ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

INFORMATION SYSTEM FOR NON-FORMAL EDUCATION PLANNING: THE CASE OF AMHARA NATIONAL REGIONAL STATE EDUCATION BUREAU

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LIST OF ABBREVIATIONS

ANRS	Amhara National Regional State
AREB	Amhara Region Education Bureau
CSTC	Community Skill Training Centre
CSA	Central Statistical Authority (of Ethiopia)
EMIS	Educational Management Information System
IIZ/DVV	Institute For International Co-operation of the German Adult Education Association
IT	Information Technology
LC	Learning Centres
MIS	Management Information System
MOE	Ministry of Education
NFAE	Non-Formal Adult Education
NFBE	Non-Formal Basic Education
NFE	Non-Formal Education
NFEDB	Non-Formal Education Database
EIM	Education Information Management
NGOs	Non-Governmental Organisations/Institutions
RDBMS	Relational Database Management System
REBs	Regional Education Bureaus
SNNP	Southern Nation and Nationalities People
TGE	Transitional Government of Ethiopia
UNESCO	United Nation Education, Scientific and Cultural Organisation

ABSTRACT

Information is a key resource in any planning activity. Planning in education, particularly in non-formal education is not exception to this fact. Information in the educational environment is needed for operation, control, planning, and management decision. The proper organization, processing, and dissemination of Non-Formal Education (NFE) information have been proved important to render effective services for users.

Amhara Education Bureau, in addition to the formal school system, has engaged in the collection, processing, and dissemination of NFE information, for examples, information about clienteles enrolment, attendants, dropout, completed, facilitators/instructors and learning centers situations, etc. starting from the grass root level.

This study attemptes to assess the information requirements of educators on NFE for planning and research activity. It also examines the major problems related to the availability, quality, and accessibility of NFE information, and tried to propose a database-based information system and design a prototype information system for NFE planning at Amhara National Regional State Education Bureau.

According to the result of the study, NFE information is not easily available, and hence availability is the major problem identified during the survey and analysis of the study. Besides, even if, NFE data/information are available, there is high inconstancies and lack of uniformity among the various reports coming from Weredas and Zones education offices. This has contributed to unsystematic organization of information and hinders accessibility of data/information for users. For example, if one needs information about literates/illiterates he/she has to look all the sections in the organization.

Thus, based on the finding of the survey, a Non-Formal Education Database (NFEDB) has been designed. An Object-oriented approach is used in the design and development of the system. A prototype NFE database has been developed for selected part of the proposed system.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

There is no doubt that education is a vital tool in bringing development to any nation. Economic, social, and political developments are facilitated when a nation builds its society through education. Education and training play a significant role in human resource development. Basic education, particularly, lay the foundation of knowledge on which further growth and development should be built. However, in many developing countries the formal school system is unable to serve their society with basic education. As a result, there are over one billion illiterate people in the world of which the majority are in developing countries; and it was estimated that in the year 2000, 98.7 percent of the world illiterate population to be in these countries (Kassahun, 1997). Similarly, over 130 millions of school age children are growing up without access to basic education (UNESCO, 1999). This is due to the limited access of the population to basic education.

An alternative means to the expansion of basic education is through Non-Formal Education (NFE) channels. Non-Formal Education is an organized educational activities carried outside the framework of the formal school to provide selected types of learning and training program to particular sub-group of population, adult as well as children (Coombs, 1985). Formal education cannot be taken as the only means where illiterate people can get basic education and training programs (Hallack, 1990; Thomson, 1995). Many educational programs, such as primary education, adults basic education, and training programs, etc. can also be provided through non-formal education so long as there is good planning activities

of NFE (Evans, 1981; Coombs, 1985).

The planning of any educational activity provides a considerable help for the successful implementation of NFE programs. As a basis of development, the expansion of basic education/training requires coordination of efforts of various organizations through the entire range of Non-Formal Education activities (Evans 1981). The provision of relevant and reliable NFE information contributes a better basis for the planning of Non-Formal Education programs. The availability and accessibility of NFE information to all those involved helps to (Evans, 1981; IIZ/DVV, 1995):

- follow-up/monitor Non-Formal Education programs,
- strengthen the planning and management capacity of educators,
- promote the collaborative/coordinated effort of the various governmental, non-government, and special agencies in the provision of integrated NFE programs,
- facilitate information sharing/exchange on current and future trends of NFE activities.

To be benefited from these advantages depends on the emphasis given by the central and/or regional government of a country on NFE. Educators (educational practitioners) can develop innovative NFE programs if they are supported with reliable and quality information on NFE. However, in many developing countries, there is a serious "information poverty". NFE information is not exception to this fact. Hanna (1999) describes "information poverty" in many forms such as:

- planning without facts (information),

- poor information support to decision-makers,
- cumbersome reporting and monitoring system,
- limited access to development information for the rural population,
- etc.

Regarding, the availability and quality of NFE information on program of NFE, Carron & Carr-Hill (1991) state that:

> The information base on NFE program, available at central level, is generally very weak. Only limited range of data are collected, limited in scope and poor in quality

That is, NFE information is limited at ministry of education (central level) and not available to regional education institutions. Besides, the quality and coverage are very poor. Generally, developing countries face major problems in acquiring, retrieving, processing, and disseminating various types of information (Hanna, 1991).

To assess or measure the dimension of the tasks of NFE, information must be known, for instance, on the number and educational background of the vast majority of out-of-school children and youth. In line with this, Coombs (1973) elaborates that:

> Yet in most countries neither ministries of education nor government statistical bureaus keep track of this large group. They are no body's primary concern. Educational ministries are pre-occupied with the in-schoolers, and in most countries no agencies or organization has over all responsibility for attending the educational needs of the out-of-schools. Information is at

present very scarce, educational planners, by far and large, have tended to ignore the informal educative influence in local environments

1.2 STATEMENT OF THE PROBLEM

In Ethiopia, the recent decentralizations of government, as a result of federal arrangement of the country has changed the roles and responsibilities of the government at central and regional level (MOE, 1999). With this change, Regional States through their education bureaus assume the responsibilities of implementing and follow-up/monitoring activities of Non-Formal Education in their respective region. These responsibilities have greatly increased the demand of NFE information (MOE, 1997) in the country. However, Regional Education Bureaux (Rebus) in Ethiopia fail to generate and disseminate adequate and quality of NFE information for users (Abbess, 1999). Concerning the problem of information on non-formal education in Ethiopia, Abbess (1999) states that:

> ... efforts were made to collect data from the center to the grass root level. It was found very difficult to get simple, statistical information, for example, the number of learning centers, learners and instructors, availability of instructional materials, etc. Even if some information was collected, it was found out contradictory. What was obtained at regional, Zonal and Wereda level was somewhat incompatible.

That is, things are even very much worse when one goes down to the lower level of administrative units where there is scarce personnel (skilled man) power, and inadequate coverage of educational information management.

Preliminary investigation (discussions made with the staff of the Amhara National Region

Education Bureau) made by the researcher also proved that most of the above problems hold true within Amhara Regional Education Bureau. Particularly, the following problems prevail:

- Poor organization of NFE information; i.e., NFE information collected from the sources through the various data channels lacks systematization so as to be easily retrievable,
- Lack of consistencies, accuracy, and timelines of NFE information within the organization, in order to effectively follow-up NFE program in the entire region,
- Lack of detailed information on the activities related to NFE, such as NFE program participant (enrolment, dropouts, attending, completes, available learning materials to learners, etc.), NFE facilitators/teachers (source, type, availability, etc.), etc.
- The number of illiterate adults at Wereda and Kebele is not well known to educators within the organization
- Data processing for report preparation is time consuming and tiresome.

These problems have contributed negatively to the planning of NFE in the entire region and limit the co-ordination/collaboration activities of the bureau with various organizations (governmental, non-governmental, and special agencies) having similar objectives on NFE program in the region. This has greatly affected the provision of integrated NFE particularly, to the majority of the rural people. Basic Education in health, agriculture, community development is not well integrated at regional level. Development is not unidirectional; rather it is an integrated phenomenon. Therefore, NFE should be geared towards it. It should be problem alleviated.

Realizing the negative impacts of the aforementioned problems on NFE in the region, the Amhara Region Education Bureau has developed a strategy on NFE and planned to establish information system on the overall NFE programs in the region that helps to monitor the programs at regional level. This would strengthen NFE planning capacity of the education bureau and support governmental, non-governmental organizations, and the mass community that are participating in NFE programs in the region. However, the type of information system needed for NFE, users' information requirements and expectation from the system, and the existing situation of NFE information are not taken into consideration. The provision of relevant and quality information for users can be realized when information system that meets user requirement is established (Saracevic & Wood, 1981). Information system those supports the planning of NFE at regional level is one such organized system that take into account the information needs of users within and outside the organization.

Therefore, the basic research questions that are to be answered in this study are listed below.

1. What is the current trend of availability, adequacy, consistency, and timeliness of NFE/information in Amhara National Region?
2. What are the major information requirements of NFE in Amhara National region, and for what purpose do they need NFE information?
3. What kind of information system is needed to solve the problem at hand? And how such system is going to be developed?

1.2 OBJECTIVES OF THE STUDY

1.2.1 General Objective

The main objective of the study is to propose information system and design a prototype database on Non-Formal Education that can meet the information requirements of NFE planning at Regional State level.

1.2.2 Specific Objectives

In order to achieve the main objective, the study will have the following specific objectives:

- To examine problem(s) in the current trend of availability and access of NFE information,
- To identify users of information on NFE within and outside the organization/the education bureau,
- To assess the information requirements of NFE practitioner within and outside the education bureau,
- To identify the sources of information concerning NFE programs in Amhara National Regional State,
- To assess the existing information system at Amhara National Education Bureau,
- To propose an appropriate information system which can solve the identified problems,

- To design a prototype NFE database in order to demonstrate the potentials of the proposed system in the planning of NFE activities.

1.3 JUSTIFICATION OF THE STUDY

Committed to the education and training policy of the country, regional education bureaus (REBs) have formulated strategies on NFE programs to implement the education and training policy in reference to the capacity and education needs of each region (MOE, 1996). The main objective is to disseminate basic education and training programs through non-formal education in order to alleviate the problem of illiteracy, backwardness, and poverty from the country. To achieve this objective planners and managers of education at regional level should be supported with relevant, reliable and timely information on NFE in the region. Besides, to promote and strengthen the provision of basic education to rural and disadvantaged group of people, organization, which have similar objectives on NFE would able to get NFE information on the region.

Though sporadic effort has been made on literacy and basic education, achievement of goals seems far out of the sight in many developing countries (Mehta, 1998). Currently, the scope of NFE is widening and not limited to literacy programs. The trend is the provision of integrated NFE programs, particularly basic education in literacy, numeracy, health, agriculture, environmental science, etc. to enable problem solving ability of the learner, particularly to the rural communities. The same thing is true in the case of Ethiopia, large campaigns have been done, which was appreciated by UNESCO, and mobilized a number of teachers and illiterate community. The campaign was largely based on literacy and created little or no role in social, economic and environmental condition of the country and

now illiteracy has relapsed. Thus, it is hoped that efforts would result into fulfillment of objectives by introducing innovative NFE programs at regional level to promote basic education and training programs. NFE planning supported by adequate and quality information helps in this regard. The provision of data/information for the planning of NFE will be facilitated if appropriate (a properly designed IT-based) information system is developed that can collect, store, process, and disseminate timely, relevant and quality NFE information to planners and managers.

Therefore, first there is a need to develop an efficient information system, which support the planning of NFE programs at regional level. Thus, the research will be aimed at proposing information system for non-formal education at Amhara Region Education Bureau by designing a prototype NFE database (NFEDB).

Many of the information systems (UNESCO 1996; UNESCO 1988) developed in NFE concentrate mainly on literacy programs. The type of information system needed to support planning of NFE programs at Regional Education Bureaus in Ethiopia is not yet well studied. Of course, Anbessu (1999) has stressed the need for information management system on NFE at Regional, Zones, and Weredas level. Research in this area needs further investigation. Hence this study is unique in this regard.

The result of this study is expected to be useful for education bureaus, donor agencies and/or special organizations, local and international non-governmental organizations, and to individual researchers.

Regional education bureaus can adopt the result of the study by establishing a Non-Formal

Education database system for internal as well as for external users. REBs may make a slight modification in adopting the proposed system. Donor agencies or special organization can get timely, adequate and accurate information form education bureaus. This helps REBs to find out financial/material sources from donor agencies. On the other hand, donor agencies will have current information on the existing activity of NFE in each region, including the problems encountered by the REBs. Similarly, NGOs can benefit from the study: to get consistence and reliable information of NFE in each region; plan appropriate NFE project; and collaborate with REBs. The creation of such NFE information system helps as a reliable source of information for individual researchers and educators.

1.4 METHODOLOGY

In order to have a clear picture on the existing problems and to attain the objective stated earlier, a descriptive method of research, particularly survey method were used. In descriptive studies the researcher will have no formal hypothesis (Bailey, 1982). The researcher attempts to describe phenomenon in detail; i.e, the researcher begins by describing or stating the problem, setting questions to be answered, and formulating objects to ensure that the collected data are relevant to the questions raised. The data gathering tools employed were questioners, interview, on site visit, and document analysis.

1.4.1 Methods of Data Collection

The selection of the above data collection methods is based on the advantages the methodologies provide in collecting facts and opinions from the respondents. What follows is brief description of these methodologies.

Questionnaire: Questionnaires is a list question to be answered by the survey respondents to collect information and opinions from respondents. It helps to collect facts from large number of people while maintaining uniform responses. When dealing with a large audiences, no other fact-finding technique can tabulate the same facts efficiently (Bailey, 1982). Using questionnaire many questions can be answered quickly and it is relatively inexpensive means for data gathering for a large number of individuals, Besides responses can be tabulated and analyzed quickly. Having theses advantage, questionnaire tend to be inflexible. There is no guarantee that an individual will answer or expand on all the questions. There is no opportunity for the researcher to reword questions that may have misinterpreted. Again, It is also difficult for the researcher to observe and analyze the respondent's body language (Bailey, 1982; Bentley, 1998). Hence, in order to probe for more feed back, address selected part of respondents and to fill the gap encountered in questionnaire, interview is most important and most used fact finding technique. One major advantage of interview is its flexibility. In a situation where different types of questions are appropriate for different respondents, the interview situation makes it possible for the researcher to decide what questions are appropriate (Bailey, 1982).

Reviewing of relevant literature can help to have concept of NFE programs and as well as information requirement for planning of NFE. It helps to find how others approach the development of information system in non-formal education. Document analysis also helps to study exiting system, the researcher can develop good feel for the system by studying existing documentation, forms, and files. These include documents that describe the problem, documents that describe the business function being studied or designed. Therefore, document analysis was employed to gather information for the study.

On site visit is also to identify the tasks that have been missed or inaccurately described by the above data collection methods. Sometimes, on site visit is important to the validity of data obtained from respondents.

For the purpose of gathering data on information requirements, the sources of information and to examine the existing information system on NFE, two types of questionnaires were prepared. The first questionnaire was designed for users within the organization. The second types of questionnaire were designed for NFE practitioners in organizations other than the Education Bureau (Health, Agriculture, Social Affairs Bureaus, and the Office of the Regional Council, and NGOs). Interviews were also conducted with those educators that are believed more important and have rich experience in areas of NFE in the Education Bureau. These people are mainly educational planners, managers, data encoders, data base administrators and researchers who are based in the different sections or units of the organization having activities related with NFE. In order to conduct the interview discussion guide were prepared.

In this study individuals who have rich experience in NFE and organizations that have NFE programs were included both for interview as well as for the questionnaire in the sample. Out of the total 50 educational practitioners, a sample of 25 was selected during the survey. Sample size of 55 individuals from governmental, non-governmental and special agencies were also selected to collect data from external users. As indicated above, the selection of the respondents for the questionnaire as well as for the interview is based on the criteria of selecting those with rich experience or knowledge in NFE. Thus, a total sample size of 80 was used and 61 of them have responded to the questionnaire and interview. The collected

data were analyzed using data analysis tool such as Chi-squared test, percentage, and table of frequency.

1.4.2 Employed System Study Approach

Object-Oriented approach to system development has got much popularity in the software industry. This is due to the many good qualities of system development with object-oriented methods. Among the most prominent qualities is understanding of the system easier, as a small semantic gap exists between the system being developed and the reality (Jackobson, 1992). It also provides less labor intensive and more enjoyable way to develop system than the traditional structured techniques. Hence, objects technology, particularly Lorenz's (1993) object-oriented software development process were used for the design of the system. A relational DBMS was used in the construction of the prototype database. Since it allows the user of data to avoid dealing directly with storage structure and devices and it is still the choice of data that naturally represented as table (Singer, 1997). It allows convenient access to information to any table; i.e., *ad hoc* queries.

1.5 SCOPE AND LIMITATIONS OF THE STUDY

The scope of NFE is diverse and includes distance education and evening class. In this study, basic education and training programs were considered in order to delimit the scope of the study. Similarly, due to time and financial constraints, the scope of the study is also bound to consider only the situation at region-wide level. It does not go down to the Zones and Weredas level, where details program planning and implementation is taking place.

The assessment made on the information requirement and the reasons for the problem of integration NFE programs on health, agriculture, and on other NFE related area were not addressed in detail. The main reason was relevant individuals selected in the sample were not available at the time of data collection. As a result, the researcher was forced to use less knowledgeable (in NFE programs) individuals as a substitute.

1.6 DEFINITION OF TERMS

Information: Information is evaluated data or processed data against a purpose or put into a meaningful and useful context and communicated to the recipient who uses it to make decisions (Burch, 1989).

Data: Data is a non-evaluated fact or raw data against a purpose meaning attached to it.

Non-Governmental Organizations (NGOs): NGOs are voluntary associations, which are formed by people who share common objectives and cooperate to achieve them, (Kassahun, 1997). Organizations, institutions, and agencies can interchangeably be used.

1.7 ORGANIZATION OF THE THESIS

The thesis is organized into five chapters. The second chapter discusses the subject area on which the theme of the thesis dwelt upon. The third chapter is devoted to survey and analysis of the existing system. The fourth chapter describes the design of the proposed information system based on the analysis and the survey results and shows a prototype for

selected classes and subsystem. Finally, the fifth chapter presents summary, conclusion and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 DEFINITIONS AND CONCEPTS NON-FORMAL EDUCATION

Coombs (1985) define non-formal education as "... any organized, systematic, educational activity, carried on outside the framework of the formal system, to provide selected types of learning to particular subgroup in the population, adult as well as children." It can be applied to any types of educational activities that carried outside the formal schooling such as agriculture extension and farmer training programs, adult literacy programs, occupational skills, and various community development programs in health, nutrition, family planning, and so on (Coombs, 1985; Evans, 1981).

NFE is aimed at meeting specific needs of a particular subgroup of population targeting adults as well as children. NFE is being considered as an essential approach that would supplement and support the formal education. Thus, it is considered to be effective educational tool in developing countries where the formal education system is already overburdened.

In developing countries, NFE emphases on the expansion of basic education and skill training, and particular attention has been paid to illiterate adults, unserved children, and dropouts as a major target group (UNESCO, 1990).

2.2 BASIC EDUCATION

Basic education refers to the education intended to develop basic learning skills that includes construction at first level on which subsequent learning can be based on (UNESCO, 1988). It is aimed at the learner or participant with basic knowledge that is important for their day to day activities of a sub-group of population. Basic education for adults may take several forms. For example, basic education for rural people is directly related with rural development in attacking poverty (Wagner, 1992).

According to the Ethiopian education and training policy basic education encompasses literacy, numeracy, environmental science, agriculture, health, civics, etc. (TGE, 1994). The participants in non-formal basic education are adults as well as children.

Basic education for out-of-school children can also be used as non-formal primary education, which is an alternative route to the provision of primary education to children in late age group (usually 8-14) who have no access to formal education. ACTIONAID-Ethiopia (Ahmed Ali, 1996) define NFE for children as:

> An organized and systematic, but equally flexible and common based program and activities carried outside the framework of the formal school system in order to provide basic education, equivalent to grade 4 of formal schools, to children in the age group of 7-14 who have no access to formal school.

The aim is to provide school equivalence program as a second chance to those disadvantage children that are living in isolated places, inaccessible and nomadic areas. It may have several forms; for example, mobile primary schools can be used to provide the primary education to nomadic people. It promotes educational enrolment for rural children.

In Kenya, the Undgu program of basic education can be mentioned as an example of NFBE (UNESCO, 1990). The program, which was set up for the children of disadvantages families in Nairobi, is aimed at preparing them to live in society and to assume adult responsibilities upon reaching adult age (UNESCO, 1990). In India NFE has been an important universalisation of primary education. The national programs are based on the needs of the pupil. It address NFE programs:

- for children who no longer attend the traditional school,
- for children who live in villages that have no schools,
- for children who are working, and
- for girls who can not attend full-time school.

2.3 SKILL TRAINING

Though formal schooling can best provide training program which concern broads occupational field or several related fields, they are limited in their capability to provide training in very specific skill area (UNESCO, 1990). The limitation arises mainly because of the varying and fast changing skill needs of specific clientele. In many developing countries the majority of the population is engaged in the traditional sector of agriculture and handicraft skill. Thus, diversified skill training that aim at impairing new knowledge and skill is needed in order to have employment-generating (income generating) effort by relating to locally appropriate technologies to traditional, local skills and locally accessible materials (Hidebrand, 1999).

2.4 THE NEED FOR NON-FORMAL EDUCATION

Though formal schooling is well suited to meet certain types of important learning needs, it could not be expected to meet other rapidly growing and learning needs (Coombs, 1985). NFE programs handle such learning needs because it has the following essential features:

- Organizational flexibility, i.e., its ability to adjust to the living and working condition of the population and organization of teaching activities
- Relevance of curriculum, the rapidity with which it introduces innovation and reject absolute elements in the content of education
- Diversity of learning activities to relate to the learning needs of the participants, and
- Its autonomy and decentralization of management

In developing countries, the coverage of the formal education is limited to urban areas, while the majority of the population is living in the rural areas. In such countries the majority of the population do not have access to basic education. Fekadu (1998) recommends the need for NFE on basic education as follows:

> Although formal primary education schooling is the preferred means of providing basic education, many children in the rural areas live and work in places where schools are not found or do not coincide with the demand for their labor. Hence, in such situation the use of non-formal education is very important for children who work during formal school hours.

In Ethiopia, there are many reasons for the expansion of basic education through non-formal education. The major ones are (Berhanu, 1999):

- Many school-aged children have no access to formal schooling

- High dropout at lower level
- High gender disparity
- High investment (financial and human resource) for the expansion of primary school
- Some area are remote and inaccessible

Generally, non-formal education can play a great role in meeting the growing need of basic education and skill requirement for development. The integration of rural development-oriented activities in health, agriculture, community development, etc. with literacy and numeracy programs for rural communities can also be taken as a reason for the need of NFE.

2.5 COMPARISON WITH FORMAL EDUCATION

The concept of NFE is better understood when a comparison is made with the formal education system. Below is summary of comparison of formal and non-formal education (Roger 1992).

Formal Education	Non-Formal Education
• Its purpose is long term , general, and expected to provide the basis for individual whole future life	• Its purpose is specific and meets short term training needs of individuals
• Preparatory formal education is child-centered and future oriented	• NFE can be related to children or adults based on the learning needs of the individual or community

• Formal education is rigid structure with regard to participant age, performance, and entry point. Programs are continuous	• Flexibly structured programs are discrete
• Full time. i.e., does not permit any parallel activities	• Part-time, activities may be timed in a variety ways depending on the target group

2.6 INFORMATION REQUIREMENTS AND SYSTEMS IN NON-FORMAL EDUCATION

2.6.1 Information Needs in Educational Environment

The information needs vary according to the profiles of users to their levels of responsibility. Planners at central level and planners at regional level have different information need. Thus, any effort to develop information system for users on NFE starts with the identification of user needs. The information need in the educational environment is divided in to three levels (Khan, 1998):

- information for operation
- information for control
- information for management decision and planning

At the lower level information for the day to day functioning of an organisation is needed. For example, student record, payroll, etc. At the middle level much of the information

needed is used to implement administrative decision and policies; for example, student promotion to the next academic class. At the top level, the information need is pertained to management decision and policy development that requires a comprehensive information in order to explore alternative and allocate resources for various activities (Ibid.).

