ESTABLISHMENT OF RAW MATERIALS RESEARCH AND DEVELOPMENT INFORMATION SYSTEM FOR AFRICA

INT/89/K09

A FEASIBILITY REPORT PREPARED FOR THE OFFICE OF THE CHAIRMAN OF GROUP OF 77, NEW YORK

By

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DECEMBER 1995

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LIST OF ABBREVIATIONS

1.	ACRM	Action Committee on Raw Materials
2.	ARCT	African Regional Centre for Technology
3.	ARCTIS	African Regional Centre for Technology Information System.
4.	ASCII	American Standard Code for Information Interchange
5.	BCEAA	Banque Centrale de l' Afrique de l' Quest
6.	C.A.R	Central African Republic
7.	CRAT	Central Regional Africain pour Technologie.
8.	CSIR	Council for Scientific and Industrial Research
9.	DBMS	Data Base Management System.
10.	ECDC	Economic Co-operation for Developing Countries
11.	E-Mail	Electronic Mail
12.	ENSTINET	Egyptian National Scientific and Technological Information Network
13.	FAO	Food and Agricultural Organization of the United Nations
14.	G.77	Group of 77 Countries
15.	HND	Higher National Diploma
16.	HQ	Headquarters
17.	IDSC	Information Decision Support Centre
18.	IFCC	Inter-Governmental Follow-up Coordination Committee
19.	ISN	Institut Senegalais de Normalisation
20:	ISRA	Institut Senegalais de Recherches Agricoles
21.	ITA	Institut de Technologie Alimentaire
22.	ITC	International Trade Centre
23.	KBS	Kenya Bureau of Statistics
24.	KETA	Kenya External Trade Agency
25.	KIRDI	Kenya Industrial Research and Development Institute
26.	LAN	Local Area Network
27.	LNG	Liquefied Natural Gas
28.	LPM	Lines Per Minute
29.	MAN	Manufacturers Association of Nigeria
30.	M A N	Municipal Area Network
31.	MF	Main frame
32.	NCR	National Cash Register
33.	NFR	National Focal Points
34.	NNPC	Nigerian National Petroleum Corporation
35.	OCR	Optical character Recognition
36.	ORSTOM	Institut Française de Recherche Scientific Pour le Developement en Cooperation
37.	OSI	Open System Inter connect
38.	PC	Personal Computer
39.	PIED	Profiles of Industrial Enterprises Databases.
40.	PO	Programme Officer
41.	PSTN	Public Switched Telephone Network
42.	PTA	Preferential Trade Area
43.	R & D	Research and Development
44.	RCC	Regina Co-ordinating Centre
45.	RMIS	Raw Materials Information System
46.	RMRDC	Raw Materials Research and Development Council
47.	SAS	Statistical Analysis Software
48.	SITTDEC	South Investment, Trade and Technology Data Exchange Centre.
49.	SONEPI	Societe Nationale d'Etude et de Promotion Industries.
50.	SPSS	Statistical Package for Social Science
51.	SC	Sub-regional Centre
52.	UNCTAD	United Nations Conference on Trade and Development.
53.	UNDP	United Nations Development Programme
54.	UNIDO	United Nations Industrial Development Organization
55.	WAN	Wide Area Network
56.	WHO	World Health Organization

ACKNOWLEDGEMENT

The Raw Materials Research and Development Council wishes to express appreciation to the office of the Chairman of the Group of 77, New York, for entrusting this project to the Council. This undoubtedly was an indication of the confidence reposed in the Council's ability to successfully undertake the assignment.

We are also grateful to the Inter-governmental Follow-up Coordination Committee (IFCC) for recognizing the appropriateness of the study and thereafter approving the proposal for execution.

The office of the Nigeria Permanent Representative to the United Nations believed in this project from the onset. We are grateful for the additional support which the office rendered to the project.

The United Nations Development Programme (UNDP), Lagos, offered enormous assistance by organizing the visits undertaken by the team of consultant. UNDP, Lagos, went a step further by contacting their field offices as well as those of the United Nations Industrial Development Organization (UNIDO) in the countries visited.

We cannot fail to acknowledge the contributions of over three hundred officials of both governmental, privately-owned and international organizations in the various African countries. They cooperated, and freely held useful discussions with us. Their forthrightness made the first and second missions worthwhile.

Finally, we wish to recognize the team of consultants as well as the staff of ACRM Secretariat for the diligence with which the work was undertaken.

Thank you.

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EXECUTIVE SUMMARY

The feasibility study for establishing a Raw Materials Information System (RMIS) project INT/89/K09 was undertaken to explore the possibility of identifying a viable centre(s) within the Africa region that could generate and disseminate information on raw materials. The project was financed by the Perrez Guerre Trust Fund to the tune of US $100,000. The office of the Chairman of the Group of 77 which is the executing agency, subcontracted it to the Raw Materials Research and Development Council (RMRDC), Lagos (now in Abuja), Nigeria.

To achieve the above objectives, nine locally sourced consultants were commissioned. Ten countries were visited and discussions were held with over three hundred officials in about a hundred and sixty eight institutions in those countries. Two missions namely, the preliminary fact finding mission and the final assessment mission, were undertaken. The preliminary fact finding mission was aimed at identifying four countries capable of hosting the RMIS. This first mission was to ten countries representing four, African subregions, taking cognisance of the registered members of the Action Committee on Raw Materials (ACRM). As a result of the critical assessment of the data of the first mission, four countries representing the four African sub-regions of North, West, Francophone and East Africa were selected namely Egypt, Nigeria, Senegal and Kenya. The final assessment mission was able to identify the most suitable institution within each country in terms of existing information and communication facilities, manpower capability, information management and dissemination, among other criteria.

