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INFORMATION SUPPORT SYSTEM FOR EDUCATION PLANNING (ISSEP) TANZANIA

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION SCIENCE

BY

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INFORMATION SUPPORT SYSTEM FOR EDUCATION PLANNING (ISSEP)

IN TANZANIA

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Dedication

This work is dedicated to my husband Merchades, our daughter Neza, sons Bukulu (deceased), Butoyi and Chiiza.

Tanzania Commission for Science and Technology, Faculty of Education at the University of Dar es Salaam, the Director of the Library of University of Dar es Salaam Dr J. M. Newa and the staff, the education institutions and information centres visited and the education and information Professionals with whom I had discussions, for their cooperation and invaluable contributions.

While I share with them the achievements of this work, any errors are entirely mine.

The members of one's family give more than one can realise: a certain resigned faith that all things come to an end, and a healthy scepticism that the sooner the better! No one has expressed this view more sympathetically and with more practical encouragement than Merchades my husband, for taking care of our young children.

M.M.M-B.

ABSTRACT

The broad objective of the work is strengthening and enhancing the efficiency and effectiveness of education planning in Tanzania by facilitating access to timely, relevant and reliable information to planners, decision makers, executives, and all those involved in planning and provision of education. For the purpose, the establishment of a supporting information system is proposed, its features elaborated, and a plan for its implementation suggested.

The study discusses, to begin with, the role of timely and reliable information in education planning. The justification for such an undertaking has been the inherent information problems in education planning expressed in the reports reviewed in the study. The motivation of the study has been the perception and the experience of benefits accruing from the use of timely and relevant information in any development undertaking.

The methodology used by the study takes the form of action research. The tools used include a questionnaire to identify information needs of potential users of the system and another set of questionnaires to collect data for designing databases of profiles of institutions, information systems, education projects, and education experts. Several prototype databases have been developed to demonstrate some of the information products to be generated by the proposed information system. Secondary sources of information, on-site visits and interviews were also used for the purpose.

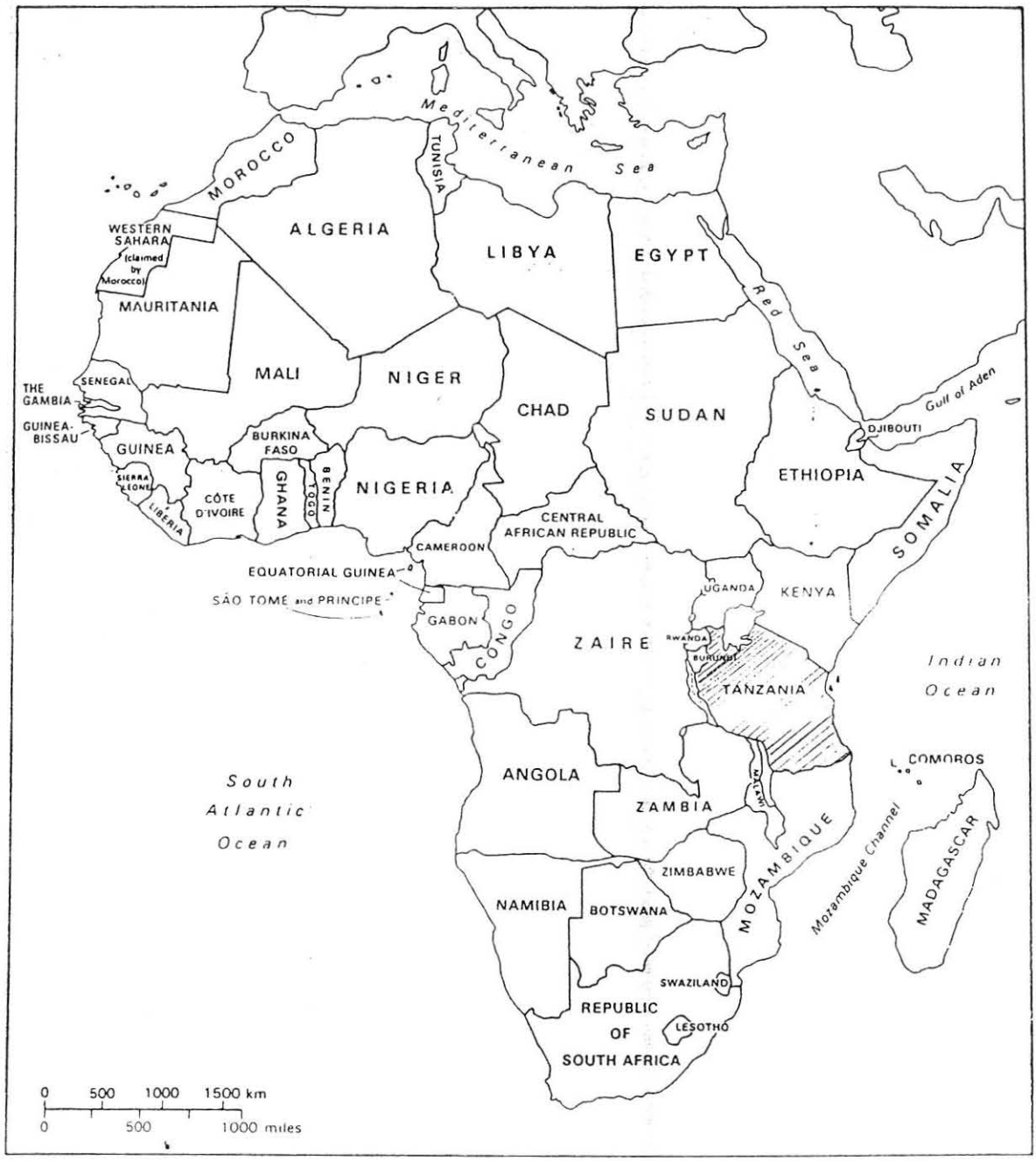
The Information Support System for Education Planning (ISSEP) proposal, the core of the study, outlines the policy underlying the ISSEP establishment, its management structure, functions, and budget considerations.

ISSEP will be constituted out of networking of appropriate existing information systems and services, and new information systems that may be established. The National Educational Information Policy and Coordinating Agency (NEIPCA), to be placed as high as possible in the government structure, will consist of three functional components: the Educational Information Network Council (EINC) having a policy making and coordination function, the Executive Directorate, having an executive function, and the Advisory Board with an advisory function.

The main ISSEP function will be to strengthen and enhance provision of information services with emphasis on value-added information products. Appropriate information infrastructure components are identified and their development recommended to ensure efficient execution of ISSEP activities.

The implementation strategy, relating to the programmes, outputs, activities and inputs of the system is flexible and several objectives can be implemented in parallel. The immediate outputs serve as incentives for further development of the system. The necessary hardware and software requirements are indicated, to be refined at the time of implementation.

Several recommendations for further research and government intervention are suggested especially in the development of the information infrastructure, and the environment for establishing the ISSEP network and making it operational.



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LIST OF ABBREVIATIONS

AACR2: Anglo American Cataloguing Rules

ADIPA: Association of Development Research and Training Institutes of Asia and the Pacific

AIT: Asia Institute of Technology

CAICYT: Centro Argentino de Informacion Cientifica y Technologica

CCF: Common Communication Format

CDS/ISIS: Computerised Data System/Integrated Set of Information System

COSTECH: Tanzania Commission for Science and Technology

EICH: Education Information Clearing House

ERIC: Education Resources Information Centre

ERNESA: Educational Research Network for East and South Africa

ERNETA: Educational Research Network for Tanzania

ERP: Economic Recovery Programme

ESAP: Economic and Social Action Programme

GDP: Gross Domestic Product

GNP: Gross National Product

IASLIC: Indian Association of Special Libraries and Information Centres

IBE: International Bureau for Education

ICD: Institute of Curriculum Development

IDRC: International Development Research Centre

IIEP: International Institute of Education Planning

ISSEP: Information Support System for Education Planning

MANTEP: Institute of Management and Training of Education Personnel

MEC: Ministry of Education and Culture

MIBIS: Manual for Preparing Records for Micro-computer Based Bibliographic Information Systems

MIS: Management Information System

MSTHE: Ministry of Science Technology and Higher Education

NACET: National Advisory Council on Education and Training

NDDCE: National Documentation and Dissemination Centre for Education

NEDC: National Education Documentation Centre

NEIPCA: National Education Information Policy and Coordinating Agency

NESP: National Economic Survival Programme

NORAD: Norwegian Agency for Development Cooperation

O-ODB: Object-oriented Database

PADIS: Pan African Development and Information System

REDUC: Latin American Educational Research Network

RERIC: Regional Energy Resources Information Centre

SAP: Structural Adjustment Programme

SIDA: Swedish International Development Agency

TANISSAT: Tanzania National Information System for Science and Technology

TLA: Tanzania Library Association

TLSB: Tanzania Library Services Board

UNESCO: United Nations Educational, Scientific and Cultural Organisation

UNICEF: United Nations Childrens Fund

CHAPTER 1

INTRODUCTION

1.1 PROBLEM STATEMENT AND JUSTIFICATION

1.1.1 Problem Statement

The importance of developing the human resource as a pre-requisite for national development is recognized world over. Education, as a process for the transmission of knowledge, skills, values and culture is a natural activity in all societies. Recognizing its potential contribution towards the development of society, nations have undertaken deliberate management of certain aspects of the educational process. The right to education has been declared by the United Nations as one of the fundamental Human Rights. Investment in education, or satisfaction of the consumer demand for it is now one of the biggest single item of public expenditure in many countries, and an increasing proportion in others.

In the early times, education as a means of transmission of culture and value systems used to be undertaken largely at home, by society at large, by work relationships, or by voluntary organisations. Now, it is a publicly regulated and financed activity for the most part. It is provided as a necessary service by an expanding range of public employees. Of course, individuals continue to take interest, especially with their own children, but increasingly it is the State which coordinates and directs the process for all children.

the problems requiring immediate attention as improvement of educational support services, specifically pointing out that, "... The planning process and data management in the Ministry of Education are inadequate in the areas of collection and use of information about education performance, costs, finances, and the results of national examination. Weaknesses in the management of personnel and resources are evident throughout the system". Educational planning, like all other planning, is an information intensive activity. Given the growing demand for education and the scarcity of resources available, strategic planning has become even more important.

There is a need to strengthen the capacity to plan and implement appropriate and effective educational policies and programs. Improvement in the information base available to education planners and decision makers in terms of having a systematic method of collecting and analyzing school performance indicators, efficiency measures and the cost and financial data would improve planning in the sector.

Lack of information support, and specifically value- added information to guide contingency decisions in the overall planning of education seems to be a major problem area in the overall education planning in Tanzania.

1.1.2 Justification

As already mentioned, the pivotal role of education in the socio-economic development process of every country is universally acknowledged. Indeed, the primary goal of education is to harness as well as to develop human talents and potentialities so that people can meet their moral obligations as well as intellectual

and material needs, and so contribute effectively to the general survival and development of the society.

At present, for example, in the Department of Education Planning and Administration at the Ministry of Education and Culture there exists no efficient system for gathering, processing, storing, retrieving, or using data on which plans can be based at either the headquarters or regional level. Similarly, there is no mechanism for checking and standardising data. Data is often not systematically collected and analyzed, hence not reliable.

The need to device appropriate procedures for collecting, processing, storing, retrieving, and using data in preparing and implementing education plans has been expressed by many study reports (MEC and MSTHE 1993, Nawe 1989).

Logical and rational progress toward the accomplishment of higher education objectives implies the need for strategic planning. Higher education institutions in particular have to re-think their knowledge generation and research function by, among other things, establishing a machinery for co-ordinating and facilitating research between the institutions. The need for the provision of facilities which would make it possible to plan and implement desired programs is therefore obvious.

Education planning should be considered both at national (macro) and institutional (micro) levels. Planning at national level requires to take into consideration the different economic sectors for which the education system is expected to prepare manpower. For example, in order to attain sectoral objectives in the fields of agriculture, livestock, forestry, and fishing, farmers will have to be

made aware of the possibilities of the use of simple technologies designed to make the farm labour less laborious but more productive. The practice of proper animal husbandry must be encouraged. The problem of deforestation must also be addressed and arrested. This emphasis on appropriate people centred technologies, as well as application of science towards the exploitation of, while protecting the country's resources will, for example, need to be reflected in the education and training curricula.

Generally, in order to produce graduates with the appropriate cultural orientation and the relevant academic, vocational, technical, and technological skills demanded by the economy, a wider integrated approach to knowledge acquisition will have to be adopted by harmonizing and synchronising the functions of the different ministries. The system of knowledge acquisition will have to be streamlined so that the different avenues for education and training allow for compatibility and convergence at various levels of schooling and training, including higher education. This pre-supposes that the integration of education and training systems to be centrally coordinated, thus having the different economic sub-systems coordinated and networked.

At the Ministerial level, however, the need for establishing different information sub-systems to cater to the information needs of planning at institutional level will call for, among other things, setting up of information sub-systems and databanks to support institutional level planning, for example;

-establishing an up-to-date inventory of all properties or assets belonging to the

institutions;

-setting standards for all machinery, equipment, and building materials acquired to ensure standard maintenance schemes, etc.

The need for research and evaluation as a means of appraising performance is unquestionable. Policy formulations need to be backed up by research findings. The Government commitment in this is high as reflected by the following policy statement: "the Government shall establish, maintain and resource a National Documentation and Dissemination Centre for Education" (MEC and MSTHE 1993).

A study of the current situation of education planning, and identification of the information problems inherent in it, and a proposal to work out strategies for its improvement through the provision and management of information necessary for decision making at different levels is an essential step towards the improvement of education and a contribution towards national development in general.

The need for an information support system for education planning in Tanzania has been a wish for the education planners and researchers, and has been expressed in different reports (World Bank 1990, Sekimang'a 1992, MEC and MSTHE 1993a, MEC and MSTHE 1993b, COSTECH 1993). For example, on research and development, it is a national policy to "publicise, widely disseminate and make available research findings in an appropriate and usable form". A World Bank report (1990) indicates inadequacies in the planning process in the Ministry of Education where planning is limited to collecting routine statistics and preparing annual budgets. Weaknesses in management and in the collection and use of

information about educational performance are especially severe. No data are collected on costs and financing, and no use is made of the results of the national examination to modify or reorganise the curriculum and provide pedagogical support to the teachers. Weaknesses in the management of personnel, resources, and information are evident throughout the system. The reasons, as noted by the report, lie in two basic factors:

First, there are no selection procedures for education managers, and in many cases, responsibility is given to staff who do not have the training or the talent required to perform managerial duties, and secondly, to a significant extent, management problems are exacerbated, if not caused by, poor facilities... buildings, equipment, communication, transport and information resources.

On strengthening Educational Research and Evaluation capacity, the Government put forward two policies and implementation strategies as follows:

1. Educational research and evaluation units shall be strengthened and adequately resourced. This policy will be implemented through strategies to ensure that:

- existing educational research and evaluation units are maintained and provided with requisite funds, equipment and facilities;
- academically competent personnel are recruited, trained, and properly motivated;
- researches undertaken are policy-focused and action oriented.

2. The Government shall establish, maintain and resource a National Documentation and Dissemination Centre for Education (NDDCE).

This policy will be implemented through the following strategies:

- Identifying a suitable institution for the location of the NDDCE;
- Providing the necessary resources needed to establish, maintain, and operate the centre, including physical infrastructure, equipment and trained personnel.

Thus, in order to enhance the activities in planning, policy analysis, and evaluation, the establishment of ISSEP is a definite requirement.

1.2 OBJECTIVES

1.2.1 General Objective

The general objective of the research is to strengthen and enhance the efficiency and effectiveness of education planning in Tanzania by facilitating access to timely, relevant and reliable educational information by planners, decision makers and executives, researchers and all those who are concerned with the provision of education.

1.2.2 Specific Objectives

The following specific objectives are derived from the general objectives:

1. To propose:

- a plan for the establishment of ISSEP in Tanzania;
- an appropriate administrative and functional structure of ISSEP;
- national and international cooperation strategies through networking and other cooperation formats;
- steps towards implementation of the plan; and
- different databases to be maintained at the different nodes of the system network.

2. To create prototype databases that would respond to some common queries on education in Tanzania from different user groups.
3. To generate information products and services from the system to serve as models for ISSEP.

1.3 SCOPE AND LIMITATIONS

1.3.1 Scope

Education is a very wide subject. The primary role of education is to harness as well as develop human talents and potentialities so that the people can meet their intellectual and material needs, and so contribute effectively to the general survival and development of their society. "Education is thus a process by which the individual acquires the knowledge and skills necessary for one to appreciate and adapt to the ever changing physical and social conditions of society and in order to realise his/her potential (MEC and MSTHE, 1993 1).

Education will thus encompass a number of activities ranging from formal to non-formal education, institutionalised and non-institutionalised education processes in the society. Ideally, an information support system should be able to cater to the needs of the wide range of users and the different aspects of education.

The current study covers only the formal education system, usually falling under the jurisdiction of the ministries of education in Tanzania i.e the Ministry of Education and Culture (MEC), and The Ministry of Science, Technology and Higher Education (MSTHE). The activities and programmes undertaken by these ministries are numerous, and relate to policy, regulations, curricula, physical plants and their maintenance, teaching materials, textbooks, examinations, preparation of teachers, transport, financial control, research and development, administration, quality control, etc, at the levels falling under each ministry's jurisdiction. The study considers in some detail information support for education planning at the tertiary level. It is recognised that education planning cannot be considered in isolation, and thus other areas which are closely related will also be considered in the context of education planning in Tanzania.

1.3.2 Limitations

Some two decades ago, a UNESCO-IBE world survey (1976) pointed out that, a methodology for the study of user needs in education has not been developed. The

situation has not changed significantly since then. The same study proposed the need to develop methodology and conduct user needs studies both nationally and internationally. In the absence of such studies, a few target groups were identified, and questionnaires administered to them. The user needs assesment has thus been limited to these groups.

Another limitation is the lack of an information centre/documentation or library devoted to education where formal queries could be received and attended to. Currently, due to bureaucratic procedures involved and poor services, most users find it easier to identify a friend, a former teacher/student or classmate and process a problem through him or her. Thus, the official queries presented formally are few, although a number of queries are answered daily through the informal channels. Compounded by the limited time available for the study, it was difficult to collect complete data on queries.

Finally, the fact that the study environment dictated that the data be collected much earlier to the actual thesis writing schedule, and the distance barrier between the researcher and the environment which the research is expected to benefit, (i.e Ethiopia and Tanzania), data realised later as needed could not be obtained. This has led to much reliance on secondary sources of data, which are more general.

1.4 ORGANISATION OF THE THESIS

The thesis is organised into seven chapters. The first two chapters, "Introduction" and "Methodology", give the statement of the problem and

justification, elaborating on the general and specific objectives, and the methodologies employed in data collection, analysis, and organisation.

The third chapter on "Background Information about Tanzania", provides in general terms, an overview of the country, relating to its population, physical features, the economy, and the information infrastructure. This was found necessary in order to provide the overall picture of the context in which the proposed information system will be operating.

Chapter four gives details of education planning and discusses in context the need for information support for education planning. Chapters five and six present the proposal to establish an Education Information Support System (ISSEP), outlining its objectives, structure, functions, and implementation strategies. The last chapter gives recommendations for further survey, study, and research in educational information as a necessary strategy in education planning.

1.5 DEFINITION OF TERMS

1.5.1 Educational Information

Includes the generation and communication of ideas, opinions, facts, figures, etc relating to the performance and improvement of educational systems (policy, organisations, structure, content, methods, evaluation) among those concerned at the local, national, regional, and international levels (Unesco IBE 1976).

1.5.2 Education Information Clearing House

An organisation that collects and maintains records of research, development, and other activities being planned, currently in progress, or completed: it provides documents derived from these activities, and referral services to other sources of information relating to these activities (Harrod's glossary 1987).

For the purpose of this study, taken in the context of the above definition, an education information clearing house (EICH) will refer to a facility for collecting and organising documentary, institutional, and human sources of information about education in Tanzania as well as generating value added information products for the purpose of answering queries about education either by providing answers or providing information about where answers can be obtained.

1.5.3 Information Support System

Purpose-oriented information system designed to help in problem identification and/or finding solutions to problems, or a goal seeking system. Such a system should be capable of presenting analyzed and synthesized data in a readily usable form to different user groups at different levels (Neelameghan 1993d)

1.5.4 Information Network

An arrangement or structure that links a group of individuals or organisations, who have agreed to work together or share resources. All groups may already share some resources on an informal, unorganised basis to a certain degree.

In information, networking involves sharing resources to meet the information needs of current and potential users of information for all the network participants (Nega 1992).

1.5.5 Education Planning

At national level, it refers to setting up the short and long term human resource development priorities in the context of the overall national development plan. This involves setting up of policies and general implementation strategies. At the lower level, it refers to decisions taken by educators themselves as to what proposals they should make in their draft proposals in response to the objectives which they have been set, and the decisions and modifications which must be made subsequently to ensure that the proposed educational development represents a justifiable claim upon the national resources during the period of the plan (Unesco IIEP 1969).

CHAPTER TWO

METHODOLOGY

2.1 GENERAL

Much of what is involved in this study can be categorised as a 'modified' action research. Action research involves setting something up and running to see what happens. It involves a continuous thread of formulation of objective, evaluation, and a mechanism whereby the results of the evaluation and the lessons learnt during the project can be fed back into the process so that it becomes a dynamic process and constantly modified in the light of experience. For the researcher, it brings the real world into focus and makes all the more apparent the purpose of research (Moore 1983). However, this has very much been limited by the fact that there will be a considerable time lapse between the setting up of the prototype system and its actual full scale implementation.

Usually the methods chosen for specific research should be applicable within the available resources. Data may be collected in different ways, but the methods chosen should be such that they produce reliable, precise and valid data.

For the purpose of this work, a combination of methods was adopted in order to facilitate fast collection of data within the limited time available. Questionnaires,

interview, on-site visits and literature survey are the main methods used for data collection.

2.2 DATA COLLECTION

Two types of questionnaires were designed, one for identifying educational information needs of potential users; and a second set designed to collect data for creating prototype databases for profiles of institutions, information systems, experts, and projects.

Object-oriented databases, as the name explains, focus on specific aspects (attributes) of an object of interest, and may take different formats as may be preferred by the user. Given the variations that result from this, free forms were used to collect data from various documentary, institutional and human sources of information for the object oriented database. Statistics were mainly obtained from the regularly issued report 'Basic Education Statistics in Tanzania' prepared by the Planning Unit of the Ministry of Education and Culture and the Ministry of Science, Technology and Higher Education.