2.6.2 Planning and Management Of Non-Formal Education

Planning is the process by which an individual or organization decides in advance on some future course of action (Bricker & Cope, 1977). The process of planning involves a number of steps to reach the desired goals. In any plan preparation, planning involves (Hailye, 1998):

- Reviewing past performance
- Setting objectives, targets and strategies
- Allocate/setting resource within which the plan is to be realized.

Planning in NFE focuses on the diagnosis of existing situations followed by review of past plan, programs or policies with respect to literacy, adult basic education, out-of-school programs (Kahl, 1998). This planning activity helps to identify areas where more out-of-school children and illiterate are concentrated so that action can be taken. Such planning activities are close to the local level where details program planning is taking place. In such action based programs a strong management information system is required.

Evanes (1981), on the other hand, view the planning of NFE at three levels: national, regional, and local levels. At national level no effort is made to provide detail planning,

rather it focuses on policies, articulating national priorities and identification of the worst case of program duplication. The shortcomings are strong pressure for NGOs programs (i.e., NGOs programs will be influenced/controlled by ministry of education and lose their very features of NFE flexibility). On the other extreme, details program planning at the local level solves the problems that appear at the national level. However, the disadvantages are that duplication/overlapping of NFE programs, competition of scarce resources, uneven quality and effectiveness in the program.

The compromise position, according to Evans (1981), is a mixture of these two planning activities. The planning activities, thus, formed is planning activities at regional level. At regional level, co-ordination of effort through the entire range of NFE activities in the region is highly emphasized. This co-ordination includes different kinds of process. Evans (1981) further states the co-ordination process to be:

- getting the various ministries that have NFE activities, which usually include education, agriculture, rural development, and possibly health and labor as well to work together
- a more general co-ordination between the government and NGOs by facilitating communication channel in order to share/exchange information on NFE

The planning activity at the regional level improves co-ordination of the various sector ministries in health, agriculture, and social affairs so that integrated NFE programs can be developed. It also overcomes the shortcomings that can appear at central and local level planning activities.

2.6.3 Information System in Non-Formal Education

The development of information system in education incorporates various levels of users of information. Such information system requires the creation of several databases and brings them together so that the information need for the activities at each level of users can be met.

For effective planning and monitoring of activities strong management information system (MIS) is required. The development of such system is based on the objective of the non-formal education program. Many countries established literacy management information system in order to monitor the adequacy, quality, and performance of the programs. For example, in India MIS has been developed on literacy program for girls and women with the following objectives (Mehta, 1998):

- to collect, process, store, analyze and disseminate information
- to provide educational planners or project functionaries with reliable and timely data and information for decision making
- to aggregate different databases and integrate them into a system
- to prepare and disseminate aggregate statistics

Databases integrated in MIS can be used to convert information into a variety of indicators and helps as decision support systems for management decision making purpose.

The CAMPE (Campaign for Popular Education) Database of Bangladesh (Rahman, 1998) is used to collect and provide non-formal education information such as literacy coverage, research, evaluation, training, and development to its users for better planning. The system also accommodates the directories of several organizations having NFE programs in the country.

In Ethiopia, during massive literacy campaign efforts were made to develop literacy management information system at the Ministry of Education in order to support educational planers with reliable, relevant and timely information on literacy. The campaign was carried out in stages with a pre-set cycle. For the planning of each stage, information from the previous stage was required. However, the delay of reporting from below (base line information) was the main problem (UNESCO, 1988).

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CHAPTER THREE

SURVEY OF EXISTING SITUATIONS

3.1 NON-FORMAL EDUCATION (NFE) IN AMHARA REGIONAL STATE

In Ethiopia, NFE started initially to help adults read, write, and perform arithmetic operations. Later on, training activities such as community skill training were included as part of the program. Besides, basic-development oriented education and distance education was added to the literacy and post literacy programs. Yet, the literacy program was the dominant program.

In this regard, a wide range of activities was conducted through literacy campaigns. In 1975-76, for instance, a literacy campaign known as Development Through Cooperation was conducted all over the country for 18 months during which more than a quarter of rural inhabitants were taught reading and writing skills (Fikre, 1999). In 1979 also a National Literacy Program which aimed at eradicating illiteracy from the country was launched.

The current education and training policy of Ethiopia defines NFE as " ... teaching and learning activities to be provided to children, youth, and adults who don't have access to and/or withdraw from formal schools due to various reasons irrespective of age and time" (TGE, 1994). In this respect NFE is an alternative route to the provision of basic education. It is given at different levels to enable participants/learners to understand their surroundings, protect and use their environment and thereby to solve social and economic problems. Literacy, numeracy, environmental science, civic education and health/population education are the priority area of NFE in the country (MOE, 1999). Currently, several Regional State

Education Bureaus such as Oromiya, Tigray, and Southr Nations, Nationalities, and People (SNNP) regional states are widening the scope of non-formal education by introducing out-of-school programs for children and youth for those who are unable to get the formal schooling including dropouts. The aim is, generally, to help and strengthen the formal primary schooling by way of non-formal provision of basic education.

3.1.1 General Profile of Amhara National Regional State

The Amhara National Regional State is sub-divided into 11 zones, 105 Weredas and 2711 Kebeles. The region accounts for 16 percent of the total population of the country; i.e., 14 millions of which about 90 percent live in the rural area. The region constitutes the second largest (next to Oromiya region) proportion of illiteracy rate in the country. According to the 1994 housing and population census of the Central Statistics Authority (CSA, 1994), over 7.8 million people are illiterate. In this regard only 17.8 percent of the total population of age 10 and above are literate. This is an average figure. The literacy distribution based on urban/rural and male/female is described in Table 3.1. Out of the total illiterate population, 6.3 million are above age 15 while the rest are within 10-14 age group. The ***Gross Enrollment Ratio*** (the ratio of pupils in primary grades to that of the primary school-age population) is 39.6 percent (AREB, 1998).

Table 3. 1 Percentage of literacy of age 10 and above

Sex / Location	Male	Female	Total
Urban	73.8	52.3	61.8
Rural	18.7	7.1	13.0
Total	23.5	12.1	17.8

Source: Non-Formal Education &Training Program Strategy &Structure: (1997)

3.1.2 Non-Formal Education in Amhara National Regional State

The scope of non-formal education in Amhara region is divided into two broad categories. These are non-formal basic education (NFBE) and various skill-training programs, which are commonly known as Community Skill Training (CST) programs. The participants in non-formal education are adults of age 16-45. Adults above age 45 can also be included upon request. Basic education for these adults comprises classes in literacy, numeracy, health, agriculture, crafts, civics, and environmental science. Basic education for out-of-school children (non-formal primary education) is not included as part of NFE program. Rather, it is planned to be included as part of formal education. As indicated earlier, REBs such as Oromiya, Tigray, and SNNP incorporated non-formal primary education (out-of-school children) as part of NFE program.

In 1998, the Amhara Region Education Bureau set up a strategy serving as a guideline for the implementation of non-formal education in the region (ANRS, 1998). The strategy focuses on the following two types of NFE programs:

- Basic adult education programs having three phases and which is equivalent to

the formal basic education and,

- Handicraft skill and basic technologies training programs

Among the many objectives of the strategy, some of them are listed below:

- to liberate the people in the region from illiteracy,
- to develop the ability of adults for solving problems,
- to enable adult participant in the region's social, economic and political affairs,
- to develop the ability of the adult in environmental protection,

3.2 BACKGROUND TO THE EDUCATION BUREAU

3.2.1 Establishment

The Amhara Regional State Education Bureau was first established in 1993 under proclamation No. 41/1993 which defines the power and duties of the central and regional executive organ of the Transitional Government of Ethiopia. Later, with the formation of the Federal Democratic Republic of Ethiopia, the above proclamation is amended and replaced with Proclamation No. 4/1995 and delegated the bureau to have the following power, duties and responsibilities (Zikire Hig, 1995).

1. *"Devise strategies which enables the expansion of education at regional level; facilitate condition for their implementation;*
2. *Prepare on the basis of education policy of the country the education and training plan and program of the region, and upon approval implement the same;*
3. *Devise strategies which enables the provision of the educational opportunities to all school age children of the region and provide basic education for all;*

4. *Ensure the quality of education provided in the region comply with the approval of national standard;*
5. *Prepare and implement, following the education policy and standard of the country, having regard to the specific situation of the region; the curriculum of kindergartens, adult education, elementary and junior secondary school and teacher training institutions; ensure the curriculum prepared at any level is free from religious, political outlook and cultural influences;*
6. *Ensure the qualifying standards to teach in each level have been met*
7. *Train and cause the training of teachers of teachers and education personnel; ensure the observance of the rights and benefits of the same;*
8. *Follow up the execution of national examination provided in the school of the region; ascertain the adequacy of examinations and certificate prepared and given at the regional level;*
9. *Ensure the provision of books and the material necessary to undertake educational works;*
10. *Organize and administer elementary and secondary schools, the established and would be established training institutions and colleges in the region;*
11. *Issue license to schools up to secondary level established by domestic organisation and investors; supervise the same to ensure that they maintain adequate standards;*
12. *Undertake studies to enable the expansion of educational quality, prepare and implement projects assisting such studies, provide the necessary support to studies undertaken at national level;*
13. *Provide special support, in co-ordination with concerned organs, to educational services rendered to minority nationalities to women, children, and adults;*
14. *Ensure the education program of the region is supported by educational mass media ;*

15. *Collect compile and disseminate to the concerned organs, statistical data on education;*
16. *Plan construction works necessary for educational proposes; and implement the same upon approval;*
17. *Devise strategies in order to strength various strategies to be rendered to students, and co-ordinate the same;*
18. *Devise strategies and organizational systems, in line with educational policy with the view to strengthening, extensive, community participation in learning - teaching processes, educational administration, and construction works; follow up the implementation of the same."*

The duties and responsibilities that have been mentioned above are more general. Detailed tasks related to NFE are visualized if functional/sub-functional units are considered. Generally, although the NFE Panel is responsible for program supervision of NFE program, other sub-functional units such as Curriculum Department and the Planing and Engineering Service are also engaged in carrying out the duties and responsibilities of the organization with respect to NFE. In this study, each activity at sub-functional levels (including the job description in some cases) has been analyzed. The detailed activity of each sub functional unit is broad and could not be described exhaustively. However, mentioning some of the tasks that the bureau performs helps the reader to have clear vision as to the activities of NFE the organization is engaged in. These generally include:

- Expansion of basic education in order to contribute for the improvement of the life of the society, enabling problem solving and other skills;
- plan and implement basic education through non-formal education programs;

- plan special opportunities for delivering non-formal primary education for those children who are unable to get the chance of formal education;
- supports ideas and possibilities on networked/coordinated effort with bureaus of other ministries and development-oriented NGOs engaged in NFE;
- based on research, prepares, improves, and distributes books, articles and different materials for the activities of non-formal basic education;
- devise methods of improving local cultural knowledge and skill scientifically and provides ways of improving them;
- for adults, who completed basic education and could not get the chance to continue further, the organization studies the possibilities for access to continuing education and training programs. Prepare such training programs and monitor up its implementation;
- prepare and distribute books, literature and training materials on non-formal education;
- collect, compile and handle information relevant to adult and non-formal educational activities and report to the concerned organs;
- promote adult and non-formal education in sufficient quality and quantity, based on study, and supervise or follow up the implementation.

3.2.2 Organizational Units

Basically, the Amhara Education Bureau is organized into three main lines and five supporting staff. The line staff include those functional units (the departments and services) that directly carry out (or discharge) the above duties and responsibilities of the organization. These include the Curriculum Development Department, Educational Programs and Supervision Department, and Higher Education Experts.

The Curriculum Department deals with the development of curriculum and production and distribution of educational materials for educational programs in the region. This department is further divided into three sub-functional units: Academic Curriculum Development Panel, Fine Arts Curriculum Development Panel, and Research Panel. The library and documentation center, which is responsible for storing and providing information services, is placed under the Research Panel. The Educational Programs and Supervision Department supervises educational/training programs; i.e., it monitors/follow up, inspect, and evaluate educational programs undergoing in the region. This department is again divided into five panels: Formal Education Panel, NFE Panel, Educational Mass Media Panel, Student Affaires & Placement Panel, and Training Panel. The above two main departments are directly accountable to the Deputy Head of the education bureau. The Higher Education Experts, on the other hand, deals with issues related with higher educational institutions in the region.

In order to carry out the teaching - learning activities of the line staff, five supporting services/departments have been established. These are Planning & Engineering Service, Finance & Administration Department, Legal Service, Public Relation Service, and Audit Service. The Planning and Engineering Service deals with short term and long-term educational program development. The information processing activities are categorized as supporting functions to the primary purpose of the organization and come under the Planning and Engineering Service. The Administration and Finance Service is responsible for the administration of financial matters within the organization. The Public Relation serves as information exchange unit with the external environment.

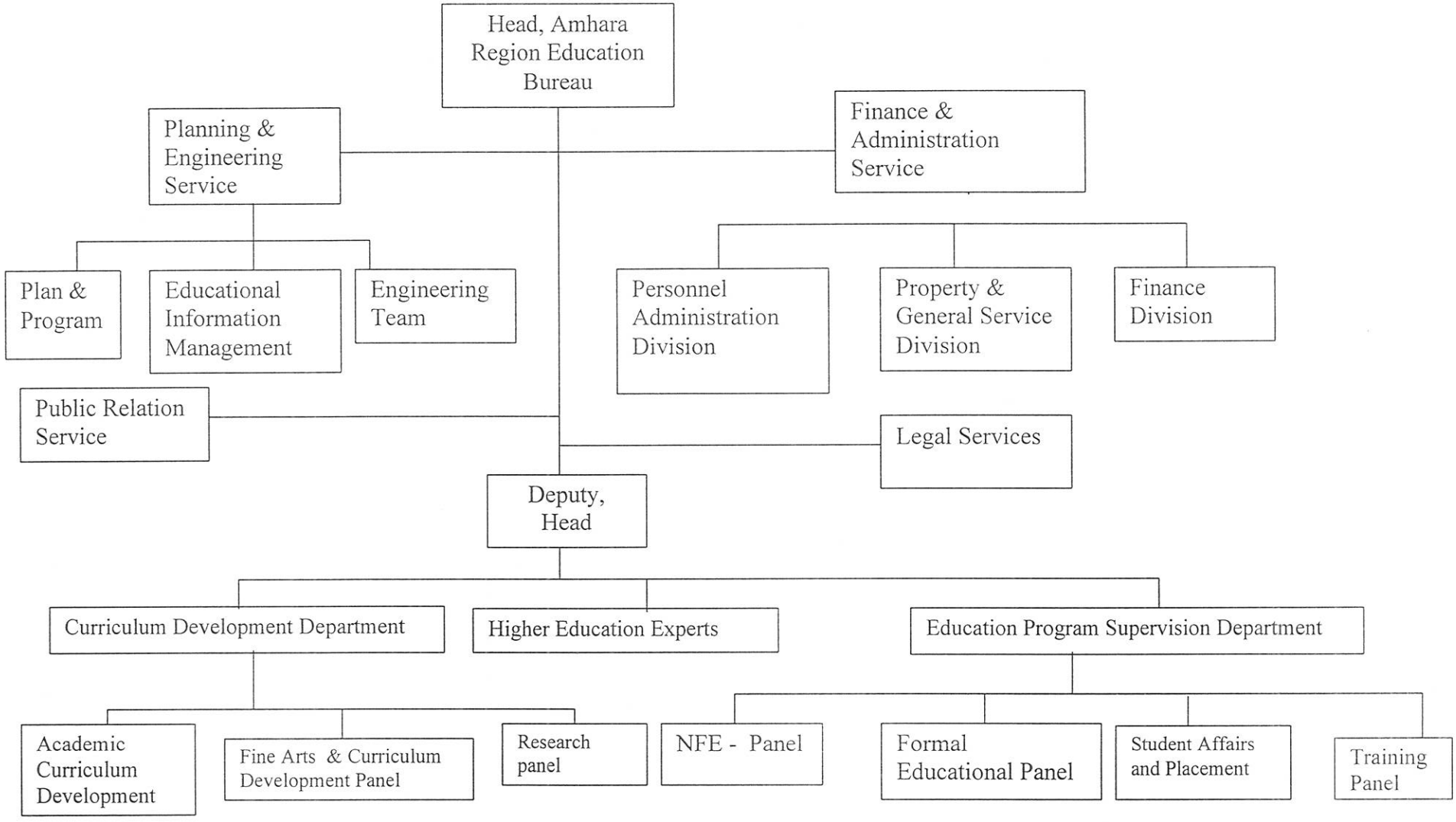

Figure 3. 1: Organisational Structure of Amhara National Region Education Bureau

3.3 INFORMATION USERS

The users of information on non-formal education were examined from the perspectives of basic activities of users within and outside the education bureau. The basic types of information users are, generally, educational planners, managers, researchers, database administrators, and encoders. Educational planners, database administrators, and encoders are mainly fall under the organization.

The external users are individuals working in government and non-governmental organizations including special agencies whose jobs are directly or indirectly related to NFE program activities.

- Governmental Organizations include Health, Agriculture, Labor & Social Affair Bureaus; and Regional Council and Ministry of Education.
- Non-governmental Organizations include international and local NGOs having programs on NFE;
- Special Agencies include donors, and other special agencies that provide financial support or capacity building to programs of NFE.

3.4 SOURCES OF INFORMATION

Zone Education Department and Wereda Education Offices are the primary sources for the bulk of NFE information for the users within the Education Bureau. The education bureau receives information predominantly from the Zone Education Department and Wereda Education Offices. Other sources include surveys conducted to collect *base-line information* at learning centers and Kebele level (See fig. 3.1, below). For the majority of users (above

57 percent), the Ministry of Education together with IZZ/DVV, and line ministry at Region, Zone and Wereda level are the main organizational sources of NFE information. A few respondents also use the Central Statistics Authority (CSA) as a source. The Christian Relief Development Association (CRDA), Ethiopian Family Planning and Guidance Association, and Pact Ethiopia are among the few non-governmental organizational sources of information.

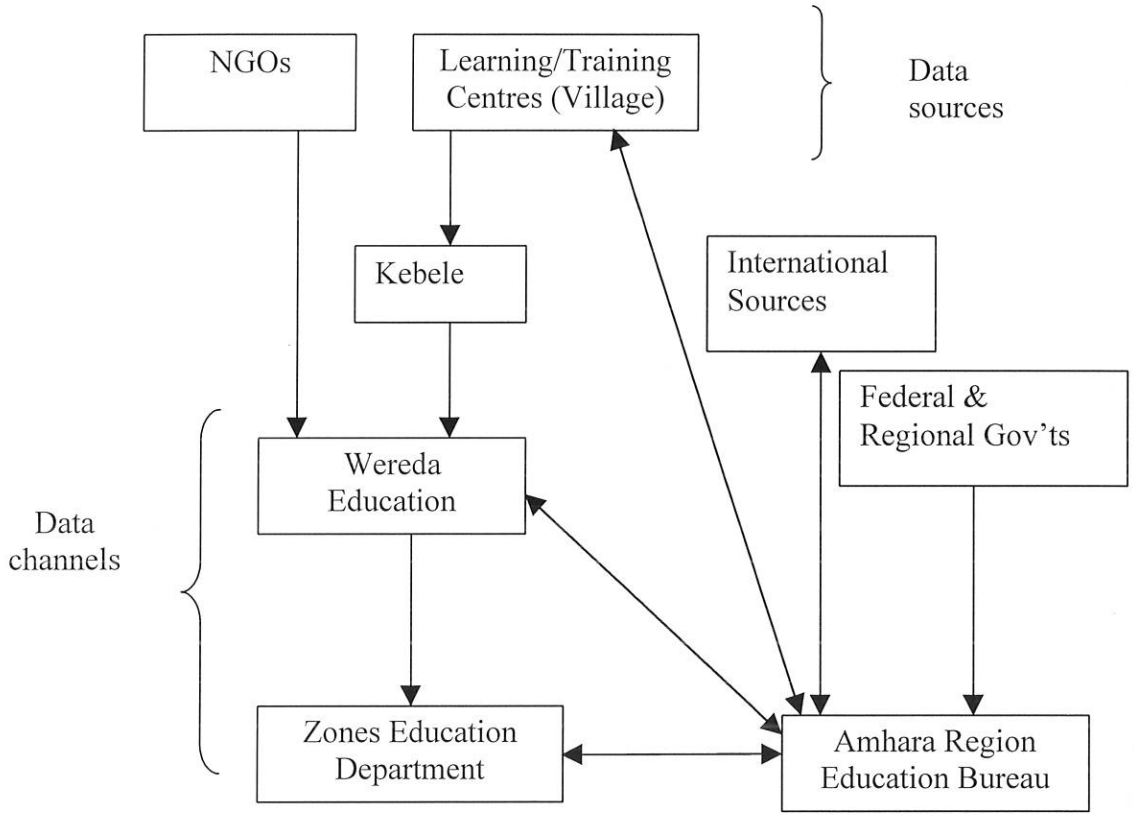

Figure 3. 2: Data Sources and Channels of NFE for the Amhara National Region Education Bureau (the arrows indicate bi-directional information flow from the sources)

3.5 HARDWARE AND SOFTWARE FACILITIES

The main existing support level of the organization includes the documentation unit (library) and the information unit. The information unit mainly supports the formal education program. The educational data management system (EdDat) captures, processes, and disseminates school-related information*. The annual educational statistics of the bureau is the main official publication on the formal educational programs. The existing

* School-related information include information such as the number of school, primary-school enrolment, dropouts, etc. in a given (locality) Kebele or Wereda.

support level for planning and management of NFE with respect to computer is limited to secretarial services.

In order to support the activities of the organization, the bureau has acquired the following computers, accessories and software.

Table 3. 2: Hardware and Software Facilities Available in the Organization

Microcomputer Type	Processor Speed in MHz	RAM	Quantity
Gateway 2000	100	16 and 64	8
Delloptiplex	300	64, 32	4
IBM	133	32	1

- **Available Printers and Scanners**
  - Laser Jet 5L four in number
  - Laser Jet 5 Plus seven in number
  - One scanner
- **Operating systems**
  - ♦ Microsoft Disk Operating System
  - ♦ Windows 95/98
- **Application package**
  - ♦ Database Management System available
    - Microsoft Access
    - dBase for Windows
  - ♦ Word processors

- Word Perfect and Microsoft Word 6, 7, and Word 97

♦ Spreadsheet

- Microsoft Excel, Lotus 1-2-3

♦ Other applications

- Software like MS- Power point and MS – Publisher

♦ Special package

- EdDat, special package for educational data/information management, which is developed by the Ministry of Education.

The above software and hardware facilities are mainly used for word processing. Few of them are used for database management. They have database for the formal education program (EdDat) used for storage and retrieval on primary, junior, and secondary school data/information. Annual statistical abstract is also produced. The electronic spreadsheet, particularly MS-Excel, is used in the analysis and preparation of the abstract after the data is being exported to the spreadsheet.

3.6 PURPOSE OF UTILIZATION OF NFE DATA/INFORMATION

Before dealing directly with results of the survey, it is better to mention how users exactly utilize NFE data/information for purposes, such as planning activity. In relation to the planning for Non-Formal Educational programs, it is better first to diagnosis literacy/illiteracy situation at the Regional, Zonal, Wereda and even at Kebele levels. Both literates/illiterates over a period of time in different age groups and educational level of literates needs also to be thoroughly analyzed. The literate in different age-groups should be

linked to the corresponding population so that areas where illiterates population concentrate can be identified, which should ultimately be linked to the opening of learning centers.

The purposes of utilization of NFE information for users were analyzed within and outside the organization. The survey result revealed that NFE information are mainly needed for: planning purpose (32.8 percent), research activities (29.5 percent), monitoring purpose (18 percent), etc. Details are described in Table 3.3 as shown below.

Table 3. 3: *Summary of purposes for utilization of NFE data/information*

Purposes	Internal Users		External users		Both users	
	In No.	In %	In No.	In %	In No.	In %
Planning	7	29.2	13	36.1	20	32.8
Management decision making	4	16.7	3	8.1	7	11.5
Monitoring	8	33.3	3	8.1	11	18.0
Research & development	5	20.8	13	32.1	18	29.5
Keeping up to date	2	8.2	5	12.5	7	11.5
Total	24	100	37	100	61	100

The above table, generally, shows that monitoring activities are mainly limited for the users within the Education Bureau, where as research and developments are for external users.

3.7 TYPES OF NFE DATA/INFORMATION REQUIRED

Due to the diversified activity that NFE practitioners engaged in, the bulk of information needed by users are listed as follows.