Generally, the study observed that the absence of proper information technology, that is, existing modalities for data collection, analysis and dissemination of available information on raw materials, and even lack of focal points charged with data collection on all raw materials, have adversely affected promotion of investments in local resource-based industries. It was for this reason that the study proposed to the office of the Chairman the immediate establishment of a Raw Materials Information System (RMIS) for the Africa Region. This System would be for the benefit of other G.77 countries and especially the countries of the Africa region as indicated below:

Cairo - for North Africa and Arabic speaking states of Algeria, Chad, Egypt, Libya, Morocco, Sudan and Tunisia.

Nairobi - for East and Southern African States such as Angola, Botswana, Comoros, Djibouti, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Madagascar, Swaziland, Somalia, Tanzania, Uganda, Zambia and Zimbabwe.

Dakar - for French speaking countries such as Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central Africa Republic, Congo, Cote d'Ivoire, Equitoria Guinea, Gabon, Guinea-Conakry, Guinea-Bissau, Mali, Mauritania, Mauritius, Niger, Rwanda, Sao Tome and Principe, Seychelles, Togo and Zaire.

Abuja - for West African countries such as Gambia, Ghana, Liberia, Nigeria and Sierra Leone.

The study shows that establishment of RMIS as proposed is highly feasible. It is our submission that the Office of the Chairman of the G.77 takes the under-listed recommendation into consideration for the project objectives to be realized both within the Africa region and among the Countries of G.77.

It is proposed that Africa be divided in the meantime into four subregions with each having an information centre in the following locations:

- Information Decision Support Centre, (IDSC), Cairo, Egypt
- Raw Materials Research and Development Council, (RMRDC), Abuja, Nigeria
- Societe Nationale d' Etude et de Promotion Industrelle, (SONEPI), Dakar, Senegal.
- Kenya Industrial Research & Development Institute, KIRDI), Nairobi, Kenya.

These Centres have been found to have the largest concentration of data processing facilities in their respective sub-regions. It is also observed that a Centre could be established in Central Africa and in the nearest future, a centre should be established in South Africa to effectively reach out to all members of the Group of 77. The case of South Africa has now become imperative with the stable governance in that country at the moment.

The report discussed the Structure of the proposed RMIS Centres, and the organization and management of the information network. A three tier structure is recommended to serve the needs of the regions. These are:

- Regional Coordinating Centre (RCC)
- Sub-regional Centre (SC), and
- National Focal Points (NFP)

It is expected that these would maintain inter-dependent relationships and function to provide relevant information to countries, institutions and individuals in their respective areas of coverage. Nigeria being the Secretariat of the ACRM should serve as the coordinating centre for the RMIS.

The roles of each Centre are carefully spelt-out including the staffing. A full staff strength of various ranks recommended is 24, 48, and 6 for RCC, SRC and NFP, respectively. However, considering the cost involved a minimum number of staff of 9, 18, and 5 for RCC, SRC and NFP, respectively is also indicated. The report also gave detailed financial analysis of the budget, salaries, revenue generation among others for a period of three years. This will enable the establishment of a well equipped and functional RMIS Centres with various options and modalities for take-off summarized as: The sum of US $734,591 would be required for establishing one RCC and a sub-regional centre; US $2,430,289 for 3 - sub-regional centres and 20 NFPs and US $1,749,628 for 20 NFPs over years 1, 2 and 3 respectively. This brings the estimated financial requirement to US $4,914,504 to cover costs and other expenses for the RMIS Centres.

It is recommended that an implementation Committee be established consisting of four members, including one of the Consultants in the feasibility team. It would be essential early in the implementation process to develop standards and procedures for data capture, information development and computer operations. Following the recommendations stated above the participating countries should be actively encouraged to designate specific national focal points for raw materials data collection and dissemination of information.

When established, the RMIS would strengthen the Action Committee on Raw Materials (ACRM) in gathering and disseminating various raw materials related information among the G.77 Countries. The realization of the plan however, depends on the willingness of the Governments of the G.77 countries and the Office of the chairman of the Group of 77 to provide the commitment and the political backing necessary for its success and sustainability.

The office of the Chairman of G.77 had also indicated her desirability for the RMIS project to be harmonized with those of the Pacific/Asiatic regions. This was on the occasion of the visit of a senior staff of the ACRM Secretariat to present the Draft copy of this report for approval. The idea is quite desirable, but regrettably, authentic information could not be accessed by us to reflect such harmonization. However, whenever such documents are available, it would be necessary that harmonization of both systems be considered.

CHAPTER ONE

INTRODUCTION

Many developing countries, the bulk of which form the G.77 countries are richly endowed with conducive climatic conditions for agricultural development and high productivity. The countries are also rich in mineral resources. However inspite of their enormous resource endowment, majority of the G.77 Countries continue to be net importers of industrial raw materials. The bulk of the G.77 countries are ardent exporters of primary raw materials without any value - added. These raw materials are afterwards exported by the developed countries to the G.77 countries at exhorbitant prices after value-addition.

The constant downward trend in commodity prices dictated by industrialized countries coupled with the inability of the developing countries to establish resource-based industries have largely been responsible for the perennial depressed economy prevailing in these countries. Very many reliable socio-economic studies have revealed that inspite of their common problems there is very little exchange of goods and services in the areas of raw materials and raw materials research and development. This situation is largely due to their inability to significantly address the problems of development of required industrial inputs through coordinated institutional framework for information gathering and dissemination that will enhance regional collaboration for industrial development.