Five different questionnaires were used and data collected about education information needs, and profiles of educational institutions, information systems, projects, and experts. Sample questionnaires are given in Appendix 1B to 1F respectively. For bibliographic data, AACR2 standard as applied in MIBIS was used.

Interview schedules were arranged for the top decision making administrators, most of whom did not wish to go through questionnaires. The list of persons

interviewed, and the interview questions, are given in the Appendix 2 and 3 respectively. The interview with administrative personnel and decision makers in particular was intended to elicit facts and their perception on:

-information as a vital resource for planning and decision making;

-the existing mechanisms for collecting data for education planning;

-the major requirements/limitations in education planning; and

-the prospects/feasibility of establishing ISSEP in Tanzania.

Literature survey was used to collect data on basic facts about education in Tanzania: geographical, political, educational, social, and economic facts regarding the current situation. The national development priorities, and short and long term education policies and priorities were identified from budget speech documents, and ministerial annual reports. The report "Tanzania integrated education and training policy" by the Ministry of Education and Culture, and Ministry of Science, Technology and Higher Education has been an important source of information on the future plans for Education in Tanzania.

Various documents about information policy in Tanzania, were consulted. This is because the planning of sectoral information systems is essentially related to the general planning of the national information policy. In this respect, ISSEP is proposed within the existing National Information Policy Plan proposal (Sekimang'a 1992), and the National Science and Technology Policy for Tanzania (draft report) by the Tanzania Commission for Science and Technology (1993).

Guidelines for Planning of Libraries and Information Centres (Seetharama 1990) and Unesco Handbook for Information Systems and Services by Atherton and views about networking in information in Tanzania as presented in various workshops have been the major sources of ideas on the design of ISSEP.

Site visits to the Planning Unit at the Ministry of Education and Culture, the National Archives, the National Bureau of Statistics, the National Library, the National Museum, the Planning Commission, the Civil Service Department Library, the National Science and Technology Commission, the Ministry of Science, Technology and Higher Education were undertaken for getting additional information about the information infrastructure and existing facilities in Tanzania.

Much data were also obtained from the Planning Units of the Ministry of Education, the University Library, the National Bureau of Statistics, and from data collected by Sekimang'a (1992) for the research on "A National policy on information systems and services for Tanzania: Formulation and strategy for implementation".

The ISSEP proposed in this work essentially covers the formal sector of education in Tanzania. An information system to cover in detail all aspects of education would call for a longer and more thorough survey. The ISSEP proposed here should however lay the groundwork for a future comprehensive information support system design.

2.3 SAMPLING

Unesco IBE survey (1976) found that, in most countries, educational information is provided to user groups in the following priority:

1. Decision makers
2. Educational administrators at various levels
3. Educational researchers
4. University professors and teachers of higher learning institutions
5 Teachers in schools
6. Students
7. Parents of students

Guided by these findings, a purposeful (target) sampling was done in order to get data about education information needs from decision makers, planners, and teachers. These categories of users were identified in the Ministry of Education and Culture, Ministry of Science, Technology and Higher Education and the Faculty of Education at the University of Dar-es-Salaam.

CHAPTER 3

TANZANIA: BACKGROUND INFORMATION

3.1 THE ENVIRONMENT OF EDUCATION PLANNING

The role of education in the development of the human resource which is central for the overall development of any nation places education activities in general and education planning in particular in direct relationship with the other sectors in any country. Any changes in national development priorities, introduction of new technologies (which may require new and more sophisticated skills) for example, will have an effect on education planning. Given this relationship, the education system and all those involved in and concerned with it should be aware of what is happening in and expected from education by the other sectors, what resources and facilities are available for its exploitation, as well as any economic, social, political, or cultural implications of the environmental factors.

Any information system exists within a dynamic environment - a geographical, socio-economic, socio-political, socio-cultural environment - the elements in which some change faster than others. Since most of these environmental elements consist of open systems, it is inevitable that they will be interacting with each other. An essential function of an information system is to assist people cope with change. It is, therefore, necessary to take into account the environmental context within which

education system planning takes place, that is, the physical, political, cultural, social, economic and other pertinent conditions. As Montviloff (1990) observes, the physical environment provides a measure of the geo-climatic conditions, and ease of internal and international communication which make information activities easier or more difficult. Similarly, the general economic condition provides a measure of the overall economic resources of a country and therefore it becomes indicative of the extent of support that it can extend as incentives for information activities. In turn, this would indicate the type of information required, and the sectoral information systems to be established.

3.2 THE COUNTRY

The United Republic of Tanzania was formed in 1964, following the union of Tanganyika and the Islands of Zanzibar and Pemba. Tanzania lies between longitudes 29°E and 41°E and latitudes 1°S and 12°S. It is bordered by Kenya and Uganda in the north, Rwanda, Burundi and Zaire in the west, Zambia, Malawi and Mozambique in the south, and the Indian Ocean in the east. It has an area of 945,234 square kilometres of which 883,739 is covered by land and 61,495 square kilometres covered by rivers and lakes.

Physically, the country falls into three main zones: the islands and coastal zone, the inland plateau, and the lake basins. Two other natural features, the Great Rift Valley, which runs into two forks northwards across the country and a system of mountains which are at their highest in the in the north with the Mt. Kilimanjaro

peak, and the southern highlands, and the break up of the uniformity of the central plateau in between. As a result, Tanzania is a country of infinite scenic and climatic variety, and it is impossible to generalise about it except under the broad terms imposed by its position in the tropics.

3.3 THE PEOPLE

Tanzania consists of four major racial groups, namely Africans (98%), Asians, Arabs, and Europeans. The african population is composed of 126 ethnic groups with different tribal languages, and cultures. However, the use of a national language, Kiswahili, which is fluently spoken throughout the country, has facilitated national unity and communication. English is being used for international communication and at institutions of higher learning. It is also a medium of instruction at the post primary education level.

3.4 POPULATION

Tanzania's population has been increasing steadily. In 1961 at the time of attaining independence, the country had a population of about 9 million. The 1967 census showed that the population had increased to 12.3 million. It was 14.9 million in 1975 as indicated in a national demographic survey. The 1988 population census gave the total population of Tanzania as 23.2 million. With an annual growth rate of 2.8% in 1988 the population of Tanzania is estimated to be about 25 million at

present (1994). A summary of the population between 1961 and 1994 is shown in Table 1.

Table 1: POPULATION GROWTH 1961-1994

Year	Population(mill.)
1961	9.0
1967	12.3
1975	14.9
1988	23.2
1994	25.0

Among this population, in 1980, by ILO estimations, the economically active population were as shown on Table 2.

Table 2: ECONOMICALLY ACTIVE POPULATION BY MID 1980

(Figures in '000 persons; ILO estimates).

Sector	Total	Males	Female
Agriculture	8140	3787	4353
Industry	431	353	78
Services	938	630	308
Total	9508	4769	4739

Source: Africa South of Sahara 1992

3.5 POLITICS

Being under British rule as a Mandate Territory under the League of Nations (1922-1945) and a Trust Territory under the United Nations (which replaced the

League of Nations in 1946) Tanzania had the advantage (over the other East African countries), that political activities were more tolerated by the ruling authorities. In 1954, the first political party, Tanganyika African National Union (TANU) was formed for the purpose of mobilising the people for independence. This was achieved on 9th December 1961 with Dr J.K. Nyerere as the first president. In 1962, Tanganyika became a Republic, and in 1964 it merged with Zanzibar to form the United Republic of Tanzania. Since independence, the country has been under a single party system until 1990 when it was constitutionally agreed to introduce a multiparty political system.

In Tanzania, the party functions over and above the government. The function of the government is that of implementing policies that the party has put forward. National policies are practically prescribed, but the influence of the party becomes less at ministerial and local level. The practice may change with the introduction of the multiparty system, and the market economy environment which advocates economic and scientific feasibility of policies rather than political popularity in policy formulation.

Administratively, Tanzania is divided into regions, districts, wards, and streets/villages. The country is currently ruled by Chama cha Mapinduzi (The Revolutionary Party) CCM, and the country is preparing itself for the first multiparty elections in its history in 1995. Presently, the country is headed by an elected president who is also the chairman of the ruling party. There is a Prime Minister who is also the Vice President. Elections are held every five years. The president is

eligible for election for two consecutive terms only.

3.6 THE ECONOMY

In 1989, according to estimates by the World Bank, the gross national product (GNP) of mainland Tanzania (at average 1987/1988 exchange rates) was U$3097 million, equivalent to $120 per capita. Between 1980 and 1989, it was estimated, the GNP per head declined in real terms, at an average annual rate of 1.6% per year, although an average annual increase of 0.1% was sustained in the period between 1987 and 1989.

Tanzania's economy, like that of many developing countries, is agriculture based. Although agriculture's contribution to foreign exchange earnings has slightly gone down between 1981 and 1988, it remains the major source of foreign exchange for the country.

Agriculture's percentage share of gross domestic product (GDP) in 1965 and 1988 are as shown in Table 3.

Table 3: AGRICULTURE'S SHARE OF GDP IN 1965 AND 1988 (in percentage).

Sector	1965	1988
Agriculture	46	66
Industry	14	7
Manufacturing	8	4
Services	40	27

Source: Africa South of Sahara 1992

The annual rate of inflation, measured in terms of urban consumer prices, declined from 42.9% in 1984 to 28.2% in 1985, but increased to 44% in 1986. It had been reduced to about 19% in 1990.

The first five year development plan, launched in 1964, had to be abandoned in 1966, partly because the required amount of foreign aid did not materialise. The second five year development plan, (1969-1974) envisaged an average annual GDP growth rate of 6.7% but only 4.8% was achieved. The initiation of the third five year development plan, scheduled for 1975 was delayed until 1977. The target for GDP growth under the 4th five year development plan, 1981-86, was 6% per year, but in 1981 GDP decreased to 3.6% in real terms.

The fourth plan allocated nearly one quarter of total expenditure to industry, while agriculture took second place. However, the country's economic situation worsened drastically between 1979 and 1982, and the plan was replaced by the National Economic Survival Programme (NESP), announced in March 1981. In June 1982, a Structural Adjustment Program (SAP) was announced. SAP was a three year

programme prepared jointly by the Ministry of Planning and Economic Affairs, and a team of World Bank advisers, and aimed to stimulate the productive sectors (particularly the main export crops), to curtail government spending, and relax price controls.

In the budget of June 1986, a new three year economic recovery program (ERP) was announced, and was closely allied to the IMF agreement, and to the associated new aid arrangements agreed with the World Bank. Overall, the ERP has been a success, and even though targets have not been fully met, there have been signs of economic recovery during the late 1980's and into the 1990s. The second three year phase of the ERP, the Economic and Social Action Plan (ESAP), was launched in January 1990. It aims to continue ERP policies but also to alleviate the social costs of adjustment measurers. Five year plans have virtually been abandoned, and development planning is now taken year by year. The priority areas for 1990/91 were roads, health, and education. (Africa South of Sahara 1992).

3.7 INFORMATION INFRASTRUCTURE

3.7.1 Information Policy

Following the establishment of the Tanzania Commission for Science and Technology (COSTECH) in 1986 by transforming the National Scientific Research Council, the Ministry of Science, Technology and Higher Education in November 1990, and the opening up of the country to market economy, the information scene in Tanzania opened a new chapter. The late 1980s and early this decade has been

characterised by moves to improve the information infrastructure, and more encouraging is the fact that, the efforts are coming from different levels, starting from the lowest (user) to the highest (ministerial level), and the professionals.

Although much of the scene as observed by Sekimang'a (1992) remains unchanged, i.e. duplication of terms of reference in the legislation of some information units, absence of a coordinating body or agency for information systems and services, information services operating with different levels of success (in fact minimum levels), information manpower completely inadequate both in quality and quantity, minimum user sensitization, and minimum use of information technology in information handling, there are signs that the environment is very much conducive for improvements in many of these aspects.

A study of the existing information infrastructure in Tanzania was conducted in 1991 which led to the proposal on a National Information Policy on Information Systems and Services in Tanzania (Sekimang'a 1992). Almost at the same time, COSTECH prepared a project proposal on the "Establishment of Scientific and Technical Information Network in Tanzania". Later in 1993 in view of the fast changing environment in the country, and the proliferation and use of computers, the MSTHE appointed a task force to review the National Science and Technology Policy of 1985.

The rationale for reviewing the 1985 policy was the major changes in the macro economic policies that had taken place in the 1980s. One of such changes was the change from state ownership to privatisation of some parts of the economic activities

and the introduction of a free market economy.

Several economic structural adjustment programs were launched one after the other: NESP (1981), SAP (1982), ERP (1986), ESAP (1989). The government implemented a number of far reaching policy reforms including trade liberalisation. In order to meet the objectives of the trade liberalisation policy, the government formulated the Investment (Promotion and Protection) Act of 1990 which officially opened up the country for a market economy.

These major economic reforms had implications on the information infrastructure in the country. The country was opened up to more competitive economic ventures. Planning in all sectors called for more reliable data, since much government subsidies which were keeping ailing parastatals moving were removed, and self-reliance at institutional level had to be practised in the real sense of the word.

Another factor, which though not acknowledged remains much true, is the pressure from major international lending agencies (World Bank and IMF) on the one hand, and investors on the other. After the Investment Act of 1990, many foreign investors studied the feasibility of investing in the country. One of the limiting factors they pointed out was lack of modern information communication infrastructure, that is, the environment capable of supporting the dynamic and timely nature of business information both internally and internationally. This includes internal communication and transport infrastructure, high capacity telecommunication facilities (an efficient telephone system, E-mail services, etc.), modern banking

facilities, and timely reliable data to help contingency decision making. In general, they found the information infrastructure too poor to support competitive and information intensive business undertakings.

At present, the National Information Policy proposed by Sekimang'a is the most comprehensive and authoritative document on Tanzania. It provides for all other sectoral information systems, of which education is one. In the proposal, the National Information Coordination Chart puts the Education sub-network under the Sectoral Subnetworks which are under the Directorate in the Prime Ministers Office, the coordinating office (more details are given in chapter 5).

3.7.2 **The Publishing Industry**

The contribution of the publishing industry in disseminating information in general and educational information in particular is undisputable. In recognition of this contribution, a general overview of the industry is presented here, placing the industry in the education planning context.

The publishing industry in the country was acutely hit by economic hardships, and due to import restrictions for spare parts and other inputs, only a few private publishing industries survived. There is one government owned publishing house and the Government Printer. The rest (numbering five) are either owned by parastatal organisations like the Dar es Salaam University Press, or religious groups like the Central Tanganyika Press, the Ndanda Mission Press, etc.

Due to rising costs of paper and printing, the publishing industry is stagnant.

Manuscripts submitted for publication take an unduly long time to get into print due to unpredictable market for books, etc. It is also true that in a country with a GNP of $120 per head, expenditure on books is a near luxury.

A report of a task force on education system for the 21st century, indicates the existence of an acute shortage of educational materials at all levels of education. The major problems as regards books production have been:

-Low incentives: teachers who spend a lot of time in subject panels writing manuscripts rarely benefit from the proceeds of the sale of books.

-Slow turn out of manuscripts: The institute of Curriculum Development (ICD) has not been producing manuscripts fast enough due to inadequate funding, lack of expertise in textbook writing, poor facilities and an overloaded curriculum with too may subjects to cover.

-Inability of local publishers: In most cases manuscripts remain unpublished for three to ten years and by the time they come out they are out of date. The main cause of the delay has been lack of funds to hire editors, designers, and qualified staff. Lack of basic publishing equipment and the wrong textbook pricing systems have also disadvantaged publishers.

-Low printing capacities: Only two printing presses have the capacity and the

experience to handle printing of school books.

These, together with an inefficient distribution system and insufficient encouragement for producing works of reference, textbooks, reading books and teaching manuals have made the book industry even weaker.

With assistance from SIDA, UNESCO/NORAD, and UNICEF, between 1986 and 1991 Rural Printing Presses have been established in several regions. Originally, they were conceived as printing presses for rural newspapers, although the presses have a potential far in excess of the capacity needed. A Unesco (1992) evaluation report recommended privatisation of the presses and making them economically viable enterprises.

3.7.3 **Libraries**

Libraries in Tanzania function at different levels of success. They are characterised by traditional approaches, where the librarian is there to take care of/protect the books more than to assist readers. They are stocked with old books, and under utilised. The housekeeping activities are mainly manual, and services are hardly beyond the traditional bibliographic reference searching.

3.7.3.1 **School Libraries**

Effective school libraries hold a central place in the teaching and learning processes in schools. They can provide a range of information and reading materials for student use outside the classroom; and offer opportunities for teachers to supplement the textbook and blackboard with new and stimulating material in the classroom. The effective exploitation of school library resources, however, requires a gradual change in attitude towards the teaching process, away from a rigid reliance on 'chalk and talk' methodology.

In recognition of the role of the library in education development, the Education (School Library Resource Centres) Act was enacted by the Government in 1986. In this document, the functions of School Resource Centre have been generally outlined as executing the national education policy by:

-providing support for curricula work and act as an instructional tool;

-providing facilities for the use of audio-visual materials, and act as an agency for the organisation and maintenance of technical equipment for the school;

-providing opportunities for teachers and students to learn how to use relevant educational materials, and training in the exploitation of the facilities of a resource centre;

-providing comprehensive collection of learning materials in different formats, so as to satisfy educational and information needs and supplementary materials;

-facilitating consultation by the teaching staff on the selection of appropriate materials to achieve their instructional needs;

-helping stimulate independent study, develop initiative and creative skills; and

-helping incorporate members of the community into the cultural life of the school.

On staffing, the regulation provides for the engagement of full time qualified library staff. Together with this, it provides for the appointment by the commissioner for education of an experienced professional librarian who shall be the coordinator of the library resource centres.

The resource centres are to be inspected by an experienced professional librarian, who shall submit a report to the Commissioner.

Although the Government agreed to the establishment of these centres as a matter of policy, the environmental conditions for the implementation of the policy leave much to be desired. An evaluation report (Nawe 1989) indicates that the 1986 regulation with regard to staffing of library resource centres is still a dream. Schools have not managed to engage even para-professionals full time in most cases, let alone qualified staff. For example, out of 17 secondary schools and 6 teacher training colleges covered by the Nawe survey, only 4 library assistants possessed some formal training. Only one teacher training college had a trained librarian. Two libraries were run by registry clerks.

Lack of initiative in running/improving library services could partly be attributed to the fact that, those who matter in government and particularly in educational institutions and who decide the fate of the libraries in the country, are not well aware or sensitized of the importance of libraries for educational development.

Development in education is the base for development in every other sector.

3.7.3.2 **Public Libraries**

Public libraries in East Africa were initiated by the British in the late 1950s, and in 1961 when Tanzania (then Tanganyika) attained its independence, the government was quite committed to development of libraries. The Tanganyika Library Service Board (TLSB) was enacted in 1963 and given the mandate to develop all types of libraries in the country. The act has given the Board the responsibility of advising, executing and coordinating the activities in the fields of libraries, documentation, publishing and training.

There is a network of national (public) libraries maintained in 15 (out of 21) regional headquarters, and several other institutional libraries are served through the book box programme. Bulk loans are offered to institutions, community centres, industries, etc. The National Central Library (the headquarters) provide services to children, for borrowing books for home reading, children participate in story telling, film shows, book talks, quizzes and imaginative writings.

The TLSB is expected to promote book publishing through its publishing program, though it is hindered by stagnant publishing presses.

3.7.3.3 Academic Libraries

Academic libraries considered here are college and university libraries. With particular reference to university libraries, (which are three), the libraries are relatively better stocked and staffed. The services are limited to the traditional/conventional type, and an evaluation report by Kiondo and Kimbunga (1992) indicate problems of accessibility due to use of traditional card-catalogue retrieval systems, lack of funds, inadequate staffing (both in quality and quantity) and lack of clear information services policy. They recommend the use of information technology to improve access, provision of adequate funding and having personnel capable of managing modern information handling facilities.

3.7.3.4 Special Libraries

Special libraries are mainly in government ministries, industries, financial institutions, agriculture institutes, international organisations, non-government organisations and some religious institutions. They range from book corners/stores to well built and maintained information centres, with qualified personnel, and an adequate budget. The services of special libraries are not coordinated as the case is in some other countries where association for special libraries are active. They all fall under the TLSB and are members of the Tanzania Library Association (TLA).

3.8 TELECOMMUNICATIONS

Telecommunication services and infrastructure has in recent times occupied a central role in information communication, especially after the integration of the telephone and computer technology i.e the development of telematics. Electronic mail services, and online access to international databases require efficient telecommunication services. There exists in Tanzania a telephone network and a telex system. The Tanzania Posts and Telecommunication (TPTC) does not operate a public data communications network.

Recently, in an effort to improve the efficiency of telecommunication service, the TPTC was separated into Posts and Telecommunication corporations. The telecommunication part has greatly improved its services of late, by the establishment of a television network, instalment of a modern satellite station and expansion of the telephone network capacity.

3.9 SCIENCE AND TECHNOLOGY

Science and technology in the country was being promoted by the Tanzania Scientific Research Council, which pioneered the establishment of the National Science and Technology Policy in the 1980, adopted in 1985. On the recommendation of the policy, the Government transformed the Scientific Research Council into the Tanzania Commission for Science and Technology. In 1990, the government demonstrating its further commitment to science and technology, established a full fledged ministry, the Ministry of Science and Technology and Higher Education. This

ministry reviewed the 1985 policy and came out in May 1993 with an updated science and technology policy.

Through the Ministry of Science, Technology and Higher Education, the different institutions are linked together functionally and structurally as a science and technology system whose main task is to spearhead development through the utilisation of science and technology in all sectors of the economy.

The vital role of science and technology in socio-economic development is acknowledged the world over, by all nations, developed and developing. A science and technology policy is realised as a means to an end. The science and technology policy in Tanzania has realised and reflects the key role that science and technology will play in bringing about rapid socio-economic development and subsequent realisation of self reliance. Tanzania, has however, realised the limitations imposed by scarcity of resources in the development and promotion of major scientific discoveries or inventions across the whole science and technology spectrum. All the same, the policy spells out directions in which science and technology can be developed and utilised more effectively and efficiently in the key sectors of the economy.

A clear national science and technology policy is necessary to regulate the flow of technologies and to reduce excessive dependence on imported technologies. The policy is a guide to government ministries and parastatal organisations, including universities and other research and training institutions as well as to the private sector and non-government organisations in the choice, assessment and transfer and

adaptation of technologies. It is also a guide in the development of the national scientific and technological capacity and capability and spells out clearly priority areas of research and development which have the potential to accelerate national development and increase national competitive power at the global level. The implementation of science and technology policy will, however, require the establishment of an institutional framework and linkages necessary to ensure that the detailed plans to be drawn up for the implementation of the policy are facilitated. This is an area which needs to be carefully studied and is characterised by information-intensive activities.