- Population information:
  - ♦ Total population by age, sex, urban, rural distributed at dis-agregated level, which further used for a variety of indicators, such as, sex ratio, density of population, annual growth rate of population. This can be great help at the time of formulation of plan at different level of planning, since it is a pre-requisite to know thoroughly the population for which the scheme is planned and illiteracy distribution with respect age group (adult and children), education level, etc. over spatial level. Literacy/illiteracy statistics over a period of time by sex, and urban/rural
  - ♦ Literates/Illiterates over a period of time in different age-group and educational level
- Aggregate data/information about clientele or participants status on NFE programs:
  - ♦ Enrolment: the number of clientele enrolled (male/female) by NFE program they take,
  - ♦ Attendant: the number of participant attending NFE programs,
  - ♦ Participants who sat and pass exam,
  - ♦ Repeaters: participants, who fail the exam,
  - ♦ Clienteles who drop out the programs.
- Aggregate data/information about facilitators/instructors:
  - ♦ Volunteer, non-volunteer (paid), trained instructors

- Indicators, such as:
  - ♦ Sex ratios of participant/facilitators involved in a particular NFE program,
  - ♦Growth rates of adult illiteracy,
  - ♦Percentages of out-of-school children, etc
- Organizations/Institutions Information
  - ♦ Directories: organization addresses and their program emphasis,
  - ♦ Projects conducted by organizations and its coverage in a given locality,
- School related information: since primary schooling and literacy programs are complementary to one another, it is necessary to collect in formation on the number of primary schools, enrolment pattern, etc.
- Information related to educational materials and other activities of NFE
- Current and future planes of NFE in the region (Guidelines and related information)
- Information on budget allocated for the NFE

From the above descriptions of NFE information, the format of data required include numerical/statistical data on literacy situation, participant, facilitators, etc. and document agreements related to NFE programs of NGOs with the Region Disaster Prevention and Preparedness Bureau are also required.

The spatial administrative level for which the above information required is also analyzed. Almost all the user marked that information is needed at all level. According to the discussions made with users at the Amhara Education Bureau, it was known that many of the information are needed at Wereda, Zone, and Regional Level. However, a few respondents suggest that there is a time they need information such as illiteracy distribution.

Generation of NFE data/information: The survey also assessed if organizations, other than the Education Bureau, could generate information related to NFE programs. Accordingly, it revealed that 65 percent of the organizations (organizations that users affiliated in) generate information for internal consumption and a few of them distribute to others in the form of report.

3.8 ORGANIZATIONS OF NFE INFORMATION AND RELATED PROBLEMS

In this section the problems of the existing system such as NFE information organization, the availability, consistencies, and accessibility, etc. of NFE information have been examined. The existing problems were analyzed based on user judgements. Respondents were asked to rate the above factors based on their experiences. Through out the questionnaires, adjectives like highly, moderately, poorly, etc. were used in order to express the existing situation of NFE information in measurable magnitude.

3.8.1 Organization of Information

The organization of NFE data/information in the education bureau was analyzed in terms of data collection, and storage. Five personnel were interviewed as to the data collection or data capture format of the organization. As described earlier, NFE information is mainly collected through reports of Zones and Wereda education offices. However, the current reporting format varies from report to report and from Zone to Zone, etc.; i.e., there is no standard way of data capturing. Thus, lack of uniformity in reporting and, the incompleteness of the data reported from Zone and Wereda education offices have also contributed for the poor organization of NFE information. This really causes the problem of producing sex ratios on dropouts, enrolment, and attendant of participants, for example. On

the other hand, the bureau has prepared data capture format, i.e., a sort of reporting format at each level (Kebele, Wereda, Zone) to the next higher organs, but not yet implemented.

Data organization in the Education Bureau is also examined in terms of physical storage of NFE information. The interview result suggests that documents on NFE are not kept properly, rather the documents are placed in different section of the bureau. This causes problem of getting information, for example, if one need information in literates/illiterates, he/she has to look all the sections. Thus, mismanagement of documents (reports, survey results, etc.) is the main factor that limits accessibility.

3.8.2 Availability

The problem of the existing system is also examined in terms of availability of NFE information. The availability of NFE data/information were surveyed using the questionnaire prepared for users within and outside the organization. A Chi-squared test was done (Table 3.4) and revealed that there is significance variation among the four groups of user responses about the availability of NFE data/information. Further more, in order to see if there is any significant variation among the response, Chi-square test was also used by grouping the four groups into two groups: Group I and Group II. Group I consists of the 'not available' and 'poorly available' categories where as Group II consists of the rest two categories, 'moderately available', and 'highly available'. The Chi-squared test indicated that there is significance difference between the two groups (Table 3.5). Thus, it possible to say that NFE data/information availability is really worrying the users.

The reason given to the causes of the problem of availability were also surveyed accordingly. Many of them (55 percent) responded lack of organized system that

capture/collect, store, process and disseminate NFE information at each spatial level as one of the causes of the problem. Table 3.6 is list of causes for the poor availability of information on NFE and the percentage of respondents that marked each reason.

Table 3. 4: *Summary of Response for NFE Information Availability*

Rating	Observed Frequency	Expected Frequency	Residual
Highly available	5	15.25	-10.25
Moderately available	19	15.25	3.75
Poorly available	35	15.25	19.7
Not available at all	2	15.25	-13.25
Total	61	61	

Chi-squared	Degree of Freedom
44.9	3

Significance at 5%

Table 3. 5: *A two Group Chi-square Analysis for the Response of NFE Information Availability*

Rating	Observed Frequency	Expected Frequency	Residual
Group I	24	30.5	-6.5
Group II	37	30.5	6.5
Total	61	61	

Chi-squared	Degree of Freedom
84.5	3

Significance at 5%

Table 3. 6: Summary of Reasons for the Problem of Availability of NFE Information

Reason	Frequency	Percentage
Lack of system that collect, store, process, and disseminate information related NFE programs	20	55
Lack of awareness on the value of information	6	15
Poor utilization of Information technology	18	23
Lack of attention given to NFE program by the bureau	3	7
Total	37	100

Users were requested to rank the reasons for availability of information if they have more than one choice and the results were also included in the above table. Respondents were also requested to specify the causes other than the one listed in the questionnaire. Low attention given to NFE by the government is one among the many reasons cited by the respondents. That is, even the official education statistics of the Ministry of Education does

not publish NFE information. In order to examine this response, discussion was made with the experts at the NFE Education Panel of the Ministry of Education. It was identified that REBs are the major sources for this information, but due to limited capacity of the REBs, NFE information are not available to publish and distribute to users.

3.8.3 Consistencies

Problem of consistency of information was another aspect, which attracted attention. The consistencies of the available information were analyzed and users were asked to rate the level of consistency of NFE information. Of the total 61 respondents 55 percent rated 'inconsistent', 26 percent rated 'moderately consistent', and 19 percent 'consistent'. To check the variation among the response, Chi-squared test was used and it was found that there is a significance variation among the response (Table 3.7). Further analysis also used by grouping the categories in to two groups (Table 3.8). The result of the Chi-squared test showed that, the inconsistencies of NFE information is found to be significant. Hence, it is hard to say whether inconsistency of information does worry the user, as the result is inconclusive.

The reasons for the problem of inconsistencies were also examined. The survey result shows that frequent failure to update data and absence of database system were the main reasons identified (Table 3.8).

Discussions made with relevant personnel from government and non-government institutions (for example, Ministry of education, CRDA, Agri-Service Ethiopia, Associations of NFE in Ethiopia, etc.) indicate that data on the number of

participants/learners of NFE, teachers and learning or teaching material distribution, etc. are inconsistent at Wereda, Kebele, and Zone level.

Table 3.7: Summary of Response for NFE Information Consistency

Rating	Observed Frequency	Expected Frequency	Residual
Consistent	11 (19 %)	20.33	-9.33
Moderately Consistent	16 (26 %)	20.33	-4.33
Inconsistent	34 (55 %)	20.33	13.67
Total	61 (100 %)		

Chi-squared	Degree of Freedom
14.4	2

Significance at 5%

Table 3.8: A two Group Chi-square Analysis for the Response of NFE Information Consistency

Rating	Observed Frequency	Expected Frequency	Residual
Group I (consistent, moderately consistent)	27	30.5	-3.5
Group II (Inconsistent)	34	30.5	3.5
Total	61		

Chi-squared	Degree of Freedom
0.803279	1

Not Significance at 5%

Table 3.9: Summary of Reasons as to the Cause for Inconsistencies of NFE Information

Reason	Frequency	Percentage
Failure to up date information frequently	16	43
Absence of database system	11	34
The existence of many sources of information	3	10
Others		
- Poor data collection method at lower level (village and Kebele)	3	8
- little attention given to the activity of NFE programs	1	5
Total	34	100

3.8.4 Accessibility, Adequacy and Timeliness of NFE Information

Users' response regarding the accessibility of NFE information within the Amhara Region Education Bureau was analyzed and the results of the analysis suggests the existing information system does not allow for easy access. The analysis on the categories of NFE information accessibility indicate that 73 percent marked 'poorly accessible', 17 percent marked 'fairly accessible' and the rest 10 percent marked 'accessible'. Users within the

organization commented that the organization of the information system itself as the main reason for the poor accessibility information.

Regarding the adequacy and timeliness of the current information, 45 of the 61 (74 percent) marked that they do not get adequate information. The rest of the respondents answered 'fairly adequate' and 'adequate' 18 percent and 8 percent each, respectively. In order to see user response on the categories of NFE adequacy, Chi-squared test was done. The test signifies that there is strong variation on user response on the categories of information adequacy (Table 3.9). From the percentage analysis and the Chi-squared test, one can infer that the current situation of NFE information inadequacy is very series.

Discussions also conducted with personnel from Ministry of Education, IZZ/DVV, and some selected NGOs indicated that availability of learning/teaching material, the problems encountered during the program, facilitator/trainer/teacher source, etc. need immediate response by the Education Bureau NGOs, and donors. These users were asked to indicate the reasons for the problems. Of the 61 respondents 27 percent mentioned 'inadequate effort to collect and analyze data on time on the parts of the information sources', 32 percent mentioned 'the existence of unorganized situation among the sources of information', etc. Summary of reasons for timeliness of information is described in Table 3.13.

Table 3.10: Summary of Response for NFE Information Accessibility

Rating	Frequency	Percentage
Accessible	3	11
Fairly Accessible	4	16
Poorly Accessible	17	73
Total	24	

Table 3.11: Chi-squared test for Response of NFE Information Adequacy

Rating	Observed Frequency	Expected Frequency	Residual
Adequate	5 (8 %)	20.33	-15.33
Fairly Adequate	11 (18 %)	20.33	-9.33
Inadequate/poorly adequate	45 (74 %)	20.33	24.67
Total	61 (100 %)		

Chi-squared	Degree of Freedom
45.78	2

Significance at 5%

Table 3.12: Summary of Response for NFE Information Timeliness

Timely available?	Frequency	Percentage
No	41	67
Yes	20	33
Total	61	

Table 3.13: Reasons Given to the Problem of Adequacy and Timeliness of NFE Information

Reason	Frequency	Percentage
Inadequate effort to collect data on time at lower level	10	27
The existence of unorganized system among the sources of NFE information	14	32
Absence of NFE Database	13	31
Low level of IT utilization (for example networking system)	4	10
Total	41	100

3.9 THE NEED FOR INFORMATION SYSTEM

The results of the survey from Part III of the questionnaire, Appendix A and Appendix B, were jointly used to assess users response as to the quality of information, and the need to have information system for Non-Formal Education. Users attitude towards NFE information was partially summarized from the reasons they provided to the problems discussed so far. It was also collected from the respondents' comments/suggestions. It was

found that 64 percent of the respondents reported that non-existence of well-organized information system is the main cause for the problem discussed so far (Table 3.14). It was also found that strengthening the current weakness of NFE information gathering and reporting at lower level of administrative region is another solution suggested by the respondents, which accounts for 25 percent of the total respondents. Though, users doubt about the establishment of such a system at the education bureau, they are in strong favor of it.

The existing system captures NFE information through report and survey. The existing systems process the information and produce various types of reports. Besides, the system computes indicators such as sex ratios of participants and facilitators, percentage, growth rate, etc. as outputs.

Table 3.14: Summary of User Responses on the Creation of NFE Database

Classification (user attitude)	Frequency	Percentage
Well organized NFE information system	39	64
Strengthening weakness of collecting, and organizing base-line information at lower level (Zones/Wereda)	15	25
Priority to other factors such as -restructuring NFE Panel as institution - lack of awareness and/or low attention given by the government	7 4 3	11
Total	61	100

3.10 SUMMARY OF PROBLEMS AND DISCUSSION OF RESULTS

The survey and analysis have showed the existence of problems in relation to availability and accessibility of information.

- Availability, adequacy, and consistencies of NFE information are the main problem identified during the analysis and the survey,
- The introduction of NFE database were highly recommended in the comments given by respondents,

- There is no uniform data collection or report format used at the Amhara Region Education Bureau.
- There is no such thing as NFE data statistics
- Zone Education Departments and Wereda Education Offices are the channels for most for the sources of information. They also serve as sources of information for the organisation.
- Lack of proper organisation of NFE information has greatly contributed for the poor accessibility of information.
- Information is generated mainly from the grass root level, Kebele. It is also generated and used by each level. The higher level consolidates the information coming from the lower level not only for internal consumption but also as input for the next higher level.
- The existing information system with regard to data collection, storage, processes, and dissemination is very poor. It can be described as follows.

  Collection: the data collection method has no uniformity and lacks completeness,

  Storage: information is not organized systematically manner so as to be easily retrievable,

  Dissemination: there are no official publications on non-formal education activities in the region,

  Processes: the preparation of report is very tiresome and time consuming. Data has to be complied from the lower administrative level.

CHAPTER FOUR

PROPOSED INFORMATION SYSTEM FOR NON-FORMAL EDUCATION

In chapter three, attempts were made to analyze the existing information system and the problems related to NFE information. From the survey results, it has been observed that information on NFE is poorly organized. This made poor accessibility and non-availability of NFE for the purpose of the bureau. In this study, NFE database based information system is suggested. This is because database organizes logically related data, and holds processed or organized data. It consolidates records previously stored in independent file so that it serves as a common pool of data to be accessed by application programs (O'Brien, 1993). In this chapter, interface and system requirements of the proposed system of NFE activities will be described. The approach used in the design of the information system, the output of the design and the prototype NFE database also outlined.

4.1 REQUIREMENT SPECIFICATION

Requirements are functions the user needs to accomplish some goal or solve some problems (Lorenz, 1993) which are selected as end-user functions. End user functions are product capabilities that solve user problems. Functional requirements are end-user information requirements that are not tied with the hardware, software, and people resource that end users might use (O'Brien, 1993). In functional requirements analysis, the analysts together with end user need to determine specific information needs, including its volume, format, and frequency should be.

As it has been discussed in the previous chapter the existing problem of NFE information can be tackled if NFE database has been created that can be a reliable sources of information for users. The development of such a system requires specification of requirements, i.e., what is required of the system, rather than how it is to be accomplished. From the results of the survey and analysis of the existing system, the following major requirements were identified.

4.1.1 System Requirements

The information required can be classified in to three categories based on its production and nature. These are:

1. Information in relation to NFE of the bureau,
2. General statistical information in the region, and
3. Information in relation to organizations, involved in NFE in the region, other than the bureau.

Details of the above broad categories of NFE information that the NFE database should maintain are described below.

1. ***Information in relation to NFE of the bureau:*** This category includes information in relation to
   - Participants/clienteles enrolment, attendant, dropouts, participants sat for exam, participants who passed exam in NFE programs by sex,
   - Facilitators/instructors (volunteers, non-volunteers (paid), trained, non-trained, etc),
   - NFE educational materials (the quantity of educational material by their items),

- Distribution of Learning Center at spatial level.

2. ***General statistical information in the region***: This category of includes

   - Population: Profiles of population distribution based on age group and education level. Literates/Illiterates information is expected to be included under this category.
   - School related data/information (number of primary school in a given locality, enrolment pattern, and dropouts)
   - NFE indicators such as, sex ratios of participants, percentages, population growth rate, illiteracy rate, etc.

3. ***Information in relation to organizations involved in NFE in the region other than the bureau:***

   - Directories of Organizations involved in NFE, such as organization's name, organization's type, address, contact person, target group, etc.
   - Project information: Information on projects undergoing by these organizations such as, project name, learning centers used by the project, its coverage.

Moreover, the database for NFE should include classifications by male/female, urban/rural, spatial levels such as, Zone, Wereda, and Kebele.

4.1.2 User Interface Requirements

In defining or specifying the user interface, the following points were taken into account.

♦Results of the input-output formats

♦Human factors for the user interface design. This includes, for example:

- What to do next or how to proceed next; i.e., the system should always provide instructions on how to proceed next or what to do next
- The system should anticipate error users might make, etc.

♦User requirements

Therefore, the interfacing requirements are listed below.

- Access control: Data maintenance (entry, editing, deletion, etc.) is allowed by authorized personnel
- Provision for interactive database access
- The system is expected to print information or export to other application (for example, to electronics spread sheet)
- Provision for NFE information (participants and facilitators) detail and easy navigation with related records
- Interface features for exporting/importing numerical/statistical information from other applications
- Search facility at Zone, Wereda, and Kebele level also to be included

4.1.3 General Requirements

- Developing uniform NFE information reporting format at each level

4.1.2 User Interface Requirements

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- Provision for NFE information (participants and facilitators) detail and easy navigation with related records
- Interface features for exporting/importing numerical/statistical information from other applications
- Search facility at Zone, Wereda, and Kebele level also to be included

4.1.3 General Requirements

- Developing uniform NFE information reporting format at each level

- Developing a NFE information input format that will be used for data entry (a source document) into the computer

4.1.4 Process Related

The activity of NFE data organization and maintenance starts when information arrives to the organization either through reports or survey. This is followed by preparing the information to be encoded into the computer, thus data are encoded to input format to be entered into the computer at later stage. The input format is prepared at Kebele level for all information specified in the requirement specifications. That is, the data is captured at grass root level. The encoder then enters the data/information using the input format.

As it can be understood from the above requirements and from the objective of the study (to propose information system on the over all situation of NFE programs) a NFE database based information system that fulfill the specification mentioned above is chosen as the appropriate tool to support the planning of NFE.

4.2 BASIC CONCEPTS IN OBJECT-ORIENTATION

The object-oriented approach to system development is based on the concept of 'object'. Objects are central concept in object technology. Rumbough (1991) defines an object as " a concept, abstraction, or thing with crisp boundaries and meaning for the problem at hand." It can be tangible or intangible. It can be a concept, abstraction, or thing that make sense in an application domain. An object has state, behavior, and identity (Hoffer, 1999). A *state* constitutes the object's properties (attribute and relationship) and the values of those

properties have. The value of an object's attribute determines its state. An object behavior represents how the objects acts and reacts. That is, the creation of objects, changing the state of an object, destroying an object and generating an event (Singer, 1997). In object-orientation, an object behavior is referred to as method or service (Bentley, 1998). Object identity refers to an object that has unique identity. The very feature of object that makes it significant in the object orientation approach is that it resembles more with the real world. Problems that are described in terms of objects are analogous with the way things are working with the natural environment.

Classes and instances: a class is a set of objects that share the common attribute and behavior (Bentley, 1988). It is also called an object class, which is a set of objects that share common structure and common behavior. Objects can be organized into classes. Each instance of a class conforms to an object. For example, consider a class of objects called person. If one person can walk, jump, and dance, all person can. And an object that belongs to a class of person is called an instance of the class person (Jacobson, 1992).

Message: Objects communicate through message. A message is passed when object invokes one or more of another object's methods (behaviors) to request information or some action.

Encapsulation: Encapsulation (information hiding) is the integration of the data with the process that operate on that data. Attribute and behavior are packed together so that access to the object's attribute is through the object's specified behavior (Bentely 1998). Details of the object that are not important to other objects are encapsulated, i.e., the data storage and the implementation of its method. Protecting the state of the object from any external

accidental change, while allowing behaviour(s) available to other objects helps to achieve encapsulation.

Class hierarchy and inheritance: Class may form a hierarchy, such that objects in any given class are automatically members of all its super class. All attributes and methods that apply to a class apply to its subclass as well. That is, methods and/or attributes defined in an object class can be inherited or reused by another object class (Whitten & Bentley, 1998; Cordes & Carves, 1992). Inheritance is the "property that occurs when entity types or objects classes are arranged in a hierarchy and each entity type or object class assumes the attribute method of its ancestors; i.e., those higher in the hierarchy" (Hoffer, 1999). With in a given hierarchy, objects at a lower level inherit the data and properties of the class at a higher level in the hierarchy. Object class is a logical grouping of objects that have the same (or similar) attribute and behaviour (methods). Inheritance is one of the major advantages of using object-oriented model. It allows new but related classes to be derived from existing classes. Inheritance helps to show similarities in class, which other classes can inherit. It allows reusing of common description; i.e., code reuse. It is possible to generalize/specialize classes in an inheritance hierarchy. By means of extracting and sharing common feature, one can generalize classes and place them higher up in an inheritance hierarchy.

Polymorphism: Polymorphism means occurring in various forms (David Brown, 1997) Instances together provide us with the dynamic behavior in O-O model. When instances start to communicate with each other the system's behavior is performed. An instance sends a stimulus to another instance, but does not have to be aware of which class the receiving instance belongs to, then this called polymorphism.; i.e., the sending instance does

not need to know the receiving class instance (Jacobson 1992; David 1997). Polymorphism allows to specialize a behavior for particular subclasses.

4.3 DESIGN METHOD

In this study the employed method is largely based on Lorenz's (1993) object-oriented software development methods. The methodology employs a general sequence of activities that bounce back and forth while developing the system. Use cases are the core of the methodology, which is a set of usage scenarios in terms of events initiated from outside the system boundary. Singer (1997) advocate the use of use cases in the analysis and design method, since use cases assist in the development of requirement elicitation, requirement specification, implementation, testing and achieve full life cycle traceability. Bentley (1998) and Lorenz (1993) also advocates the benefit of uses cases as a tool for validating requirements, an effective communication tool, and a basis for a user's manual.

The Lorenz's (1993) steps are the following:

- Write use cases: write down what is heard from the user in using the system
- Verify use case with the user
- Extract the document requirements from use case
- Update requirements
- Expand responsibilities
- Add new classes when needed
- Draw collaboration diagram
    - Identify the classes
    - Identify the attributes

- Identify the responsibilities/methods
- identify the subsystem
- identify the contracts

- Place classes in the inheritance hierarchies
- Walk through the design diagrams and documentation
  - expand responsibilities needed
  - add new classes as needed
- Implement sub systems
- System test

4.4 USE CASES OF NFE DATA/INFORMATION AT AMHARA REGION EDUCATION BUREAU

From the requirement list the following use cases were identified:

- Access control
- Maintain Projects
- Maintenance of NFE Program,
  - create a new NFE program record
  - update the newly created NFE program record
  - delete the record
  - search NFE program participants and/or facilitators
- List NFE information (participants and their facilitators)

Access Control is a repeated use case when actors initiate any other uses case. The descriptions of scenarios for the above use cases are listed below.

Figure 4. 1: Use cases

USE CASE - ACCESS CONTROL

A machine is made available at different section to be used by users within the organisation. The user is prompted for user name and password. If it matches with his/her password and user name in the database, a menu choice of actions on the screen appears. If the password does not match, the user is shown a message on the screen.

USE CASE - CREATE NFE PROGRAM

<USE CASE - ACCESS CONTROL is prerequisite> If create button is pressed, the user is allowed to enter the detail. If the record exists, the system displays a message on the screen, the new detail will not be recorded. The user is allowed to then request another action or exit.

USE CASE - UPDATE PARTICIPANTS

<USE CASE - ACCESS CONTROL is prerequisite> If update button is pressed, the user is asked to enter Kebele name and NFE type, if it exists the user is allowed to edit the detail, else the system displays a message on the screen. The user is allowed to then request another action or exit.

USE CASE - DELETE NFE DATA/INFORMATION

<USE CASE - ACCESS CONTROL, is prerequisite> This use case searches and delete any mistakenly entered data.

USE CASE - LIST NFE INFORMATION

<USE CASE - ACCESS CONTROL is prerequisite> If list button is pressed, the user is asked to enter/select any spatial level (Zone, Wereda, Kebele), and/or start date and end date, all information matching the searching argument is displayed as report. The user is allowed to then request another action or exit.

