

a. Description of assignment	Place	Year
.....	.....	.....
.....	.....	.....

Annex 4

LIST OF INSTITUTIONS SURVEYED

Addis Ababa Water and Sewerage Authority  
Agricultural and Industrial Development Bank  
Central Statistical Authority  
Demographic Training and Research Centre (Institute of  
Development Research, Addis Ababa University)  
Department of Statistics at Addis Ababa University  
Department of Community Health in Medical Faculty, Addis  
Ababa University  
Ethiopian National Unesco Agency  
Ethiopian Telecommunication Authority  
Ethiopian Electric Light and Power Authority.  
Family Guidance Association of Ethiopia  
ILO  
Institute for the Study of Ethiopian Nationalities  
Ministry of Culture and Sports  
Ministry of Education  
Ministry of External Economic Cooperation  
Ministry of Natural Resource Development and  
Environmental Protection.  
Ministry of Health  
Ministry of Planning and Economic Development  
Ministry of Labour and Social Affairs  
Ministry of Industry  
Ministry of Works and Urban Development

Ministry of Agriculture  
National Organization for the Control of Malaria and  
Other Vector Borne Diseases  
National Urban Planning Institute  
Pension and Social Security Authority  
Region 14 Urban Development and Works (Municipality of  
Addis Ababa)  
Relief and Rehabilitation Commission  
Sociology and Social Administration, Addis Ababa  
University  
UNDP (United Nations Development Programme)  
UNFPA (United Nations Fund for Population Activities)  
UNICEF (United Nations Children's Fund)  
WHO (World Health Organization)  
WFP (World Food Programme)

Annex 5

LIST OF SURVEYED INSTITUTIONS USING THE SECOND  
QUESTIONNAIRE

Central Statistical Authority

Demographic Training and Research Centre (Institute of  
Development Research, Addis Ababa university)

Family Guidance Association of Ethiopia

Ministry of Planning and Economic development

Ministry of Health

Ministry of Labour and Social Affairs

National Urban Planning Institute

## Annex 6

Sample output from Pop.Stat Database

### Distribution of Population by Sex, Age-Group (Addis Ababa 1984)

Age-Group	Male	Female	Total	Sex Ratio
00 - 04	90441	86714	177255	95.3
05 - 09	106399	105249	211648	103.7
10 - 14	104727	113210	217937	101.1
15 - 19	76120	101242	117362	92.5
20 - 24	50369	62309	112678	80.8
25 - 29	37398	55220	92618	67.7
30 - 34	47973	44174	92147	108.6
40 - 44	33879	23074	56953	145.8
45 - 49	25152	17106	42258	147.0
50 - 54	17609	19023	36632	92.6
55 - 59	12477	14844	27321	84.1
60 - 64	9244	11707	20951	79.0
65 - 69	7216	8904	16120	81.1
70 - 74	4871	6985	11856	69.7
75 - 79	2893	3332	6225	86.8
80 - 84	2029	3314	5343	61.2
85+	1936	2741	4677	70.6
Not Stated	746	472	1218	158.1
<b>Total</b>	<b>685184</b>	<b>737927</b>	<b>1423111</b>	<b>92.9</b>

Annex 7  
Sample Outputs from ABNCD Database

\*\*\* PROFILE OF EXPERT \*\*\*

NAME	ANTENANE KORRA
BIRTH	1962
SEX	Male
NATIONALITY	ET
AFFILIATION	Family Guidance Association of Ethiopia
ADDRESS	Box: 5716, Addis Ababa
TELEX	21473
FAX	512192
PHONE	514111
QUALIFIC.	Statistics. BSc. Addis Ababa University. 1984. Demography. MSc. Cairo Demographic Centre. 1990.
LAST EMPLOY.	Statistician, Ministry of Planning and Economic Development, 1985-1991

\*\*\* PROFILE OF INSTITUTION \*\*\*

INSTITUTION	National Urban Planning Institute
START DT	1987
LOCATION	Ethiopia
ADDRESS	Box: 2405, Addis Ababa
TELEX	21551
FAX	251-1-510545
PHONE	151968
WORK. LANG.	eng
GEOG. COVERAGE	Ethiopia
INST. TYPE	Government
OBJECTIVES	To conduct research and prepare plans for urban centres and regions.
INFO. SERVICE	Reference
EQUIPMENT	Mainframe HP 9000

\*\*\* RESEARCH PROJECT \*\*\*

PROJ. TITLE	Yeka Project Census Survey
INSTITUTION	Department of Community Health. Addis Ababa University
DURATION	1990-1993
ADDRESS	Box: 1176, Addis Ababa
FAX	517701
PHONE	157701
INST TYPE	Government
OBJECTIVES	To develop Population based data collection skill

\*\*\* INFORMATION SYSTEM \*\*\*

INSTITUTION	Ministry of Health, Health Information Systems Unit
START DT	1970
ADDRESS	Box: 1234, Addis Ababa
TELEX	21488 ET
PHONE	444933
PERSONNEL	Professional, 3
INST. TYPE	Government
OBJECTIVES	To organize and collect, analyze, and disseminate health information for planners and researchers
INFO. SERVICE	Statistical Data Service

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