CHAPTER 4

EDUCATION PLANNING IN TANZANIA

4.1 EDUCATION

4.1.1 Introduction

In order to understand the nature of activities involved in the planning of education, and thus the data required for the purpose, a brief discussion about the educational planning process is given.

Education, the process by which the individual acquires the knowledge and skills necessary for one to appreciate and adapt to the ever changing physical and social conditions of society, is a central actor in the socio-economic development of a country. There is a close relationship between the level of socio-economic development of a country and the average educational level attained by its people. However, the relationship between education and development depends to a degree on the extent to which the education provided is relevant, that is, education in which the content and methods are connected in some way with the needs and aspirations of society. Since the needs and aspirations are always in a state of flux, relevance of education must be related not only to the present needs and aspirations of society, but also to those of the future. Taking into consideration the development trends in a country, the concept of education must transcend the mere passing of societal wisdom from one generation to another, to the distillation of that wisdom in the search for

critically relevant knowledge, which will advance and change society rather than merely reproduce it. Education has to enable its recipients not simply to fit into their environments only, but also to transform them. This can be achieved by having an education and training geared towards building up a science and technology base which is a prerequisite in the quest for a self-reliant and self-sustaining economy.

In developing countries and particularly in Tanzania, the education and training agencies have to incorporate in their programmes:

-environmental, cultural, social, and civic values of society;

-strategies to train technologists who can import and adapt foreign technologies;

-methods to encourage a large number of students to study science, mathematics, logic and other methodological disciplines in preparation for advanced research especially in scientific subjects;

-modes of imparting critical technology-related knowledge to all students at various levels of schooling;

-ways to coordinate the provision of vocational and technological education; and

-training of trainers programs to facilitate the above tasks.

In Tanzania for example, this calls for a more integrated approach to knowledge acquisition which demands harmonizing and synchronizing of the functions of the different ministries responsible for optimal utilisation of resources. This includes, currently, the Ministry of Education and Culture, Ministry of Science, Technology and Higher Education, Ministry of Agriculture, Ministry of Energy and Water Resources Development, Lands and Environment, Industries and Trade,

Labour and Youth, Ministry of Community Development, Women Affairs and Children. The system of knowledge acquisition will have to be streamlined so that the different avenues for education-cum-training allow for compatibility and convergence at various levels of schooling and training, including higher education, which calls for a centrally coordinated system. The planning implications, and consequently the information needs to accomplish such an undertaking are discussed in section 4.3.2.

4.1.2 **Education Provision in Tanzania**

It is not aimed here to give a full account on the historical provision of education in Tanzania, because such discussion will be quite lengthy. In short, education in the country from the 16th century to date, has gone through a series of changes due to administrative and political changes that have taken place. The indigenous education, first were influenced by Arab and Christian missionaries, then the Germans, the British, and finally after the independence of the country in 1961, the Arusha Declaration introducing a major reform, Education for Self Reliance (ESR) in 1967. These influences can even to the day be traced in the education policy formulations and implementation.

4.1.2.1 <u>The Education System</u>

Education and training in Tanzania is undertaken by all ministries, but the main ones for general formal and non-formal education are the Ministry of Education

and Culture, Ministry of Science Technology and Higher Education and the Prime Ministers Office (Department Regional Administration and Local Government). The other ministries are involved in sector-specific professional education and training. In addition, formal and non-formal education is provided by communities, non-government organisations (NGOs) and individuals under the coordination of the central government ministries.

There are three channels constituting the education and training system. These include the Formal, Vocational and Professional, and Non-formal.

The formal education system is predominantly academic, ranging from pre-primary to university level. It takes 18 years with the structure being 2-7-4-2-3+. Pre-primary education takes two years at age 5-6. The seven year primary education cycle that follows is compulsory in enrolment and attendance. At the end of this cycle, pupils can go on with secondary education, vocational training, or enter the world of work.

Secondary education is subdivided into Ordinary Level (Forms 1-4) and Advanced Level (Forms 5 and 6) which lasts for two years. Students who complete ordinary level secondary education can go on to the next stage of Advanced Level secondary education, vocational training, professional training or enter the world of work, while those who complete advanced level secondary education join other tertiary and higher education and training institutions or join the world of work.

Tertiary and higher education and training provides education and training in specific skills and professions. Tertiary institutions operate under various ministries, public and private organisations. They have differing management, administrative

structures and legal status. The course duration in these institutions is usually between two to three years. University education and training is the apex, with degrees offered as a symbol of academic and/or professional achievement.

The general aims and objectives of education and training in Tanzania are to:

- guide and promote the development and improvement of
  the personalities of the citizens of Tanzania, their human resources and effective utilisation of those resources in bringing about individual and national development;
- promote the acquisition and appreciation of culture,
  customs and traditions of the peoples of Tanzania;
- promote the acquisition and appropriate use of
  literary, social, scientific, vocational, technological, professional and other forms of knowledge, skills and understanding for the development and improvement of the condition of man and society;
- develop and promote self-confidence and an inquiring
  mind, an understanding and respect for human dignity and human rights and a readiness to work hard for personal self-advancement and national improvement;
- enable the acquisition, improvement and upgrading of
  mental, practical, productive and other life skills needed to answer the changing needs of the industry and the economy;
- promote the love for work, self and wage employment and improved performance

in the production and service sectors;

- inculcate principles of the national ethic and integrity, national and international cooperation, peace and justice through the study, understanding and adherence to the provisions of the National Constitution and other international basic charters; and
- enable rational use, management and conservation of the environment.

The specific aims and objectives for tertiary and higher education and training which encompass all post Ordinary Level secondary education are to:

- enable people with the requisite baseline qualifications to access and benefit from opportunities of higher levels of intellectual, professional and managerial skills;
- prepare middle and high level professional human resource for service in the different sectors of the economy; and
- provide opportunities for intellectual, scientific and technological excellence and high level performance.

4.1.2.2 **Public expenditure on education**

Up to now, the central government is the main provider of funds for education in Tanzania. Except for primary education and adult literacy where the central government grants are transferred to regional units, all public expenditure on education e.g. secondary, teacher training, technical education, and university

education, are met centrally by the government.

An analysis of the recurrent government expenditure over a five year period 1987/88-1993 shows that on the average only 14% of the budget was allocated to the education sector. This is rather low, compared to sub-Saharan Africa standards where the average is over 20%.

Central government budget allocation to the Ministry of Education and Culture (recurrent) for 1980/81 to 1990/91 is shown on Table 4.

Table 4: Central Government Budget allocation to the Ministry of Education and Culture 1980/81-1990/91(recurrent in mill. shillings)1US$ = 350Tsh

Year	Total budget	Ministry of education allocation	Percentag
1980/81	14895.0	1737.7	11.7
1981/82	18316.1	2258.6	12.3
1982/83	18993.0	2524.0	13.3
1983/84	21460.9	2502.6	11.7
1984/85	27438.4	1795.1	6.5
1985/86	39764.4	2321.2	5.8
1986/87	53300.6	4227.1	7.9
1987/88	77667.9	4168.2	5.4
1988/89	118672.0	5659.3	4.8
1989/90	144248.7	8322.0	5.8
1990/91	160000.0	10153.7	6.3

Source: United Republic of Tanzania. Ministry of Education and Culture 1993. Basic Education Statistics in Tanzania (BEST). Dar-es-Salaam: Ministry of Education and Culture

Table 5: Central Government Expenditure by Function (% of Total) compared to SSA highest and lowest expenditures

	Education			Health			Agriculture			Trans & Com		
Year	75	80	88	75	80	88	75	80	88	75	80	88
Highest	25	32	-	11	11	-	28	23	-	18	26	-
Lowest	9	8	-	2	2	-	1	1	-	1	1	-
Tanzania	12	13	-	7	6	-	16	11	-	5	9	-

Source: ECA 1991. 1988 African socio-economic indicators

A survey of education in Tanzania since 1961 shows that school enrolments have more than tripled at all levels. There has been an attempt to apply a work-oriented curriculum, especially at post-primary levels as well as to adopt an equitable distribution of education across regions and between sexes. Despite these gains, the education system still suffers from a number of contradictions, among them being:

-gross primary school enrolment has gradually declined from 96% in 1983 to 70% in 1992 besides being made worse by high attrition rates of 10-15%. Higher level classes (Standards 5 to 7) in some regions virtually have few or no students at all;

-the illiteracy rate which in 1984 was only 10% has gradually risen to the region of 20 to 30% (1992);

-the number of primary school leavers proceeding to secondary school barely represents 15% of those completing primary education. This is the lowest in sub-Saharan Africa;

-the quality of primary school academic performance is most unsatisfactory. Only 15% of the candidates, especially in urban areas, manage to score 50% in Standard VII examinations;

-the physical learning environment leaves much to be desired, with classrooms in a state of pathetic despair: and exacerbated by acute shortage of desks, textbooks and other essential teaching materials;

-the curriculum, especially at the lower levels of schooling, tries to teach too many subjects and is not flexible and adequate enough to meet the various needs of school leavers;

-teachers are demoralised because they are dissatisfied with their working conditions being on the average, poorly renumerated compared with other professions. A significant number are under qualified and untrained, especially in private schools;

-although about half of the O-level secondary school student population pursue sciences, the number remains inadequate, considering the increasing scientific and technological needs of the future. Moreover, the performance of the schools in these disciplines is still relatively poor, mainly as a result of inadequate teaching materials and equipment;

-tertiary and higher education has been provided for the needs of the public sector, but it has been supply rather than demand driven. It has also been restricted to a few students, making it elitist and highly expensive in terms of unit costs. The problem has been exacerbated by low student-staff ratios due to low

Table 6a: Education Provision in Tanzania 1980-1989: Students enroled.

STUDENTS ENROLED	1980	1982	1984	1986	1987	1988	1989
Level 1							
Total	81153	84000	91359	94928	95503	-	-
Female	29927	-	34716	37322	37701	-	-
Level 2							
Total	3987	4162	5081	5917	6678	-	-
Female	-	-	-	1451	-	-	-
General							
Total	3158	-	3935	4869	5655	-	-
Female	-	-	1012	1227	1377	-	-
Vocational							
Total	150	-	115	230	-	-	-
Female	-	-	13	16	-	-	-
Teacher Training							
Total	679	-	951	1048	-	-	-
Female	-	-	-	208	-	-	-
Level 3							
Total	-	-	1072	1428	-	-	-
Female	-	-	-	-	-	-	-

Source: African Statistical Yearbook Vol 2 Part 3: East and Central Africa: 1988/89, UNECA.

Table 6b: Education Provision in Tanzania, 1980-1989.
Teaching Staff

TEACHING STAFF	1980	1982	1984	1986	1987	1988	1989
Level 1							
Total	3368	3513	3493	3169	3160	3350	3351
Female	1585	1697	1726	1581	1575	1681	1794
Level 2							
Total	80	79	84	104	115	120	126
Female	-	27	30	40	45	48	52
General							
Total	67	69	74	92	-	-	-
Female	22	24	27	35	-	-	-
Vocational							
Total	1	-	1	-	-	-	-
Female	-	-	-	-	-	-	-
Teacher training							
Total	11	-	9	11	-	-	-
Female	-	-	4	4	-	-	-
Level 3							
Total	4400	5244	5160	4987	5070	5619	6226
Female	-	-	731	689	641	767	919

Source: African Statistical Yearbook Vol 2 Part 3:
East and Central Africa: 1988/89, UNITED NATIONS. 1991

Table 7: Gross Enrolment Ratios for Primary Schools by Sex 1975-1988 Compared to Highest and Lowest Enrolments in SSA Countries

	BOTH			MALE			FEMALE		
Year	1975	1980	1988	1975	1980	1988	1975	1980	1988
Highest	151	158	128	133	164	130	140	153	127.1
Lowest	15	18	19.1	19	23	24.1	10	13.5	14
Tanzania	53	2.8	67.8	62	99.7	67.6	44	86.2	68

Source: ECA 1991. 1988 African socio-economic indicators

Table 8: Gross Enrolment Ratios for Secondary Schools and Higher Education 1970-1988: Comparisons with SSA data.

	SECONDARY SCHOOLS				HIGHER EDUCATION			
Year	1970	1975	1980	1988	1970	1975	1980	1988
Highest	41.8	51.1	82.3	40.7	2.5	3.0	5.6	6.2
Lowest	1.2	3.0	2.7	3.7	0.1	0.1	0.1	0.2
Tanzania	2.8	3.0	3.4	3.7	0.1	0.2	0.3	0.2

Source: ECA 1991. 1988 African socio-economic indicators

Notes:

The gross enrolment ratio is the total enrolment of all ages related to the population in age groups corresponding to primary, secondary and higher education age levels.

4.2 EDUCATION PLANNING

4.2.1 Planning

Planning is the optimal allocation of available or mobilizable resources to the components of the entity whose development is the subject of the plan (Neelameghan 1993b).

This implies decisions regarding the options that appear open for the future and then securing their implementation, with allocation of necessary resources, such as human, material, information etc. Planning therefore has a strong political aspect as options that will have to be selected may not benefit equally all the members of the society. Planning involves societal choice about the future which in turn implies political intervention. To exercise choice calls for genuinely alternative views/scenarios of the future.

In order that choice from among possible courses of action is purposeful and deliberate, a knowledge and understanding of the present and an explicit anticipation or foresight of future consequences of present actions are required. Such knowledge and understanding can be productive only if appropriate data and information needed on each of the alternative course of action are accessible at the right time at reasonable cost and that they are reliable, precise, and presented in conveniently usable forms.

In general sense, the purpose of planning rests on two ideas that serves as overall aims: The first is achieving efficiency in the resources management that is human, financial, material knowledge and information, required to prepare the plan

itself as well as to achieve its goals. Efficient resource management is ultimately defined in terms of the values held in society, that is to what extent the plan meets the varied needs of the society.

The second purpose is rationality - that is reasonableness in the exercise of choice of alternatives. While it may not be possible to achieve complete rationality, the notion of bounded rationality which focuses on fairness of decision making is widely accepted.

A rational decision is one in which various alternative courses of action are considered, the consequences resulting from them identified and compared, and the preferred alternative(s) selected in the light of the most valued ends.

In practice, this involves the provision of relevant information to decision makers about what exists in the planning region, and what may be expected under certain conditions. Several sectors need information for the purpose of their planning e.g. urban planning requires information on social infrastructure and facilities, such as education, health, recreation, leisure, and other social amenities.

Data for such purposes may be obtained from the respective ministries, e.g. the Ministry of Education and Culture etc. The factors that constrain access to such data for urban planning in third world countries:

-existence of data not known to the potential users;

-existing data is confidential or assumed to be so;

-data related to areas inappropriate for planning purposes;

-unreliability of data;

-outdated data, delayed publication of statistical and census surveys;

-poor or inconvenient organisation and processing of data;

-poor information services available at source institution;

-unfamiliar and/or inconvenient presentation of data; and

-other barriers to communication, including man-machine interface, language, etc. (Neelameghan 1993e).

4.2.2 **The Nature of Education Planning**

Education planning is the application of rational, systematic analysis to the process of educational development with the aim of making education more effective and efficient in responding to the needs and goals of its students and society (Thompson 1981). Although education planning has been done for many years, the approach has been changing with the changing needs of the society. The desirability of education planning was asserted by economists as they increasingly came to realise that the problems of economic development were largely problems of human development and by the social scientists as their understanding grew of the ways in which education systems related to social structures and patterns of privilege and disadvantage.

Education as one of world's fast growing industries, is too crucial for national development and too costly to be allowed to develop simply through the momentum exerted by social demand.

Decisions of a political character, relating to priorities and purposes, had to be related to the solution of administrative and practical problems. The result had been, national development plans, extended conventionally over five year periods. The plans set out national goals, analyze national resources and constraints and present a broad design broken down into programs and projects within each sector of national development. This was done in the hope that the interrelationships between the various sectors could be taken account of and the most appropriate courses of action chosen in the light of overall goals and means. Experience, however, did not fulfil this hope, and much educational development took place with scant regard to development activity in other sectors.

Education planning has in the past, been severely criticised for failing to anticipate and give warning about such trends as the rising costs of education provision, the inefficient functioning of school systems, the growing number of educated unemployed and the failure of schools to reduce inequalities.

This leads one to ask the question, why such problems? One possible explanation is the fact that, education planning, in the past, did not involve all the sectors it was directly or indirectly related to. Education planning cannot be taken up by educationists alone. It is also true that education planning cannot be done by planners alone. Several sectors need educational information for their planning, and similarly the educational sector needs information from different sectors for its planning. For example, Urban Planning, requires information on social infrastructure and facilities, for the education, health, recreation, leisure, and other social

amenities.

The following, data on educational facilities has been found necessary for Urban Planning (Neelameghan 1993c):

-existing educational establishments and facilities;

-type of existing schools and their levels;

-eligible population for education;

-demand for educational facilities;

-enrolment;

-number of sections;

-student-class ratio;

-teacher-student ratio;

-school age population;

-male-female teacher ratio;

-shortfall or surplus etc.

Data for such purposes may be obtained from the respective ministries, e.g. the ministry of education for educational data, or the census office etc.

4.2.3 Approaches to Educational Planning

We have seen that the desirability of educational planning was asserted by economists as they increasingly came to realise that the problems of development were largely problems of human development and the realisation by social scientists

of the ways in which education systems related to social structures and patterns of privilege and disadvantage.

Educational decisions are thus being influenced by socio-economic factors. In the 1960s, for example, educational decisions were dominated by economic considerations. Planning tended to be viewed at this point as a highly specialist activity demanding no very extensive knowledge of schools and educational processes. Educationists themselves were rarely capable of talking the language of planners and statisticians, and were often bemused by their complicated models (Thompson 1981, 133).

We now realise that, while planning has a vital role to play in developing societies, the planning techniques which we have at our disposal are still extremely crude. The basis of understanding of our problems upon which they operate, is still highly defective.The effectiveness of the planning process depends very much upon the extent to which the specialised knowledge and understanding of educationists and others whose activities are being planned but who have tended to remain outside the planning process, is made available to the decision makers.

Thompson further notes that, there have been wide differences between countries in respect of the agencies used for planning, the degree of integration sought between education and other aspects of development, and the legal and effective status given to plans. A close examination of what goes on in education planning indicates that three main approaches to education planning have been influential: The Social Demand Approach, the Manpower Forecasting Approach, and

the Rate of Return Approach. They will each be described briefly.

4.2.3.1 The Social Demand Approach

This approach amounts on the one hand to a calculation of what the situation is in respect of costs, supply of teachers, plant and resources, and the school leaver output will be at the end of a specified planning period if existing school provision remains more or less as it is, and on the other to a calculation of what the situation would be if various kinds of social demand were acceded to. Such calculations are of vital importance in establishing the baseline for projecting desirable changes in the system, notably of scale. For example, where the aim is to provide universal education at certain levels of the school system, or where the principle of doing so has been conceded, account may be taken of demographic trends in anticipating the resource and administrative implications of such policy or alternatively, perhaps, of maintaining the provision of schooling for a fixed percentage of the school age population.

Since political decisions must take into account the need to satisfy the demands of the general public, simple projections of this kind are important in informing the decision makers of the implications of such demand. However, few countries in the world are in a position to provide as much education as may be demanded and the decision makers must reconcile private demand with public need. Where resources are acutely limited, as in most African countries, and where the aim is to provide

those kinds of quantities of education which will offer the greatest good to the greatest number, such planning techniques, whilst useful, cannot offer all the guidance needed as to how best to meet identified needs.

This approach requires data for the purpose of calculating what the situation is in respect of costs, supply of teachers, plant and resources, school leaver output etc. for an existing period of school provision. Data about demographic trends relating to the age groups of population, population growth rates, percentages of school going population are required. Different models have been used for forecasting purposes. Availability of reliable data for the above mentioned variables are important in making use of any available models.

4.2.3.2 The Manpower Forecasting Approach

This approach, focusing upon a major area of need, does appear to offer the kind of guidance lacking in the social demand approach. It involves an analysis of the skilled manpower requirements of the economy from which a calculation may be made of the quantities, kinds, and levels of education required to meet these requirements. If it is known that, by a particular target year, so many people in each of a number of crucial employment categories, and if certain assumptions are made about the length and kind of education required for each category, in theory, one can set about adjusting the education system to ensure that the people are available when needed. During the 1960s when most African countries attained independence, the

need for this approach was pre-dominant. But, it encountered a number of problems.

The absence in most African countries of an adequate basis for statistical knowledge about prevailing employment structures initially resulted in the application of international correlations of increasing specificity and the use of various assumptions about for example the relationship which would exist between rates of growth in GDP and in various categories of employment.

More detailed national manpower surveys are needed to arrive at a truer understanding of the existing employment structure and stock of skilled manpower as a basis for forecasting future needs. The process of education planning based on the manpower approach calls for data and information about, for example:

1. The process of education:

    -the different levels involved;

    -duration of each level;

    -wastage rates;

    -enrolment capacity at each level;

    -skills imparted etc.

2. Minimum skills needed:

This is a translation of the human resource (manpower) requirement by the employment sector in terms of education outputs. Data required for this purpose include:

-Opinions of employers about their current and future manpower needs in different sectors in terms of:

-the different categories of skills required;

-qualifications;

-quantity;

-trends in the employment structure;

-brain drain data;

-job mobility rate data;

-stock of skilled manpower;

-lower level skilled and unskilled manpower;

-basic knowledge/education requirements etc.

The above mentioned data may not have been generated by the education sector, but will be required by the sector for planning purposes. Different manpower forecasting models exist for the purpose, but even the best models, if fed with wrong/unreliable data cannot produce reliable results.

4.2.3.3 The Rate of Returns Approach

The rate of return approach, is also sometimes referred to as the cost-benefit analysis approach. It is basically an analysis of current relationships between education and income, which provides valuable insights which may be of value in planning the development of education systems. The approach is based upon the assumptions that the wages and salaries paid to workers closely reflect differences in

their productivity, and that the variations in their productivity are primarily the result of differences in the depth and kind of education they have received.

A comparison of the benefits likely to be gained from investing in education with the benefits to be gained from alternative investments, in physical capital for example, may help in determining to what extent a country should devote resources to education as opposed to other things.