In order to redress the above mentioned anomalies, the sixth meeting of the Inter-governmental Follow-up Coordination Committee (IFCC-VI) of G.77 held in Havana, Cuba from 7th - 12th September, 1987 established the Action Committee on Raw Materials (ACRM). The first meeting of ACRM was held in Abuja, Nigeria from 3rd - 7th April, 1989. The Constitution for the future operations of the ACRM was adopted in August 1989 at Kuala Lumpur, Malaysia during the IFCC-VII meeting. The Constitution was signed by Nigeria, Ghana, Togo and Liberia in the office of the Chairman of G.77 on 21st November. 1989 to signify registration with the hope that other countries would register later.

The objectives of the ACRM were identified as:

a. formulation of appropriate programme of actions and strategies that would enable developing countries to accelerate the processing of their agricultural raw materials, textile, fibre raw materials, non-metallic minerals, ferrous and non-ferrous metals into usable and tradable products with value-added;

b. achievement of the twenty-five percent share in World Industrial Output by the year 2000 A.D. as stated in the Lima Declaration and Plan of Action; and

c. enhancement of South-South Cooperation in the areas of commodities, marketing and distribution of raw materials in their primary and processed forms in order to improve their terms of trade and ensure increased foreign exchange earnings from exports.

The ACRM is expected to perform the following functions:

i. development of guidelines for National Focal Point for the collaboration of ACRM objectives;

ii. defining the characteristics and format for inventory of requirement and capabilities in the field of raw materials;

iii. assisting member states in strengthening their national capabilities for collection, storage and utilization of data on raw materials for purposes of planning, investment promotion and the attainment of self reliance in the sector;

iv. promoting collaboration between institutions engaged in research and development, marketing, technological information and dissemination, manpower training and exchange;

v. facilitating the establishment of Raw Materials Agencies in each member country to help focus attention on the available raw materials within the individual countries for development;

vi. organizing workshops designed to enlighten member countries on new developments in the field of raw materials development, exploitation and processing;

vii. coordinating the execution of specific programmes and projects of cooperation agreed upon by the participating member countries and which form part of the Caracas Programme of Action of ECDC; and

viii. constantly seeking financial resources for the pursuance of ACRM objectives.

The office of the Chairman of the G.77 which is the executing agency of the regional Raw Materials Information System project, subcontracted the project to the Raw Materials Research and Development Council, Abuja, Nigeria. The project is being financed under the Perez-Guerero Trust Fund to the tune of $100,000 through the UNDP field office in Lagos, Nigeria. The actual study was conducted by an investigative team of nine National Consultants constituted by the Raw Materials Research and Development Council, Abuja, Nigeria.

The feasibility study project which commenced on 27th June, 1992, was completed in twelve months.

The immediate task of the Action Committee on Raw Materials was the preparation of a feasibility study report for the establishment of a regional raw materials information network for the African regional Raw Materials Information System (RMIS). RMIS is an information network for the Africa Region, and a project conceived and executed by the office of the Chairman of Group G.77 in information collection, storage and utilization for use by member states of the committee.

The establishment of the RMIS is also vital since African nations for which the system was meant are themselves richly endowed with agricultural and mineral resources. However, they are known to export these commodities in their primary forms without any value-added and at prices dictated by industrialized countries. Given the penial depressed economy prevailing in these African countries, as well as other developing countries of G.77, the RMIS would among other things assist these countries in strengthening their national capacities for collection, storage and utilization of data on raw materials for purposes of planning, investment promotion and attainment of self reliance.

The concept of the RMIS is indeed a welcome development, especially at this time in the economic arena of Africa where the market prospects for most of the traditional commodities exported by Africa are most unfavourable. It is therefore necessary to develop a more diversified structure to facilitate the tapping of new, more rapidly growing product markets and to increase exports of value-added products. For countries in Africa the main market outlets are the developed countries. These countries make demands for some tropical commodities such as coffee, cocoa and tea; and protectionism in a number of others such as sugar, temperate zone fruits, vegetables and oil seeds. Reluctantly, many of these markets are and will remain depressed unless there is significant progress on trade liberalization. For this reason, the United Nations General Assembly in 1993 made a request to the Secretary-General in the United Nations New Agenda for the Development of Africa for a "study on the need for and feasibility of the establishment of a diversification fund for Africa's commodities". This document Ref: A/48/335/ of 2nd October, 1993 was considered during the forty-eighth session of the United Nations General Assembly.

The feasibility study proposed was to consider the possibility of creating fund for diversification of Africa's commodity sector. A facility would be established or provision made in an existing financal institution, preferably in an existing regional fund or bank such as the African Development Bank (ADB). This is because, ADB has an administrative capacity to reach all the African Countries and also enjoys close links with the World Bank, UNDP, the specialized agencies of the United Nations System, and bilateral donors. ADB also works with both the public and the private sectors.

The feasibility for the establishing a Diversification Fund had made a case for diversification of Africa's production structure and exports. Firstly, the region relies solely on very few commodities for a large share of its exports earning thus, exposing the countries to increased risks of fluctuations in export earnings. Secondly, the exports of the commodities have been at a standstill and will likely face poorer prospects in future. Thirdly, diversification is an appropriate strategy for transforming the regional economies since it promotes agro-industries and processing of raw materials. This will resultantly lead to the development of the tertiary sectors needed for expanded trade, for instance, transport, communications, finance and banking.

TERMS OF REFERENCE

The project's terms of reference are as follows:-

1. The project will gather information on existing facilities in the African Countries that could house information/databanks, as well as generate adequate information on raw materials for the basic problems being addressed at sectoral and project levels, as well as current and future programmes of action plan of the sector.