USE CASE - SEARCH NFE PROGRAM

<USE CASE - ACCESS CONTROL is prerequisite> If search button is pressed, the user is asked to enter NFE program type, start date and end date, if it exists the record is displayed on the screen, else the system displays a message on the screen. . The user is allowed to then request another action or exit.

USE CASE - UPDATE NFE PROGRAM

<USE CASE - ACCESS CONTROL is prerequisite> If update button is pressed, the user is asked to enter NFE program type, start date and end date of the NFE, if it exists the user is allowed to edit the detail, else the system displays a message on the screen. The user is allowed to then request another action or exit.

4.5 CLASSES

Lists of key nouns in the problem domain can be gathered from the requirements documents and/or use case as potential classes (Lorenze, 1993). Hence, from requirements specification and from the above use cases the following application and interface class have been identified.

Table 4.1: Application classes

Project	Spatial Administration
Clienteles/Participants	Zone
Facilitators	Wereda
Learning Centers	Kebele
Education Materials	School
NGOs	Population
Government	Special Agency
Organization	Budget

AREB_IMunit (Amhara Region Education Bureau Information Management unit)	Program

Table 4.2: Interface classes

Input	Display
Window	Printer
Menu	File
Output	

4.6 COLLABORATION DIAGRAMS

The following section provides collaboration diagrams of major subsystems, classes and contracts. It also presents class inheritance and relationships.

Collaboration diagram is a graphical view of an object-oriented system design including subsystems, classes, and contract usage. Classes collaborate by delegating work to the most appropriate class to carry out a requested service for a client. (Lorenz, 1993).

A contract is a simplifying abstraction of related public behavior/responsibilities, which are provided by subsystems and classes. Subsystems are a group of classes that work together to provide a group of functions, (Lorenz, 1993).

Figure 4. 2: Collaboration Diagrams

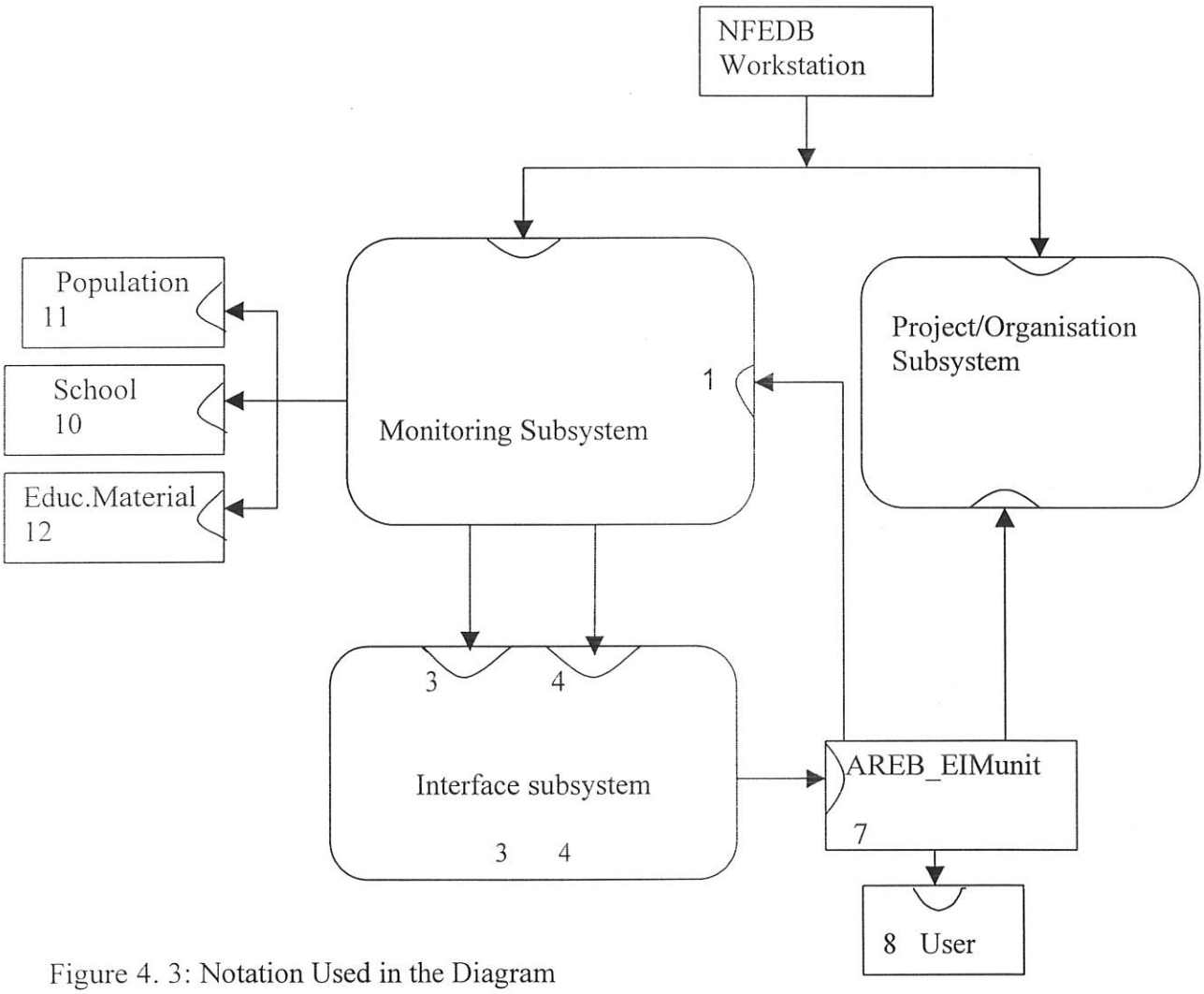


Figure 4. 3: Notation Used in the Diagram

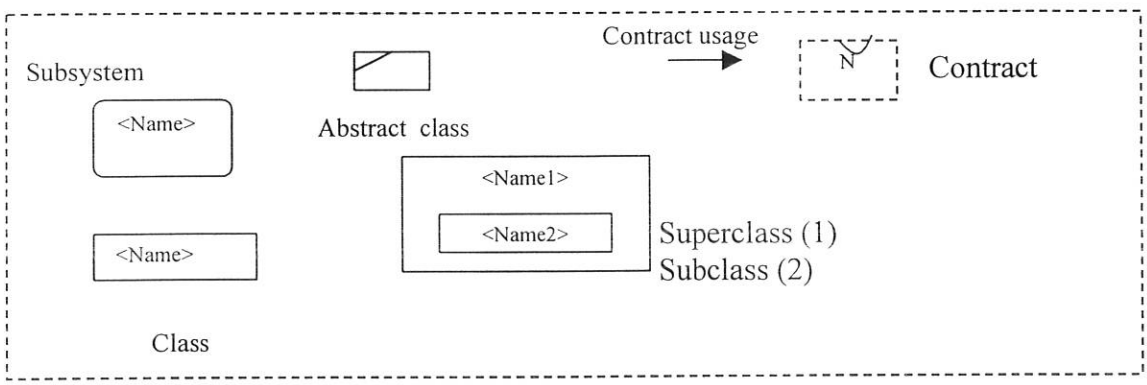


Figure 4. 4: NFE Information and Organizations/Projects Subsystems

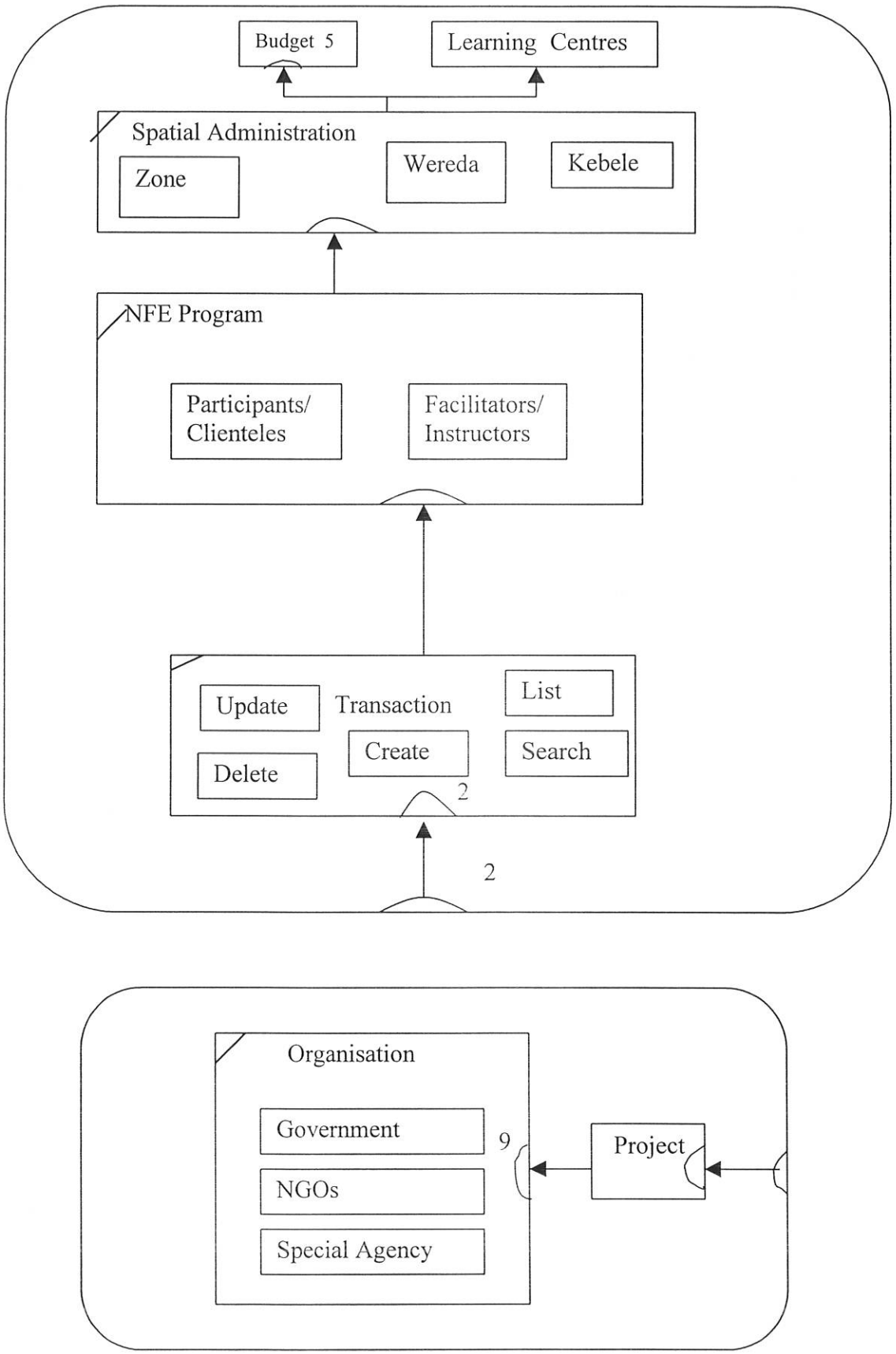
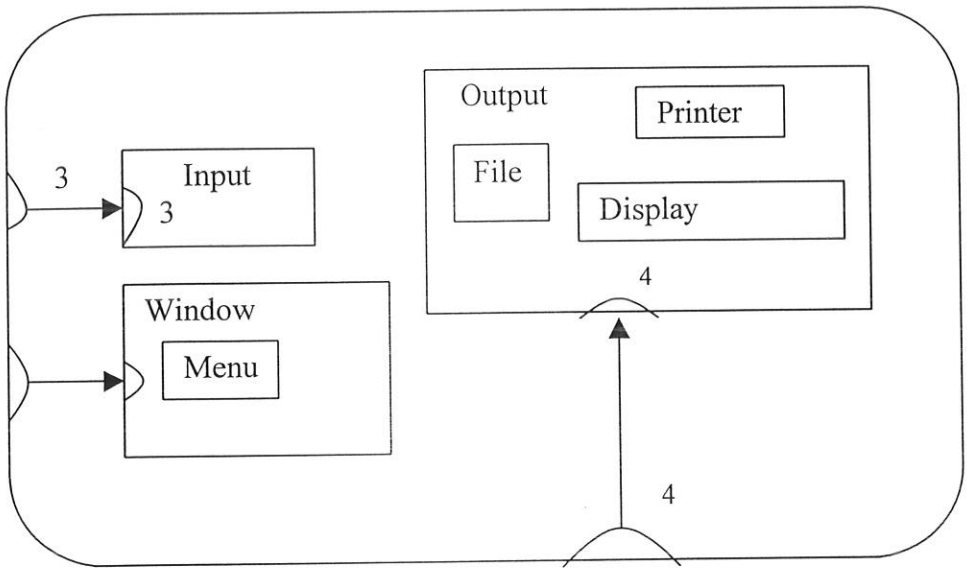


Figure 4. 5: Interface subsystem



The above subsystems shown are portion of the system, broken along major functionality boundaries. Similar classes that are used for similar purpose have been grouped together into a subsystem to achieve strong coupling between classes (classes that deal with each other are kept/grouped together into a subsystem).

MONITORING SUBSYSTEM

DESCRIPTION: Co-ordinate the activities related to transaction affecting NFE information system.

CONTRACT	**RESPONSIBLE CLASS**
Process Transaction	Transaction

ORGANISATION/PROJECT SUBSYSTEM

DESCRIPTION: Co-ordinate the activities related to organisations and their projects.

CONTRACT	**RESPONSIBLE CLASS**
Maintain & Associate Project	Organisation, Project

INTERFACE SUBSYSTEM

DESCRIPTION: This subsystem consists of the classes that communicate to and from the user.

CONTRACT	**RESPONSIBLE CLASS**
Get user input	input
Put output to the user	output

Figure 4. 6: Description of NFE Database Contracts

CONTRACT 1 - MAINTAIN NFE PROGRAM

DESCRIPTION: provide basic function for the maintenance of participants and facilitators engaged in a particular NFE program.

Server	NFE program
Clients	Transaction, and its sub classes,

CONTRACT 6 - ASSOCIATE SPATIAL ADMINISTRATION

DESCRIPTION: provide basic function that maintain and associate spatial administration with NFE program class.

Server	Spatial administration
Clients	NFE program and its sub classes

CONTRACT 2 - PROCESSES TRANSACTION

DESCRIPTION: Processes the NFE information maintenance services available at the NFEDB workstation.

Server	Transaction
Clients	AREB_NFEDB_workstation

CONTRACT 5 - MAINTAIN BUDGET

DESCRIPTION: provide basic function that maintains budget information allocated for NFE program for spatial administation.

Server	Spatial Adm.
Clients	Budget

CONTRACT 4 - PUT OUTPUT TO THE USER

DESCRIPTION: Provide output to the user

Server	Output
Clients	Transaction

CONTRACT 11 -MAINTAIN AND ASSOCIATE POPULATION

DESCRIPTION: Handles population information and associate with spatial administration.

Server	Population
Clients	Spatial administration

CONTRACT 8 - VERIFY PASSWORD

DESCRIPTION: make sure that the user has the right password

Server	User
Clients	AREB_EIM unit

CONTRACT 7 - VERIFY USER

DESCRIPTION: Make sure that the create, update and delete transactions can be started for the user.

Server	AREB_EIM unit
Clients	Input

CONTRACT 9 - MAINTAIN AND ASSOCIATE PROJECT

DESCRIPTION: Maintain and associate projects with organisation.

Server	Organisation
Clients	Project

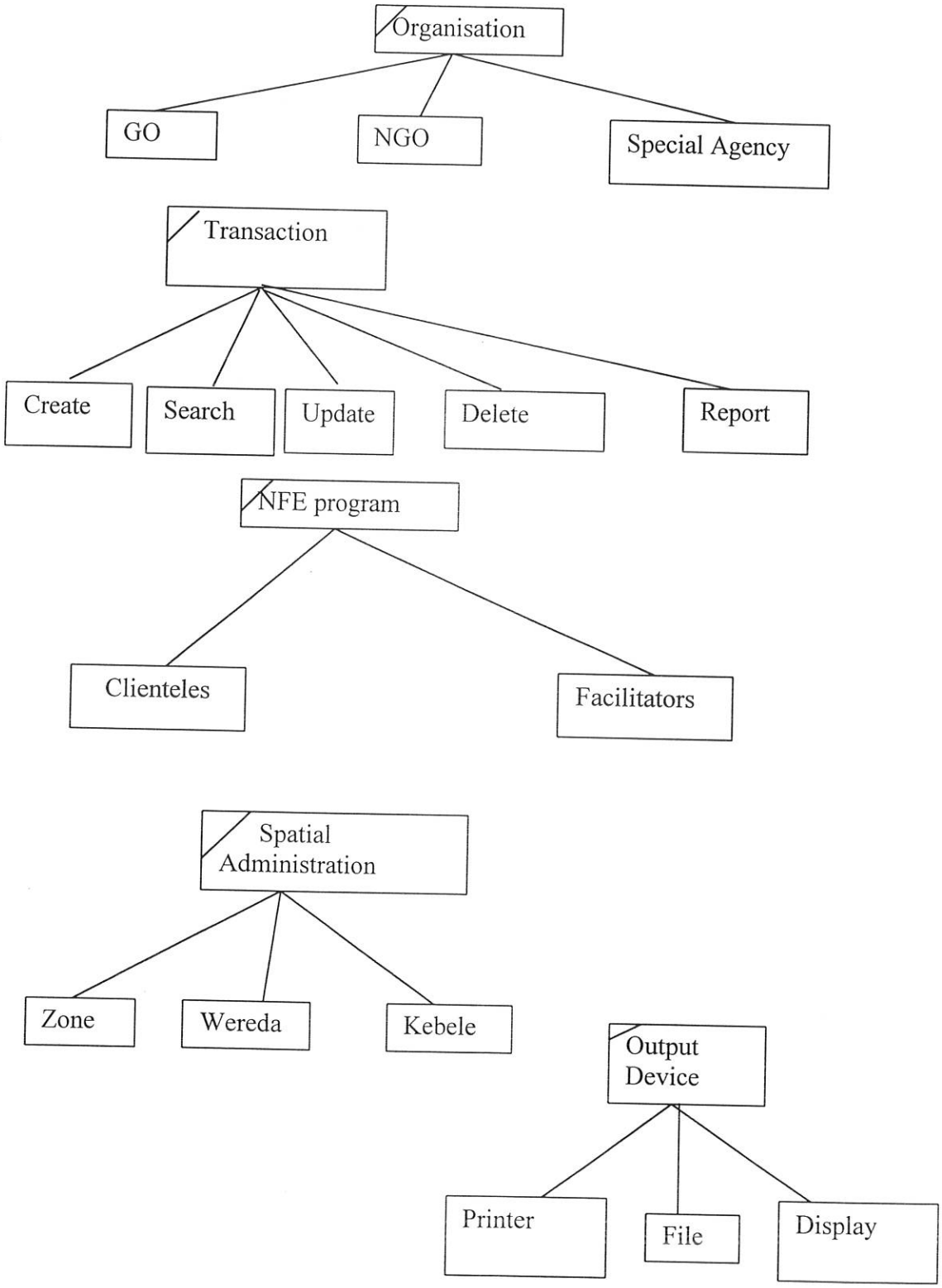
CONTRACT 3 - GET USER INPUT

DESCRIPTION: Handles input from the user.

Server	Input,
Clients	NFEDB_workstation

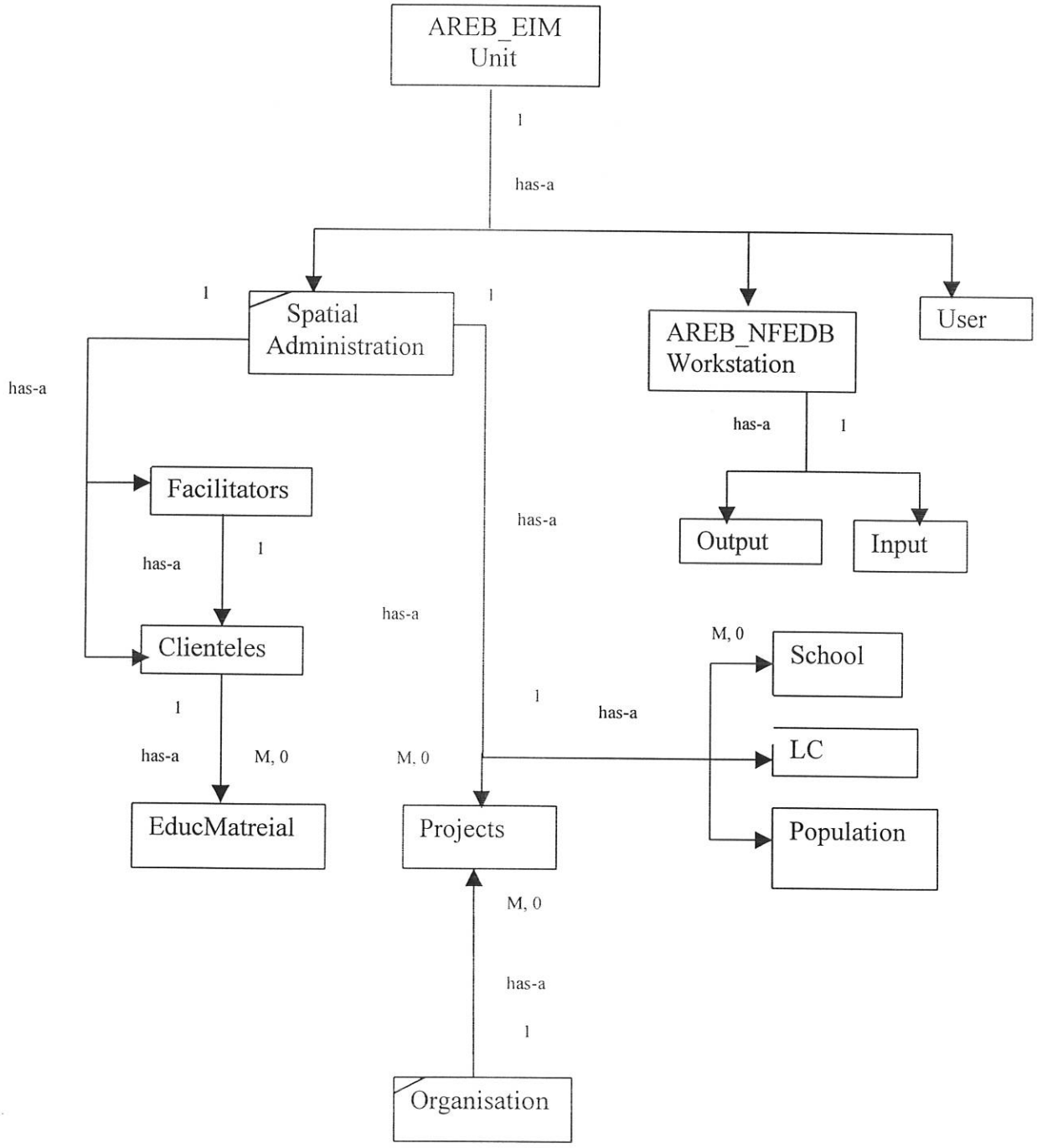
4.7 INHERITANCE HIERARCHIES

Figure 4. 7: NFE Inheritance Hierarchies



4.8 CARDINALITY RELATIONSHIP

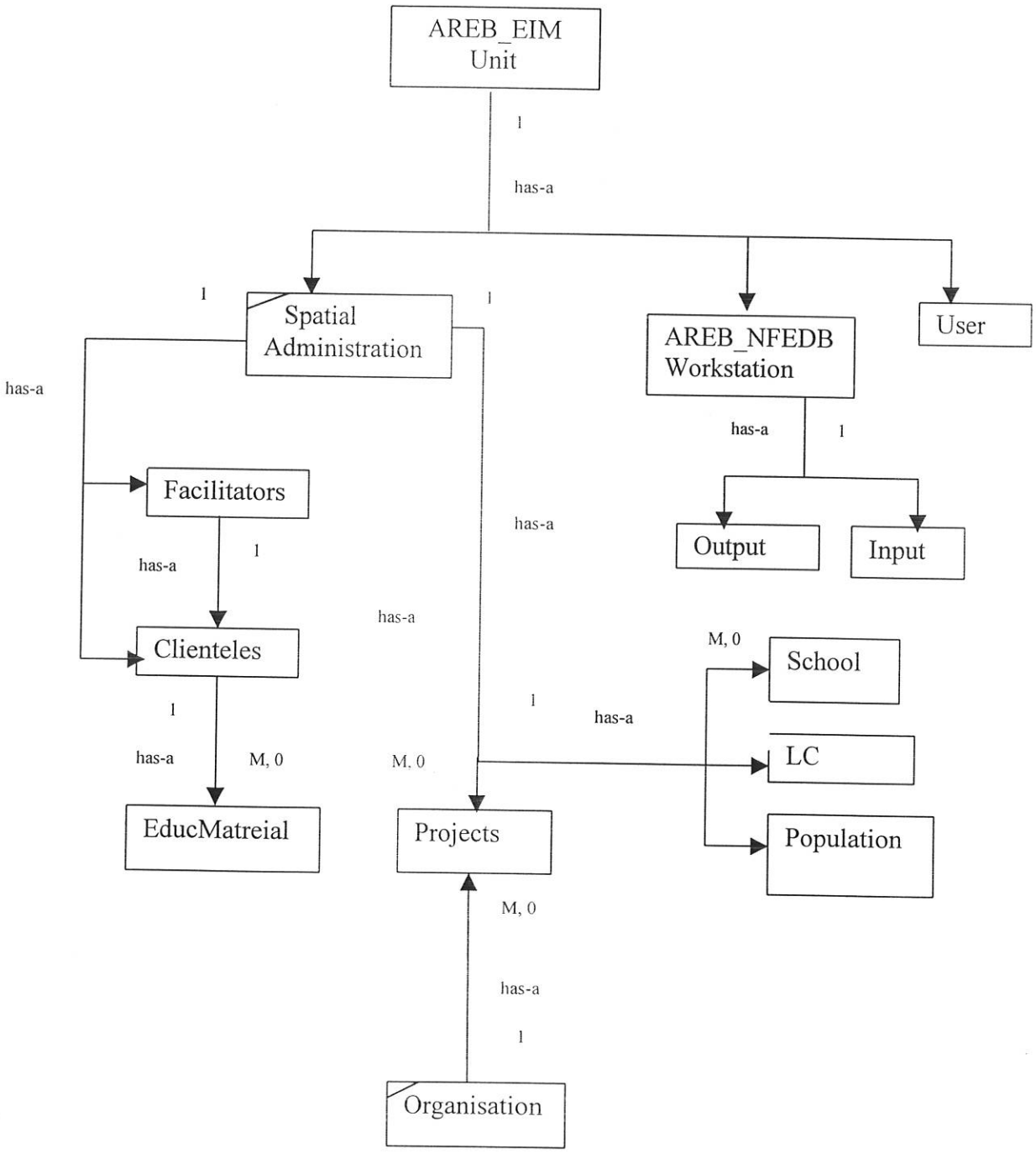
Figure 4. 8: Cardinality Relationship*



* The arrow shows cardinality relationships (one-to-one, one-to many, etc.)