Academic studies of rate of return in a number of African countries between 1960 and 1970 were surveyed by Jolly and Colclough (as quoted by Thompson) and were criticised as involving techniques based upon unreasonable assumptions and inadequate data. The studies were also found to be inconsistent, apparently revealing considerable variation in cost/benefit ratios between countries and even within a single country at different times.

The application of some of the assumptions of this approach to Africa have been questioned, notably, the extent to which salaries reflect productivity. Major discrepancies are likely to remain so long as wages and salaries are more closely linked to educational qualifications than to productivity and to social value of the work performed. Secondly the rate of returns approach is based upon study of past trends and cannot be assumed to be surely future oriented. It analyses past and current relationships between the costs of gaining more education and the increase in earnings to which this leads, but it cannot guarantee that salary levels will maintain the same relationship with educational qualification over the period of years required for the acquisition of the qualification.

The models employed in this approach are heavily dependent upon the existence of the required data which forms the basis for establishing past trends. Data required for this purpose are about:

-wages and salaries paid to workers as relates to educational background;

-data on the unit cost of education;

-data on lifetime earnings for different categories of workers;

-productivity data;

-salary levels etc.

Such data is not usually collected/generated by the education system, and may not have been collected with the education planning aim in mind. It will thus require to be restructured for the required purpose.

The three approaches to planning of education just examined have their limitations: for example, manpower forecasting attempts to tell how many people with certain kinds of qualifications need to be produced by the education system over a set period: it does not tell anything about the costs of producing them, or whether the investment will pay itself. The social demand approach seeks to tell how many people with certain kinds of qualifications will be forthcoming at the end of a planning period, but does not tell whether there will be jobs for them, and whilst saying something about costs does not tell anything about benefits. The rate of return approach tells something about how the demand for and supply of educated people are currently matched but cannot forecast what the situation will be at the end of the planning period.

Although these methods are the ones mainly in use, (especially the manpower approach), the three approaches should be complimentary. Approaches combining the three methods, called 'synthetic models' seek to draw upon all three approaches to complement each other.

4.2.3.4 Problems of Education Planning

Some of the problems which have arisen from the context within which planning is conducted and upon which its effectiveness largely depends are many. Some are economic, others political, and yet others are information related.

Economically, many African countries have failed to achieve the rates of growth upon which plans were based, and thereby to create the wealth upon which further education as well as other investments depended. Equally significant difficulties have arisen in the political sphere: the rational procedures of planning have often been undermined by the failure of political leadership to implement plans fully and its tendency to take decision in capitulation to social demand or sometimes even on the basis of sectoral interests. Political instability or uncertainty which has plagued many countries has not encouraged leaders to look beyond short term concerns. Determined and consistent political direction and support is vital for the implementation of longer term development plans.

Planning is dependent upon the formulation of goals and objectives in a manner which clearly tells the planners what is expected of them. The goals should be clearly stated and understood. Where multiple objectives exist, as is the situation

with any education system, the goals should be reasonably consistent with one another and ordered in terms of priorities so that where choices have to be made this may be done with minimum problems.

The definition of national educational goals is primarily a political responsibility - but political decision makers have to be guided by advice and information concerning the needs, the resources, the constraints and the alternatives which exist. Much therefore depends upon the quality of communication and mutual understanding between the various groups involved.

Effective planning is heavily dependent upon the availability of sufficient, appropriate and reliable data. Earlier plans in Africa especially suffered severely from lack of such information.

Data needed by education planners will necessarily go beyond the kinds of conventional educational statistics - which are usually presented in annual reports. It will include information regarding demographic trends, and the employment structure - which is usually collected with many other kinds of data by national statistical offices. Since these offices serve a wide range of purposes, the available data may not be well related to the particular purposes of educational planners, not having been collected with their specific needs in view.

Manpower studies have usually involved a separate collection of data and have frequently recommended that separate manpower statistical services should be established but there is some danger here of the fragmentation of the information base upon which overall development planning should be conducted unless there is close

coordination. Even basic educational data is not easy to obtain, where as is normal, educational and training activities are the responsibility of several ministries, each with its own accounting and statistical procedures. In consequence it may be a difficult matter even to establish the extent and cost of current educational provision in a single country, a problem further complicated by the existence of private schooling, and possible division of responsibilities between several authorities in the same government.

Under such circumstances, judgements must be based on the data obtained, a matter which involves a high degree of skill and expertise, which is in short supply in Africa.

Trends in education planning in Africa have changed significantly due to the general failure of some well constructed education plans. This has led to the questioning of the assumptions and techniques on which they were based. The reasons for such failures seem to lie in the changing nature of the context within which planning takes place. For example, the manpower shortages of the 1960s no longer exist, on the contrary, the problem is now one of manpower surpluses, unemployment, and underemployment, the reassertion of the importance of other factors besides economic considerations in development e.g. replacement of global expansion priorities with the concern for the equitable distribution of educational opportunity.

Another clear change in the planning process is a move away from global patterns of planning involving large scale survey of the needs and manipulation of

flows into and out of the national education system, towards more practical, and possibly more accurate, diffused approaches. Planners are distinguishing between macro-planning, which is more concerned with establishing broad goals and determining resource allocation and micro-planning which seeks means of achieving these goals at a much lower level, in a particular sectors of the economy, in particular kinds of occupation, and in particular regions of the country.

Many African countries are moving towards 'participatory planning' which is much more than decentralised planning which involves regional and local bodies in planning. Participatory planning involves the people who will be affected by the planning decisions. It is argued that, the participation of teachers, parents, and students in the decision making process will help them to understand what is intended, will assist them in implementing planning decisions, and more than this, will win their acceptance of changes and develop their commitment to making the changes work.

People, even educated people, resist changes which they do not understand and about which they have not been consulted. Many African countries have applied participatory planning approaches. Examples can be found in Sierra Leone 1974, Zambia 1976-77, Nigeria 1973, Lesotho 1978, Tanzania 1970s.

Though participatory approaches are more promising in some respects, they make the process of decision making more complex, attenuated and possibly more expensive, and will certainly demand far more efficient multi-directional communication between all those involved.

-the need for the information intermediary to interface,interact and work with the subject specialist/users in the preparation of the information products and services;

-the need for the information intermediary to be knowledgeable about a wide range of information and data sources and systems in the users' interest areas; and

-the need for the information intermediary to be capable of and adequately equipped with the knowledge, methodology, and techniques of information analysis, consolidation, and repackaging, as well as those for developing intelligent knowledge based systems and expert systems.

Knowledge work according to Davis and Olson include diagnosis and problem solving, planning and decision making, monitoring and control, organising and scheduling, authoring and presentation, communication, system development etc. Since most time of the knowledge worker is spent in communication, technological developments affecting the communication process can result in significant productivity gains. The cost of transmitting data, voice, and images has decreased and communications systems have become an important factor in knowledge work support.

The provision of quality education and training is the ultimate goal of any education system. This goal however, cannot be achieved without a well established and effective management and administrative machinery. The MEC and the MSTHE have acknowledged the need to review the Education Act no 25 of 1978 in order for it to integrate other categories of education and training including management,

The World Declaration on Education for All, adopted at Jomtien, Thailand in March 1990, challenged all countries to adopt an 'expanded vision' of Basic Education; that is education defined in terms of quality or learning achievement, rather than mere qualitative access. "The focus of basic education must therefore, be actual learning acquisition and outcome, rather than exclusively upon enrolment, continued participation in organised programmes and completion of certified requirements. It is therefore necessary to define acceptable levels of learning acquisition for educational programmes and to improve and apply systems of assessing learning achievement (Interagency Commission 1990:5 as quoted by Komba and Mwiria 1990).

In response to this challenge, new planning strategies, requiring new data will be necessary. This will definitely require for the planners to have reliable information for making crucial decisions for quality improvement at various planning levels related to education in general.

The current educational information in Tanzania is in general deficient, as observed by Komba (1992): "Monitoring educational quality must not involve collecting data solely on achievement, inputs, and processes and attempting to relate the former to the later in an attempt to explain problems of achievement. It must in addition involve gathering information on what decisions and actions are taken on the basis of information sent out. This entails ensuring that the information reaches decision makers and practitioners whose responsibility is to interpret and to use it to solve identified problems. Without this, the information system is really incomplete

because information generators and processors remain isolated from information users, especially teachers. This is particularly deficient in the Tanzanian education system. Assessing the overall education information system, the following significant shortcomings were pointed out among other things:

-The system does not generate systematically information on decisions and actions taken at various levels to tackle identified problems and their impact.

-The processing of information (especially rigorous analysis) is very weak, and slow as it is not computerised, and lacks trained personnel. In short, a strong documentation centre is lacking.

-The dissemination of achievement data is not accompanied by data on the education process and inputs. This makes it difficult to explain adequately achievement shortfalls in the system. For example, national examination reports are not matched with inspectorate reports to give them a clearer interpretation and explanation.

For the different expressed needs for better coordination, and control of educational information, inevitable that an information support system could reduce the current problems in education planning in Tanzania.

4.3.2.2 **User needs and views**

The need for having an information support system for education planning in Tanzania has been confirmed by the results of questionnaire distributed to education administrators, planners, and decision makers at the Ministry of Education and

lecturers at the Faculty of Education at the University of Dar-es-Salaam.

The questionnaire had items to identify the nature of work of the respondent, the type of data/information needed, where such information has been obtained from, whether there is an information centre devoted to their work, and if there are any problems encountered as a result of deficiencies in information provision.

Out of 20 questionnaires distributed for this purpose, only 14 were completed. A summary of the responses reflecting user needs is given below.

Range of activities of respondents

Activity	Number of respondents
Teaching	8
Research	6
Consultancy	4
Administration	3
Planning	1
Supervision	1
Compilation of statistics	1
Selection of student teachers	1
Inspector of schools	2

The number exceeds 14 because some respondents have more than one responsibility/duty.

Range of information/data required for duty

Statistical data about

Enrolment by gender	5
Personnel by specific subject specialisation	2
Financing of institutions	3
Number of schools	4
Number of teachers	5
Existing facilities	3
Student enrolments (general)	4
Student dropouts	3
Student/teacher ratios	2
Budget information	3
Performance	4
Instructional facilities/teaching aids	1
Teacher education institutions	1
Courses offered	1
Enrolment capacity of institutions	1
Adult literacy	1
Teachers' qualifications	1

		ive research methods	1
	1	ational theory	1
	1	tudies	1
	1	gy of education	1
	1	g research	1
	1	nts	1
	1	teacher ratios	1
	1	and development	1
	1	researchers	1
ation	1		
	1	**interest**	
issues	1	nal research abstracts	
	1	nal index	
		per articles	
		nent and administration	
1		reports of the ministry	
1		l/budget reports	
2		ks and reference books for teaching	
1		case studies	
1		upply in educational institutions	
1		l personnel statistics	

Material production facilities

Comparative statistics

Problems encountered which may be a result of information deficiencies

Discrepancy of various sources of information

Lack of up-to-date/reliable sources

Delayed reports

Getting accurate information

Unavailability of information

Lack of photocopy machines

Few copies of documents

Manual system not efficient

Misplaced items in the library

Do you feel that your information centre meets your information requirements?

Very much	1
Slightly	3
Does not	4
Information centre does not exist	5
No response	1

The different officials interviewed at the Planning unit, Lecturers at the University, officials from COSTECH, The National Archives and the other higher learning institutions all expressed the need of such a facility and indeed wished it could be done as soon as possible. The will is there, what is lacking is the expertise.

CHAPTER 5

INFORMATION SUPPORT SYSTEM FOR EDUCATION PLANNING IN TANZANIA: PROPOSAL

5.1 OBJECTIVES

5.1.1 Introduction

> "Information systems add value to an organisation. Information is viewed as a resource, much like land, labour, and capital. It is not a free good. It must be obtained, processed, stored, retrieved, manipulated, analyzed, distributed, etc. An organisation with a well designed information system will generally have a competitive advantage over organisations with poorer systems." (Davis and Olson 1985, 21).

The education system in Tanzania is undergoing major changes. These have been necessitated by economic, political, and technological changes globally in general, and in Tanzania in particular. Such changes have already been discussed in previous chapters.

5.1.2 Basic Premises

1. Any education system is likely to perform more efficiently and effectively if a mechanism is provided which will ensure that planners, decision makers, researchers, and all those who are involved and affect education either directly or indirectly have timely access to relevant, up-to-date and reliable information.

2. Horizontal information flow among departments, ministries, and sectors through cooperative arrangements for the collection of information and data from different sources and for the exchange of data and information appears to be weak.

3. Every citizen of a country has the right to development, to benefit from and contribute to the development process. Data and information are essential support to, as well as products of the development process.

4. There is a need to develop a basic policy statement about Educational Information for an effective national coordination mechanism.

Several attempts have been made to organise/improve information systems and services in Tanzania, in general, and in the education sector in particular. Although not many of those deliberations have produced sustained developments, for various reasons, it is worth taking into account such ideas/proposals in the design of something new so as to build on the ideas which are already conceived and accepted. In this regard, the information system structure proposed here draws much from the experiences and opinions expressed in the "Project Proposal on Establishment of Scientific and Technological Information Network in Tanzania" (COSTECH Jan.

1992), the experiences of ERNETA and ERNESA operations; the "Proposal for the Establishment of a National Information and Documentation Network in Tanzania" (Mascarenhas and Hutterman (editors) 1989); a proposed "Information Resource Sharing and Information Networking System for Tanzania" (Dallota et al. 1990); and the "National Information Policy for Tanzania" (Sekimang'a 1992).

5.1.3 General Objectives

The general objectives of the Information Support System for Education Planning are to assist the Tanzanian Education System in attaining its goals by:

1. Enhancing the information base and educational information infrastructure upon which planning decisions are dependent;

2. Facilitating the selection, processing and communication of ideas from the point of generation and availability to their potential users at all levels;

3. To ensure that the information made available is precise, exhaustive and accessible with minimum delay, presented in a manner convenient to the respective users, and the service provided at reasonable cost; and

4.To promote the development and use of efficient tools and techniques of information handling.

5.1.4 Specific Objectives

Specifically, the information system is expected to:

1. Co-ordinate, update, and streamline the activities involved in compiling,

systematizing, retrieving, and disseminating educational information through cooperative action and the rational apportionment of responsibilities and resources by seeking to improve the services provided, making use of new information handling techniques and ensuring the active participation of users as producers and consumers of information.

2. Develop and establish programmes for the training of personnel employed in the information units of institutions connected with the subject area, and for the sensitization and orientation of users.

3. Evaluate the progress of documentation and information programmes, projects, activities in the different specialised areas in the education sector.

4. Draw up inter-institutional agreements for the purpose of developing cooperative programmes aimed at promoting the exchange and use of information at the different levels in the education sector.

5. Enhance the information handling capacity of those institutions deemed to be centres of excellence in educational subjects.

6. Coordinate and integrate documentation and information resources in education

-The National Examinations Council of Tanzania (NECTA)

-Tanzania Elimu Supplies (TES)

-National Kiswahili Council (NKC)

-National Arts Council (NAC)

-National Museum of Tanzania (NMT)

-National Sports Council (NSC)

The Commissioner for Education is responsible for Primary Education, Secondary Education, Teacher Education, Adult Education and Inspectorate. The Commissioner for Culture receives reports from Antiquities, Archives, Sports development, Arts and Languages.

The Ministry of Science, Technology and Higher Education is relatively new, formed in October 1990 to enhance the development of Science and Technology in the country. It is headed by a minister, and under him there are five designated posts for directors of Science and Technology, Higher Education, Personnel and Administration, Technical Education, and Planning, Statistics, and Research. It has under its jurisdiction, the Commission for Science and Technology, the Universities, and the UNESCO Commission.

There also exists an Educational Research Network for Tanzania (ERNETA) which is a subsystem of the larger Educational Research Network for Eastern and Southern Africa (ERNESA). The coordinating centre for ERNETA is the Ministry

of Education and Culture through the Coordinating Unit for Research and Evaluation. The latter is responsible for policy making, providing and soliciting funds for the network. The Library of the University of Dar es Salaam is its depository and dissemination centre. The library is supposed to acquire ERNETA documents through a documentation and dissemination sub-committee.

Within such a context, it is necessary, to plan for information support with a structure that is flexible, to allow for adaptation for any changes likely to occur.

The rationale for the proposed network is derived from the ability of networks to:

1. Bring about rapid development in access to information;

2. Develop institutional information systems in harmony with the systems for other institutions;

3. Facilitate in this way system interconnections, which will bring a more comprehensive and rapid supply of information, permit task sharing, and thus reduce costs;

4. Make sure that particular needs and limitations of each institution are taken into account in the programmes and development of national systems.

The following are considered prerequisites for the establishment and successful operation of networks:

- Recognized convergence of interests between a number of information units in regard to their objectives and fields of activity. All the members must fully appreciate

the advantages of creating network, that is, they must recognize the potential benefits and realise that these benefits will not only make up for previous gaps but also offset the constraints of the system itself.

- The network must already, or potentially have at its disposal, technical resources that can be put at the disposal of all participants.

The following factors, as identified by Raynolds (quoted by Neelameghan and Gopinath 1974) are also important to be considered when structuring networks.

1. Organisational structure that provides for fiscal and legal responsibility, planning and policy formulation. It must require commitment, operational agreement and common purpose.

2. Collaborative development of resources, including provision for cooperative acquisition of rare and research material and for strengthening local resources for currently used material. The development of a multi-media resource is essential.

3. Identification of nodes that provide for designation of role specialisation as well as for geographic configuration.

4. Identification of primary patron groups and provision for assignment of responsibility for information service to all within the network

5. Identification of levels of service that provide for basic needs of patron groups as well as special needs, and distribution of each type among the nodes. There must be provision for 'referral' as well as 'relay' for 'document' as well as 'information ' transfer.

6. Establishment of a bi-directional communication system that provides

'conversational mode' format and is designed to carry the desired message/document load at each level of operation.

7. Common standard message codes that provide for understanding among the nodes of the network.

8. A central bibliographic record that provides for location of needed items within the network.

9. Switching capability that provides for interfacing with other networks and determines the optimum communication path within the network.

10. Selective criteria for network function, that is, guidelines for what is to be placed in the network.

11. Evaluation criteria and procedures to provide feedback from users and operators and means for network evaluation and modification to meet specified operational utility

12. Training programmes to provide instruction to users and operators of the system including policies and procedures.

5.3 Types of Network

There are different types of network configurations. One may be more effective and efficient than another for a given purpose or in a given context. Network configurations include:

1. Directed network: the nodes are interlinked through a coordinating or switching centre. Centralised document processing, a special centre providing referral service,

and radial routing of information materials are examples of the directed network idea.

2. Non-directed network: each node is directly linked with all the other nodes. Interlibrary lending of information materials is an example.

3. Directed network linked to a specialised centre, which could be a referral, search or bibliographic centre.

4. Non-directed network linked to a centralised centre: all nodes are linked together as well as with the specialised centre.

5. Interlinking of two directed networks: each has a specialised centre, and the specialised centres are linked.

6. Two or more non-directed networks can be linked through two (or more) switching centres. Diagrammatic presentation of the network configurations described in points 1 to 6 are given in figures 2a to 2f respectively.

The most common network configurations are centralised (star or directed) and decentralised (distributed or non-directed). A computer based star network has one or more central computers which maintain the databases from which all the services come from. There may be intermediate groupings of libraries or centres between the library and the network centres, but these either facilitate the central service or provide additional service of a more regional character.

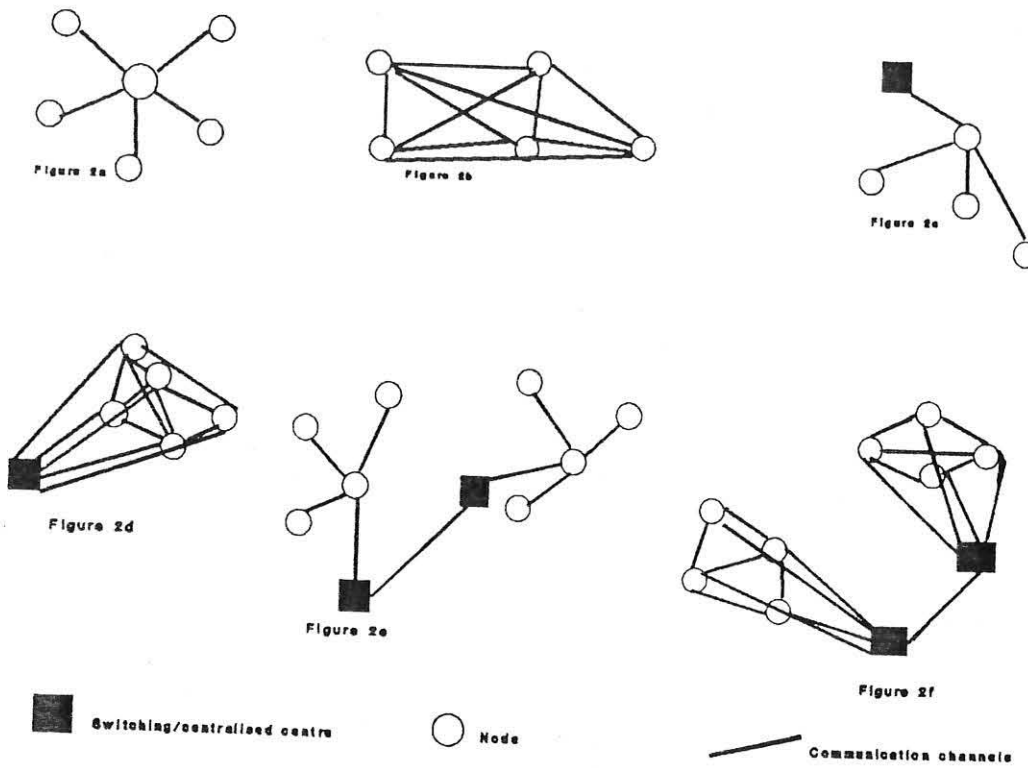

Figure 2a to 2f: Network configurations

In a distributed network configuration, each information centre (node) maintains its own bibliographic files or its own automated system. It shares those files or gains access to others through direct telecommunication links to other nodes of the network.

Additional features that facilitate decentralised system are:

1. Interlibrary lending facility.

2. Inter-institutional delivery service facilitated by a vehicle travelling to the different institutions on a schedule.

3.Union catalogue.

The star configuration requires

- a network coordinating office; and

- development and implementation of standards.

The proposed ISSEP network should be envisaged in the broadest sense, emphasizing the following concepts:

1. A network is a mechanism whereby members working or operating in diverse settings, share a common bond, such as an interest, vision, purpose, etc.