2. On the basis of information collected, the project will determine country needs and requirements (facilities/infrastructures) for the purpose of setting up the information system, programme priorities for purposes of data storage, etc.

3. The project will also determine possibilities for harmonizing the system with other systems of some United Nations' agencies, e.g. UNDP, UNIDO, FAO, UNCTAD, etc., in order to ensure wider possibilities for information gathering and dissemination.

OBJECTIVES OF THE PROJECT

The project shall determine the feasibility of the information system so as to achieve the following objectives:

i. assist member states in strengthening their national capacities for collection, storage and utilization of data on raw materials with the aim of planning, investment promotion and the attainment of self-reliance in the sector;

ii. promote exchange for raw materials information among member states;

iii. establish a system which will improve access to both statistical and other numerical data;

iv. promote the improvement of information-infrastructure in member states;

v. train information specialists at regional and sub-regional levels in order to upgrade skills and introduce modern methods of raw materials information handling;

vi. promote use of common methodologies of data handling among member states and ensure compatibility with other international information systems, and

vii. enhance information flow to other member countries of the G.77 and thereby promote effort towards strengthening South-South cooperation.

METHODOLOGY

SELECTION OF COUNTRIES

In order to achieve the objectives of the project, twelve countries representing the East, West, North, South and Central Africa sub-regions were selected for visitation during the preliminary fact-finding mission, taking cognisance of the ACRM registered members. These countries were Egypt, Central African Republic (C.A.R), Guinea, Kenya, Zambia, Senegal, Uganda, Zimbabwe, as well as Nigeria, Togo, Ghana and Liberia who are registered members. Liberia could not be visited because of the on-going strife. It was not possible either to visit the C.A.R because the mission was not able to obtain necessary clearance. In all, ten countries were visited.

FIELD TRIP

Twenty-five sets of questionnaires were distributed in advance of the field trip to industries, research institutions, strategic ministries, and relevant parastatals in each country with the assistance of the diplomatic missions in Nigeria and UNDP offices.

The questionnaires were designed to generate information on policies on raw materials, availability and utilization, research and development, capacity utilization, and process technologies as well as the information and communication facilities and manpower utilization (Sample copies of the questionnaires are attached as Annex I).

During the field trip, the information facilities were inspected and the questionnaires were fully discussed and retrieved from the respondents.

ANALYSIS OF FINDINGS

An analysis of available computer facilities/capabilities, institutional framework, raw materials endowments, information gathering and distribution capability, geographical location and political stability was undertaken.

FINAL ASSESSMENT MISSION

On the basis of this analysis and scoring, four countries, namely Egypt, Nigeria, Senegal and Kenya were chosen as the most qualified to host the Information System Centres and thus qualified for assessment during second mission. A second assessment mission was undertaken to these countries in order to identify the institution with the best facilities to house the proposed Raw Materials Research and Development Information System. Four to six institutions were visited in each country.

A structured, technical questionnaire as in Annex II on information, communication facilities and manpower was used to guide the discussion held with the institutions visited. Furthermore, substantial time was also spent on discussing the subject matter with the staff of the institutions. In addition, some demonstration exercises were carried out in some of the institutions visited. These institutions were assessed and scored on the basis of computer hardware and communication facilities, software and availability of a specialized library, organizational set up, manpower, amenability to upgrading and expansion and general relevance of institution's mandate to raw materials information management.

Although, the project originally set out to identify one country in Africa with the capability to host the Information Systems Centre, the social, cultural and geo-political realities of the Africa region have dictated a recommendation necessitating the setting up of four sub-regional centres as well as a coordinating centre.

CHAPTER TWO

STATUS REPORT ON COUNTRIES VISITED

EGYPT

PREAMBLE

Egypt is located between latitudes 22° and 32° N, and 28° and 37 °E. It is bounded in the north by the Mediterranean Sea, to the east by the Red Sea, to the south by Sudan and to the West by Libya. The country is divided vertically into two by the River Nile. On its banks, are the eastern and western deserts which combine to cover about two-thirds of the landmass of Egypt.

The population of Egypt is about 60 million out of which about 16 million people reside in its capital, Cairo. Other major cities with high population include Alexandria, Port Said and Damietta. The official language is Arabic. Although English is widely spoken. Most of the industries are also located in these high population centres. The currency unit is the Egyptian Pound. Exchange rate as at the time of the mission was 3.31 Egyptian Pounds to 1 US Dollar.

Mining and agriculture contribute substantially to the economy, with the River Nile playing a vital role in agricultural activities. All these are supported by a specialized and good quality labour force.

Communication System

The telephones, telex and FAX lines are efficient. Modern satellites, radar connections and digital telecommunication networks at both national and international levels facilitate communication in Egypt. There are effective radio links and postal services. The road, air and water transport facilities also enhance communication. Electricity supply is regular.

RESOURCE ENDOWMENT AND LEVEL OF DEVELOPMENT

Egypt is blessed with a wide-range of raw materials, including cotton, cotton-fibre, sugar-cane and sugar beet, sunflower, cereals, iron ore, phosphate, manganese, coal, kaolin, bauxite, limestone, gypsum, clay, petroleum and gas, potash, gold, sulphur, and saline water.

Most of these raw materials are processed before export with the exception of rock phosphate. The major uses of the raw materials are as indicated in Annex III.

Problems of Development and Utilization of Local Raw Materials

In the mining sector, the major constraints to raw materials development is the lack of requisite equipment; while in the agricultural sector, the major problem is low crop yield due to plant diseases.