4.8 CARDINALITY RELATIONSHIP

Figure 4. 8: Cardinality Relationship*



* The arrow shows cardinality relationships (one-to-one, one-to many, etc.)

4.9 CLASS DEFINITION

Descriptions of the class definition are listed below in Table 4.1. The classes definitions include only for the problem domain. Classes of interface objects are not defined. This is due to clearly and briefly elaborates the domain classes. The tables summarize the behavior and state data identified for the application classes

Table 4.1: Class Definitions

NFE_PROGRAM CLASS

Description - The NFE program class is an abstract class that provide all attribute and services to all NFE participants and facilitators objects

Superclass - none
Subclass - Clienteles, and Facilitators

CONTRACTS

Maintain NFE Information is sub-class responsibility.
(methods are listed below under RESPONSIBILITY)

Responsibility	**Description**
SexRatio	compute the sex ratio of (the ratio of Male to Female) engaged in a program

Data	**Description**
NFEType	the type of NFE program (Level-I, Level-II, Level-III, Training, etc.)
StartDate	the date at which a particular NFE starts
EndDate	the date at which a particular NFE ends

CLIENTELES/PARTICIPANTS

Description - The clienteles class is an abstract class that provide all attribute and services to clienteles objects

Superclass - NFE_program
Subclass - none

CONTRACTS

Maintain NFE Information is implemented by the following public methods.
(Methods are listed below under RESPONSIBILITY)

Responsibility	Description
Repeaters	computes the number of repeaters
Dropouts	computes the number of participants who discontinue NFE

Data	Description
MalEnrolle	the number of male participant enrolled in the program
FemEnrolle	the number of female participant enrolled in the program
MalAttendant	the number of male participant attending the program
FemAttendant	the number of female participant attending the program
MalSatExam	the number of male participant who sat for exam
FemSatExam	the number of female participant who sat for exam
MalPassExam	the number of male participant who pass/complete exam/training program
FemPassExam	the number of female participant who pass/complete exam/training program

CLIENTELES/PARTICIPANTS

Description - The clienteles class is an abstract class that provide all attribute and services to clienteles objects

Superclass - NFE_program
Subclass - none

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FemSatExam	the number of female participant who sat for exam
MalPassExam	the number of male participant who pass/complete exam/training program
FemPassExam	the number of female participant who pass/complete exam/training program

TRANSACTION CLASS

Description - the transaction class is an abstract class to provide common services to all transactions.

Superclass - none
Subclass - create, update, delete, search, list/report

CONTRACTS

Process transaction is a subclass responsibility
a) MaintainProgramDetail

RESPONSIBILITY	**DESCRIPTION**
VerifyProgramRecordExist	verify the Program's existence before any action is taken place

DATA	**DESCRIPTION**
NFEType	The identification associated with the Program's class
StartDate	
EndDate	

CREATE CLASS

Description - the Update class services the editing of Participants/Clienteles information. This transaction is created by the transaction class. This transaction is a transient object.

Superclass - Transaction
Subclass - none

CONTRACTS

Process transaction is implemented by the following public method.
a) CreateProgram:
b) WriteProgramDetail:

RESPONSIBILITY	DESCRIPTION
CreateProgram: NFEType, StartDate, &EndDate	create a NFE program record with NFEType, StartDate, and EndDate
WriteProgramDetail: ProgramDetail	Write its detail for this Program

POPULATION CLASS

Description - the population class is a data repository, maintaining population distribution at spatial level.

Superclass - persistent
Subclass - none

CONTRACTS

Maintain & Associate Adult Population is implemented by this class.

TotalPopulation	compute the total population at each education level and age group
GrowthRate	compute the growth rate of the population
PercentageOfilliterate	compute the percentage illiterate population

Data	**Description**
AgeGruop	the age group of the population
Illiterate	the number of illiterate male and female
1-4	the number of population (male/female) in the first cycle
5-8	the number of population (male/female) in the 2nd cycle
8-10	the number of population (male/female) in the 3rd cycle
AboveTen	

EDUC_MATERIAL CLASS

Description - the Educational Material class is a data repository, maintaining educational material information that are related to the participant class.

Superclass -persistent
Subclass - none

CONTRACTS

Maintain Materials is implemented by this class

Data	**Description**
ItemNo	the identification number for educational material
ItemName	the name of the education material
ItemDescription	the description for which the item is used for
Quantity	the number of educational material in a given item number

AREB_NFEDB WORKSTATION CLASS

Description - the AREB_NFEDB (Amhara Region Education Bureau NFE Database) workstation class is responsible for providing NFE information services available for the organisation users, creating the appropriate transactions. There is one instance of this class for each workstation.

Superclass - object
Subclass - none
Contacts - none

RESPONSIBILITY	**DESCRIPTION**
aCreateTransaction:	Initiate the appropriate transaction.
aNFEType, aStartDate, aEndDate:	Get the NFEType, StartDate, and EndDate the user wants to take action
aProgramInfo:	Get the Program's information the user wants to update or create a new one
aKebeleName:	Get the Kebele name for which the user wants to take action
Iterate:	allow user to request another action.

FACILITATOR CLASS

Description - The Facilitator class maintains information on Facilitator objects.

Superclass - NFE_program

Subclass - none

Data	**Description**
VolenTrainMale	the number of trained volunteer male facilitators/instructors
VolenTrainFem	the number of trained volunteer female facilitators/instructors
VolenNotTrainMale	the number of volunteer untrained male facilitators
VolenNotTrainFem	the number of volunteer untrained female facilitators
PaidTrainMale	the number of paid trained male facilitators
PaidTrainFem	the number of paid trained female facilitators
PaidNotTrainMale	the number of paid untrained male facilitators
PaidNotTrainFem	the number of paid untrained female facilitators
Remark	remarks about the sources of these facilitators

LEARNING_CENTRE CLASS

Description - The Learning Centre class is a class that provide all attribute and services to Learning Centre objects at spatial administration

Superclass - none

Subclass - none

CONTRACTS

Maintain LearningCenter is implemented by the following public methods.
(methods are listed below under RESPONSIBILITY)

RESPONSIBILITY	**Description**
DiplayLC	show the number of functional and non-functional learning centre

Data	**Description**
LCType	the type of learning centres used as a class room (tree shed, primary school, etc.). On the average a typical LC contains 50 adults.
Functional	the number of currently working learning
NonFunctionalLC	the number of not working learning centres

SCHOOL CLASS

Description - The School class is a data repository class that maintain formal school system related information

Superclass - persistent
Subclass - none

Maintain School is implemented by this class.

Data	**Description**
SchoolType	the type of school (primary or junior secondary school)
NoOfSchool	the quantity of schools
MalEnrolment	the number male enrolment
FemEnrolment	the number of female enrolment
MalDropout	the number of male dropout
FemDropout	the number of female dropout

ORGANISATION CLASS

Description - The Organisation class is an abstract data repository class on about organisations" directory.

Superclass -Persistent class
Subclass - Government, NGO, Special Agency

CONTRACTS

Maintain & Associate Organisation is implemented by this class.

RESPONSIBILITY	**Description**
DisplayProject	shows the associated projects run by the organisation

Data	**Description**
OrgID	*identification code for an organisation*
Name	the name of the organization
Acronym	the abbreviation used to name the organization
P.O.Box:	the postal office box
Tele	telephone number
e-mail	internet address
ContactPerson	the person that co-ordinate NFE programmes on behalf of the organisation.

GOVERNMENT CLASS

Description - The government class is a data repository for government objects.

Superclass -Organisation
Subclass - none

CONTRACTS

Maintain & Associate Organisation is implemented by this class.

Data	**Description**
Sector	the sectors (Health, agriculture, Gender, etc) in which the government object is involved
FocusArear	this takes values: mother & child care, sex education, fertiliser usage, improved practices, etc. the organisation involved.

NGOs CLASS

Description - The NGOs class is a data repository for non-governmental organisations objects

Super class -Organisation
Sub class - none

CONTRACTS

Maintain & Associate Organisation is implemented by this class.

Data	**Description**
NGOType	classifications such as local, International, International religious,
CRDAMember	whether the NGO is member of the CRDA (this will take value Yes or No)

SPATIAL ADMINISTRATION CLASS

Description - the spatial administration is an abstract class that provide all attribute and services to spatial objects

Superclass - none
Subclass - none

CONTRACTS

Associate Spatial Administration is implemented by the following methods:

RESPONSIBILITY	**Description**
DisplaySpatial	allow the display of spatial objects

Data	**Description**
SpatialName	the classification name of spatial administration
SpatialLevel	the administrative level of the spatial entity

NGOs CLASS

Description - The NGOs class is a data repository for non-governmental organisations objects

Super class -Organisation
Sub class - none

CONTRACTS

Maintain & Associate Organisation is implemented by this class.

Data	**Description**
NGOType	classifications such as local, International, International religious,
CRDAMember	whether the NGO is member of the CRDA (this will take value Yes or No)

SPATIAL ADMINISTRATION CLASS

Description - the spatial administration is an abstract class that provide all attribute and services to spatial objects

Superclass - none
Subclass - none

CONTRACTS

Associate Spatial Administration is implemented by the following methods:

RESPONSIBILITY	**Description**
DisplaySpatial	allow the display of spatial objects

Data	**Description**
SpatialName	the classification name of spatial administration
SpatialLevel	the administrative level of the spatial entity

WEREDA CLASS

Description - The Wereda class is a persistent class that maintain and provide information on Wereda object.

Superclass - SpatialAdm
Subclass - none

Associate Spatial Administration is implemented by this class

Data	**Description**
GovTeam	the number of government teams found in a given Wereda. A GovTeam is representative of government bureaus/institutions at the grass root level and contains a group of three persons. For example government team on gender matter deals with all affairs about women on behalf of the government and collaborate with NGOs and the community.

ZONE CLASS

Description - the Zone class is a class that provide all attribute and services to zone objects

Superclass - SpatialAdm
Subclass - none

CONTRACTS

Associate Spatial Administration is implemented by this class:

Data	**Description**
Language	The media of instruction of NFE (Amharic, Afan Oromo, Agewigna, and Tigrigna)

KEBELE CLASS

Description - the Kebele class is a class for all services to spatial objects

Superclass - SpatialAdm
Subclass - none

CONTRACTS

Associate Spatial Administration is implemented by this class:

Data	**Description**
Village	the number of Gute/Mender in Kebele. A village can contains more than one learning centres

PROJECT CLASS

Description - The project class maintains information on NFE projects being undertaken by organisation other than the education bureau in the Amhara Regional State

Superclass -non
Subclass - none

CONTRACTS

Maintain & Associate Organisation is implemented by this class.

Data	**Description**
ProjectNo	projects identification code that identifies project in the region
ProjectName	the name of the projects
LCused	the number of learning centres used by the projects
MaleParticip	the number of male participants in the project
FemParticip	the number of female participants in the project
TargateGroup	the target group of the project
ProjectBegins	the date when the project begins
ProjectEnds	the date when the project ends

4.10 DESIGN OF THE PROTOTYPE

Due to limitation of time it was not possible to develop a prototype for all the classes and subsystems described in the previous chapter. Since the monitoring subsystem is the main and the most complex part of the proposed subsystem, the prototype is developed for this subsystem of the NFEDB system. Relational database management system (RDBMS) was used to develop the prototype. Relational databases allow the users of data to avoid dealing directly with storage structure and devices. It is still the choice of data that naturally represented as table (Singer, 1997), and allows convenient access to information stored in any table; i.e., *ad hoc* queries.

4.8.1 Objects into RDBMS Tables

A table in the database represents each one of the objects identified in the NFE information subsystem. In order to achieve the strategy the logical database design the following object conversion into tables is considered (Jackobson, 1993). That is, an object is mapped into tables in one of the following manner:

- one table is assigned for each object
- objects attribute becomes column in a table
- classes instances (objects) are now represented as record (a row) in the table

In the expression of inheritnace in the RDBMS, no table will represent the abstract class.

4.8.2 Database Design

What follows is brief description of database design of the prototype. Sample of forms and reports used for the database design has been attached in Appendix D. The objects used for the design of the prototype database were Facilitators, Participants, Learning Centers, NGOs, Project, Budget, Zone, Wereda, and Kebele. The normalized entity relationship diagram and detail explanations of the attributes in each entity have been described in Figure 4.9 and Table 4.2, respectively. The Microsoft Access RDBMS is used to change the above objects into tables. The objects provided by Microsoft Access represents the forms, reports, controls, and modules in the prototype.

The data dictionary contains the following information.

- Field name or attribute,
- Data type,
- Field length,
- Whether the field is a primary key or not,
- Whether the field is a foreign key in the table,
- Nullity: whether the field is required or not,
- Indexed or not (for retrieval purpose), and
- Description: brief description about the attribute.

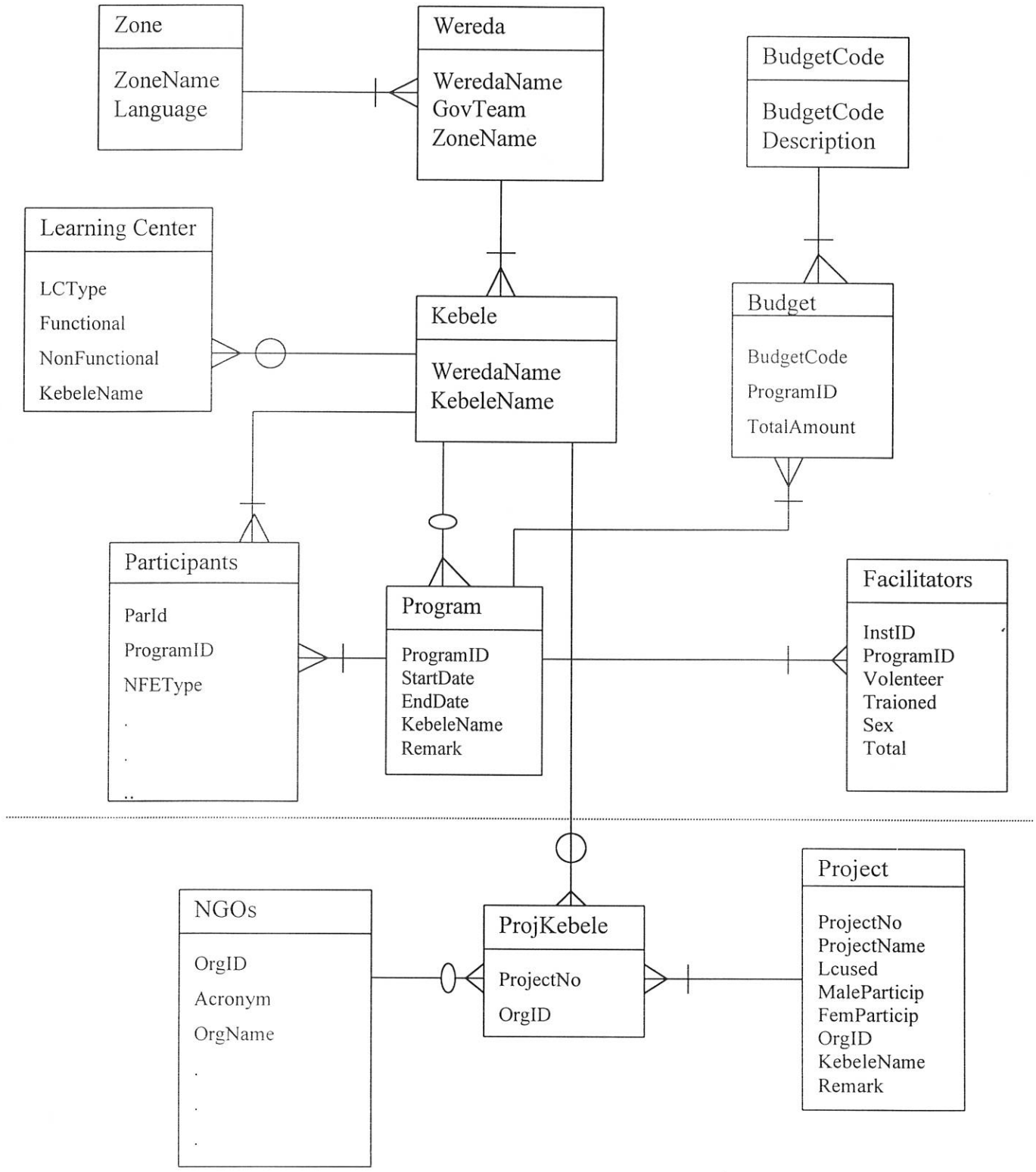


Figure 4. 9: The Entity Relationship (ER) Diagram of the prototype after normalization (The broken line shows boundaries for subsystems)

Table 4.2: Data dictionary for the prototype NFE database*

Participants

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
ParID	Autonumber	Int	Yes	No	Not null	Yes	This primary key identifies a particular type of participants by NFE, Kebele, start date and end date of program.
ProgramID	Number	Int	No	Yes	Not null		
NFEType	Text	10	-	-	Not null	Yes	The education/training type that classifies participants (Level-I, Level-II, Level-III, Training, etc)
MalEnrolle	Number	Int	-	-	Not null	No	
FemEnrolle	Number	Int	-	-	Not null	No	
MalAttendant	Number	Int	-	-	Null	No	
FemAttendant	Number	Int	-	-	Null	No	
MalSatExam	Number	Int	-	-	Null	No	
FemSatExam	Number	Int	-	-	Null	No	
MalPassExam	Number	Int	-	-	Null	No	
FemPassExam	Number	Int	-	-	Null	No	
Kebele	Text	15	No	Yes	Not null	Yes	
StartDate	Date/Time		-	-	Not null	Yes	The date when the program starts. The same program can start at different time.
EndDate	Date/Time		-	-	Not null	Yes	
InstID	Text	10	No	Yes	Not null	Yes	

* The definition of some fields are not described, since these fields have already been described in the definition of classes (See the objects/classes definition in Table 4.1)

Facilitators

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
InstID	Autonumber	Int	Yes	No	Not null	Yes	Facilitators are categorized in a certain group. The group is identified by their data type (Boolean) as described in the data type column. The Boolean data types take values: Y for Yes N for No.
ProgramID	Int		No	Yes	Not Null	Yes	
Volenteer	Boolean	One	-	-	Null	Yes	
Trained	Boolean	One	-	-	Null	Yes	
Sex	Boolean	One	-	-	Null	Yes	
Total	Int.		-	-	Null	-	The total number of facilitators

Program

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
ProgramID	Autonumber	Int	Yes	No	Not null	Yes	Kebele, start date, end date and Kebele together identifies a particular program.
Kebele	Text	15	No	Yes	Not null	Yes	
StartDate	Date/Time		-	-	Not null	Yes	The date when the program starts. The same program can start at different time.
EndDate	Date/Time		-	-	Not null	Yes	

Project

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
ProjectNo	Text	10	Yes	No	Not null	Yes	The project identification
ProjectName	Text	30	-	-	Not null	No	The name of the project
LCused	Number	Int	-	-	Null	No	LC used by the project
MaleParticip	Number	Int	-	-	Null	No	
FemParticip	Number	Int	-	-	Null	No	
KebeleName	Text	15	No	Yes	Not null	Yes	
StartDate	Date/Time		-	-	Not null	Yes	
EndDate	Date/Time		-	-	null	No	
Remark	Memo	10	No	Yes	Not null	Yes	Projects that target special clientele such as street children, disabilities, etc. should be maintained

OrgProject

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
OrgID	Text	15	Yes	No	Not null	Yes	This table avoids the many to many relationships that could have been existed between organisation and project
ProjectNo	Text	10	Yes	No	Not null	Yes	

NGOs

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
OrgID	Text	15	Yes	No	Not null	Yes	This ID is made of organisation acronym, year.
Acronym	Text	10	-	-	Not null	Yes	
OrgName	Text	30	-	-	Null	No	
OrgType	Text	20	-	-	Null	No	
POBox	Text	10	-	-	Null	No	
Tele	Text	10	-	-	Null	No	
e-mail	Text	35t	-	-	Null	No	
ContactPerson	Text	20	-	-	Null	No	
CRDAMember	Yes/No		-	-	Null	No	This field takes Yes if an NGO is member of CRDA, No otherwise

Learning Centres

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
LCType	Text	10	Yes	No	Not null	Yes	The type of learning centres
Functional	Number	Int	-	-	Null	No	LC currently working
NonFunctional	Number	Int	-	-	Null	No	LC currently not working
Kebele	Text	15	No	Yes	Not null	Yes	

Zone

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
Zone	Text	10	Yes	No	Not null	Yes	
Language	Text	12	-	-	-	No	The media of instruction in which the NFE program is conducted such as Amharic, Afan oromo, Agewigna, etc.)

Wereda

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
Wereda	Text	15	Yes	No	Not null	Yes	
GovTeam	Number	Int.	-	-	Null	No	The number of government team at Wereda
Zone	Text	15	No	Yes	Not null	Yes	

Kebele

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
Kebele	Text	15	Yes	No	Not null	Yes	
Village	Number		-	-	null	No	The number of village/Gute
Wereda	Text	15	No	Yes	Not null	Yes	

OrgProject

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
ProjectNo	Text	10	Yes	No	Not null	Yes	Kebele can have more than one projects. The same project can be conducted in different Kebele. Thus this table eliminate the many to many relationship between Kebele and project table.
Kebele	Text	15	Yes	No	Not null	Yes	

BudgetCode

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
BudgetCode	Text	12	Yes	No	Not null	Yes	Budget identification code
BugdetItem	Text	30	-	-	Null	No	Description of items/activities
FundSource	Text	20	-	-	Null	No	The source of fund such as assistance, loan, community contribution, government, etc.

Budget

Field Name	Data Type	Field Length	Primary Key	Foreign Key	Nullity	Indexed	Description
BudgetCode	Text	12	Yes	No	Not null	Yes	
ProgramID	Int.		No	Yes	Not null	No	
TotalAmount	Int.		-	-	Not null	No	

Users in a similar organization, i.e., Ministry of Education were used to demonstrate the prototype and users comments has been included.