2. A network is a mechanism whereby members overcome isolation imposed on them by geographical, cultural, linguistic, social, institutional and other barriers. Thus, a network becomes a means of "pulling down walls and building up bridges" (Komba 1991) among the members, enabling each to share information, experience, feelings, and ideas through encounters to enrich one another. In this conceptualisation, a network is not simply a group, but a working or functional group in dialogue.

The individuals, or individual institutions should see themselves as networkers, that is, part and parcel of network team, with a sense of shared or reciprocal responsibility, commitment, and solidarity in achieving a common purpose. In such circumstances, the legitimacy of a network should lie in its institutional bases (nodes), where it should project itself as a resource in enhancing activities at that level, and feeding the national/central node having the national databases.

these documents can inform the clearing house or send them a copy. The clearing house will then circulate a description of the documents (bibliographies, indexes) and see that they are available by making copies, and getting in touch with the relevant organisations by addressing the users to the producers if it does not posses a copy itself.

At the other nodes, the following activities are envisaged:

1. Collection of data/information/documents related to the specific area.
2. Inputting into institutional databases.
3. Preparing document lists and other inputs for the central database.
4. Serving users at their respective levels.

5.4.2 Structure of the Documentation Centre

The structure of an information unit can be visualised in accordance with the following criteria (Guinchat and Menou 1983):

1. The functions of the documentary chain (acquisition, bibliographic description, retrospective searches, etc.)
2. Types of documents: books, reports, periodicals, legal documents, etc.)
3. Fields covered: for example, an education documentation centre will cover adult education, special education, classroom management, etc.
4. In case of large units, the location of each service e.g.central services, and the services attached to its branch units

5. Services e.g. library, documentation, translation, publication, liaison, etc.

These criteria can, however, be combined so as to meet user needs more effectively. Basing the organisation of an information centre on the functions of the documentary chain mentioned above facilitates standardization and control, and makes for greater homogeneity in the division of work, but tends to be more fragmented, and it becomes more difficult to staff each section with people who are familiar with different types of document, subject, and clientele.

The other methods of organisation result in more interesting tasks with staff members covering at least one of these different areas, but there is greater risk of overlap, and standardization and control are rendered more difficult.

It is recommended that the selected structure should minimize effort, that is, each operation should serve directly for as many subsequent operations as possible and everything needed for each service provided should be quick and easy to obtain. The communication channels should be as direct as possible to avoid pointless duplication for both staff and users.

The choice of an organisation structure for the ISSEP network, its documentation centre, and services provision will be guided by the Normative Principles of Information Services adapted from Ranganathan's Five Laws of Library Science by Bhattacharyya (1978). The normative principles so derived take into consideration the overall objective of the total information system. The principles are:

1. Information is for use. This use is primarily for

- generating new primary information for further use;
- understanding and evaluation of existing information and known phenomena;
- decision making at all levels of personal and social activities;
- production of commodities and services;
- education;
- communication; and
- derivation of emotional satisfaction.

2. Every information-user his information.

3. Every piece of information its use.

4. Save the time of the information-user: only timeliness adds value to information.

5. The universe of information is ever growing.

The growth of the universe of information is responsible for various barriers between right information and right users. Some of the universally recognised barriers according to the same author are:

- barrier of large number including the phenomenon of a small piece of information lying buried in avast mass of information;
- barrier of inadequate finance;
- barrier of language;
- barrier of space;
- barrier of time; and
- barrier of lack of accessibility to right sources of information.

The structure of an idealised user-oriented information centre is shown in figure 3.

There is much that still need to be learnt about education planning. Some from research, others from the analysis of experience. To bridge the existing gap between educationists and planners, it is necessary for both parties to try to get a better understanding of the way in which the existing educational systems work, of the interrelationships and relative efficiency of their separate parts, of the way in which different combinations of general education and training in formal and non-formal arrangements may meet needs, of the extent to which economic goals may be combined with political and social goals, of the extent to which client aspiration and background can be purposively modified, and how the impact of changes in structure, institutional patterns, curriculum, examination, staff development and support services may be maximised.

Specialist assistance of other social scientists will be required in developing the necessary techniques for the purpose, which makes the planning process much more information intensive.

4.3 EDUCATION PLANNING IN TANZANIA

4.3.1 Current Situation

Education planning in Tanzania started way back in 1948, when a ten-year plan included educational projects. By 1961, when a three-year plan for development (1961-1964) was launched, the planning concepts had advanced and targets for

educational expansion clearly expressed (Mwingira and Pratt 1969).

With the recommendation of the Report of the Unesco Educational Planning Mission in 1963, a permanent Educational Planning Unit was established in the Ministry of Education, together with a committee of the Ministry's heads of the professional sections, to act as a Standing Planning Commission. Early in 1963, a separate Ministry of Development Planning, which was later transformed to the Directorate of Development and Planning attached to the President's Office, and finally again a separate ministry, the Ministry of Economic Affairs and Development Planning were formed. The five-year development plan 1964-1969 had as an educational objective, 'to be fully self sufficient in trained manpower requirements by 1980. Education's role, with the influence of the Report on High level Manpower Requirements and Resources in Tanganyika (1962-67) and the establishment of a Manpower Planning section, was to plan education basing on the 'manpower approach'.

The work of the planning unit (1971) was:

1. To assist the Minister of Education in consultations leading to the formulation of national plan objectives and to analyze and interpret them in educational terms using statistical methods where these are applicable

2. Also, using statistical methods, wherever they are applicable, to analyze such constraints as, legal, administrative, professional, and historical which must be respected or modified in reaching these objectives.

3. To formulate educational programmes accordingly, so that objectives can be costed

in terms of both money and manpower.

4. To provide the quantitative information with educational interpretation required for decisions about priorities when resources are not adequate for implementation of the whole of the proposed plan, and, in doing so, to assist the Chief Education Officer in establishing the priorities to be given to the different projects in the various sections of the plan so as to retain the viability of the plan as a whole.

5. To advise the Chief Education Officer on all matters relating to co-ordination of plan implementation between the various sections of the Ministry and other departments of the government, notably the Treasury and the Directorate of Development and Planning.

6. To advise the Chief Education Officer whenever it seems prudent to make amendments to the plan as formulated, by adjustment of either the plan targets or of their interpretation or by the introduction of new methods of implementation.

Given the nature of changes occurring in society, as reflected in the change of priorities, the tasks of the Planning Unit now include research and evaluation, but basically remain the same.

Commenting on the current state of the Planning and Administration Department at the Ministry of Education and Culture, a report of the task force to propose an education system for the 21st century summarized the situation as follows:

-The present department is paying more attention to project implementation than to the essential work of educational planning. There exists no system of gathering, processing, storing, retrieving or using data on which plans can

be based. Lack of mechanism for checking and standardizing data has resulted into having unreliable data.

-There is acute shortage of well trained manpower for planning, especially economists, programme and project planners, financial analysts, statisticians and computer experts.

-There has been neither systematic nor comprehensive planning at tertiary and other institutions of higher learning. The function of the planning units at these institutions are marginalised, poorly staffed and ill equipped.

-Generally, there is poor human resource planning which manifests itself in lack of qualified administrative and support staff, poor placement of available personnel, overstaffing due to lack of realistic workload indicators and over-centralisation.

-Expansion of teaching needs has not been matched by an expansion of the teaching facilities. Libraries, seminar rooms, lecture theatres, equipment and office space are all needed.

Concern was also expressed over the approaches used in the planning of education, which are either manpower, social demand or rate of returns approach, with little or no consideration for the other 'synthetic' approaches for a more balanced education system.

To solve some of these problems, a well managed database was proposed as a pre-requisite for a more reliable information system together with efficient human resources management, effective student services and broad planning at higher

education institutions. For this purpose, a proposal for the establishment of an information centre that will receive, store, process, and make available information on a regular basis for making informed decisions. Specifically, a need for establishing a planning database was expressed(MEC & MSTHE).

4.3.2 The Need for Information Support

4.3.2.1 Literature Review

An information support system is a purpose oriented system that can help in problem identification and/or finding solutions to problems, or it may even be a goal seeking system. Such a system should be capable of presenting analyzed and synthesized data in readily usable form to different user groups at different levels. The different sub-systems of an information system should be designed to relate to and be compatible with each other (Neelameghan 1993d). This is in agreement with Davis and Olson ([1974] 1985, 365) when they say that,

"... information systems do not operate independent of the organisation; they exist because they support organisational processes and the achievement of organisational goals. Thus, information systems are therefore termed 'support systems'."

Tanzania has a centralised pyramidal education structure with some measure of control left to the local government. The structure consists of five levels related to planning and decision making and management information system for quality

monitoring and control. These include the national, zonal, the regional, district, ward and the institutional or school levels.

A review of education planning in Tanzania shows a move towards a decentralised education planning. Decentralised-multilevel planning necessitates attuning of planning and development programmes to the structural, demographic, economic and societal characteristics specific to a given country. Such orientation would entail sharing of planning functions at different area levels, devising mechanisms and procedures for the effective capture, processing, flow, and management of data and information; interfacing and coordination between and among area levels, and interactions for meaningful participation of people.

Such a strategy is expected to make the planning process at the different levels harmonious, independent but participatory and the plans relevant, authentic and implementable.

As mentioned previously, in multi-level, multi-objective planning, like in education, there will be several groups of information needs. Data will thus have to be aggregated to appropriate levels, e.g. primary, secondary, tertiary, technical, vocational, formal, non-formal, etc. For each level, data needs may be derived through a combination of four major approaches in which key determinants include:

-goals/sub-goals and policy areas (sector-wise and program-wise);

-scope of planning functions;

-programmes/projects included in the plans; and

-methodology and techniques of planning.

Identification of information and data will be aided by taking into consideration the planning stage, that is, pre-planning, action planning, implementation planning and the planning tasks/steps involved at each stage.

Two broad purposes for information systems to support multi-level planning have been identified (Neelamenghan 1993d) as:

- a general purpose system for use by heterogenous groups of users concerned with policy making and planning at local and regional levels. Such planning oriented information systems are designed to handle the tasks of diagnosis or problem identification and for building up macro-framework of the plan.

-specialised specific-action oriented systems focusing on specific requirements, such as, sectoral planning or specific programme/project/segments.

Problems of education planning have also arisen from the administrative structures of the Ministry of Education. Ministries of education are, for example, commonly organised in such a way that primary schools, secondary schools, and teacher training institutions are separately administered and technical education is operated through its own hierarchy of officials. Coordination between the different ministries, and between divisions has always been a problem. At lower levels, the problem can be worse, and officers often find themselves working in relative ignorance of what their colleagues are doing in the same area. As Thompson (1981, 149) puts it, "the understanding of and concern for the overall national and sectoral plans stands in inverse proportion to the degree of direct involvement in project implementation".

Thus the information system to support multilevel planning proposed by Neelameghan (1992b) is a model to be used in education. There are a number of information based systems which support major organisational functions: for example, strategic planning support systems, decision support systems, management control support systems, office support systems, and transaction processing support systems.

The information based support system include support for planning, control, and decision making associated with the above functions, and are characterised by knowledge work (as contrasted with manual work support technology). They are briefly discussed below.

Decision support systems:

The term 'decision support system' refers to a class of systems which support the process of making decisions - the emphasis is on 'support' rather than automation of decisions.

Knowledge support systems:

Knowledge work is based on the knowledge possessed by the worker, not the ability to perform physical tasks. The output of knowledge work are diagnoses, descriptions, instructions, schedules, plans, memoranda, position papers, decisions, etc. Therefore, knowledge work is work that involves thinking, processing information, and formulating analyses, recommendations, and procedures. Knowledge

Figure 1: The Information Hierarchy

Source: Neelameghan 1992b, p.117

consultants), and with analyzed, consolidated and repackaged information responding to the specific needs of users. Further, while the quantity of information provided becomes progressively less through selection, analysis and consolidation, the quality/value of information in relation to users' need progressively increases.

It is also worth noting that,

-a progressive deeper knowledge of the subjects or fields of operation of the clientele served is required in preparing the value added information products and services;

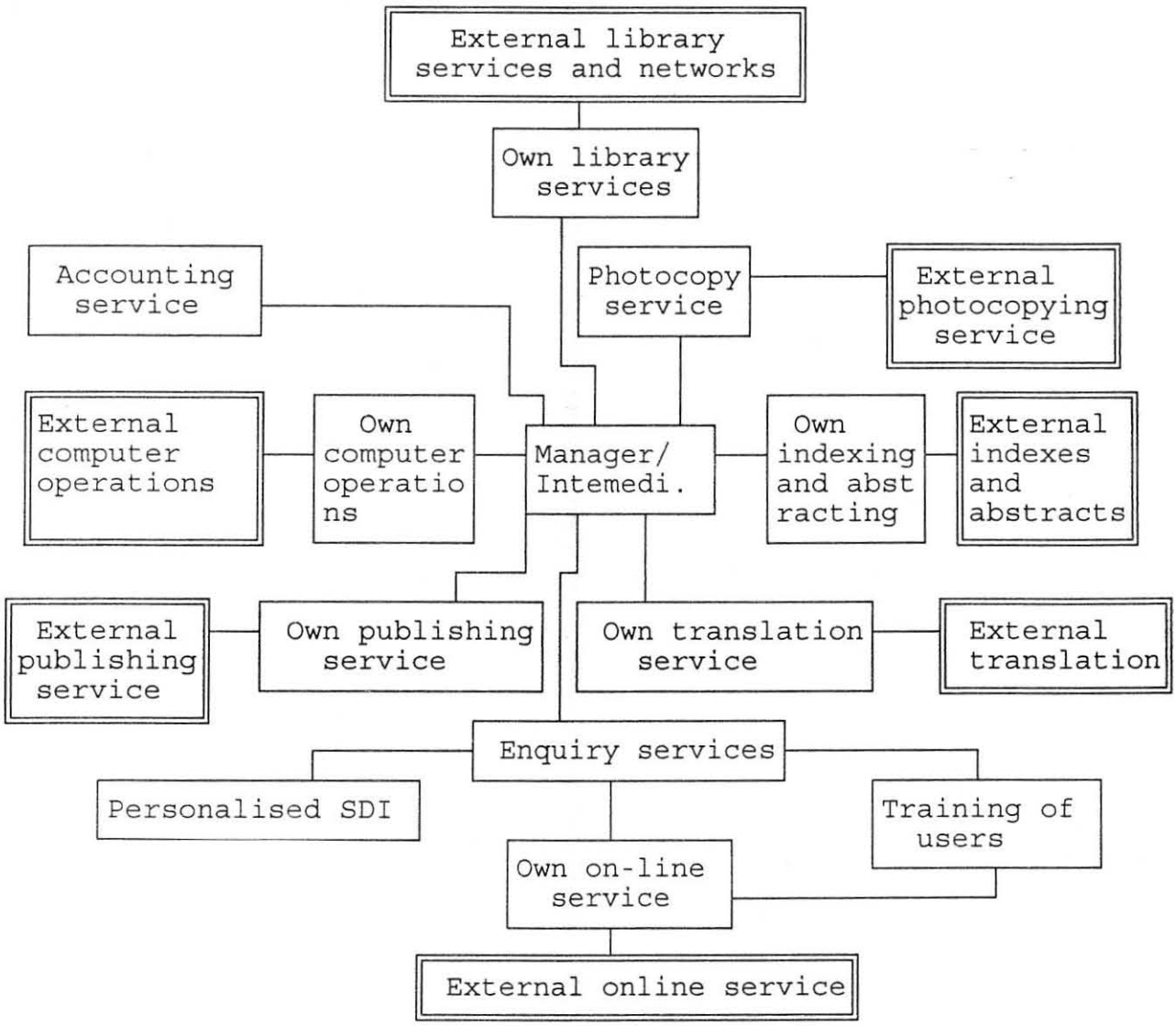

Figure 3: The Structure of Idealised User-oriented Information Centre
Source: Willis, J.B. 1982, p200

The features of such an information system are listed below:

-a system designed for efficiency, speed, economy, relevance and usefulness in terms of information services;

-the system should cooperate and coordinate with other national information systems such as TANNISAT, ERNETA, and other

Table 9. Under whose authority should the ISSEP be?

	Rank			
Authority	1	2	3	Total
MEC	0	1	2	3
MSTHE	1	1	1	3
UDSM Library	8	1	3	12
COSTECH	0	3	2	5
National Library	0	2	1	3
Independent	4	5	3	12

Experiences from other countries, both developed and third world countries show that such information systems usually function under the authority of an existing institution. For example, in Colombia, it is under the Ministry Education. In America, it (ERIC) is under the Institute of Education, which is under the Department of Education and RERIC in Asia is under the Asian Institute of Technology (AIT). Moreover, it has been found worthwhile to develop an information centre basing on an existing collection, that is a library, unless a substantial grant is initially available to purchase much of the material that is needed.

A close link with a faculty, researchers and students has also been found to

help in several ways, one of which being their assistance in answering questions, giving advise and help in improving the information system and drawing up on their resources in running short courses and seminars.

5.5 MANAGEMENT STRUCTURE OF ISSEP

5.5.1 General Considerations

Some experiences from programmes and activities of Unesco for assisting Member states to develop their national information infrastructure and their implementation are worth mentioning and have been used to guide the suggestions for management structure for ISSEP. Some of the experiences are as follows:

1. Inappropriate designation or placement of the national coordination mechanism in the government structure may result in limiting the possibility of achieving overall coordination.
2. Absence of a formal overall national policy on information systems and services limits the commitment and involvement of the government in the development of national information systems.
3. Low priority assigned to information matters in general and absence of a national plan of action and commitment of public funds and resources to such programme actions are not conducive to efficient national information systems development.
4. Weak cooperation among government agencies and ministries and tendency among them in some cases to resist coordination, sometimes due to misunderstanding of the

functions of the national coordination mechanism, do not help in the overall development of the system.

5. Inadequate budget for the coordinating mechanism constrains its support for substantial information infrastructure development activities.

6. Inadequate staffing of the national coordination mechanism, partly due to inadequate bubget, leads to management inneficiency.

7. Cooperation based solely on goodwill, without an institutionalised mechanism for coordination, has not proved to be very effective in most cases.

8. Coordination is difficult when effective ways and means to secure cooperation from all parties concerned do not exist or are not applied. Imposed coordination without clearly understood incentives has not proved to be effective in the long run.

9. Coordinating mechanisms or focal points that have given technological and financial support to other components of the national information systems e.g. for human resource development, research and development etc., have generally been more successful than those who have tended to centralise all these activities.

10. Information for decision making being inter-disciplinary and inter-sectoral, its gathering and channelling to top management appear to be easier where conditions are created for effective horizontal cooperation among ministries and government agencies by the coordinating mechanism.

11. The trend is to place the coordinating mechanism in a government department responsible for policy making, since the choice of a structure which does not have any authority over other structures limits the efficiency of the coordinating

mechanism.

12. Successful examples of policy implementation show that the presence of documentation, library and information development and training activities in the educational institutions, research units and the private sector are essential for the development of sound, stable national information systems as well as information conscious society.

13. National efforts that have placed heavy stress on the hardware aspect of the information system, neglecting other important aspects such as manpower development user needs, information resources development, provision for document delivery, have encountered problems. On the other hand, systems developed ignoring the emerging trends in the information processing and communications miss the advantage to be gained by the application of information technologies especially providing fast access to a wide range of data and information, even to those in remote areas.

14. Successful examples show that the coordinating mechanism must be staffed with dynamic, motivated, well trained specialists who are given the necessary status, responsibilities and salaries to secure continuity and stability of the operations.

5.5.2 National Coordination

The ISSEP will be constituted out of networking of appropriate existing information systems and services and new ones that may be established. For such a

network to operate efficiently and effectively, there arises the need for cooperation and coordination of the network activities of the various network participants.

The management coordination structure of ISSEP suggested here, the number of bodies, committees, number of members in each, and schedule of meetings take into consideration, among other things, the experiences outlined in section 5.5.1, and the financial implications but in line with similar structures elsewhere. ISSEP is a governmental network, (at least to start with) expecting most of its budget allocation to come from government sources. Many of the participating members are government institutions, thus having the same source of finance. Under such circumstances, only the very necessary bodies are proposed. The number of members and schedules for meeting are also suggested within this context.

5.5.2.1 Policy Regarding National Coordination of ISSEP

The Policy shall be to establish a national mechanism for the ISSEP (an information support system for the education sector), for implementing the policy and for coordinating the activities of the system and services. The national coordinating mechanism should be placed as high as possible in the government structure, with a view of ensuring effective implementation of ISSEP coordination and harmonising the educational information system and services in Tanzania. This mechanism will

minimize unnecessary duplication of effort and wastage of resources in the development and operation of the ISSEP, and maximize benefits of the services provided to the country. The mechanism is hereafter referred to as The National Educational Information Policy and Coordination Agency (NEIPCA).

Implications for the implementation of the policy include:

-creation of a National Educational Information Policy and Coordination Agency;

-translation of the elements of the ISSEP policy into long, medium and short term plans of action;

-assigning responsibilities to different institutions and organisations constituting ISSEP;

-coordinating, promoting and monitoring of the developments in the ISSEP, ensuring the harmonisation of the components of the activities, assessing the performance of the components, correcting deficiencies and filling in gaps; and

-formulating and implementing appropriate legislative,regulatory and administrative procedures and measures conducive to the sustained growth of the national educational information system.

5.5.2.2 Structure and Functions of the National Educational Information Policy and Coordination Agency

5.5.2.2.1 Coverage

The National Educational Information Policy and Coordinating Agency will be concerned with the development of national educational information and therefore will cover all matters related to educational information data in textual, factual, numerical and graphical forms recorded in conventional or non conventional media, information and data sources, systems, educational networks and services of different types, including educational databanks, educational clearing houses, school library systems, educational documentation centres, referral centres, information analysis and consolidation and repackaging centres and services, and the relevant educational information industry.

5.5.2.2.2 Position in the government structure

NEIPCA should be placed at a level in the Ministry of Science, Technology and Higher Education where it can have easy contact and access to the different directorates in the parent ministry, as well as other relevant government departments. This is important to facilitate the provision of information to support decision making and other management functions.

The proposed Management Structure of ISSEP is shown on figure 4.