Efforts are being geared towards modernising the equipment in the mining sector especially in the fields of exploration and exploitation. In agriculture, there are programmes to arrest the problem of low yield and attack by diseases through the breeding of resistant cultivars.

Breakthroughs in Research and Development (R & D)

There have been a number of breakthroughs in agricultural crop R & D. Some of these are in the area of increased and improved production of maize, wheat, rice, sugar-cane, banana and citrus. For livestock development, achievements have been made in the control of cattle plague, and anaerobic diseases, parasitic diseases in sheep and goats through the development of effective vaccines. Some advances have also been recorded in the area of animal nutrition.

R & D breakthroughs in industry, include reduction of the level of noise, locally produced air conditioning units; production of high resistance steel (and its use in re-inforced concrete), ferro-titanium alloy on a semi industrial scale, brick-lining for smelting crucibles suitable for oxygenated steel; manufacture of scattered dyes, and development of sizing agents in textiles.

In the petroleum industry breakthroughs include the production of additives for multi-grade lubricants; while the development of asphalt and its use in road building has enhanced the life span of roads.

In the field of energy, breakthroughs have been recorded in the areas of rationalisation of energy consumption in glass, petroleum and building industries.

Remarkable breakthroughs have also been made in the medical services such as the development of plasma substitutes, medicinal, aromatic and natural products which are useful local raw materials in the pharmaceutical industry.

Areas in which regional cooperation is needed.

Exchange of information with other countries on availability of raw materials, processing technologies, as well as breakthroughs in research efforts will enhance mutual cooperation and development. This will open up opportunities for collaboration in raw materials development and research efforts. Also, cooperation is needed in the area of exchange of information on availability of expertise and training facilities.

INDUSTRIAL SECTORS

- Egypt has eight industrial sectors classified as stated below:
- Food, Agriculture, and Irrigation
- Fisheries and Animal Resources
- Petroleum and Mineral Resources
- Electricity and Energy
- Transport and Communication
- Construction, Housing and New Settlements
- Chemical and Pharmaceutical
- Automobiles and Engineering

Strategic Resource-Based Industries that should be established

Although much has been achieved in the development of resource-based industries in Egypt, the automobile, petro-chemicals and gas, energy, electrical and electronic industries require further development. There is also the need to develop the flat aluminium product industry. The strategic industries are as follows:

- Iron and Steel
- Pharmaceuticals and Chemical
- Automobiles and Engineering
- Petro-chemicals
- Textiles
- Mining and refractory

INSTITUTIONS RELEVANT TO RAW MATERIALS DEVELOPMENT

The Institutions relevant to Raw Materials Development in Egypt are as follows:

- National Research Centre, Cairo
- Institute of Oceanography and Fisheries, Cairo
- Egyptian Petroleum Research Institute, Cairo
- Theodore Bilharz Research Institute, Cairo
- Institute of Astronomy and Geophysics, Cairo
- National Institute of Standards, Cairo
- Central Metallurgical Research and Development Institute, Cairo.

- Remote Sensing Centre, Cairo
- The Egyptian Geological Survey and Mining Authority, Cairo
- Academy of Scientific Research and Technology, Cairo
- Universities Research Centres and Institutes
- The Solid State Physics Research Institute, Cairo
- The Institute of Clinical Chemistry, Cairo.

Specialized Libraries

There are specialized libraries in the following organizations:

- Egyptian Geological Survey and Mining Authorities
- Cabinet Information and Decision Support Centre
- National Information and Documentation Centre
- Central Metallurgical Research and Development Institute
- Ministry of Trade, Cairo
- Ministry of Industry, Cairo
- Remote Sensing Centre, Cairo
- National Research Centre, Cairo
- Egyptian Petroleum Research Institute, Cairo
- National Institute of Standards, Cairo
- Academy of Scientific Research and Technology, Cairo.

INFORMATION OUTFITS VISITED IN EGYPT DURING THE PRELIMINARY FACT FINDING MISSION

Table I

S/N	Information Outfit	Information facilities	Compatibility	Types of Information Stored	Communica-tion System	Media of Information Dissemination	Beneficiaries	Manpower & Training	Additional Requirements
1.	The Cabinet Information and Decision Support Centre (IDSC)	Mainframes, Mini and Micro Computers servicing over 120 terminal. Others include magnetic tapes, floppy disks, Hard disk printers and lasers	WAN operations to trade represent-atives, worldwide. The Centre also has about 30 Inter-connected nodes &subscribers to International data bases such as EARN, TDN, PDN and COMPASS. Other organizations are UNDP/UNIDO and UNCTAD.	-Legal, social, economic, political, technical, International trade, investment opportunities in Egypt export & Imports of raw materials and semi finished goods	- Fax - Voice Fax	Publication of journals	The cabinet of Egypt public and private sectors in Egypt International Organizations	Staff are from all areas of specialization and include 38 Ph.D holders, 70 post graduates and 100 with 1st degrees as well as other supporting staff. These staff are trained on the job and also sent abroad for specialized programmes.	
2.	Egypt National Scientific and Technological Information Network (ENSTINET)	About 50 PCs, printers, Mini computers	ENSTINET has regional nodes in strategic towns, cities and relevant ministries with Cairo as the focal point.	Bibliography on Science and Technology, professional associations in Egypt, Resource persons in the area of scientific and technological research.	Inter-Net and TeleNet	Publication of journals, leaflets and periodicals; Magnetic tapes & disks. Micro films SDI	Managers of companies, government organizations researchers, other professionals, students and the general public.	Electrical Engineers Computer Programmers, analysts, technologists and scientists are employed and training programmes are conducted in-house on computers and information resources	Hardwares and soft wares.