Figure 4. 10: The Main Menu

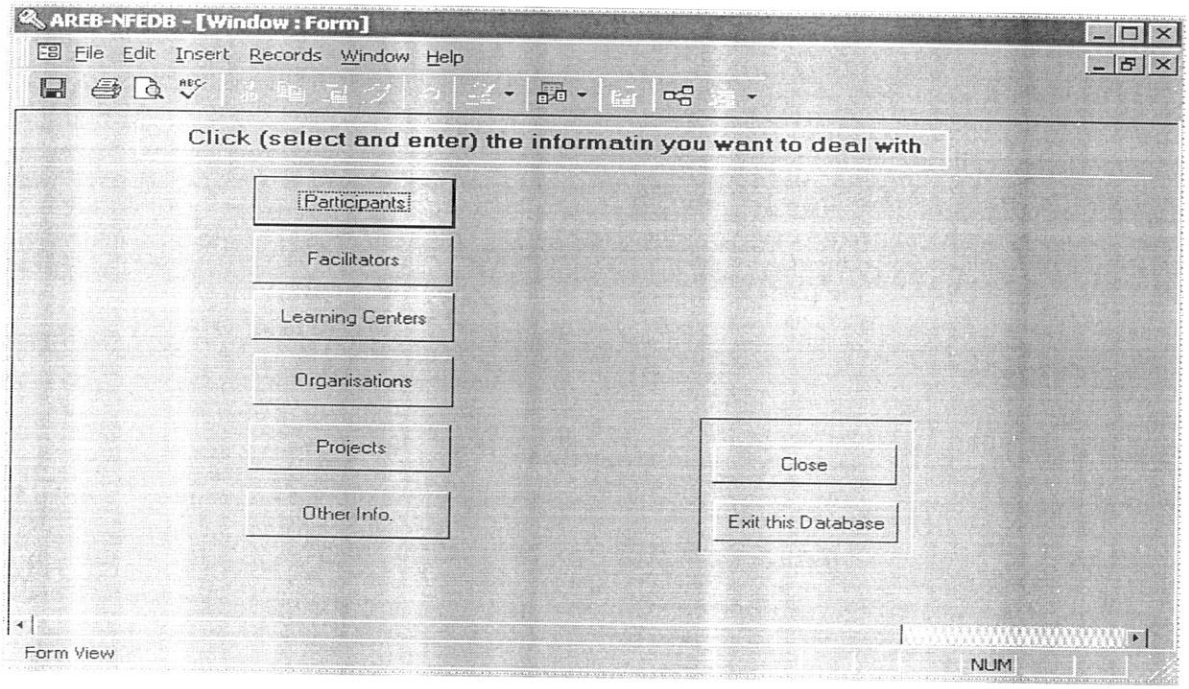
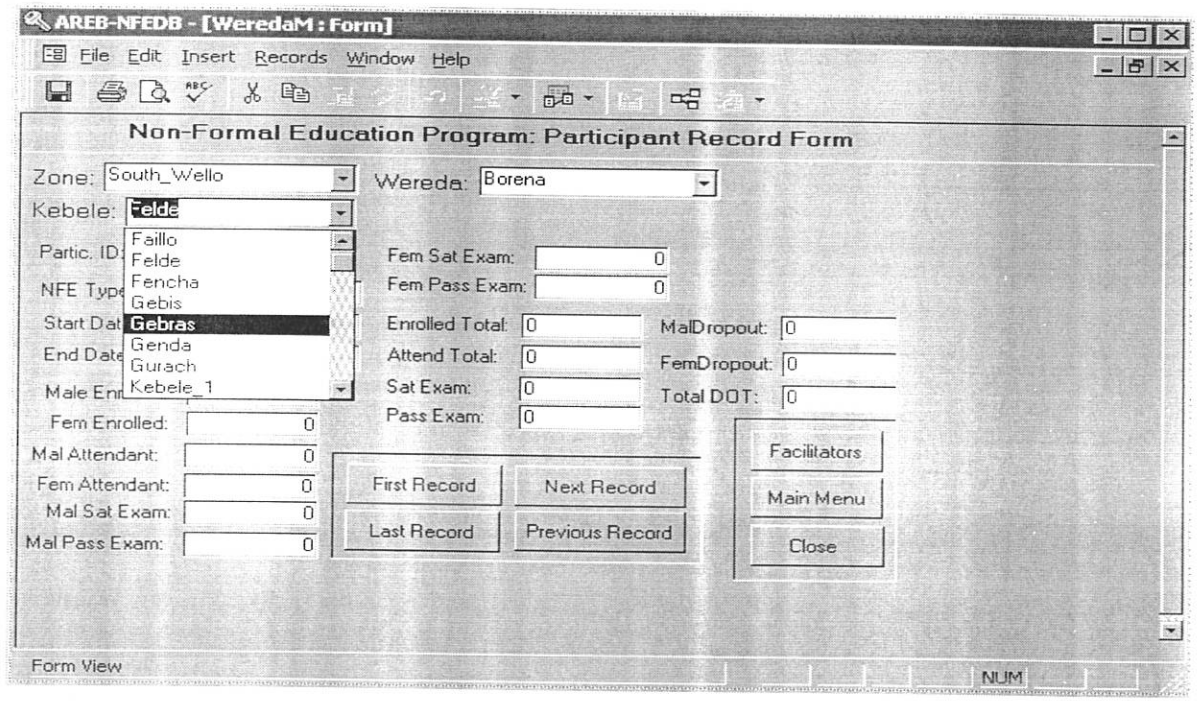


Figure 4. 11: Participants Data Entry Form



Users in a similar organization, i.e., Ministry of Education were used to demonstrate the prototype and users comments has been included.

Figure 4. 10: The Main Menu

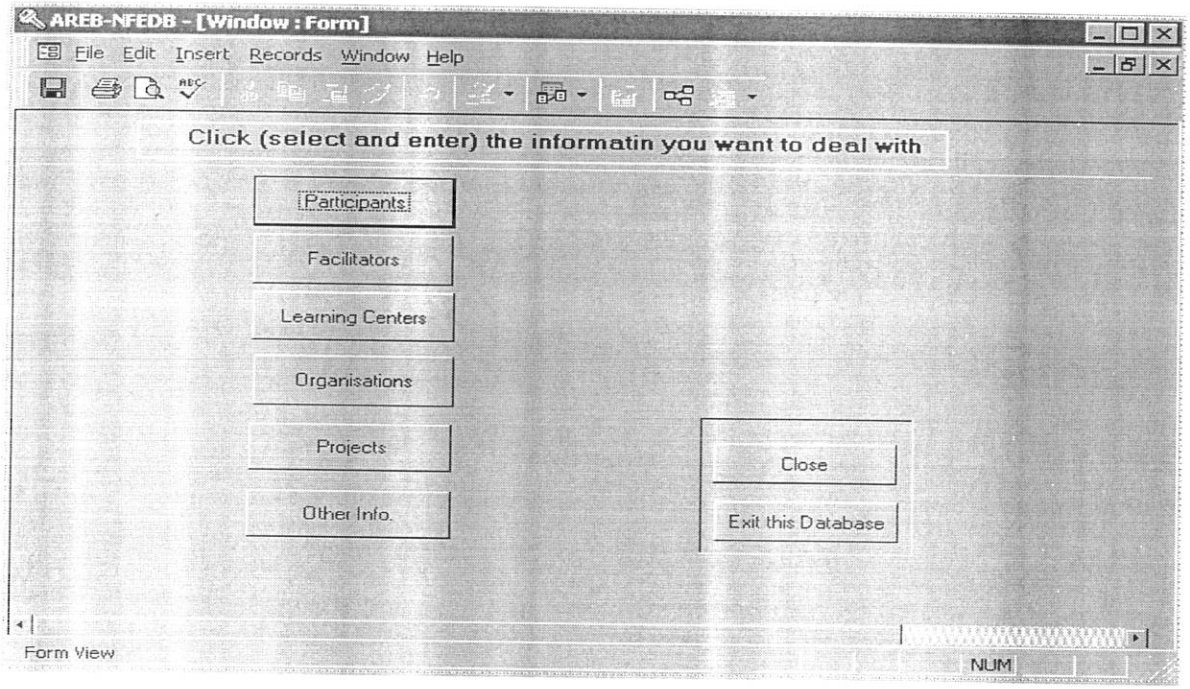
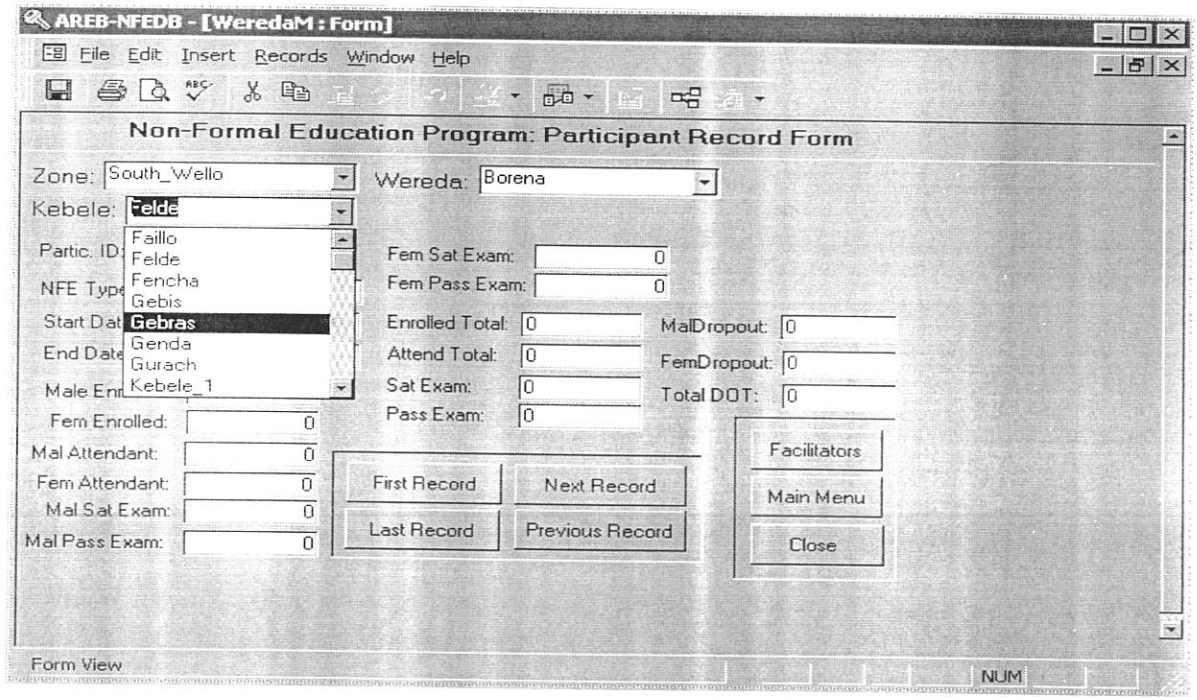


Figure 4. 11: Participants Data Entry Form



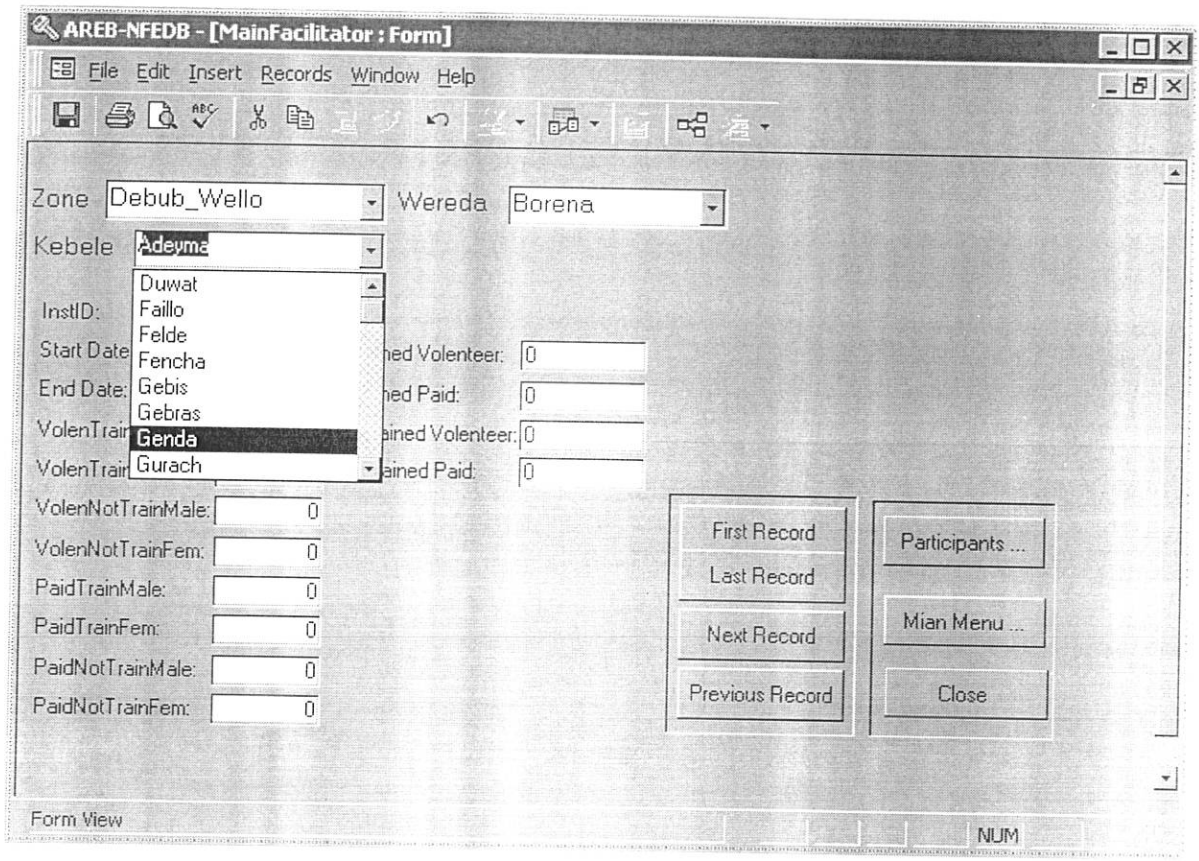


Figure 4. 12: Facilitators Data Entry Form

The above forms were shown to the users. For example, users need participants and facilitators forms to appear on the same form. Thus, these forms have been inserted in the program form, which is again a sub form in Kebele form. The modified data entry and other forms are shown below.

Figure 4. 13: The Modified Main Menu

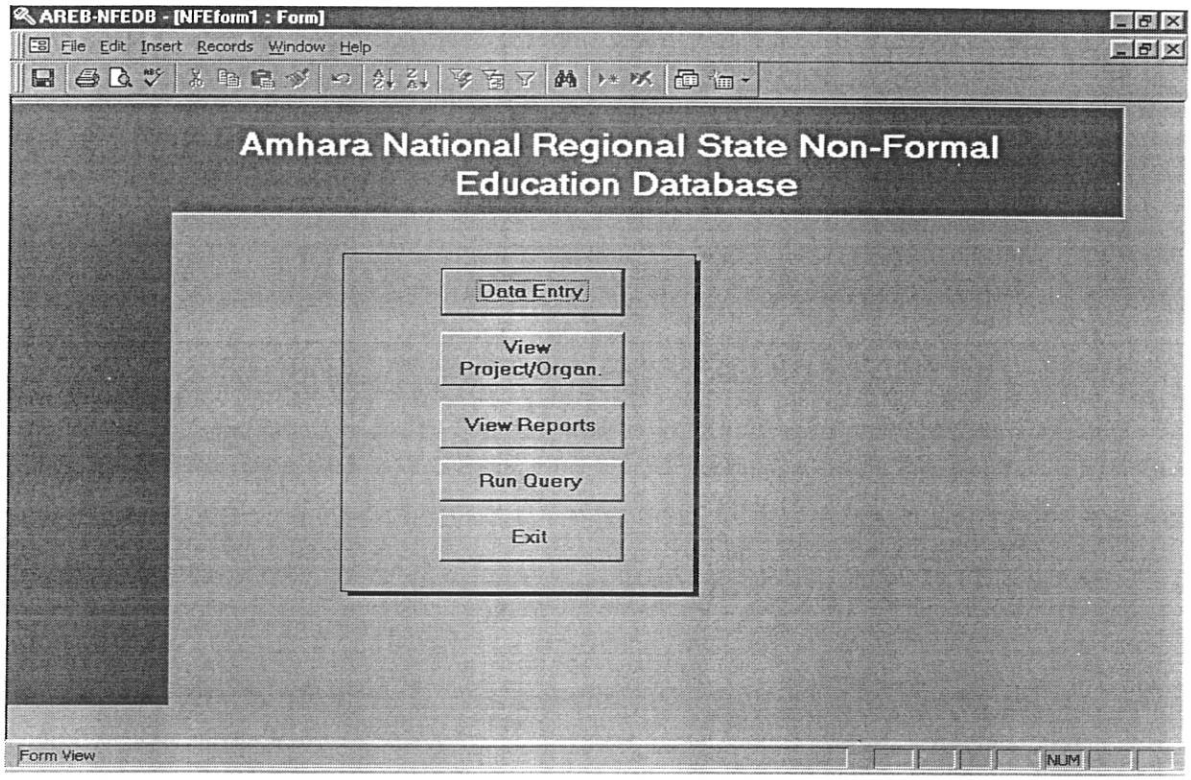


Figure 4. 14: Form for Selection of Spatial Administration

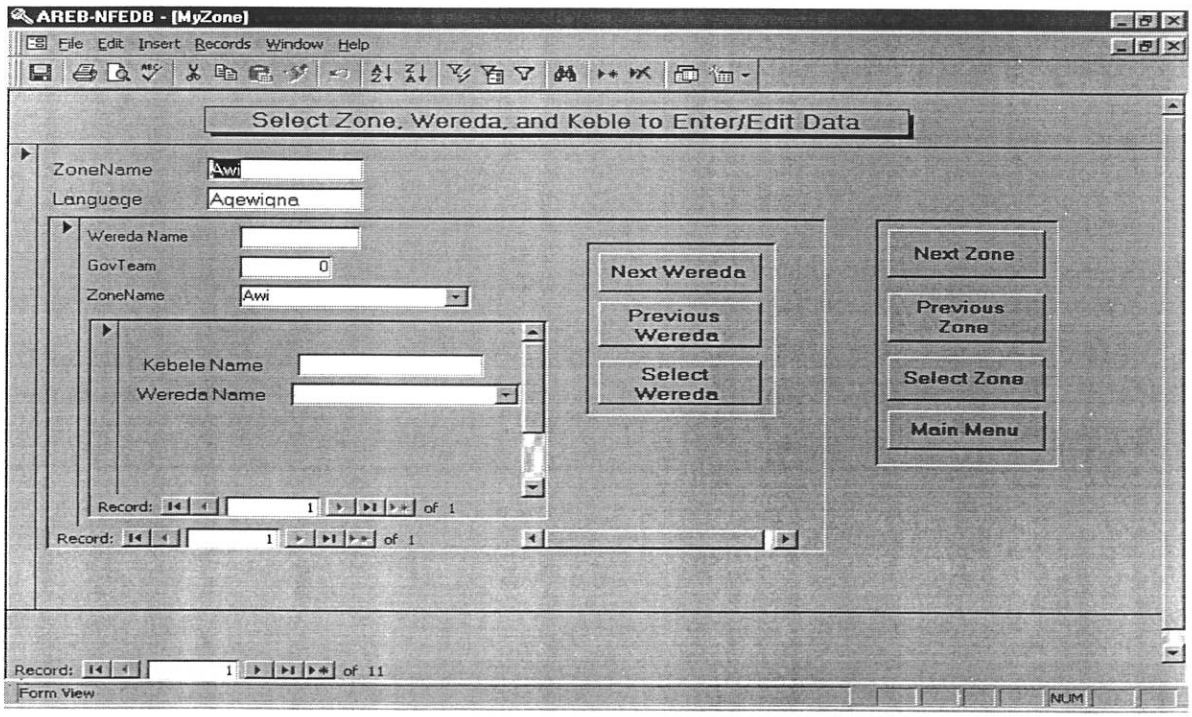
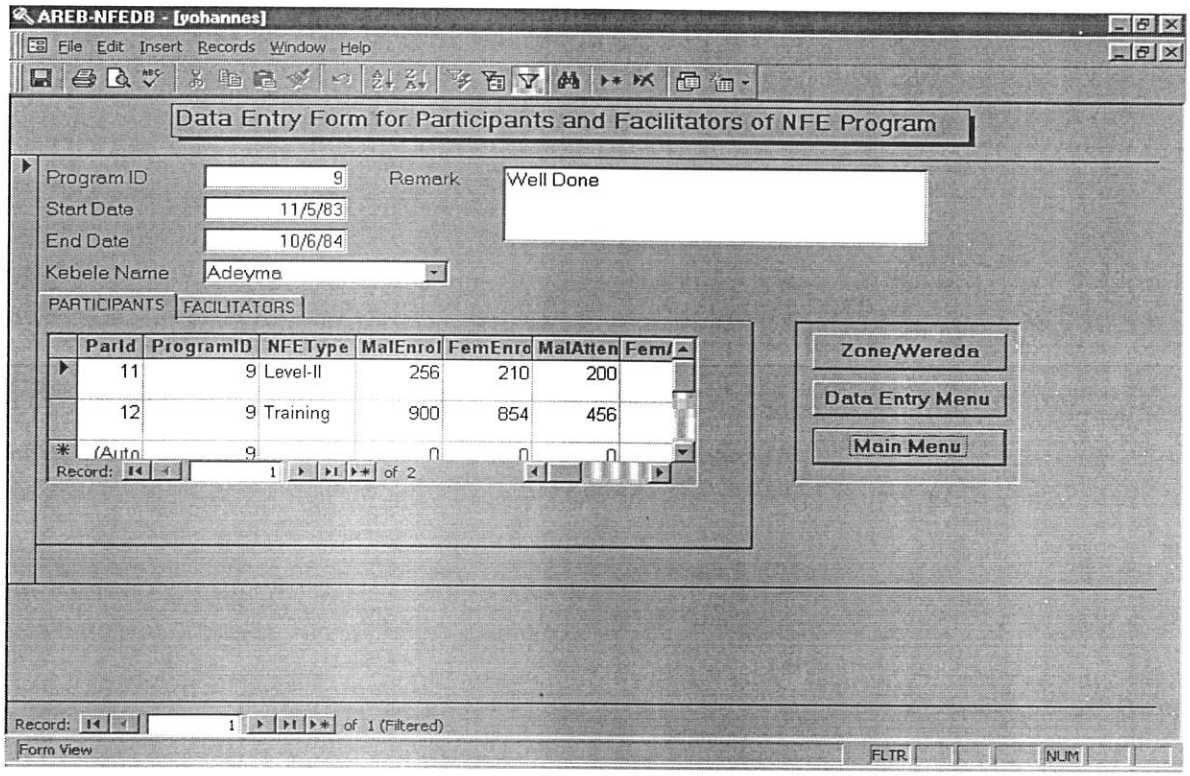