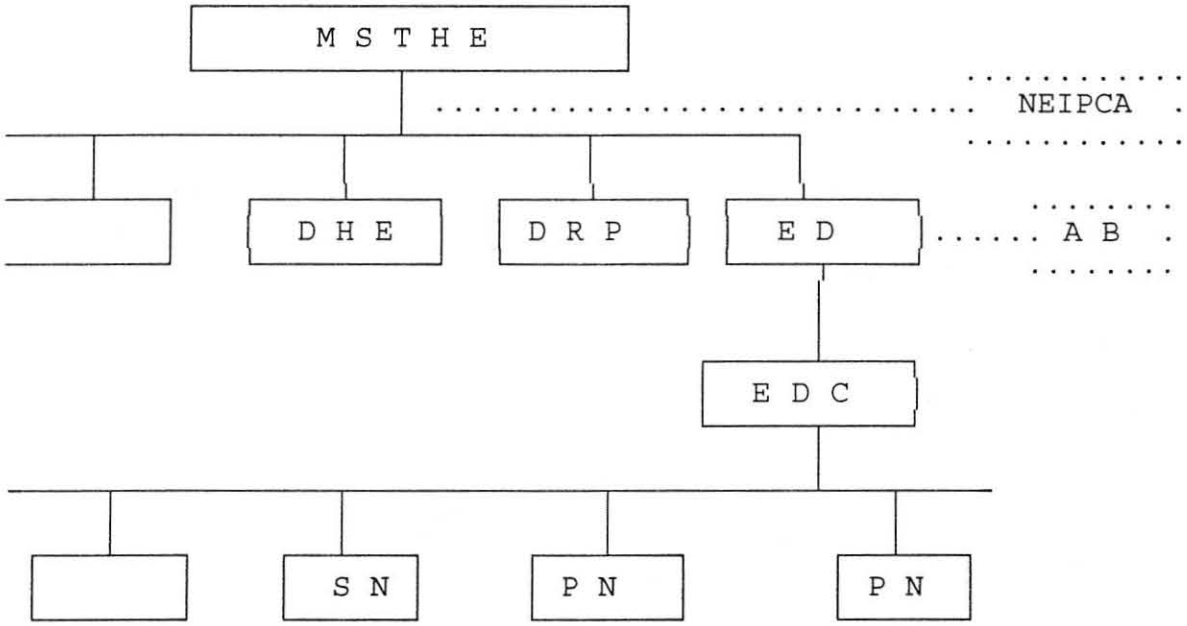

Figure 4: The management structure of ISSEP

Key to abbreviations:

M S T H E = Ministry of Science, Technology and Higher Education

E D = Executive Director

N E I P C A = National Educational Information Policy and Coordination Agency

A B = Advisory Board

E D C = Education Documentation Centre

P N = Participating Node

S N = Specialised Node

D H E = Director of Higher Education

D R P = Director of Research and Planning

5.5.2.2.3 Structure of NEIPCA

The NEIPCA will have the following functional bodies:

-an Educational Information Network Council (EINC) having a policy and decision making function;

-an Executive Directorate (ED), having an executive function;

-an Advisory Body (AB), having an advisory function.

5.5.2.2.4 The Educational Information Network Council (EINC)

The Educational Information Network Council (EINC) shall be composed of the directors in the MSTHE, selected representatives of member organisations of the network, director level representatives of other ministries and bodies directly or indirectly concerned with or supporting the provision of formal, informal, or vocational education e.g. the Ministry of Planning, the Ministry of Finance, the Ministry of Agriculture, the Ministry of Health, the Unesco Commission, the Tanzania Commission for Science and Technology, Ministry of Information and Broadcasting, the Teachers Association, and other sectors as may be found necessary. This body may meet once in two years. The costs of such meetings may be shared between the network funds and individual member institutions.

The Educational Information Network Council (EINC) will be the highest policy and decision making body. This body will:

-determine the scope, priorities and envisage new areas of involvement;

-review the progress of the network operations on the basis of reports submitted by the Executive Director. The EINC may also requisition review by other consultant(s);

-approve the bi-annual budget of the network;

-deliberate on any other policy issues deemed necessary for the optimal operation of the network.

The Executive Director will be the ex-officio secretary to the EINC. The Education Documentation Centre will provide a Permanent Secretariat to the network.

5.5.2.2.5 <u>The Executive Directorate (ED)</u>

The Executive Directorate, constituting the executive arm of the NEIPCA shall be headed by the Executive Director, supported by competent professional staff and appropriate administrative and secretarial staff.

It is proposed that the Executive Directorate be hosted and funded by MSTHE, and have a direct link with the Education Documentation Centre. This body should meet at least twice a year. It will also be working in close collaboration with the Directorate of Planning, Statistics and Research at the MSTHE.

The activities of the Executive Directorate will be:

-the implementation of policies as set by the Educational Information Network Council;

-coordinate the activities of the network;

-check and ensure maintenance of standards;

-arrange for and coordinate training, seminars, workshops, and other activities;

-study project proposals and recommend for funding and implementation etc.; and

-implement, in cooperation with appropriate organisations, the long, medium and short term plans of ISSEP.

5.5.2.2.6 The Advisory Board (AB)

This is a technical body that will provide expert advise to the network operations. It will have about ten to twelve members who are experts in different areas of data and information handling, representatives of the information user groups, academic and professional organisations and the information industry. Membership of experts from outside the country will have to be approved by the EINC.

The activities of this body shall be to advise and assist the Executive Director in ensuring the effective implementation of the policies and decisions of the EINC regarding the development and management of ISSEP.

5.5.2.2.7 Participating Centres

These will collect and process data and information for input into databases at their own centres and forward to the national documentation centre. This will be

participating in cooperative programmes being carried out in the sub-system. A summary of the potential participating centres, their role, and location is given in Table 10.

Table 10. Potential Participating Institutions (nodes)

Name	Role (of node)	Location
NEDC	Specialised (Doc.)	UDSM Lib.
FEIU	Specialised (R&D)	FoE
MECIU	Specialised (Ed.Pl)	MEC (CURE)
MSTHEIU	Focal (coordinator)	MSTHE
NECTAIU	Specialised (Exams)	NECTA
ICDIU	Specialised (Curr.)	ICD
DTCIU	Specialised (TE)	DTC
OUIU	Participant	IC
IAEIU	Specialised AE	IAE
PCIU	Participant	PMO
REIU	Specialised	REO
DEIU	Specialised	DEO
COSTECHIU	Specialised (S&T)	COSTECH
.	.	.
.	.	.
.	.	.

Notes:

NEDC = National Education Documentation Centre

FEIU = Faculty of Education Information Unit

MECIU = Ministry of Education and Culture Information Unit

MSTHEIU = Ministry of Higher Education Science and Technology Information Unit

NECTAIU = National Examinations Council Information Unit

ICDIU = Institute of Curriculum Development Information Unit

DTCIU = Dar-es-Salaam Teacher College Information Unit

OUIU = Open University Information unit

IAEIU = Institute of Adult Education Information Unit

PCIU = Planning Commission Information Unit

REIU = Regional Education Information Unit

DEIU = District Education Information Unit

COSTECH = Tanzania Commission for Science and Technology

UDSM = University of Dar es Salaam

FoE = Faculty of Education

MEC = Ministry of Education and Culture

CURE = Coordinating Unit for Research and Evaluation

MSTHE = Ministry of Science, Technology and Higher Education

NECTA = National Examination Council of Tanzania

ICD = Institute of Curriculum Development

DTC = Dar es Salaam Teachers College

IAE = Institute of Adult Education

PMO = Prime Ministers Office

REO = Regional Education Officer

DEO = District Education Officer

5.6 ISSEP INFORMATION FUNCTIONS, ACTIVITIES, AND SERVICES

Basically, two broad groups of information service centres can be identified.

1. Those that are essentially custodian libraries, with only a few user services that have been added as the need arose.

2. Those that are user-oriented, where the library is one of the many resources on which the organisation depends.

It is recommended to strive to develop the second type of information service centre. A user oriented centre providing services and activities referred to in figure 1 (chapter 4), the Information Hierarchy.

Such activities and services include:

-The conventional library and documentation activities of acquiring, organising, and cataloguing; collection and organisation of information from non-documentary sources of information (experts, consultants etc.).

-Information repackaging activities, that is, rearrangement of the physical and/or formats in which the text has been presented, tailored to the needs of specific clientele (e.g. in a more easily understandable, readable, acceptable, and

usable form and format).

-Information analysis and consolidation activities (IA&C), including the activities that have as their products state-of-the art reports, critical reviews, trend analysis, feasibility, status, forecast reports, handbooks, guidebooks, country profiles, subject profiles, news briefs, etc.

-Organisation of seminars, workshops, short training courses (for learning how to use new equipment, or instructional materials to teachers) is also an area of activities. The documentation centre will have a close working relationship with Teacher Centres and School Library Resource Centres.

5.6.1 Information Services

This relates to supplying necessary information by an information agency to potential users. Information services to be provided by the information system will include:

5.6.1.1. Referral Services

Referral services do not provide the user with the documents/information actually needed for his query, but refer him to the sources such as secondary publications, information units, professional organisations, research institutes, and individual experts etc. and tell him where to find them.

5.6.1.2 Current Awareness Services (CAS)

This is a service designed to keep users abreast of information that has recently been received or identified by the information unit, particularly in the unit's subject field. For this purpose, products like lists of acquisitions, bulletins of tables of contents of periodicals, bibliographic bulletins, indexes, are circulated to the users at regular intervals.

5.6.1.3 Selective Dissemination of Information (SDI)

It is a service for supplying each user or group of users or institutions with the references of documents relating to their centres of interest selected from among the description of all documents received during a given period.

5.6.1.4 Reference Service

This service saves the purpose of helping the user to define his/her query correctly, particularly bearing in mind how the user intends to utilise the information, since this can affect the choice of source. This includes informing the user what catalogues, directories, files, secondary publications, or databases to consult, and help in directing the search.

5.6.1.5 Liaison Services

Liaison service serve essentially as an active go between for information services and users. It is a means

of stimulating the flow of information from unit to user and vice versa. Liaison officers are able to recognise useful documents and new sources of information or expertise and inform their potential users.

After getting communication facilities, the network will also be in a position to provide the following outputs and services.

-Databases on education experts and consultants;

-Directories of on-going research and development activities relevant to education planning and development;

-Electronic mail services;

-Video demonstration for the use and application of different teaching aids;

-CD-ROM database search services;

-Computer teleconferencing services;

-Document delivery services;

-Network operation manuals; and

-Network newsletter.

5.7 DATABASES TO BE MAINTAINED

5.7.1 Why Databases?

A database is a mechanised, formally defined, centrally controlled collection of data in an organisation (Gordon 1985). The database concept has been highly

facilitated by the development of computers and other information processing and communication technologies, especially the development of database management systems (DBMS). A DBMS is a software system which performs the functions of defining, creating, revising, and controlling the database. It provides facilities for retrieving data, generating reports, revising data definitions, updating data and building applications. Because many end users and a variety of application programs can access the database, it is desirable to exercise control over the database, by having a database manager.

The database approach has been recommended due to its economy, and convenience of use. This is due to the basic characteristics of DBMS whose main objectives are availability of data for use by applications and queries, shareability of data by all application programmes, evolvability; that is, the data can evolve as application usage and query needs evolve. DBMS provide for data independence where the users of the database establish their view of the data and structure without regard to the actual physical storage of the data. Another major characteristic is data integrity. The database establishes a uniformly high level of consistency with validation rules usually applied by the database management system.

Several DBMS have been developed for different uses. Some are good at statistical manipulation, others at spreadsheet, others at payroll and personnel management, etc. Some are good at bibliographic and information (text) handling, providing high retrieval capacity. Such a DBMS is CDS/ISIS.

CDS/ISIS is an information storage and retrieval software. It is developed and

supported by Unesco. It can work on micro-computers, thus very suitable for developing countries especially Africa, where many information centres are small and resources are limited. Due to this flexible features and free availability to non-profit making institutions, it is almost the prescription to developing countries like Tanzania. In Tanzania, it is distributed by COSTECH, and several information personnel in the country have undergone courses on its use.

For these reasons, it is recommended for the creation of databases to enhance the information base of the ISSEP network.

5.7.2 Development of Databases

It is difficult at this stage to say how many databases will be maintained by ISSEP. This is because databases evolve as queries and requests for data and information evolve. The preliminary survey results indicate that users would prefer the development of databases to be done in the following order of priority: Educational research; Educational policy, reforms, and legislations; Educational facilities/equipment; Subject-related espects; Education provision; Tests, measurement and evaluation; and Teachers and Teacher education. The list is not exhaustive because given the wide nature of the education system, many more issues can have databases developed for their use. A summary of users' opinion is given by table 11.

Table 11: Users' View on Priority in Creation of Databases Subject

Stage of growth	Description
Initiation	Early use of computers by a small number of users to meet bas organisational needs.
Expansion or contagion	Experimentation with and adoption of computers by many users. Proliferation of application crisis due to rapid rise of costs
Formalisation or control	Organisational controls established to contain growth in use and apply cost effectiveness criteria. Centralisation Controls often prevent attainment of potential benefits.
Maturity/ integration	Integration of applications. Controls or adjusted. Planning well established. Alignment of information system to organisation.

It is expected that, by the time the information system (ISSEP) reaches maturity, there will be many sub-clearing houses and nodes to support other areas including social education, technical education, vocational education, guidance and counselling, audio-visual materials, etc. and the system will be able to perform to a

satisfactory level all the activities earmarked for Education Documentation Centre.

5.7.3 Information Products

Several information products are expected to be produced by the documentation centre and the network as outlined in Section 5.3. Manual production of products and services like SDI, CAB, though possible, is very tedious and time consuming. With records in machine readable form, such services are easily generated and thus cheaper to maintain.

5.7.4 Prototype databases

One prototype database was developed using as a model, ABNCD+, a prototype for an integrated information storage and retrieval system.

The integrated prototype database created has profiles for Education Institutions, Information Systems, Education Experts, Documentary (bibliographic) sources, and Projects. A second type of databases is Object-Oriented Database (O-ODB).

O-ODBs are non-bibliographic databases which usually provide information about the 'object', which may be market, equipment, or any other aspect of interest to a user or group of users. These type of databases are a basis for the provision of value-added information services, and the development of knowledge bases for expert

systems and intelligent information systems and decision support systems.

End users are usually interested in selected attributes of the object, with a view to manipulating, modifying or using the object for particular purposes. Such databases can be developed on microcomputers to meet the needs of specialised user groups and can effectively supplement or be integrated with conventional bibliographic and referral type databases and services thereof.

The design of O-ODBs, the provision of value-added information services require among other things:

- the involvement of the end user at various stages of the design and development of the system.

-close interaction between the Library Information Professional and the end users

-that the subject background and work experience of an information specialist(s) be generally compatible with with those of the end users served

-that the education and training for Library and Information Professional should cover in depth information extraction, analysis, synthesis and repackaging methods, and the theories and principles of knowledge organisation, natural language interface with information systems as well as Information Technology (IT) applications in designing O-ODBs and preparation of value added information products (Neelameghan 1992a).

5.7.4.1 The EDUC database

This is an integrated prototype database with Bibliographic records, Expert records, Information systems records, and Project records. It has been developed basing on the ABNCD+ Prototype Integrated Information Storage and Retrieval System. It uses the files defined for this prototype database. The details of the fields defined are given in a paper by Abebe et al (1992) and a manual for entering data has been prepared by Neelameghan (1993c). The files and structure of EDUC database are given in appendix 5.

5.7.4.2 The EDPLAN database

This is an O-ODB based on some simulated queries and hypothetical end users. The techniques and methodologies can however be employed in developing an O-ODB for any object when such a need is established. The files defined for this database and sample products are given in appendix 4.

CHAPTER 6

IMPLEMENTATION STRATEGY

6.1 INTRODUCTION

The implementation of the ISSEP proposal may be considered at two dimensions.

- Policy dimension: Having the policy adopted by the government through the concerned ministry so as to get their commitment for funding and provision for the management structural adjustments necessary for the implementation of ISSEP.
- Technical dimension: This relates to issues of resource requirements for each level of development, and optimal utilisation and management of the resources to accomplish the goals. The implementation strategy presented augments both dimensions, in such a way that both can be undertaken in parallel. It is however highly recommended that the policy dimension be given priority attention so as to give ISSEP the necessary impetus in its development.

6.2 GENERAL CONSIDERATIONS

In preparing the plan of action for ISSEP implementation, special attention should to be paid to:

1. Setting up or strengthening appropriate educational information systems to generate information products and services necessary for educational planning.
2. Ensuring integrated and coordinated development of the institutional information

systems that have been identified by users as priority areas.

3. Judicious application of IT for improving and enhancing the effectiveness and efficiency of the information services.

4. Information manpower development especially personnel trained in modern methods of information handling and the training of trainers and information system managers.

5. User sensitization to the value of information and enhancing the capacity of users at all levels to access information sources and to apply information for decision making, problem solving, etc.

6. Enhancing the propensity of children in primary school and students in all school levels to seek and use information for problem solving purposes is of particular importance.

7. Enhancing the capacity of the various ISSEP network participating nodes in capturing, processing, organising and disseminating indigenous information and data.

8. Adoption of appropriate norms and standards in documentation and information handling so as to enhance the compatibility among information systems and services to facilitate system interconnections, exchange of information, resource sharing etc.

9. Encourage ISSEP to participate in input and utilise appropriate international and regional information systems, services and programmes.

6.3 OBJECTIVES, OUTPUTS, ACTIVITIES AND INPUTS

The implementation guidelines have been broken down into a set of objectives, the expected output, the activities to be performed in order to achieve the objective and the required outputs, and the resource requirements for each. This strategy has been adopted to enable the implementation of one objective be considered/undertaken independent of others, depending on the availability of funds.

The following objectives, outputs, activities, and inputs are requirements during the first five years of establishment of ISSEP. They are indicative of the requirements but not absolute requirements. Therefore, they can be adjusted as the need may arise.

6.3.1 Objective 1

To enhance the capacity of the National Education Documentation Centre (NEDC) at the UDSM Library enabling it to prepare various information products and provide documentation and information services at the national level; and to establish a printing facility at the unit.

6.3.1.1 Output

The expected output is more comprehensive information resources (primary, secondary, and tertiary) and preparation of databases and information products at the NEDC.

6.3.1.2 Activities

The following activities will have to be done to achieve the stated objective.

1. Study, identification and decisions on the subject areas to be comprehensively covered by the NEDC.

2. Filling in gaps and updating the information source materials at the NEDC.

3. Contracting a consultant to assist in the introduction of automation at NEDC.

4. Staff training in modern methods of information handling.

5. Acquisition of microcomputers (IBM PC/AT 486 compatible, (2 units), laser printer, fast photocopier and software).

6. Preparation of data bases as identified by the study and keeping them updated.

7. Progressive introduction of automation in other library operations.

8. Acquisition of equipment components for a Printing Unit at the NEDC.

9. Acquisition of audio-visual equipment and teaching aids for the staff and user training.

6.3.1.3 Inputs

The following inputs will be required for accomplishing the objective:

-Consultant on automation;

-Equipment for information processing (IBM PC/AT 486 compatible, laser printer, photocopier, software);

6.3.2.2 Activities

The listed activities are necessary to accomplish the objective.

1. The NEDC should constitute an editorial team of documentation and information personnel and an abstracting panel of subject specialists.

2. The Education Documentation Centre should contract an expert to advise on abstracting, and production of the first issue of the periodical.

3. Decisions on the format for the citations and type and standard of abstracts should be made with the target audience in view.

4. A short practical training course(s) should be conducted for the team members, if found necessary in assigned tasks, and drawing up the work flow chart.

5. Preparation of abstracts for the records input to the data bases for a given period of time, say six months, and editing of the citations and abstracts.

6. Preparation of outputs for each issue, including the indexes (e.g. author, subject), providing title page, contents page, and introduction notes, and arranging the printing of the issue.

7. Arrangement for addressing and mailing of copies of the periodical according to pre-determined mailing list.

8. Based on the experience gained and feedback on the first issue, examining the need to associate other centres and specialists in the preparation and production of the periodical, revision of work schedule, citation format, etc. if necessary.

6.3.2.3 Inputs

The following inputs will be required:

-An expert/consultant to advise/assist in designing and preparation of the first issue;

-Printing cost (estimates based on number of copies);

-Mailing costs; and

-Local support staff.

6.3.2.4 Output 2

The other main output to fulfil objective 2 will be a data base on Educational Abstracts, notification and register of ongoing educational research projects in Tanzania.

6.3.2.5 Activities

The activities in this module are:

1. Design of the database, input and output formats, etc. using relevant international norms and guidelines with the help of the expert mentioned above.

2. Preparation of survey instruments/input worksheets; identification and making agreements with ISSEP participating institutions, appraising them of the network and its value to users.

3. Conducting a workshop (about 3 days) about the network, especially t preparation of inputs,

abstracting/description of research projects, indexing, etc.

4. Receipt of inputs and their editing by NEDC, updating the data base, preparing half yearly printed outputs with indexes and distribution to participating centres.

5. Provision of other information services and products to researchers, planners, government departments, international funding agencies etc.

6.3.2.6 Inputs

The necessary inputs for this objective will be:

-National meeting and training (3-4 days);

-Printing cost of register;

-Mailing cost; and

-Additional local staff for inputting data, production etc.

6.3.3 Objective 3

To strengthen the information and data resources and information service in selected nodes and specialised educational fields deemed as priority areas in the education development plan.

6.3.3.1 Output

Sectoral and specialised information systems in selected area of national educational plan priority. The Executive Directorate will be expected to initiate action.

6.3.3.2 Activities

1. The Executive Director in consultation with the National Advisory Body can draw up an annotated categorised list of sectors/specialised fields of national priority for which specialised nodes are to be developed, and identify and allocate responsibilities to a centre of excellence or a national institution that has capacity to perform each of the assigned tasks.

2. Each national specialised node in consultation with the institutions likely to cooperate in the specialised sectoral information system development, to submit proposals, in prescribed format, to the Executive Director for developing information resources, databases, and services.

3. The proposals will be approved by the coordinating body (NEIPCA) according to prescribed criteria; and then it would sub-contract each system development project to a specilaised node.

4. The projects, can then be implemented; and reports submitted periodically by the specialised nodes.

5.The Executive Directorate will have to provide technical assistance including selection and contracting of consultants, arrangements to purchase equipment from

abroad etc. for each node.

6.3.3.3 Inputs

This module will need the following inputs:

-Project assistance through sub-contracts to each specialised node;

-Consultant(s) to specialised nodes;

-Microcomputers, printers etc. for each node;

-Strengthening the document collection in each node;

-Personnel training; and

-Additional local support staff in each node.

6.3.4 Objective 4

Strengthening the management information in the Ministry of Science, Technology and Higher Education and the Ministry of Education and Culture.

6.3.4.1 Output

Computerizing the management information system to facilitate the provision of relevant and timely information and data to the MSTHE, MEC and other ministries.