3	Ministry of Industry (Information Division)	- Mini 2 - Main frame computers laser printers (including colour graphic)	Both local and international data bases are subscribed to including NOVELL network system	- Serves as data bank for industries; experts, employment records, sales and purchases of companies, prices and quality of materials capital flow in private companies	Both local Area Network and wide area Network are used. Electronic Mailing system is also available.	Pamphlets, brochures	Public and private sector organization, Industries and Industrialists	Highly specialized and skillful manpower consisting of 5 computer experts, economists statisticians and accountants. Training is provided abroad in specialized areas such as computer graphics.	Soft wares and Hard wares.
4	Ministry of Economy & Planning (Information Department)	Two PC's and printers		Economic activities within and outside Egypt			relevant public and private sector organizations within and outside Egypt	Mainly Trade representatives and with background knowledge in economics, management, business and policy analysis.	
5	Egyptian Geological Survey & Mining Authority (Information and Documentation Centre)	PC's, Main frames, Multi user systems, geological museum		Geology of Egypt Mineral resources of Egypt		Publication of periodicals	Public and private sector organizations.	2,600 work force made up of 24 Ph.D, 44 M.Sc, and 451 B.Sc degree holders as well as supporting staff which are mainly technicians. Computer scientists, programmers and analysts take care of training of staff	Soft wares and Hard wares.
6	National Information and Documentation Centre (NIDOC)			Scientific and technical information			International organizations,companies		

GHANA

PREAMBLE

Ghana is located on the West African Coast. It is bounded by Burkina Faso on the north, Cote d'Ivoire on the west, Togo on the east and the Atlantic Ocean on the South. It has a total land area of 238,537 square kilometres, with a population of about 15 million. The capital is Accra and the official language is English. The currency unit is the Cedi. Exchange rate at the time of visit was 400 Cedi to 1 US $.

Communication Systems

The telephones, telex, FAX and postal services in Ghana function satisfactorily. The available networks of railways, roads, airports and seaport further facilitate communication.

Resource Endowments and Level of their development

Raw materials available in Ghana include agricultural products such as wood and a wide-range of food and industrial tree crops, livestock, fisheries and minerals such as good, diamond, bauxite, manganese, uranium, marble, feldspar, silica sand, limestone and clays.

The wood industry is generally highly developed; it is export-oriented. The products offered for export include lumber, veneer and plywood. The fish industry is sizeable but only about 5% of the catch is processed locally. Ghana has three major bauxite deposits most of which are exported without value-added. The other raw materials like manganese, marble, feldspar, silica sand and limestone are not fully exploited.

Problems of Development and Utilization of Local Raw Materials

Some of the factors militating against raw materials development include inadequate foreign exchange, exploration and exploitation problems. There are also problems of preservation and storage of agricultural produce.

The government is planning to set up gold refining facility for processing gold bullion as well as broadening the marketing operations. In the agricultural sector, fruit juice processing, fish smoking, freezing and cold storage facilities are being established as a way of resolving the problems of preservation and storage. There are plans for the development of raw materials for refractories and glazes, among others.

R & D Breakthroughs

Ghana has perfected the art of smoke-drying her fish catches. The country has also been able to utilize local cereals in the formulation of weaning foods.

Requirements fir areas regional cooperation

In order to enhance the development of identified raw materials and related industries, there is need for regional cooperation in the area of exchange of information and provision of investment capital. Joint ventures in minerals development such as bauxite, and manganese would be welcome.

Industrial Sectors

- Ghana has sixteen industrial sectors namely:
- Food/Beverage/Tobacco
- Garments
- Textiles
- Metals
- Electricals/Electronics
- Vehicle Assembly
- Wood Processing
- Pharmaceutical Chemicals
- Cosmetics
- Leather
- Plastics
- Non-Metallic Minerals
- Rubber
- Paper and Printing
- Miscellaneous

Strategic Industries

The major strategic industries are:

- Agro-based industries
- Mining and refractory
- Energy generation
- Petro-chemicals

Strategic Resource-based Industries that should be established

The fish processing industry ought to be further developed and more attention paid to exploration and exploitation of minerals in the mining sector. A bauxite smelting plant should be established. In the energy sector, there is a need to harness and develop the uranium resource as an alternative source of energy.

Institutions Relevant to Raw Materials Development

- Food Research Institute under the Council Scientific and Industrial Research (CSIR).
- Industrial Research Institute
- Minerals Commission

Specialized Libraries

- Padmore Research Library of African Affairs Energy information Centre Library (Ministry of Energy)
- Ghana Export Promotion Council Library
- Ghana Chamber of Commerce Library
- Food Research Institute Library
- Ghana Scientific & Technological Information Network (GHASTINET) and;
- Documentation Centre (GHASTINET)