Figure 4. 15: The Modified Data Entry Forms for Participants/Facilitators



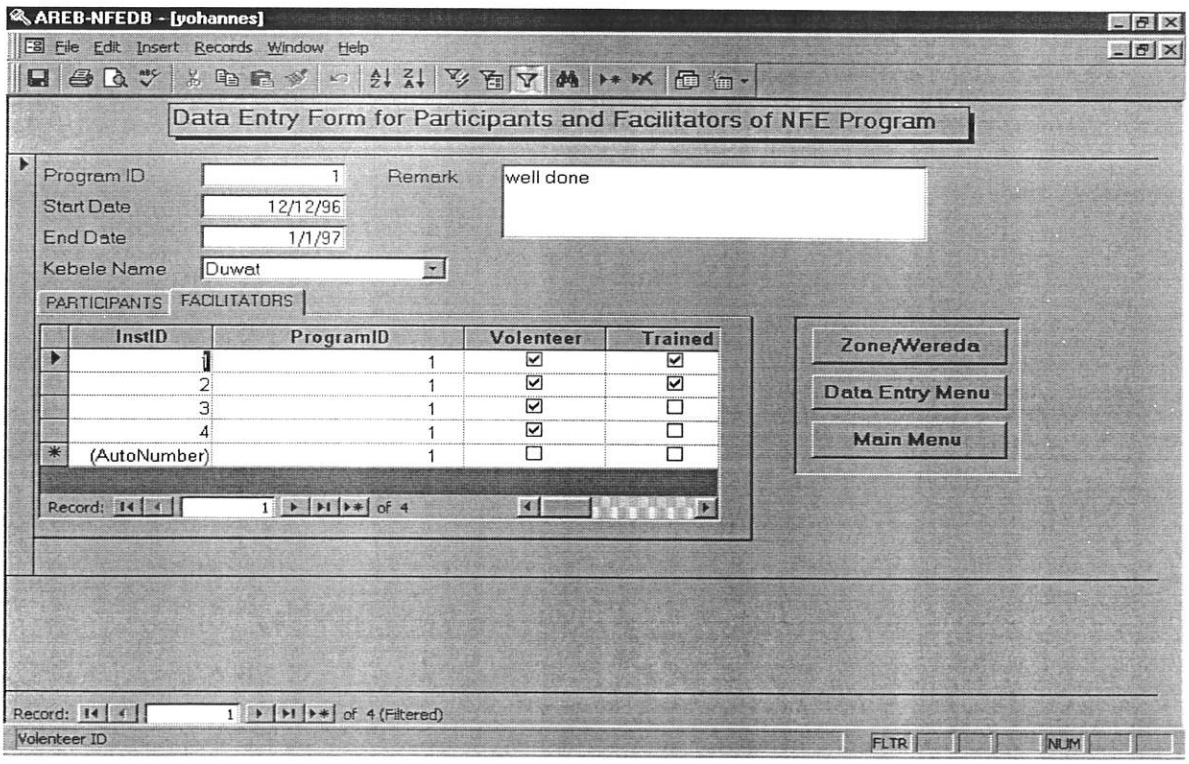
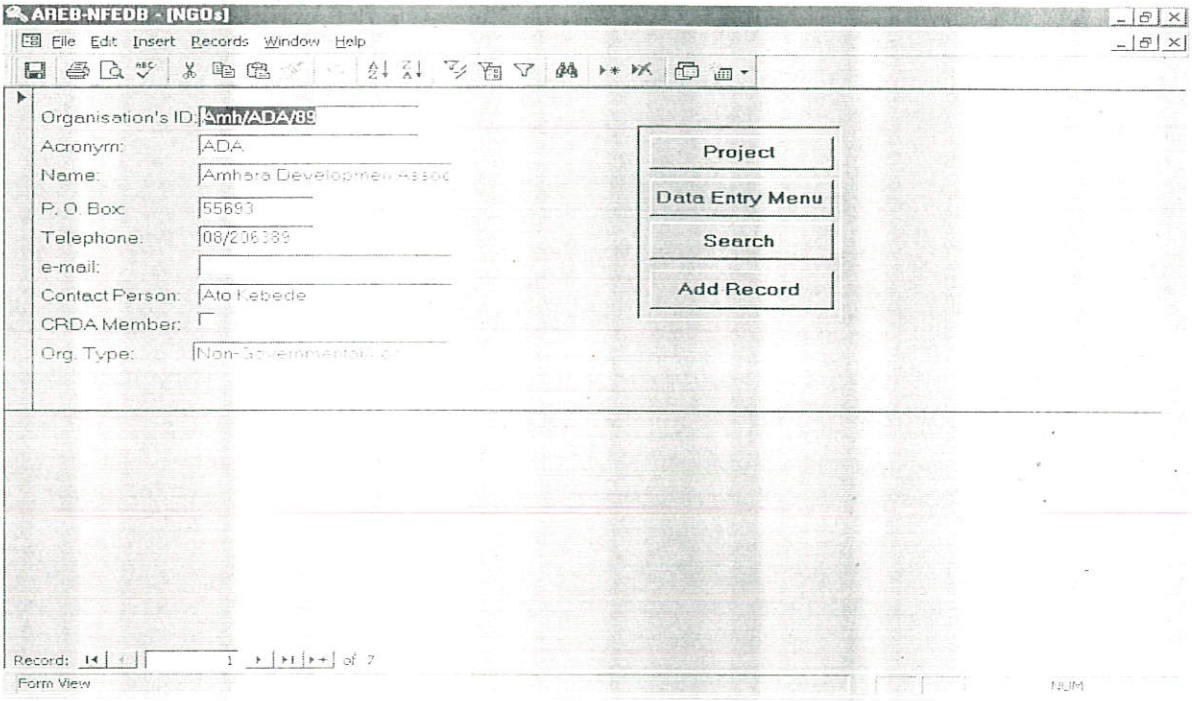


Figure 4. 16: Data Entry Forms for Organizations and Projects



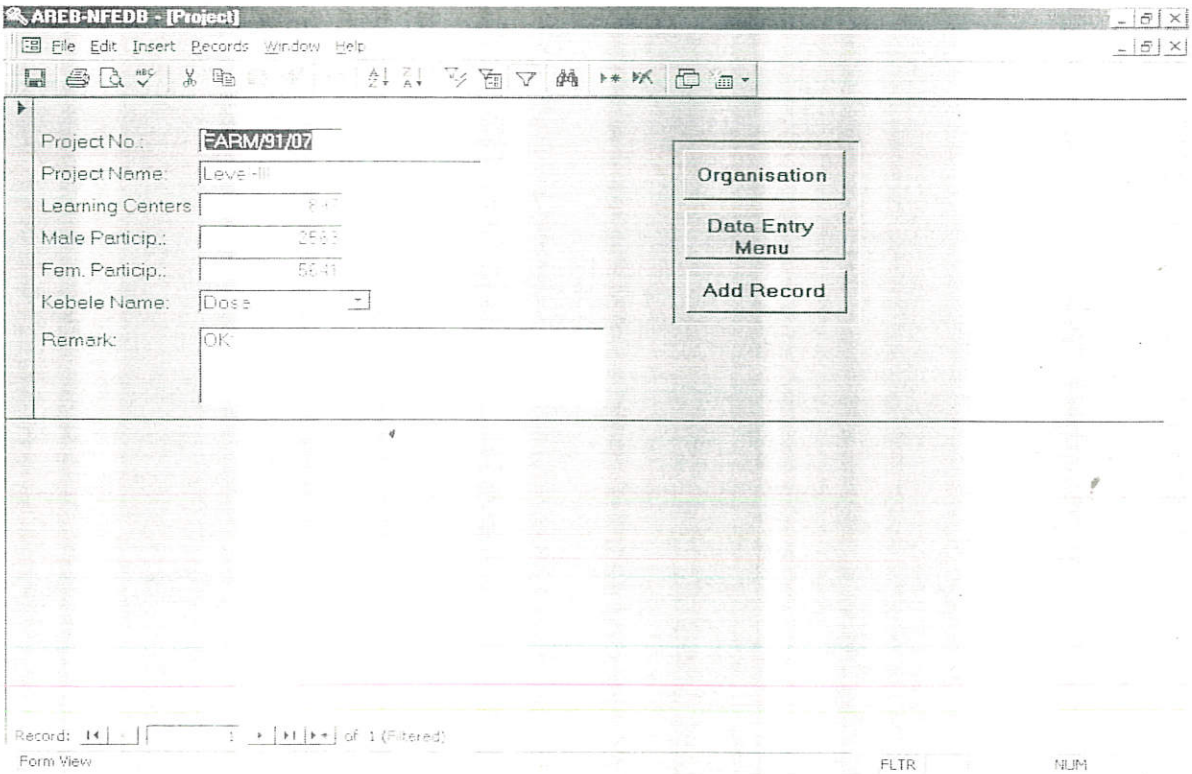
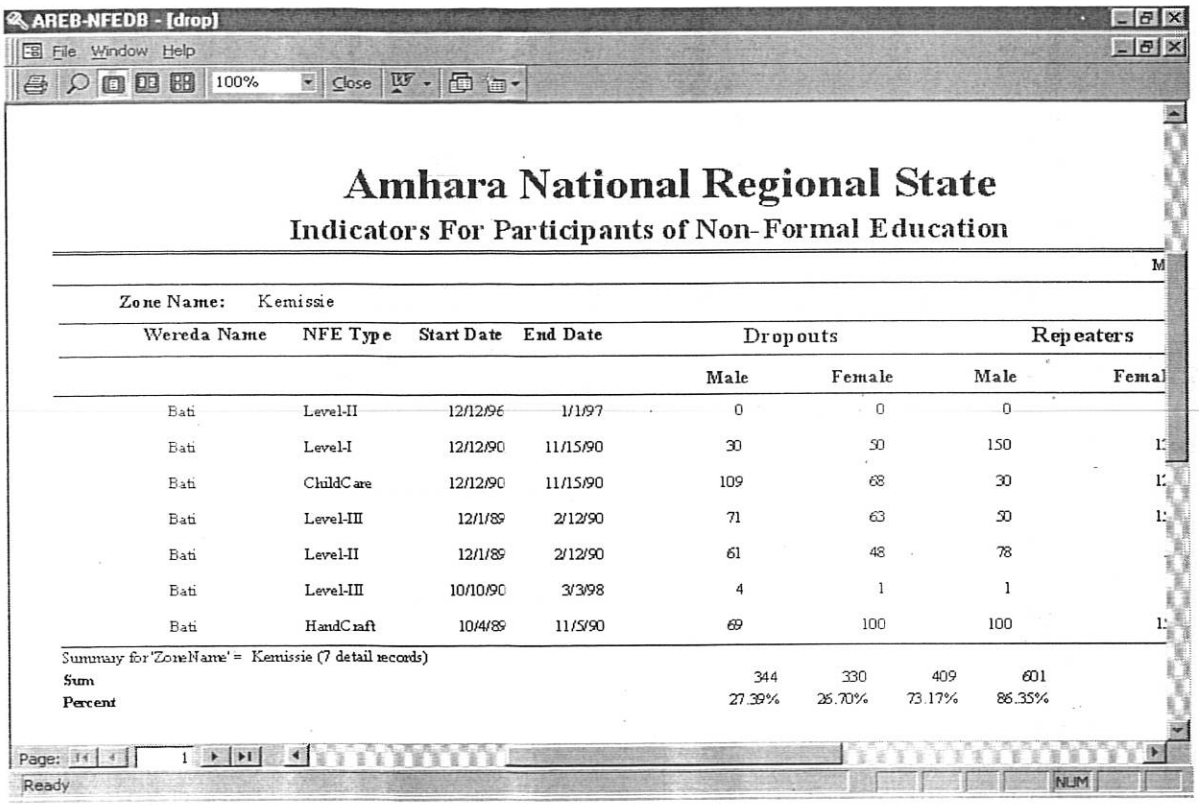


Figure 4. 17: Detailed and Summary Reports for Dropouts/Repeaters and Participants Status



AREB-NFEDB - [drop]

File Window Help

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Amhara National Regional State

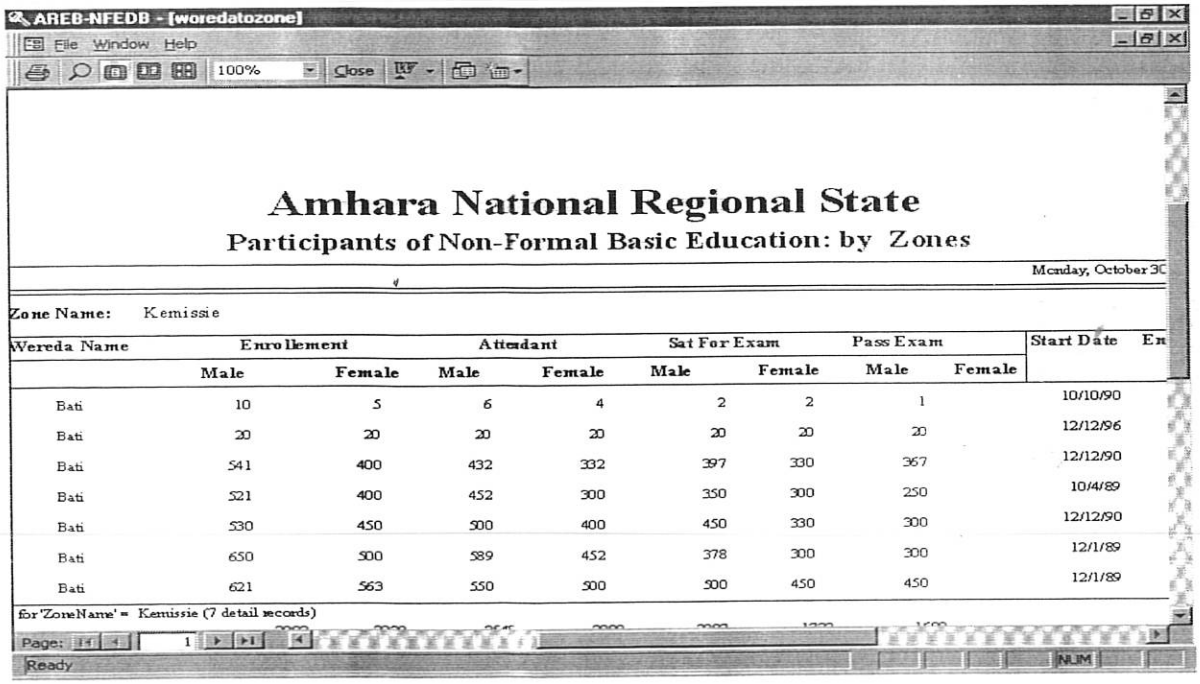
Indicators For Participants of Non-Formal Education

Zone Name: Kemissie

Wereda Name	NFE Type	Start Date	End Date	Dropouts		Repeaters	
				Male	Female	Male	Femal
Bati	Level-II	12/12/96	1/1/97	0	0	0	
Bati	Level-I	12/12/90	11/15/90	30	50	150	1
Bati	ChildCare	12/12/90	11/15/90	109	68	30	1
Bati	Level-III	12/1/89	2/12/90	71	63	50	1
Bati	Level-II	12/1/89	2/12/90	61	48	78	
Bati	Level-III	10/10/90	3/3/98	4	1	1	
Bati	HandCraft	10/4/89	11/5/90	69	100	100	1
Summary for 'ZoneName' = Kemissie (7 detail records)							
Sum				344	330	409	601
Percent				27.39%	26.70%	73.17%	86.35%

Page: 1

Ready NUM



AREB-NFEDB - [woredatozone]

File Window Help

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Amhara National Regional State

Participants of Non-Formal Basic Education: by Zones

Monday, October 3C

Zone Name: Kemissie

Wereda Name	Enrollement		Attendant		Sat For Exam		Pass Exam		Start Date	En
	Male	Female	Male	Female	Male	Female	Male	Female		
Bati	10	5	6	4	2	2	1		10/10/90	
Bati	20	20	20	20	20	20	20		12/12/96	
Bati	541	400	432	332	397	330	367		12/12/90	
Bati	521	400	452	300	350	300	250		10/4/89	
Bati	530	450	500	400	450	330	300		12/12/90	
Bati	650	500	589	452	378	300	300		12/1/89	
Bati	621	563	550	500	500	450	450		12/1/89	
for 'ZoneName' = Kemissie (7 detail records)										

Page: 1

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY AND CONCLUSIONS

The study investigated the existing situation of information in the area of NFE and tries to propose information system that may serve educational planners and researchers in NFE, particularly in basic education and skill training activities. To investigate the existing situation of information problem on NFE at region-wide, both internal and external users were surveyed. It was identified that there is week generation and coalition of NFE information. This has affected the extent of availability and adequacy of information for the users. It was also identified that the unsystematic organisation of NFE information in the organisation affected NFE program activity in the region.

As indicated in chapter four, in order to alleviate the existing problem of NFE information, NFE database-based information system has been suggested as a solution. In the course, attempts were made to review literatures on NFE, information requirements and databases in the area of NFE, object-oriented systems analysis and design. Classes/objects have been identified in the problem domain. These helped the researcher to have a clear understanding on the problem area and to design a proposed information system solution.

Generally, the survey revealed that there is a great problem in acquiring the information. Information on NFE is not easily available at regional level. Moreover, the majority of users suffer from lack of consistent information of the available information. Similarly, it was showed that the lack of uniformity of reporting from data sources/channels is the main

cause for the unsystematic organization and inconsistencies of NFE information in the education bureau.

Based on the survey results, attempts were made to demonstrate the design of NFE database (NFEDB) that helps, mainly, for follow up participants and facilitators of NFE programs in the entire region. Besides, attempts were also made to include population data, organizational directories, and formal school related information to facilitate/supports the planning of NFE.

The prototype has been developed using the databases of Microsoft Access. Microsoft Access macro language or the Macros Visual Basic for Application (VBA) has been used in the development of the prototype. The interfaces have also been developed using facilities, forms, provided by Microsoft Access.

The collection and generation of NFE information should be from the grass root level. This has many advantages such as:

- The database can also used by users at Zone, Wereda, and even to Kebele levels since the system, NFEDB, consolidate/organize and process the information at each level of users.
- In case of restructuring of administration, the spatial level in which the database rests up on can not be affected; or it may need a slight modification. This is because, the system capture the information at the grass root level (from the source). Thus it can be used without (or with little) re-work.
- It avoids the inconsistencies and inaccuracy of information as a result of the different sources for the same type of information obtained at each level.
- Detail and summary information can be obtained when needed.

The literate and illiterate under different age group with respect to a spatial administration helps to identify areas where illiterate concentrates can be identified, which helps the opening of learning centers.

Though, learning centers at Kebele are the main source of information, it is important to identify the source of other types of needy information. For example, school related information on the region can be found form the education bureau itself; population information from CSA (Central Statistics Authority); projects' information from different organizations. Once, information sources have been identified, the collection process should be conducted on timely basis. That is, this may be on regular (annually, quarterly, monthly) or ad hoc and sample survey basis which can be collected from the identified sources. It should be remembered that information should not be collected for the sake of collection. The information to be collected should be linked the objective of the proposed information system, i.e., the setting up of NFE database at regional level is to collect and provide NFE information to the users for better planning.

Generally, it was investigated that existing planning NFE activities can not continue with the current manual and unsystematic organization of NFE information. In order to generate and collate information a database-based information system (NFEDB) is needed. Thus, it is firmly believed that the result of this undertaking would help the education bureau, even other REBs (and similar institutions) as a starting point for the development of database for non-formal education in our country - Ethiopia.

5.2 RECOMMENDATIONS

As indicated in the first chapter, it is the purpose of this study to propose an information system for NFE program activities. As an academic exercise, it is not intended to propose a fully operational NFE database. Rather, it is to show that how information system for the planning of NFE can be developed at region-wide level (for a typical Regional Education Bureau in Ethiopia). Substantial time has been spent in the analysis and design of the proposed system. Bearing in mind this, the following are recommendations:

- Further study should be conducted on the requirement analysis that incorporate users of NFE at Zones and Wereda level;
- Developing a uniform data collection format, particularly on reporting format of Zone/Wereda Education offices;
- Adoption of a NFE input format that serve as source document for data entry (to insert data into the computer;
- Establishing NFE information center for the region to provide support for the various organization and individual users;
- Creation of official NFE statistical report;
- Creation of better co-ordination with the formal education system;
- Regarding projects run by different organizations, a controlling system should be developed that helps to evaluate what is being done and what has been planned.
- Further investigation is needed as to the type of NFE information is outdated and when to delete this information. The researcher did not identify when to delete total information. Besides, renewal or updating of some information also needs further investigation, for instance, the number of learning center.

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QUESTIONNAIRES USED IN THE SURVEY

APPENDIX A: SURVEY QUESTIONNAIRE TO IDENTIFY NON-FORMAL EDUCATION (NFE) DATA/INFORMATION NEEDS, SOURCES AND PROBLEMS (for external individuals of the Amahar Region Education bureau).

This questionnaire is designed to assess NFE data/information needs, sources, and problems of NFE practitioners in governmental, NGOs, and special agencies. The study is conducted for a thesis work to fulfil the requirements of M.Sc.I.S program in Addis Ababa University. Your response to the questionnaire is important to the design & development of databases for planning & management activities at Amhara Region Education Bureau. Hence, the successes of the study depends on your co-operation, I am keen to receive your response at your earliest convenience.

Thank you, in anticipation of your kind co-operation

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Addis Ababa University
P. O. Box 1176
Addis Ababa, Ethiopia

PART I. IDENTIFICATION

1. Identification Information
   Organisation Name: _____
   Position/Job Title: _____

2. Below are list of broad categories of program on NFE in Health and Agriculture, Education, etc. Please mark 'x' the type of NFE program(s) your organisation is engaged in?
   - Health
     [ ] Usage of medicine
     [ ] Malaria & Sexually transmitted disease
     [ ] Mother & child care
     [ ] Family planning
     [ ] Water & sanitation
     [ ] Others, please, specify _____
   - Agriculture
     [ ] Environmental protection
     [ ] Home Economics
     [ ] Extension program
     [ ] Others, please, specify _____
   - Education
     [ ] Literacy Program
     [ ] Children-out-of-school
     [ ] Skill training
     [ ] others, please, specify _____
   - Other programs
     [ ] Gender specific

[ ] others, please, specify _____

PART II. INFORMATION NEEDS & SOURCES

3. Below are broad categories of information on Non-Formal Education (NFE).
   [ ] Literacy/Illiteracy statistics
   [ ] Data/information related to
      - Demographic indicators
      - Primary Education (enrolment ratios, no. of primary school, etc.)

   [ ] Current & future plan of NFE programs, program setting (clientele, capacity/coverage of programs, duration of program, organizations involved, dropout, completes by age, sex, etc.)

   [ ] Data/information on Learning/Training Centers
   [ ] Directories of organisation having NFE programs
   [ ] Resource on NFE program
      - Learning/teaching material (availability, types, etc.)
      - Instructors/facilitators (Types, source, availability, etc.)
      - Finance resource (financial coverage)

   What additional information do you need? Please specify below.

   _____
   _____
   _____
   _____

4. For what purpose do you need NFE data/information?
   (if more than one choice please rank them)
   [ ] for planning
   [ ] for monitoring/follow up
   [ ] for management decision making
   [ ] for research and development
   [ ] for keeping up-to-date

[ ] others, please, specify _____

5. At what spatial level do you require the above information?

   [ ] Regional
   [ ] Zonal
   [ ] Wereda
   [ ] Kebele
   [ ] Village

   [ ] Others, please, specify
   _____
   _____

7. Do your organization generate/collect information/data on non-formal basic education?
   [ ] yes [ ] no

8. If, yes, for what purpose do you use?
   [ ] for internal consumption
   [ ] to distribute to others
   [ ] other, please, specify _____

9. What major types of sources do you use to satisfy your information requirement?
   [ ] Workshop, seminar, and conference
   [ ] Document sources (Monographs, Report, Statistical Abstracts, etc)
   [ ] Database systems
   [ ] Others, please, specify

   _____

PART III PROBLEMS RELATED TO NFE DATA/INFORMATION

10. How do you rate the availability of data/information on non-formal education?
    [ ] Highly available [ ] moderately available
    [ ] not available at all [ ] Poorly available

11. If your answer to the above question is 'poorly available or not available', what could be the possible reason?
    [ ] absences of information system that store process and disseminate non-formal education data/information to user
    [ ] weakness on collecting , and organizing base-line information at lower level (Zones/Wereda)
    [ ] lack of awareness on the value of information on NFE
    [ ] Others, please, specify
    _____

12. How do you rate the consistency of information that you get?
    [ ] consistent
    [ ] moderately consistent
    [ ] poorly consistent
    [ ] inconsistent

13. If your answer to above question is 'inconsistent' and/or poorly consistent what could be the reason?
    [ ] absences of information system that store process and disseminate non-formal education information to users
    [ ] the existence of many source for information (duplication of information)
    [ ] other, please, specify _____

14. Does your organisation share/exchange information with Amhara Education Bureau
    [ ] yes [ ] no

15. If 'yes' how do you rate the adequacy of information sharing/exchange between your organisation and the Education Bureau?
    [ ] sufficient/adequate [ ] fairly sufficient
    [ ] not sufficient/inadequate (poorly adequate)

16. If your answer to the above question is fairly sufficient or insufficient, what could be the reason?
    [ ] absence of statistical report
    [ ] absence of communication network
    [ ] absence of databases on NFE in the region
    [ ]limited number of workshop, seminar and conference
    [ ] other, please specify _____

17. In your opinion what do you suggest as a solution to solve the above problems?
    _____
    _____

18. Please, list any other comments or suggestions that you may think is important for this study.
    _____
    _____

APPENDIX B: QUESTIONNAIRE FOR STAFF OF EDUCATION BUREAU OF AMHARA REGION

This questionnaire is designed to assess the information needs, sources, and problems of information user on activities related to Non-Formal Education (NFE) in the Amhara Regional Education Bureau. This study is conducted for a thesis work to fulfil the requirements of the M.Sc.I.S program in Addis Ababa University. Your response to the questionnaire is important to design NFE database. The study will be important in order to suggest ways of developing and implementing information system for the planning and management of NFE in Amhara Education Bureau

PART I. IDENTIFICATION

1. What is your occupation/profession?_____

2. What activities you are currently engaged in? _____
_____
_____

PART II. ASSESSMENT OF INFORMATION NEEDS & SOURCES

3. Below are broad categories of information on non-formal education (NFE). Please mark "x" the category of information you need

[ ] Literacy/Illiteracy data/information
[ ] Data/Information related to
- Demographic indicators
- Primary Education (enrolment, availability of primary school, etc.)