6.3.4.2 Activities

1. Selection of specialist/consultant in government management information systems.

2. A feasibility study on networking of the Ministry of Education and Culture, the Ministry of Science, Technology and Higher Education and relevant educational

institutions/specialised nodes should be carried out.

3. Acquisition of equipment (computers, printer, local/wide area network requirements, reprography machines, software).

4. Staff training and study tour.

5. Development of databases and computerised MIS and information products.

6. User sensitisation sessions.

7. Feedback, updating and maintenance of the systems and services.

6.3.4.3 Inputs

The requirements to attain this objective are:

-A consultant;

-Equipment (2 minicomputers, PCs/terminals, printers, reprography machines, 3 facsimile machines, LAN/WAN requirement, software, etc);

-Staff training and study tours; and

-Additional personnel for input of data.

6.3.5 Objective 5

To enhance the library, documentation and information service capacity of the University of Dar es Salaam Main Library by augmenting its information resource collection, computerisation of library and documentation work, and developing an

information resource network among the campus libraries, i.e. Faculty of Education Library, Institute Promotion Innovation (IPI) Library, Faculty of Engineering Library, and the Main Library. Network development with the other University Libraries Muhimbili Library and Sokoine Library will be considered as a next step.

6.3.5.1 Output

The expected output will be a university information resource centre with capacity to meet the library, documentation, and information needs of the university teachers, researchers and scholars, students and administrative staff, as well as requests from other institutions and centres.

6.3.5.2 Activities

1. Acquisition of information resource materials - primary, secondary and tertiary - in conventional and non-conventional forms, to fill in gaps and update the collection in the main and departmental libraries.
2. Contracting a consultant to prepare a study for automating library and documentation work in the campus libraries and establishing a Local Area Network.
3. Acquisition of computer terminals and other equipment for automation and networking.
4. Training of staff in modern/computerised methods of information handling.
5. Phased introduction of automation.

6.3.5.3 Inputs

The following inputs will be required:

-A consultant;

-Equipment (1 minicomputer, micros/terminals, LAN requirements, software); and

-Acquisition of information source materials.

6.3.6 Objective 6

To strengthen and enhance the capacity of selected secondary school libraries to support the schools' education programmes.

6.3.6.1 Output

Model library/media centres in four selected secondary schools. The selection will be made by the Ministry of Education and Culture.

6.3.6.2 Activities

1. Contracting a school library/media resource expert.
2. Acquisition of documents to strengthen library collection.
3. Acquisition of audiovisual media equipment and appropriate teaching aids.

6.3.7.1 Output 1

Organisation of short training courses, workshops, demonstration sessions, and, sensitisation sessions, 3 or 4 in a year, on the subjects mentioned below. Each course to be attended by not more than 10 professionals selected from the centres participating in ISSEP in a specified duration of time.

Course content:

- Information analysis, consolidation and repackaging services (for documentation and information personnel) 3 weeks;
-Application of information technology in library and information work (for documentation, information and computer personnel) 2 weeks;
-Application of Micro CDS/ISIS (for library, documentation, and information personnel) 1 week;
-Information services (for library, documentation, and information personnel) 1 week;
- Information norms, standards, and tools (for library, documentation and information personnel) 1 week;
- Information sources, especially non-documentary materials, databases, etc. (for library, documentation and information personnel) 1 week; and
-Information use promotion, and information services marketing (for library documentation and information personnel) 2 weeks;

6.3.7.2 Activities

1.Adoption of a guide similar to the Unesco/INISIST guide for the organisation of short courses, seminars etc.

2.Identification of the host centre which is prepared to organise the course, and through an agreement, establishing the tasks to be performed by the host centre.

3.Identification and making contractual agreement with experts/resource persons (external and local). This action should be initiated at least six months in advance of each course if the contractual agreements are to made through international funding agencies.

4. Arrangement for course materials to be prepared 3-4 months in advance of each course so that copies can be made and distributed to the participants in time.

5. Preparation and distribution of announcement brochure to selected centres, months in advance, setting out precisely the background and qualification of candidates to be admitted to each course.

6. Making housing, transport and hospitality arrangement for the selected participants and resource persons

7. Proving class/seminar rooms, computer, audio-visual, photocopying, secretarial and other facilities for each course.

8. Arrangement for feedback/evaluation of each course about a year after, using appropriate questionnaires

6.3.7.3 Inputs

The following cost items should be considered:

-Experts/resource persons in the respective subject in the course;

-Allowances for participants;

-Travel for trainees to the course centre;

-Production of course materials; and

-Computer hire or other organisational expenses.

6.3.7.4 Output 2

Study tour of Heads/Senior management personnel of the participating centres to selected information systems abroad (2 persons each year, preferably from different centres, for 2 weeks each)

6.3.7.5 Activities

1.The Executive Director will notify centres participating in the ISSEP network about the availability of funds for such study tour, at least 3-4 months before the tour, indicating type, time/duration, amount, qualifications for award, etc.

2. On receipt of nominations in the prescribed format, the Executive Director should contact appropriate or suggested centres abroad, fixing mutual convenient dates, financial provision, etc.

3. The Executive Director should initiate procedures with local and internatonal agencies e.g. Unesco for award of fellowships to the selected candidates (3-4 months

in advance of the dates of the tours).

4. Nominated centres should be informed about the arrangements.

5. Making travel and accommodation arrangements in the countries to be visited.

6. After the study visits a report should be submitted to the Executive Director within four weeks after the visit.

6.3.7.6 Inputs

The major input costs are

-Travel costs and allowamnes for candidates.

6.3.7.7 Output 3

Upgrading the Library Science training programmes at MANTEP and UDSM by incorporating modern methods of information handling and services in the syllabus and leading to the award of Bachelors and Masters/Ph.D. degrees. The Executive Director will initiate action in consultation with the concerned institutions.

6.3.7.8 Activities

The main activities will include:

1. Contracting an appropriate expert to prepare a feasibility report indicating the revision of the curriculum, admission requirements, laboratory, equipment, and necessary library support etc.

2. School to acquire teaching aids, course materials, microcomputer facilities, prepare class rooms etc.

3. Recruitment of additional teachers, if necessary.

4. Training of teachers.

6.3.7.9 Inputs

The resource requirements will include:

-Expert/consultant;

-Acquisition of course materials, teaching aids, etc.;

-Microcomputers (IBM PC/AT compatibles, and printers);

-Reprography equipment;

-Audiovisual aids (overhead projectors, videocassette recorder/TV, tape slide equipment);

6.3.8 Objective 8

To meet the expressed demand for information on and texts of educational legislative measures (acts, laws, ordinances, executive orders, bills, presidential addresses, etc.) and of educational/cultural/technical assistance agreements and treaties between Tanzania and other countries and regional/international entities.

6.3.8.1 Output 1

Development of computerised information resource base and collection of complete texts of educational legislations; bills, acts, laws, ordinances, decrees, executive orders, and similar promulgations at the National Education Documentation Centre (NEDC).

6.3.8.2 Activities

1. The Ministry of Science Technology and Higher Education and the Ministry of Education and Culture in consultation with NEDC should constitute a working group.
2. Decisions on the input, indexing, and output formats for the catalogue of the legislative documents and preparing the data base should be made.
3. Citations to documents input to the data base may be notified periodically in the Educational Abstracts of Tanzania.
4. Compilation of full texts of legislative documents, assembled into useful groups, may be published periodically and distributed on a differentiated pricing policy.

6.3.8.3 Inputs

The necessary requirements are:

-Microcomputer (IBM PC/AT compatible) for the MEC;

-Printing cost;

-Mailing cost; and

6.3.8.1 Output 1

Development of computerised information resource base and collection of complete texts of educational legislations; bills, acts, laws, ordinances, decrees, executive orders, and similar promulgations at the National Education Documentation Centre (NEDC).

6.3.8.2 Activities

1. The Ministry of Science Technology and Higher Education and the Ministry of Education and Culture in consultation with NEDC should constitute a working group.
2. Decisions on the input, indexing, and output formats for the catalogue of the legislative documents and preparing the data base should be made.
3. Citations to documents input to the data base may be notified periodically in the Educational Abstracts of Tanzania.
4. Compilation of full texts of legislative documents, assembled into useful groups, may be published periodically and distributed on a differentiated pricing policy.

6.3.8.3 Inputs

The necessary requirements are:

-Microcomputer (IBM PC/AT compatible) for the MEC;

-Printing cost;

-Mailing cost; and

-Additional local support staff.

6.3.8.4 Output 2

Development of a computerised information resource base and collection of complete texts of educational treaties and agreements entered into by the Tanzanian Government through the different ministries with other countries, international and regional entities, groupings of countries etc. The work to be done by the National Education documentation Centre in cooperation with the MSTHE, MEC and the Ministry of Foreign Affairs.

6.3.8.5 Activities

*Similar to those in section 6.3.8.2 above.

Possibilities of merging the two databases should be explored.

6.3.8.6 Inputs

Resource requirements for this module would include:

-Additional local support staff for preparing inputs;

-Printing cost; and

-Mailing cost.

6.3.9 Objective 9

To facilitate referral and information clearing services at the NEDC and other libraries, documentation centres, and information centres in Tanzania.

6.3.9.1 Output 1

Computerised data bases of profiles of corporate entities (i.e. institutions, organisations, associations, societies, etc.), experts/specialists, systems and periodical events. Maintenance and updating of the data base and production of printed outputs from it periodically for distribution. The Executive Director may sub-contract the project to EDC to be carried out in cooperation with other institutions and agencies.

6.3.9.2 Activities

1. A consultant on integrated data base development should be employed on contract.
2. Decisions on and preparation of instruments of survey for collection of information and data should be made.
3. Mailing of questionnaires, site visits, and follow-ups as necessary.
4. Preparation of outputs periodically covering corporate entities and systems, experts, and notification of forthcoming events.
5. Preparation of database according to predetermined format, indexing parameters etc.

6.3.9 Objective 9

To facilitate referral and information clearing services at the NEDC and other libraries, documentation centres, and information centres in Tanzania.

6.3.9.1 Output 1

Computerised data bases of profiles of corporate entities (i.e. institutions, organisations, associations, societies, etc.), experts/specialists, systems and periodical events. Maintenance and updating of the data base and production of printed outputs from it periodically for distribution. The Executive Director may sub-contract the project to EDC to be carried out in cooperation with other institutions and agencies.

6.3.9.2 Activities

1. A consultant on integrated data base development should be employed on contract.
2. Decisions on and preparation of instruments of survey for collection of information and data should be made.
3. Mailing of questionnaires, site visits, and follow-ups as necessary.
4. Preparation of outputs periodically covering corporate entities and systems, experts, and notification of forthcoming events.
5. Preparation of database according to predetermined format, indexing parameters etc.

6. Printing and distribution of copies will be done according to a differentiated pricing policy.

6.3.9.3 Inputs

The requirements are:

-A consultant;

-Printing cost;

-Mailing cost; and

-Additional local support.

6.4.0 Objective 10

Easy identification and location of documentary materials to facilitate document delivery (e.g interlibrary loan, photocopy provision, facsimile and e-mail transmission) especially of papers published in serials.

6.4.0.1 Output 1

Development of a computerised union catalogue of serials available in selected libraries, documentation centres, information facilities in Tanzania.

6.4.0.2 Activities

1. NEDC to constitute a task force, including professionals from other centres.
2. Decisions to be made on the questionnaire for survey of holding of serials,

cataloguing details, input/output formats, indexing parameters, institutions to be addressed, frequency and modalities of updating and maintenance of the database.

3. Preparation of database, updating and production and distribution of outputs periodically.

6.4.0.3 Inputs

The following inputs are implied:

-Printing cost;

-Mailing cost; and

-Additional local staff.

6.4.1 Objective 11

To establish the institutional framework for the coordination and management of the ISSEP as a whole; to ensure availability of expert advise, and supervisory staff for managing the project; drawing up of plans and proposals for the future development of the system.

6.4.1.1 Output 1

Finalisation of the ISSEP policy document and its acceptance by the government.

6.4.1.2 Activities

1. A task force of the MSTHE will finalise the policy document as suggested by NEIPCA.

2. Establishing the national body for coordination of ISSEP 3. Bi-annual meetings of the NEIPCA and semi-annual meetings of the Advisory Body.

6.4.1.3 Output 2

Expertise to ensure smooth start-up, implementation, follow up, supervision, and efficient management and planning further development of ISSEP.

6.4.1.4 Activities

1. Recruiting a technical advisor with expertise in information systems and project management, especially international funded projects, to advise and assist the Executive Director in relation to the various aspects of project implementation and further planning.

2. Assigning national supervisory staff for the project.

6.4.1.5 Inputs

The main inputs in this module are:

-Chief technical advisor; and

-National supervisory staff.

CHAPTER 7

RECOMMENDATIONS AND CONCLUSION

7.1 RECOMMENDATIONS

Sectoral information systems are the backbone and life-blood for the national information system. The document on national policy on information systems and services for Tanzania contains policy statements and implications of their implementation regarding among other things:

- its goals;
- national coordination;
- information for national development;
- provision and access to information;
- indigenous information and information products and services development;
- promoting the effective use of information;
- informatics technology; and
- information manpower development.

The extent of commitment and involvement of the Government in setting up as early as possible the National Policy on Information Systems and Services (NPISS) and the mechanism for its implementation will provide a favourable ground for the development of sectoral information systems and thus contribute to the successful and timely implementation of ISSEP.

From the experience and lessons learnt in the course of this study, the

following recommendations are suggested:

1. Action be taken by the Prime Minister's Office in forming the National Information Coordination Body under its jurisdiction, so as to facilitate the preparation of the policy document and make NPISS as recommended by the Sekimang'a study (1992) operational.

2. Recognition by the government, of information as a resource that is central for national development, thus providing the necessary information infrastructure for its capture, processing and dissemination.

3. Sensitization of the community on the use of information for decision making, through improvements in the education system. This may call for making the necessary changes in the curriculum and teaching methods, so that information seeking habits can be inculcated in the young, and others throughout the education process and the use of several other methods, including the mass media (radio, television, etc.). Inclusion of a compulsory general introductory course on Informatics in secondary and tertiary level education are also possible measures.

Another strategy will include promotion of use of information in general and educational information in particular through information use promotion strategies.

4. User studies: periodical studies to identify sectoral information needs in general

and educational information needs in particular for the different user groups, e.g. managers, planners, researchers, decision makers, students, parents etc. is necessary, especially for the development of user oriented services, and value-added information products. Such studies can also shed light on the factors affecting the use of information, some of which could be socio-cultural or otherwise.

5. Selection and preparation of statistics: There is a need to redesign the forms used to collect statistics at the grass-root level so as to facilitate transformation of the data into machine readable form. Currently, most educational statistics are not treated for easy comparative studies, and not targeted for planning purposes. There is also need for conformity to international educational statistics standards.

7. The role of the government in the overall development of the manpower resource base by having deliberate policies on investment in information training and education need to be more explicit. This calls for planning for the establishment of an Informatics Institute, and enhancement of the existing Library and Documentation schools by, among other things, reviewing the curricula, improving facilities, and having plans for the training of the necessary cadre of teachers.

8. Adoption of international IT standards for hardware and software communication as well as the CCF for data exchange facilitate compatibility and coherent development of the information industry, and exchange of information and data.

9. The Government should encourage parastatal and private industrial enterprises in the country to further contribute to the development of research and training by sponsoring more persons within their spheres of competence for advanced learning and providing incentives for any actions undertaken in this area.

7.2 CONCLUSION

The study has established the need for ISSEP. The success of ISSEP, however hinges on various factors, among them being the extent and pace of the emergence of the information society i.e. the ability of the Tanzanian society to appreciate and use information for decision making. Like many other information systems which have been established and under-utilised, if ISSEP does not establish information use/promotion strategies, it will remain a white elephant.

Another important area is the ability of the society to attach value to information. Information as currently conceptualised, is seen as a free good. The historical development of information, especially through the conventional approaches, where libraries have been offering free services has to be strategically phased out. The provision of timely, value-added information to support management decision making is extremely expensive, and cannot be offered free. Information should be seen as a resource, just as water, energy, and finance. On the other hand, the information provided should really help in decision making. It should have a surprise value and reduce uncertainty. This call for the provision of relevant, user tailored and

Appropriate education planning has long term benefits as well as synergistic effect on the development of all other sectors of the economy. Investment in a programme geared towards the improvement of educational planning is economically viable and thus should be given priority.

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APPENDIX 1A

Dear Sir/Madam

Re: **INFORMATION SUPPORT SYSTEM FOR EDUCATION PLANNING IN TANZANIA (ISSEP): QUESTIONNAIRE(s)**

I'm a graduate student at the School of Information Studies for Africa (SISA), Addis Ababa University, Ethiopia. I'm conducting a study on "Information Support System for Education Planning in Tanzania". My study, among other things, involve identification of education information user needs, information sources, education experts, and collection of data to be input into prototype databases to be developed for that purpose.

The information you provide in the questionnaire(s) will facilitate the planning as well as the development of the Prototype Databases of Education Experts/Education Institutions /Information Systems/Educational Project Profiles in Tanzania.

A computerized version of the prototype database(s) will be maintained by the Library of the University of Dar es Salaam to provide upon request, services to researchers and other information seekers who wish to get such information. It is expected that, later, the prototype database(s) can be used as a basis for the development of the resource databases for the ISSEP and the Education Information Clearing House proposed by the study.

Please return the completed questionnaire by 30th September, 1993 to:

Mary M. Materu-Behitsa (Mrs)
University of Dar es Salaam Library
P . O. Box 35092
DAR ES SALAAM, Tanzania.

Thanking you in advance in anticipation of your cooperation.
Yours sincerely,

Mary Materu-Behitsa (Mrs)

APPENDIX 1B

QUESTIONNAIRE TO IDENTIFY EDUCATIONAL INFORMATION NEEDS

1. Name (optional).....
2. Position .....
3. Affiliation/Employer .....
.....
4. Responsibilities/Duties.....
.....
.....
.....
.....
5. In executing your duties, what types of educati
information do you need? Please fill in the appropriate sp

Numerical/Statistical data about
.....
.....

Reviews and opinions about
.....
.....

Education Institutions information about
.....
.....
Information from research reports about
.....
.....
Any other. (Please specify).
.....
.....
.....
.....

11. How do you get the information/data that you need.

[ ] send somebody for it [ ] get it yourself

[ ] by telephone [ ] ask the librarian

Any other, please specify

.....

.....

12. What problems do you encounter which may be a result of information provision deficiencies?

.....

.....

.....

13. Do you have an information/library/documentation centre catering for your needs? (please tick). [ ] Yes [ ] No

14. If yes, for what purpose do you use its facilities?

[ ] borrow books [ ] consult journals

[ ] on-line search of databases

Any other. Please specify

.....

.....

15. Does the information system mentioned above provide any of the following services? Please tick.

[ ] current awareness service (the librarian/information worker regularly informs the users about new additions to the collection and their contents)

[ ] selective dissemination of information (new information provided to people in their areas of interest)

[ ] question and answer services

[ ] reference services

Any other. (Please specify)

.....

.....

16. Do you feel that your information center meets your information requirements? Please tick one.

[ ] very much [ ] slightly [ ] does not

17. There is a proposal to establish an Education Information Clearing House (EICH) in Tanzania. In what priority should information be put in its databases. Please number in order of priority

[ ] Teachers and teacher education
[ ] Education Policy, reforms, and legislations
[ ] Education facilities and equipment
[ ] Educational research
[ ] Tests, measurement and evaluation
[ ] Education provision(primary, secondary, tertiary, adult)
[ ] Subject related issues e.g. curriculum.

Any other. (please specify)

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

18. Under whose authority do you think the EICH should be? (please tick three in order of priority)

[ ] Ministry of Education
[ ] Ministry of Higher Education Science and Technology
[ ] University of Dar es Salaam Library
[ ] National Science and Technology Commission
[ ] National Library
[ ] Independent

19. Do you receive any queries/questions for any educational information? [ ] Yes [ ] No

20. If yes, what categories of people frequently ask for what information?.....
.....
.....
.....
.....

21. Please, give any additional remarks or comments concerning your information requirements, problems in obtaining the information, how the information is presented, and any suggestion on how provision of educational information can be improved.

THANK YOU

APPENDIX 1C

EDUCATION INSTITUTIONS PROFILE

1. Name of institution .....
.....
2. Address .....
Telephone ..... Fax ..... Telex .....
3. Working language(s) .....
4. Status: [ ] Primary
[ ] Secondary
[ ] Professional training
[ ] University
Other (please specify) .....
.....

5. Name of sponsor/Parent body .....
.....
6. Year of establishment .....
7. Objective .....
.....
8. Entry qualifications .....
.....
.....
.....
.....
.....
9. Graduation requirements .....
.....
.....
.....
.....
10. Academic year .....
11. Length of course: Part time .....
Full time .....

12. Application method .....
.....
.....

13. Enrolment capacity .....
.....
.....
.....
.....
.....
.....
.....

14. Teaching staff

Qualification	Required	Present
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

15. Sponsored projects/departments
.....
.....
.....

16. Please list any publications produced by your institution.

Name	Periodicity
.....	.....
.....	.....
.....	.....

THANK YOU

APPENDIX 1D

PROFILE OF INFORMATION SYSTEMS

1. Name (of information institution)

.....

.....

2. Date of establishment .....

3. Address

.....

Telephone .....

Telex ..... Fax .....

4. Sponsor/Affiliation/Parent body

.....

.....

5. Working language(s)

.....

6. Name of head

.....

Qualifications/Designation

.....

7. Staff establishment (librarians, assistants, attendant etc)

Qualification	Number
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

8. Objectives

.....

.....

.....

9. Activities

.....

.....

.....

.....

.....

10. Subject specialization

.....

.....

.....

11. Information services provided

.....

.....

.....

12. Holdings

Type	Quantity
Books	.....
Current journals	.....
Current newspapers	.....
Audio visual equipment	.....

Computers

Type	Model	Software
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

13. Databases

Database Name	Coverage (period)
On CD-ROM	.....
.....	.....
.....	.....
.....	.....

Locally developed

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

International databases
(on-line access)

Name	Coverage
.....	.....
.....	.....
.....	.....

14.Thesaurus [ ]used [ ]not used. If used, Name.....

15. Please list any publications by your institution.

Name	Periodicity
.....	.....
.....	.....
.....	.....
.....	.....

THANK YOU

11. Equipment

.....

.....

12. Current activities and progress

.....

.....

.....

.....

13. Future plans

.....

.....

.....

14. Major references

.....

.....

.....