INFORMATION OUTFITS VISITED IN GHANA DURING THE PRELIMINARY FACT FINDING MISSION

Table II

S/N	Information Outfit	Information facilities	Compatibility	Information Stored	Communica-tion System	Mode of Information Dissemination	Beneficiaries	Manpower & Training	Additional Requirements
1.	Ministry of Trade and Tourism, Accra.	10 No personal computers, Harvard graphic, Lotus 123, D-base IV, Text processing, Word perfects. floppy disks, Hard disk printers and lasers	The system is compatible with the Comtrade of United Nations, Eurostat of EEC and Organization of Economic Cooperation.	Payment on imports, receipts, proceeds from export, level and pattern of trade, price index.	It has an on-line data exchange and communication modems Fax.	Newsletters and News bulletins	Government Institutions, private companies research institutions	20 persons	Multiusers systems UNIX-Oracle (Tara systems) Teleprinter Modems
2.	Geological Survey Department, Accra.	IBM PC 2 No CDISIS		Minerals, their location, Minerals reserves etc.	Telephone	Annual reports and memos	Investors, Research institutions, educational institutions	35 Geo-Scientists.	PC, clipper software, D-base 3, Modems.
3.	Ghana Scientific and Technological Information Network (GHASTINET) Accra.	PS 11 30 CDS, ISIS, Lotus, Reflex	Common Communication Format, UNESCO, UNIDO, (INTIP) FAO (AGRIS)	Agriculture, forestry, water resources, energy, industry & Technology trade and commerce, Minerals, Mining and Metallurgy, Transport, Communication, health and environment, Building and road construction	Electronic mailing system. Green Net communica-tion.	Newsletters, Bulletins.	Government institutions, planners investors, Researchers.	Senior Researchers 10 No. Middle level Professionals 2 No. Data Entry clerks 5 No. Illiterate helpers 4 No. Security Staff 1 No.	UNIX-based computer.

4.	Ministry of Energy	40 No PCs Lotus 123, D-base IV SBS, Ventura CDS/ISIS	Compatible with Industry standard Architecture (ISA)	Energy consumption pattern, prices, production, research, experts crude oil prices	Local area network	Newsletters and computer printout.	Researchers, Universities, Planners, Investors	Researchers 3 No.	Modem, Electronic Mailing System.
5.	Chamber of Commerce	3 No IBM Module 80,240 MB harddisk software ISIS clipper, D-base IV, Lotus 123, Word perfect	West Africa Trade Information Network and ITC Geneva	Product information such as prices and availability for export, country information, statistics on import All companies dealing in any particular product both in Ghana and outside.		Manuals, document	Products and companies, finance, Bank, interest country information, travel requirements, investment/trade opportunities, imports & exports	Researchers 3 No. Computer analyst 1 No. Librarian 1 No.	486 Computers, Network facilities, Modems.
6.	Ghana Export Promotion Council	Hewlett Packard, PCs, software.		Market trends; import export, trade analysis	Local Area network	Journals, Manuals	Government, planners investors, Researchers industries	72 members of staff	
7.	Ghana Investment Centre	20 No NCR/IBM PCs.		Possible areas of investment. Foreigners interested in investing with Ghanaians.		Bulletins and Manuals.	Industrialists and potential investors.		Modems, Electronic Mailing System. Dedicated telephone lines.

GUINEA

PREAMBLE

Guinea is located on the West African coast with Conakry as its capital. It shares borders with Senegal, Sierra Leone, Liberia, Mali, Cote d'Ivoire and Guinea Bissau and with the Atlantic Ocean on the South. The country has a landmass of 245,873 km^2, population of six million. The official language is French and the currency unit is the Guinean franc. The exchange rate as at the time the mission was carried out was 928 GF to 1 US $.

Communication Systems

Infrastructure and communication systems in Guinea are not fully developed. Only the capital city Conakry is equipped with few telephone lines and electricity supply.

Resource Endowment and Level of Development

Guinea produces a number of agricultural crops such as peanut, millet, sorghum, cassava, yam, banana, plantain,cotton, coffee, rubber, palm oil, pawpaw, cashewnut, coconut, legumes, passion fruit and rice, among others. There are a number of minerals such as bauxite, iron ore, nickel, cobalt, limestone, industrial clay, phosphate, gold and diamond. Apart from bauxite, the principal mineral which is being partly processed into alumina, most of the other minerals are yet to be exploited.

Problems of Development and Utilization of local raw materials

Lack of skilled manpower and investment capital are the major problems militating against raw materials development. In the agricultural sector, more raw materials development. In the agricultural sector, more raw materials processing industries need to be established. Similarly agro-chemical, fertilizer and pesticide plants need to be established. The mineral sector is not well developed mainly because of inadequate exploration and exploitation of the identified minerals.

National Plans for the Resolution of the Problems

Guinea has a centre for pilot scheme known as Centre Pilote de Technologie Industrielle (Pilot Centre for Industrial Technology). The centre which is supported by UNIDO is charged with the promotion and adaptation of technology.

R & D Breakthroughs

Information not available at the time the mission was carried out.

Areas in which Regional Cooperation is Needed

The low level of infrastructural development in Guinea directly reflects on the state of raw materials development in the country. This situation calls for a purposeful and aggressive bilateral cooperation on a regional basis. Cooperation will be required in exploration and exploitation of minerals, manpower development, sourcing of investment capital, research and development, and general exchange of information.

Industrial Sectors

There are four major industrial sectors namely:

- Food and Agro Industrial
- Building Materials and Construction
- Mechanics and Metallic
- Miscellaneous - to include wood, chemicals and electricals.

Strategic Resource-Based Industries that should be established

Mineral exploration and exploitation outfits need to be established. It is also necessary to exploit the abundant water resource for hydro thermal energy.

Institutions Relevant to Raw Materials Development

- Bauxite Agency of Kindia
- Centre for Agricultural Development

Specialized Libraries

The only specialized library is the Centre for Agricultural Documentation in Conakry.

INFORMATION OUTFIT VISITED IN GUINEA DURING THE PRELIMINARY FACT FINDING MISSION

Table III

S/N	Information Outfits	Information Facilities	Compatibility	Information stored	Communication Systems	Media of Information Dissemination	Beneficiaries	Manpower and Training	Additional Requirement
1.	Systems Permanent De Statistique Agricole (SPSA)	Some IBM PCs Hardwares with printer, Softwares include D-base III, Lotus 123		Agricultural data, personnel management	A functioning local Area Network is maintained.	Booklets, Leaflets, Bulletin, Mailing System	Farmers, Investors, researchers, Policy makers and Commercial Enterprises	103 staff, both technical and non-technical staff	Hardware, softwares, communication facilities, Computer experts.