[ ] Learning/training center setting (type, address/location, functionality, etc.)
[ ] Training/learning needs of clientele
[ ] Learners/participants
- participant on NFE program by age, sex, urban/rural, etc.
- participant completing with success
- dropouts/absenteeism
- participants sat for exam

[ ] Directories of organization having NFE program
[ ] Resource Input on NFE program
- Material (Learning/teaching material)
- Instructors/teachers/facilitators (source, type, recruitment & training, etc.)
- Financial resource

[ ] Data/information related to NFE committee

4. What additional information do you need?
_____
_____
_____

5. Why do you need NFE data/information? (if more than one choice please rank them)
[ ] for planning
[ ] for monitoring/follow up
[ ] for management decision making

[ ] for research activities
[ ] for keeping up-to-date
[ ] other

6. What type of information do you need for these activities?
[ ] Numerical/statistical
[ ] graphical
[ ] textual
[ ] others, _____

7. What sources do you use to satisfy your information requirement
[ ] Internal sources
    [ ] meeting, seminar, etc.
    [ ] database sources
    [ ] document source (report, periodical , etc.)
[ ] External sources
    [ ] conference, workshop, seminar, etc.
    [ ] document source of
        [ ] Ministry of Education
        [ ] Zones Education Department
        [ ] NGOs (please list them) _____
        [ ] Special agencies (IZZ/DVV, UNESCO, UNDP, etc.)

8. Which source is more relevant and reliable source of information?
[ ] Internal
[ ] Report coming from Zones Education Department
[ ] External organizational source
[ ] Others, please, specify
_____

9. At what level do you require NFE data/information?
[ ] Regional [ ] Zonal [ ] Wereda
[ ] Kebele [ ] Village [ ] others

PART III. PROBLEMS RELATED TO INFORMATION AVAILABILITY, ACCESSIBILITY, etc. & OTHER FACTORS

10. Is the current/existing system adequate to support your duties and responsibilities related to NFE activities of the bureau?

[ ] adequate [ ]fairly adequate [ ] poorly adequate/inadequate

11. How do you rate the availability of information on non-formal education in the Amhara Education Bureau?
[ ] highly available [ ] moderately available
[ ] not available at all [ ] poorly available

12. If your answer to the above question is 'poorly available or not available', what could be the possible reason?
[ ] absence of database system
[ ] weakness on collecting and organizing base-line information at lower level (learning center, Kebele, Wereda)
[ ] lack of awareness on the value of information on NFE
[ ] other, please, specify _____

14. How do you rate the consistency of information that you get?
[ ] consistent [ ] moderately consistent [ ] inconsistent

15. If your answer to the above question is 'inconsistent' in your opinion what factors contributed for inconsistencies of NFE data/information?
    [ ] the existence of many source for information (duplication of information)
    [ ] absence of database system
    [ ] others, please, specify _____

16. How do you rate the accessibility of NFE data/information available in the organization?
    [ ] highly accessible
    [ ]moderately accessible [ ] poorly accessible

17. If your answer to the above question is' poorly accessible', in your opinion what could be the reason?
    [ ] lack of proper organisation of data/information (are data/information stored so as to be easily retrievable?)
    [ ] lack of awareness on the value of information on NFE
    [ ] other, please, specify _____

18. Do NFE data/information is timely retrievable?
    [ ] yes [ ] no

17. Do you exchange data/information with organisation having NFE program within the region?
    [ ] yes [ ] no

19. What are these organisation (please list them)?
    [ ] governmental
    [ ] non-government
    [ ] donors
    [ ] others, please, specify _____

20. What mechanism(s) do you suggest to exchange/share data/information on NFE in the region?

_____
_____
_____

INTERVIEW GUIDE USED WITH SELECTED PERSONNEL FROM THE EDUCATION BUREAU

PART IV. USERS

21. Who are the users of information within the organisation?
    [ ] planners [ ] managers [ ] researchers [ ] others

22. Do you receive any query/question on the activities of NFE from any organisation?
    [ ] yes [ ] no
23. If your answer to the above question is 'yes' which organizations frequently asks for what information?

- Organisation
- Information requirement

24. How frequent do external users visit you for data/information on NFE in the region?
    [ ]daily [ ]weekly [ ] monthly [ ] quarterly [ ]half yearly
    [ ] yearly

NFE DATA/INFORMATION ORGANIZATION

29. Data collection and storage
    - How the system collects/captures data/information?
    - How is the uniformity of information reporting from Zone Education Departments and Wereda Education \offices?
    - How do you store information coming from Weredas and Zones? Is it easily retrievable whenever needed?

INPUT/OUTPUT FORMAT AND OTHER RELATED FACTORS

25. At what frequency of time do you receive data/information?
    [ ] daily [ ] monthly [ ] quarterly [ ] half yearly [ ] yearly
    [ ] others

26. In what format you present your output?
    [ ] statistical /quantitative
    [ ] graphs and charts
    [ ]textual
    [ ] others

27. What could be the periodicity in the dissemination of information?
    [ ] for internal users
    [ ] for external users

28. What publication related to NFE activities do the organization produce for both internal and external users
    [ ] Guidelines
    [ ] Statistical Abstract
    [ ] Monograph
    [ ] others

29. Types of information services within the organization

    [ ] Documentation/library service
    [ ] Information Center
    [ ] Others

35. What other activities and/or services related to NFE information do the organization engaged in?

VII. COMPUTER FACILITIES AND USES

36. What computer facilities do you have at your organization?
    - Type
    - Capacity
    - Operating System
    - Quantity

37. For what purposes do you use the computers?
    [ ] Word-processing
    [ ] financial analysis
    [ ] statistical analysis
    [ ] database management
    [ ] others

38. What application software do you have at your organization?

39. What other special package do you have?

40. Is there any plan to automate the system?

41. If there is, what type of plan do you have to develop?

42. In your opinion, what do you suggest to improve the existing problems in NFE in the region?

APPENDIX C: ORGANIZATIONS SURVEYED

I. Governmental Organization

Amhara National Region State Agricultural Bureau

Amhara National Region State Education Bureau

Amhara National Region State Health Bureau

Amhara National Region State Council

Federal Democratic Republic Ethiopia Ministry of Education

II. Non-Governmental Organization

Action- AID

Action for Development

African Valley Academy

Agri-Service Ethiopia

Adults and NFE Association of Ethiopia

Association of Family Guidance and Counseling of Ethiopia

Birhan Integrated Community Development Organization

Cheshire Foundation Ethiopia

Community Aid Abroad

Cooperative American Relief Everywhere (CARE)

Emmanuel Development Association

Ethiopian Aid

Ethiopian Catholic Sectarians

Ethiopian Gemini Trust

Ethiopian Muslims Relief & Development Association

Ethiopian Rural Self Help Association

Ethiopian Youth League, Self help Association

Farm Africa

Forum on Street Children in Ethiopia

Hope Enterprises

Hope for Rural Children and Orphans

Integrated Services for Aids Prevention & Support

International Community for Development of People

Jesuit Refugee Service -Ethiopia

Jesuit Refugee Services

Kind-heart Child Aid Development Organization

Multi-purpose Community Development Project

Oxfam - Ethiopia

Pact-Ethiopia

Redd Barna

Rift Vale Children and Women Development Association

SCF-UK

SCF-USA

Society of International Missionaries

Voluntary Council for Handicapped Children and Adults

Wello Development and Rehabilitation Association

III. **Special Agencies**

IIZ/DVV

UNESCO

ወ - ወሪ2

መደበኛ ያልሆነ ትምህርት ኘሮግራም
የወረዳ ወርሃዊ ሪፖርት - ክፍል ሁለት

(በወረዳ ኮሚቴ በሶስት ኮፒ ተዘጋጅቶ በየወሩ እየተሞላ ለዞን ትምህርት መምሪያና ለመስተዳድር ጽ/ቤት ይላካል)

የ.....ወር 19..... ዓ.ም.

የወረዳ ስም ..... ደረጃ .....ቁንጅ .....

ተ.ቁ	የቀበሌ ስም	1	2	3	የመም/ብዛት			በመማር ላይ የሚገኙ			ያቋረጡ			4	5				6	የተፈተኑ			ፈተና ያለፉ			7	8	
					ወ	ሴ	ድ	ወ	ሴ	ድ	ወ	ሴ	ድ		ሀ	ለ	ሐ	መ		ወ	ሴ	ድ	ወ	ሴ	ድ			
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መፍቻ:- 1. በጣቢያው የሚገለገሉ መንግስታዊ ቡድን ብዛት
2. የጣቢያ ብዛት
3. በጣቢያው የሚገኙ ክፍሎች ብዛት
4. አማካይ ቀሪ (average attendance)
5. በአማካይ የልማት ሠራተኞች ጉብኝት
ሀ/ የግብርና ሰ/የጤና
ሐ/የኦሮ ዘዴ መ/ሴሎች
7. የንባብ ቤቶች ብዛት
8. የሬዲዮ ብዛት

ክ-ትአሪ

መደበኛ ያልሆነ ትምህርት ኘሮግራም
በክልል የትምህርት አጀማመር ሪፖርት

የ.....ወር 19....ዓ.ም.

ደረጃ ..... ቋንቋ .....

ተ.ቁ	የዞን ስም	1	2	3	4	ትም/ የተጀመረበት ወራት	የጣቢያው አይነት					የመም/ብዛት			የንባብ ቤቶች ብዛት	ለመማር የተመዘገቡ			በመማር ላይ የሚገኙ		
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የመያት ኤክስፐርት ስም..... ሬርማ.....

መፍቻ፡-

1. ትምህርት የተጀመረባቸው ወረዳዎች ብዛት
2. ትምህርት የሚሰጥባቸው ቀበሌዎች ብዛት
3. በመማሪያ ጣቢያዎች የሚጠቀሙ መንግስታዊ ቡድን ብዛት
4.. የመማሪያ ጣቢያ ብዛት

የጣቢያ አይነት 1. ትምህርት ቤት 2. የሣር 3. የቆርቆሮ 4.ዛፍ ጥላ 5. ሌሎች

ዘ-ሩአሪ2

መደበኛ ያልሆነ ትምህርት ፕሮግራም
የዞን የሩብ ዓመት ሪፖርት - ክፍል ሁለት

(በዞን የትምህርት ባለሙያ በኮፒ ተዘጋጅቶ ለክልል ትምህርት ቢሮ ይላካል)

የ.....ሩብ ዓመት 19..... ዓ.ም.

የዞን ስም ..... ደረጃ .....ቁጥር .....

ተ.ቁ	የወረዳ ስም	1	2	3	4	የመምህ/ብዛት			በመማር ላይ የሚገኙ			ያቋረጡ			5	6				7	የተፈተኑ			ፈተና ያለፉ			8	9	
						ወ	ሴ	ድ	ወ	ሴ	ድ	ወ	ሴ	ድ		ሀ	ለ	ሐ	መ		ወ	ሴ	ድ	ወ	ሴ	ድ			
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የመያዣ ኤክስፐርት ስም..... ፊርማ.....

መፍቻ:- 1. ትም/የሚካሄድበት ቀበሌ ብዛት
2. ትም/የሚያገኙ መንግስታዊ ቡድን ብዛት
3. የጣቢያ ብዛት
4. በጣቢያው የሚገኙ ክፍሎች ብዛት
5. አማካይ ቀሪ (average attendance)
6. በአማካይ የልማት ሠራተኞች ጉብኝት

ሀ/ የግብርና ለ/የጤና

ሐ/የኦሮ ዘዴ መ/ሴሎች

7. የተፈተኑ
8. የንባብ ቤቶች ብዛት
9. የሬዲዮ ብዛት

መደበኛ ያልሆነ ትምህርት ኘሮግራም
የክልል አመታዊ ሪፖርት - ክፍል ሁለት
የ19..... ዓ.ም.

ደረጃ ....ቋንቋ ....

ተ.ቁ	የዞን ስም	1	2	3	4	5	የመም/ብዛት			በመማር ላይ የሚገኙ			ያቋረጡ			6	7				8	የተፈተኑ			ፈተና ያለፉ			9	10
							ወ	ሴ	ድ	ወ	ሴ	ድ	ወ	ሴ	ድ		ሀ	ለ	ሐ	መ		ወ	ሴ	ድ	ወ	ሴ	ድ		
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	ድምር																												

የመያት ኤክስፐርት ስም.. ፊርማ..................................

<u>መፍቻ</u>:-
1. ትም/የሚካሄድበት ወረዳ ብዛት
2. ትም/የሚካሄድበት ቀበሌ ብዛት
3. ትም/የሚያገኙ መንግስታዊ ቡድን ብዛት
4. የጣቢያ ብዛት
5. በጣቢያው የሚገኙ ክፍሎች ብዛት
6. አማካይ ቀሪ (average attendance)
7. በአማካይ የልማት ሠራተኞች ጉብኝት

   ሀ/ የግብርና ለ/የጤና

   ሐ/የትም ዘዴ መ/ሴቶች

8. አጠቃላይ የኤክስቴንሽን አገልግሎት
9. የንባብ ቤቶች ብዛት
10. የሬድዮ ብዛት

ዞ-ሩአሪ1

መደበኛ ያልሆነ ትምህርት ፕሮግራም

በዞን የሩብ ዓመት ሪፖርት-ክፍል አንድ፣

(በዞን መያት ባለሙያ ተሞልቶ አንድ ኮፒ ለክልል ት/ቢሮ ይላካል)

1. በዚህ ሩብ ዓመት ማስተማር ያቋረጡ መምህራን ብዛት፣

   ወንድ _____ ሴት_____ድምር_____

2. አዲስ የተተኩ መምህራን ብዛት፣

   ወንድ _____ ሴት _____ ድምር _____

3. የመምህራን ምንጭ፣

   ሀ/ በጎ ፈቃደኛ/ነጻ/፡- ወንድ_____ሴት_____ድምር_____

   ለ/ በክፍያ ፡- ወንድ_____ሴት_____ድምር_____

   ሐ/ ሌሎች /ይገለፅ/፡- ወንድ_____ሴት_____ድምር_____

   መ/ የክፍያ መጠን ፡- _____

   _____

4. የመማሪያ ጣቢያዎች ብዛት በዓይነት፣

   ሀ. ት/ቤት ☐

   ለ. ሣር ☐

   ሐ. ቆርቆሮ ☐

   መ. ዛፍጥላ ☐

   ሠ. ሌሎች /ይገለፅ/ _____

   _____

   ረ. ለመማር ምቹና የተደራጁ ጣቢያዎች ብዛት ☐

   ሰ. ድምር ☐

5. የተዘጉ የመማሪያ ጣቢያዎች አሉ ?

ተ.ቁ	ደረጃ	ወረዳ ብዛት	ጣቢያ	ወ	ሴ	ድ	አበይት ምክንያቶ
	ድምር						

10. መደበኛ ያልሆኑ የትም/ፕሮግራሞች ወይም ሥልጠና የሚያካሂዱ መንግስታዊ ያልሆኑ ድርጅቶች/መያድ/አሉ?

ሀ/ ፕሮግራም የሚካሂድባቸው ወረዳዎች ስምና የቀበሌ ብዛት

ወረዳ ስም	ቀበሌ ብዛት

ለ/ የፕሮግራሙ አይነትና የተሳታፊዎች ሁኔታ፣

የፕሮግራሙ ባለቤት	የፕሮግራሙ ስም	የተሳታፊዎች ዓይነት	የመማሪያ ጣቢያ ብዛት	ተሳታፊዎች		
				ወ	ሴ	ድ

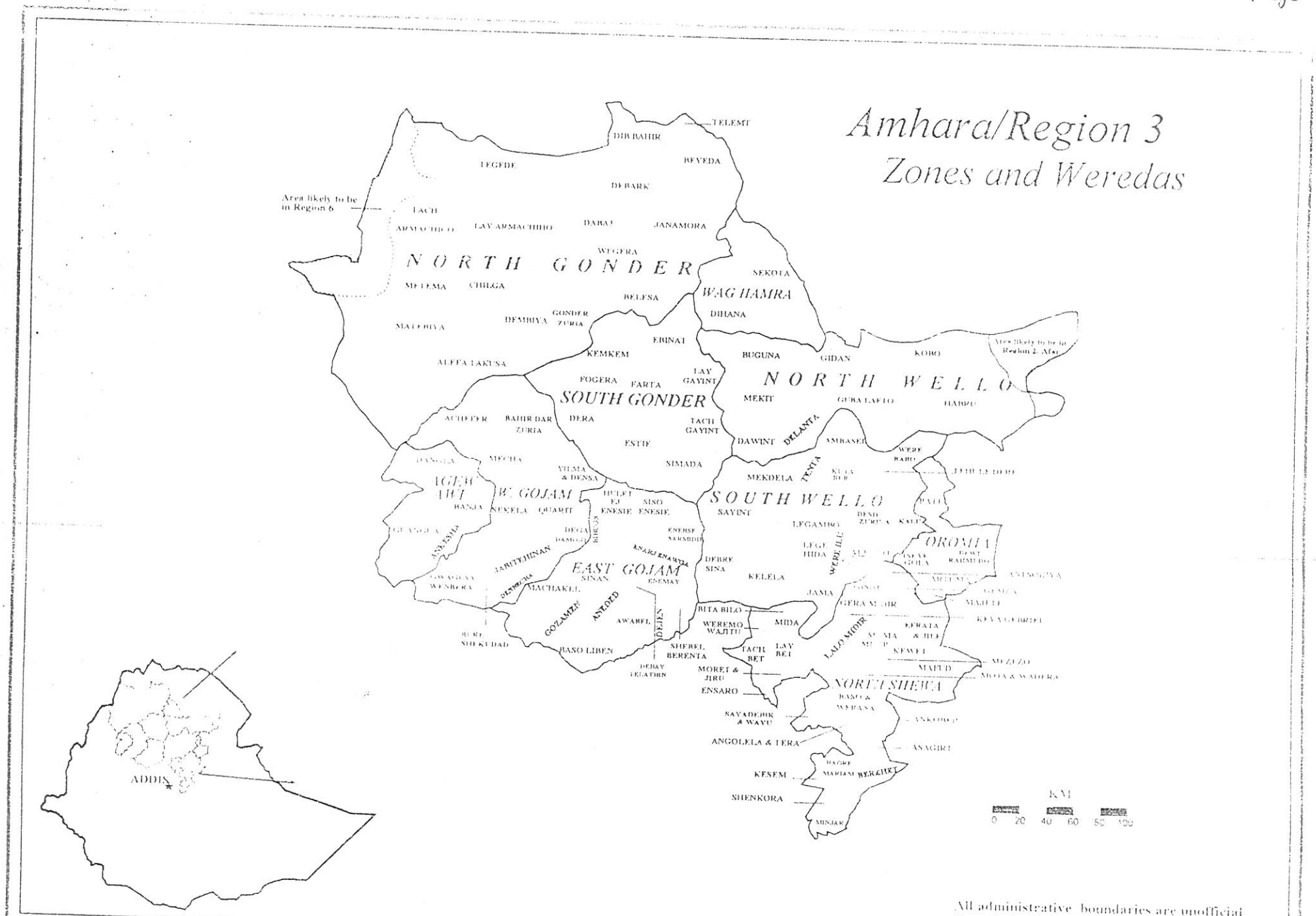
Table 3.8(a) Percentage Distribution of Population Ten Years and Over by Age Group, Sex and Highest Grade Completed, Amhara- Urban+Rural: 1994

AGE GROUP	SEX	LITERATE COMPLETED GRADES						Illiterate	Not stated	Total
		1-6	7-8	9-12	Above 12	Non Regular	Literate			
		URBAN+RURAL								
10 - 14	Total	77.1	7.1	0.7	0.0	15.0	14.6	85.4	0.1	100.0
	Male	71.7	6.5	0.7	0.0	21.0	15.0	84.9	0.1	100.0
	Femal	83.3	7.8	0.8	0.0	8.1	14.1	85.8	0.1	100.0
15 - 19	Total	45.0	18.5	15.0	0.3	21.2	20.7	79.2	0.1	100.0
	Male	43.1	15.5	13.1	0.4	28.0	22.6	77.4	0.1	100.0
	Femal	47.5	22.0	17.3	0.2	13.0	18.9	81.0	0.1	100.0
20 - 24	Total	33.8	12.2	22.9	2.3	28.8	24.7	75.2	0.1	100.0
	Male	32.7	11.1	20.6	2.7	32.9	30.2	69.7	0.1	100.0
	Femal	35.3	13.7	26.2	1.8	23.0	19.7	80.3	0.1	100.0
25 - 29	Total	29.6	9.0	17.6	3.3	40.5	25.1	74.9	0.1	100.0
	Male	29.0	9.3	17.0	3.7	41.0	35.5	64.4	0.1	100.0
	Femal	30.8	8.5	18.7	2.4	39.6	15.6	84.4	0.0	100.0
30 - 34	Total	26.1	6.1	11.6	4.1	52.1	21.4	78.5	0.1	100.0
	Male	26.1	6.4	11.9	4.3	51.4	34.2	65.7	0.1	100.0
	Femal	26.3	5.3	10.8	3.4	54.1	10.3	89.7	0.0	100.0
35 - 39	Total	24.1	4.9	8.8	3.6	58.5	20.2	79.7	0.1	100.0
	Male	23.9	4.9	9.5	4.1	57.7	32.3	67.6	0.1	100.0
	Femal	25.0	4.8	6.6	2.1	61.4	8.9	91.1	0.0	100.0
40 - 44	Total	20.9	4.1	5.6	2.4	66.9	14.9	85.0	0.1	100.0
	Male	20.6	4.4	6.3	2.9	65.8	25.2	74.7	0.1	100.0
	Femal	22.5	2.7	2.5	0.5	71.8	5.3	94.7	0.0	100.0

Table 3.8(a) Cont'd

AGE GROUP	SEX	LITERATE COMPLETED GRADES						Illiterate	Not stated	Total
		1-6	7-8	9-12	Above 12	Non Regular	Literate			
		URBAN+RURAL								
45 - 49	Total	20.0	3.3	4.3	1.8	70.6	14.3	85.6	0.1	100.0
	Male	19.6	3.6	4.6	2.1	70.1	22.5	77.4	0.1	100.0
	Femal	22.1	1.7	2.2	0.3	73.7	4.6	95.3	0.0	100.0
50 - 54	Total	17.0	2.8	2.7	0.9	76.5	10.2	89.8	0.0	100.0
	Male	17.0	3.1	3.0	1.0	75.9	17.8	82.1	0.1	100.0
	Femal	17.0	1.6	1.2	0.2	80.0	2.9	97.0	0.0	100.0
55 & above	Total	14.2	2.5	1.7	0.5	81.0	10.8	89.1	0.1	100.0
	Male	14.3	2.6	1.8	0.5	80.7	17.3	82.6	0.1	100.0
	Femal	13.7	1.1	1.2	0.5	83.6	2.8	97.2	0.0	100.0
Not stated	Total	11.6	1.8	1.3	0.4	85.0	7.0	93.0	0.1	100.0
	Male	11.6	1.7	1.3	0.4	85.0	11.6	88.3	0.1	100.0
	Femal	11.7	2.5	0.7	0.3	84.9	1.3	98.6	0.1	100.0
Total	Total	37.7	9.3	11.6	1.9	39.6	17.8	82.1	0.1	100.0
	Male	33.6	8.0	10.6	2.2	45.5	23.5	76.4	0.1	100.0
	Femal	45.6	11.7	13.4	1.1	28.1	12.1	87.9	0.1	100.0

APPENDIX-E : MAP OF AMHARA NATIONAL REGIONAL STATE



DECLARATION

The thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Yohannes Mulugeta

October, 2000

The thesis has been submitted for examination with our approval as university advisors.

Dr. Seyoum Teferra

October, 2000

Ato Workshet Lamenew

October, 2000