THANK YOU

APPENDIX 1F

EXPERTS PROFILE QUESTIONNAIRE

Main name ..... Other name(s) .....
Year of birth ..... Sex ..... Nationality .....
Permanent mailing address .....
.....
Telephone: Office ..... Home .....
Telex: ..... Fax .....
E-Mail .....

ACADEMIC QUALIFICATIONS

1. Field of study
.....
.....
Degree .....
Year obtained .....
Name and place of institution
.....
.....
.....

2. Field of study
.....
.....
Degree .....
Year obtained .....
Name and place of institution
.....
.....
.....

APPENDIX 1F

EXPERTS PROFILE QUESTIONNAIRE

Main name ..... Other name(s) .....
Year of birth ..... Sex ..... Nationality .....
Permanent mailing address .....
.....
Telephone: Office ..... Home .....
Telex: ..... Fax .....
E-Mail .....

ACADEMIC QUALIFICATIONS

1. Field of study
.....
.....
Degree .....
Year obtained .....
Name and place of institution
.....
.....
.....

2. Field of study
.....
.....
Degree .....
Year obtained .....
Name and place of institution
.....
.....
.....

3. Field of study

.....

.....

Degree .....

Year obtained .....

Name and place of institution

.....

.....

.....

MAIN FIELD(S) OF SPECIALIZATION

.....

.....

.....

MAIN PUBLICATIONS

1. .....

.....

.....

.....

.....

.....

2. .....

.....

.....

.....

.....

3. .....

.....

.....

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.....

.....

Main working language(s) .....
Other working language(s) .....
.....

EMPLOYMENT RECORD

1. Current employer

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

Title of post

.....

Duration: from ..... to .....

Description of duties

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

2. Last employer

.....
.....

Title of post

.....

Duration: from ..... to .....

Description of duties

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

3. First employer

.....

.....

Title of post

.....

Duration: from ..... to .....

Description of duties

.....

.....

.....

.....

.....

MAIN CONSULTANCY OR EXPERT ASSIGNMENTS UNDERTAKEN

1. Description of assignment

.....

.....

.....

.....

.....

Duration: from ..... to .....

Place

.....

.....

.....

2. Description of assignment

.....

.....

.....

.....

.....

Duration: from ..... to .....

Place

.....

.....

.....

THANK YOU

ANNEX 2

LIST OF INDIVIDUALS WITH WHOM INTERVIEWS/DISCUSSIONS WERE HELD IN TANZANIA

Dr D. Komba - Lecturer, Faculty of Education, University of Dar es Salaam; ERNESA Coordinator.

Dr K. M. Osaki - Lecturer, Faculty of Education, University of Dar es Salaam.

Dr Sumra - Lecturer, University of Dar es Salaam; Coordinator, Bureau of Educational Research (BERE),

Dr G. Malekela - Lecturer, Faculty of Education, University of Dar es Salaam.

Ms G. Puja - Lecturer - Faculty of Education, University fo Dar es Salaam.

Prof O. C. Mascarenhas - Librarian, The Library, University of Dar es Salaam.

Dr J. M. Newa - Director - University Library Services.

Mr.D. R. M. Katundu - Librarian, University of Dar es Salaam.

Ms D. A. Sekimang'a - Librarian, Tanzania Library Services Board.

Ms C. J. Hongoke - Head, Educational Research Coordinating Unit, Ministry of Education and Culture.

Mr A. A. Mburuja - Assistant to the Principal Secretary, Ministry of Education and Culture.

Mr H. K. Mwenisongole - Director of Planning, Ministry of Education and Culture.

Mr L. C. J. Shuma - Information Desk Officer, Unesco National Commission, Dar es Salaam.

Mr T. E. Mlaki - Director, Information and Documenation, COSTECH.

Mr E. Yonazi - Information Officer, COSTECH.

Mr H. Nguli - Information Officer, COSTECH.

Mr A. M. Machagge - Head, Research Department, Ministry of Science, Technology and Higher Education.

Mr S. Mongella - Director, National Archives.

ANNEX 3

INTERVIEW GUIDELINE

-Person's status
-Place of work
-Brief introduction to the purpose of interview
-What type of data/information do you need for execution of duties (e.g. reports, minutes of meetings, research reports, etc)
-Is there a library/information service at your Institution/Ministry?
-What services does it provide?
-In the short/long term plan of the organisation (mention name of specific organisation) is there provision for the establishment of an information centre?
-What are your opinions about the existing information which supports the execution of your activities? (Is it adequate? Is it timely?)
-What are your opinions on the usefulness of information in planning and decision making?
-What are your opinions about the prospects of establishing an Information System to Support Educational Planning?
-What do you think should be the immediate areas of concern for such an instrument?
-What are the possible sources of funds?
-What are your general opinions about the role of information/accurate data in the general performance of activities in your area of concern and in educational planning in general?

30	Policy	A repeatable field to cater for different policy aspects
35	Operational experience	Provides room to give different experiences from different areas for the same problem
40	Information sources	The different sources from where the information given in the record has been extracted
99	Key words	Words selected with the aid of the IBE Thesaurus to control the vocabulary of the database for indexing purposes

NOTE: Many fields are repeatable to overcome the limitation of the field length which cannot be more than 1650 characters. Because most data is textual, it is possible that a field can exceed it. In that case, different paragraphs can be treated as subfields. The CDS/ISIS Screen outline for the FDT is shown

Field Definition Table (FDT) Data Base: EDPLAN

?|	Tag|	Name	|Len	|Typ|	Rep|	Delimiters/Pattern |
	5	File	50	X		
	10	Topic	250	X		
	15	Details on	250	X	R	
	20	Current situation	800	X	R	
	21	Statistical data	1000	X	R	pqrs
	22	Statistics	1000	X	R	klmn
	25	Forecast	800	X	R	
	30	Policy	800	X	R	
	35	Operational experience	800	X	R	
	40	Information Sources	500	X	R	
	99	Key words	300	X		

A - Insert (after) \|B - Insert (before) \| C - Change line \| D - Delete line
P - Previous page \|N - Next page \| T - Top \| E - Bottom
\| X - Exit \|↵ - Next line

A2. The Worksheet

This file is used to create and/or modify the lay out data entry worksheet screens. The data entry worksheet is u to enter and modify database records. Sample screen lay for a worksheet where data has been entered is shown belo

```
File(5):EDPLAN
Topic(10):Higher education provision
Details on(15): Data on education provision at tertiary and university levels
rom 1970 to 1988.

Current situation(20): 1. Gross enrolment ratios for secondary and higher educ
ion for the past 20 years are almost the lowest in sub-Saharan Africa.

Statistical data(21): ^p1970^q41.8^r1.2^s2.8%^p1975^q51.1^r3.0^s3.0%^p1980^q82
^r2.7^s3.4%^p1988^q40.7^r3.7^s3.7

Statistics(22) ^k1970^12.5^m0.1^n0.1%^k1975^13.0^m0.1^n0.2%^k1980^13.0^m0.1^n0
%^k1988^16.2^m0.2^n0.2

Forecast(25) Liberalisation in education allowing NGOs to establish and manage
rimary and secondary schools will increase the demand for higher education. Th
current enrolment ratios are too low and there is pressure from the society f
the expansion of secondary and higher education in Tanzania.
```

Policy(30) Reduction of unit costs by increasing enrolments, reducing administra
tive overheads, expanding programmes and enrolment at universities, transfer of
upkeep costs (boarding, meals, etc. to the individual.

Operational experience(35) Education is a very expensive industry. Even the high
ly industrialised countries have not been able to offer free education to all it
s people. It is unlikely that the government will be able to offer free quality
education to most of its people. Instead, it should have education loan schemes

Information sources(40)1.ECA 1991. 1988 African Socio-economic indicators%2. MST
HE and MEC, 1993.

Key words(99) <education provision><education supply><statistical data><higher e
ducation data>

| J - Next page | B - Previous page | M - Modify | N - New record |
| X - Exit | D - Delete | C - Cancel | T - End revise |
Last page MFN= 4

A3. The Field Select Table (FST)

An FST defines criteria for extracting one or more elements from a database record. Depending on the context in which an FST is being used, the extracted elements may be used to create inverted file entries for the record from which they were extracted, for sorting records, to the desired sequence before producing a printed report, or to reformat records during import or export operation.

The FST used for EDPLAN is shown below.

Data Base Name: EDPLAN FST for Inverted File FST name: EDPLAN

ID	IT	Data extraction format
20	4	v20
25	4	v25
30	4	v30
35	4	v35
99	2	v99

A - Insert (after) | B - Insert (before) | C - Change line | D - Delete line
P - Previous page | N - Next page | T - Top | E - Bottom
X - Exit | ↵ - Next line

A4. The Display Format

The display format, created by using CDS/ISIS formatting language is used for displaying records on the screen or printing the records. The format used is shown below.

Data Base Name: EDPLAN **Format name: EDP**

```
mhl,'FILE :',C20,V5,X2,'REC. NO. :'mfn(4)/'TOPIC :',(c20,v10(20,19)/)'DETAILS ON
 :',(c20,v15(20,19)/),'CURRENT SITUATION :',(C20,V20(20,19)/),/if p(v21) and a(v
21^t) then 'STATISTICAL DATA:'/c30,'Secondary Education',/c20,'----------------
--------------------',/c20,'Year',c29,'Highest'c39,'Lowest',c49,'Tanzania',/(c20
,v21^p,c30,v21^q,c40,v21^r,c50,v21^s)/,c30,'Higher Education',/c20,'------------
--------------------------',/c20,'Year',c29,'Highest'c39,'Lowest',c49,'Tanzania
'/(c20,v21^k,c30,v21^l,c40,v21^m,c50,v21^n) else if p(v21) and p(v21^t) and p(v2
1^u) and p(v21^v) then 'STATISTICAL DATA:'/c5'----------------------------------
------------------------------------'/c5'Institution',c20,'1',c30,'2'c40,'3'c50,
'4'c60,'5',c70,'6'/c5'-----------------------------------------------------------
------------'/(c5v21^p,c20,v21^q,c30,V21^r,c40,v21^s,c50,v21^t,c60,v21^u,c70,v21
^v/) /,c5,'Notes:'/c5,'1: Total enrolment'/c5,'2: Total number of teachers'/c5,'
3: Staff:student ratio'/c5,'4: Projected enrolment by year 2000'/c5,'5: Proposed
 teacher:student ratio'/c5,'6: Projected number of teachers'fi fi/#/'FORECAST :'
,(C20,V25(20,19)/),'POLICY :',(c20,v30(20,19)/)'OPERATIONAL EXPER. :',(c20,v35(2
0,19)#/),'INFO. SOURCES :',(C20,V40(20,19)#/)


EDIT: Replace
```

SAMPLE RECORD FROM EDPLAN DATABASE

(Query: Education provision)

FILE : EDPLAN REC. NO. :0004

TOPIC : Higher education provision

DETAILS ON : Data on education provision at tertiary and university levels from 1970 to 1988.

CURRENT SITUATION :1. Gross enrolment ratios for secondary and higher education for the past 20 years are almost the lowest in sub-Saharan Africa.

STATISTICAL DATA:

Secondary Education

Year	Highest	Lowest	Tanzania
1970	41.8	1.2	2.8
1975	51.1	3.0	3.0
1980	82.3	2.7	3.4
1988	40.7	3.7	3.7

Higher Education

Year	Highest	Lowest	Tanzania
1970	2.5	0.1	0.1
1975	3.0	0.1	0.2
1980	3.0	0.1	0.3
1988	6.2	0.2	0.2

FORECAST : Liberalisation in education allowing NGOs to establish and manage primary and secondary schools will increase the demand for higher education. The current enrolment ratios are too low and there is pressure from the society for the expansion of secondary and higher education in Tanzania.

POLICY : Reduction of unit costs by increasing enrolments, reducing administrative overheads, expanding programmes and enrolment at universities, transfer of upkeep costs (boarding, meals, etc.) to the individual.

OPERATIONAL EXPER. :

Education is a very expensive industry. Even the highly industrialised countries have not been able to offer free education to all its people. It is unlikely that the government will be able to offer free quality education to most of its people. Instead, it should have education loan schemes.

INFO. SOURCES :

1. Economic Commission for Africa. 1991. 1988 African Socio-economic indicators.
2. Ministry of Science Technology and Higher Education. 1993. Integrated Education and Training Policy Tanzania. Dar es Salaam.

APPENDIX 5

B: FILES DEFINED FOR THE EDUC DATABASE

B1. The Field Definition Table (FDT)

All the fields/data elements necessary to describe/catalogue documentary material, institution, information system, project and expert are enumerated in a single FDT. Several of the fields may be common to two or more of these entities. For example:

-"Name of person" occurs as "Name of Personal Author" in bibliographical records, as "Name of Head of Institution" in institution records, as "Name of Expert" in records on experts, as "Name of Leader of Project" in a project record.

- "Name of Corporate Body" occurs as Corporate Author in a bibliographic record, as "Name of Institution" in institutional records, as "Performing Institution" in a project record and as Affiliation in records on experts.

- "Descriptors", "Description/Abstract", "Notes", etc., occur in all types of records.

- "Objectives" occur in institution record, and project record.

-"Services Offered" occurs in institutional record, information systems records and records of experts.

The screen outlines for the FDT is shown below.

Field Definition Table (FDT) Data Base: EDUC

?	Tag	Name	Len	Typ	Rep	Delimiters/Pattern
	1	Participating centre code	100	X		
	2	Participating centre record no	6	N		
	3	Record status	1	P		A
	5	Date record entered	10	P		9999-99-99
	6	Date record changed	10	P		9999-99-99
	7	Bibliographic level	5	A		
	8	Bibliographic level - parent	1	A		
	9	Country of origin of record	2	P		AA
	10	Record number of parent	6	N		
	11	Record number(s) of part(s)	6	N	R	
	12	Record no of other lang ver(s)	6	N	R	
	20	Language of analysis	18	A		
	21	Language(s) of text	2	A	R	
	22	Language(s) of summaries	2	A	R	
	25	Record heading	50	X		
	100	Title	500	X		
	101	Parallel title(s)	500	X	R	
	102	Translated title - English	500	X		
	105	Translated title - other	500	X		
	110	Personal author(s)	80	X	R	ab
	111	Corporate author(s)	500	X	R	abcdz
	112	Affiliation	500	X		abcdz
	113	Other associated inst(s)	500	X	R	abcdez
	114	Meeting	500	X	R	abcde
	115	Trans. name of instn.	200	X		
	116	Address	300	X	R	abcdefghi
	120	Edition	25	X		
	121	Publisher	250	X		abc
	122	Date of publ/issue - free form	30	X		
	123	Date of publ/issue - ISO form	10	P		9999-99-99
	130	Collation (M/C)	200	X		abc
	131	Part statement	150	X		ab
	140	Monographic series	200	X	R	abz
	141	Thesis	200	X		abcd
	142	Related project(s)	200	X	R	ab
	150	Notes	700	X		
	160	ISBN	13	X	R	
	161	Document number	50	X	R	
	162	Availability	100	X		
	200	Title of serial	400	X		z
	201	ISSN	9	P		9999-999X
	202	Title of parent (M/C)	500	X		
	210	Personal author(s) - parent	80	X	R	ab
	211	Corporate author(s) - parent	500	X	R	abcdz
	300	Primary descriptors	200	X		
	301	Secondary descriptors	400	X		
	302	Geographic descriptors	200	X		
	303	Local descriptors	200	X		

514	Requester	25	X	R	
515	Supplier	200	X		abcdez
516	Price	20	X		ab
517	Acquisition notes	200	X	R	
901	Corporate body	500	X		abcd
902	See reference(s)	500	X	R	
903	Other language version(s)	500	X	R	
904	Former name(s)	500	X	R	
905	Later name(s)	500	X	R	
908	Reference code	20	X		
911	Serial title	400	X		
912	ISSN	9	P		9999-999X
913	See reference(s)	400	X	R	z
914	See also other lang edition(s)	400	X	R	
915	Former name(s)	400	X	R	
916	Later name(s)	400	X	R	
304	Proposed descriptors	100	X		
310	Abstract/Description	1000	X	R	
320	Broad subject heading	100	X		
400	Processing status	4	X		
410	Location	10	X	R	
411	Call number	40	X		
412	Number of copies	2	N		
415	Accession numb.	10	X		
420	Type of material	50	X		
430	Documentalist (initials)	10	X	R	
500	Acquisition type	4	X		
509	Order number	25	X		
510	Date ordered	10	P		9999-99-99
511	Date claimed	10	P		9999-99-99
512	Date received	10	P		9999-99-99
513	Number of copies ordered	2	N		
1017	Vendor	300	X		
1018	Price	100	X		cp
1020	Provenance	100	X		
1021	Archaeological site	500	X		
1025	Ethnic group	100	X	R	
1028	Date	100	X		
1030	Material	300	X	R	
1035	Condition	1000	X	R	
1040	Dimension (Front)	100	X		hwid
1041	Dimension (Back)	100	X		hwid
1042	Weight	100	X		
1050	Description	1000	X		
1055	Fine number	100	X		
1056	Photo number	100	X	R	
1060	Negative number	100	X	R	
1065	Accession number	100	X		

A - Insert (after) | B - Insert (before) | C - Change line | D - Delete l
P - Previous page | N - Next page | T - Top | E - Bottom
X - Exit | J - Next line

921	Supplier authority code	4	X		
922	Supplier name and address	200	X		abcde
997	Authority record notes	200	X		
998	Authority record date	10	P		9999-99-99
441	Duration	50	X		
442	Date:proposal/approval	25	X		ab
443	Date:starting	10	X		
444	Date:expect. compl.	10	X	R	
445	Date:actual compl.	10	X		
446	Date:terminated	10	X		
447	Date of birth	100	X		
830	Nationality	100	X	R	
831	Qualifications	100	X	R	abcd
832	Specialization	100	X	R	
833	Work experience (last)	200	X		abcde
834	Current work	200	X		abcde
835	Marital status	10	X	R	
836	Sex	6	X		
850	Recommended by	100	X	R	abcd
855	Honours and awards	200	X	R	abc
856	Membership in societies	200	X	R	abcd
525	Language competence	100	X	R	abc
556	Assignments	200	X	R	abcd
895	Databases	300	X	R	ndrfa
896	Classification system used	100	X	R	
897	Subject headings list	100	X	R	
898	Thesaurus	100	X	R	
899	Periodical publicat.	300	X	R	ij
890	Patents taken	200	X	R	abcdefgh
900	Services offered	200	X	R	
570	Personnel	100	X	R	ab
625	Objectives	500	X	R	
700	Financial aspects	200	X	R	sacp
950	Project status	50	X		
952	Training courses	200	X	R	
954	Project number	50	X	R	a
955	Contract number	50	X	R	
957	Resources(equipment...)	200	X	R	
960	Type of institution	100	X	R	
961	Type of research	100	X	R	
965	Research priority	100	X		
966	Commitee's decision	100	X		
999	Record type	1	P		A
1000	Name of object	100	X		
1001	Local name (Eng.)	100	X	R	
1010	Function	300	X	R	
1015	Source/Donor (Person)	100	X	R	sfh
1016	Source/Donor (Organization)	300	X	R	

B2. **Worksheets**

Different worksheets are used for the purpose of data entry for different records. The purpose of the different worksheets is given below:

Worksheet name	Contains fields for describing
ABNCD	Monographs and collections
PARTM	Part of monograph
PARTS	Part of a serial e.g. paper in a journal
SERIAL	Whole serial
ABNEX	Expert
ABNIN	Institution
ABNRP	Project
ABNIS	Information System
ABCOR	Corporate body authority/code

B3 Specification for Indexing Parameters

A single Field Select Table (FST) specifies the indexing parameters (i.e the field identifier, indexing technique and the data extraction format) for the different record types.

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

INSTITUTION: Ministry of Science, Technology and Higher Education, Dar-es-Salaam Technical College, Tanzania

START DATE: 1957

LOCATION: Tanzania

ADDRESS: Dar-es-Salaam Technical College
P.O.Box 2958
Dar-es-Salaam

WORKING LANGUAGES: English, Kiswahili

PERSONNEL (Teaching staff):

Diploma	109
B.Sc. or equivalent	80
Masters or equivalent	34
Ph.D.	1

GEOGRAPHICAL COVERAGE: Tanzania

INSTITUTION TYPE: Governmental, Higher Learning Institution

OBJECTIVES: To meet Tanzania's needs for technicians, technologists, and engineers in order to facilitate the country's industrial programme.

DESCRIPTORS: TECHNICAL EDUCATION

SERVICE: Professional training

FINANCE Ministry of Science, Technology and Higher Education

SAMPLE RECORDS FROM THE EDUC DATABASE

BIBLIOGRAPHIC RECORD

Higher and Technical Education Statistics in Tanzania 1988/89 - 1992/93 / United Republic of Tanzania. Ministry of Science, Technology and Higher Education, Dar-es-Salaam: TANZANIA, July 1993.
31 pages : Pamphlet. (Basic Education Statistics)

Gives data for enrolment, output, and staffing situation and requirements.

Availability: Available from the Ministry of Science, Technology and Higher Education, Dar-es-Salaam, Tanzania.

DESCRIPTORS: EDUCATION STATISTICS; HIGHER EDUCATION STATISTICS; EDUCATION

ABSTRACT: The pamphlet provides data from 1988/89 - 1992/93 for the following:

1. Enrolment data with gender specification for Arusha, Mbeya and Dar-es-Salaam technical colleges as well as the outputs for the same colleges.
2. Teaching staff information for the same colleges.
3. Enrolment for the universities as well as staffing information.
4. Fees and financial requirement for undergraduate courses.

Record no. 4

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

NAME	KIWIA, S.F.N
SEX	M
NATIONALITY	Tanzanian
QUALIFICATIONS:	Management of Education and School Administration. PhD. Bristol University, UK. 1992. Educational Administration. M.A(Educ.). University of Dar-es-Salaam, Tanzania. 1984. Education and Political Science. B.A (Educ.). University of Dar-es-salaam, Tanzania. 1982.
SPECIALIZATION:	Education Management and Administration.
WORKING LANGUAGES:	English. Kiswahili.

Employment Record

CURRENT EMPLOYMENT:	Lecturer, University of Dar-es-Salaam. Full time.
LAST EMPLOYER:	Ministry of Education, Teaching, Secondary School, July 1978 - July 1979, Teacher. Primary Education, Primary School, 1975 - July 1977, Teacher.
ASSIGNMENTS:	Tanzania, Tanzania Food and Nutrition Centre, April-July 1990: Assessment of training needs for nutrition personnel in Tanzania. Tanzania, TEC, February-June 1993, Basic Management Training Programme for Middle Level Managers