KENYA

PREAMBLE

Kenya with its capital city in Nairobi is located on the east cost of Africa, and bordered by Somalia on the north-eastern cost, Ethiopia and Sudan on the north, Uganda on the west, and Tanzania on the south. The official language is English and the population is about 23 million, seventy percent of which is employed in Agriculture. The currency unit is the Kenyan Shillings (KS) and the exchange rate as at the time of the mission was carried out was 30.7 KS to 1 US $.

Soda Ash Production contributes the lion share to GDP while agriculture accounts for about twenty-eight percent. Tourism is a major source of foreign exchange earning.

Communication Systems

Communication in Kenya is facilitated by means of reliable radio, television, telephone, FAX, telex and satellite systems. The road, rail, air and water, transport networks are also well-developed. Electricity supply is regular and steady.

Resources Endowment and Level of Development

The major agricultural raw materials in Kenya include Coffee, tea, cereal, sorghum, cashew, cotton, fish and hides and skins. Soda ash, salt and flourspar are the major minerals currently being exploited, while there are traces of a host of other minerals and gemstones.

Problems of Development and Utilization of Local Raw Materials

One of the major problems is the lack of data on availability of mineral raw materials. The associated problems are inadequate funds for exploration and exploitation of the minerals and also manpower development.

National Plans for the Resolution of the Problems

The Agro-based Industrial Raw Materials Development Authority scheduled for commissioning in January 1993 is expected to deal with problems related to raw materials development. Furthermore, the expansion of present capacities in the cement industry and the establishment of two new ones are part of the national plans.

R & D Breakthroughs

Major R & D breakthroughs have been achieved in the area of agricultural produce development, namely processing of sorghum, cashew shell liquid and processing of fish skin to leather. The major breakthrough in the chemical and pharmaceutical sector is in the production of vaccines by the Kenyan Veterinary Vaccines Production Institute for the following diseases:

- the foot and mouth disease
- rinderpest
- rabbies
- the rift valley fever and pox

Requirement for Regional Cooperation

Cooperation is required for the development of the chemical and pharmaceutical sector.

Strategic Resource-Based Industries that Should be Established

In the chemical and pharmaceutical sector, the strategic areas requiring industrial development are:

- Development of petro-chemical industry

- Development of the Cinchona plant industry to process Quinine and Quinidine. These are important active ingredients which can be used in the manufacture of Anti-malarial and Cardio-Vasculla drugs, respectively.

- Development of the Sisal industry to produce Hecogenin, a sapogenic agent used in the manufacture of Cortico-steroid drugs.

- Establishment and development of Cassava-based processing industries to produce starch and glucose. These are important alternatives to corn-based starch and glucose industry.

- Development of the cotton industry to produce bandages, gauze and other wound dressings.

In the textiles industry, the establishment of more cotton processing plants is required.

In the engineering and metal work sector, the requirements are:

- efficient collection of local scrap metals
- exploration and development of iron ore deposits

Industrial Sectors

There are five industrial sectors:

- Agro-industrial
- Chemicals and pharmaceuticals
- Energy
- Ceramic and building materials
- Engineering and metalworks

Strategic industries

The major strategic industries are in:

- Food
- Textile
- Leather

Institutions Relevant to Raw Materials Development

- Kenyan Industrial Research and Development Institute (KIRDI)

Specialized Libraries in Kenya are:

- Kenyan Industrial Research and Development Institute Library.
- Kenyan Association of Manufacturers Information Centre.
- Ministry of Industry Library
- Agricultural Information Centre
- Kenyan Agricultural Research Institute Library
- Mines and Geological Department Library
- African Centre for Technology
- Kenyan Bureau of Standardisation Library
- Kenyan National Chamber of Commerce and Industry Library.

INFORMATION OUTFITS VISITED IN KENYA DURING THE PRELIMINARY FACT FINDING MISSION

Table IV

S/N	Information Outfits	Information Facilities	Compatibility	Information stored	Communication Systems	Mode of Information dissemination	Beneficiaries	Manpower and Training	Additional Requirements (Facilities)
1.	Kenyan Industrial Research and Development Institute Nairobi	Hyundai PC 1 No. IC Pc 1 No. Clone PC 1 No. Toshiba PC 40 No.	UNIDO	Raw Materials Research activities, Industrial input and output, Research personnel, Research findings.	-	Tapes, diskette copying and listings	Researchers, Investors, PTA members	Analyst/Programmer 1 No. Data Entry Operators 3 No.	Communication and networking facilities, file server.
2.	Ministry of Commerce and Industry, Industrial Registration Division, Nairobi.	Hyundai PC 7 No.	-	Personnel, Companies, parastatals, Raw materials inputs and output, salaries, investment capital, profits, industrial problems.	-	Tapes, diskettes	Industrialists, Investors	Analyst 4 No. Trained Statisticians 3 No.	Communication and networking facilities. Hardware and softwares.

NIGERIA

PREAMBLE

Nigeria with its capital in Abuja is located between latitudes 4° and 15°N, and longitudes 5° and 16°E. The country is bounded on the north by Niger Republic, on the west by Benin Republic, on the east by the Republic of Cameroun, and on the south by the Atlantic Ocean. It has a total landmass of about 923,773 sq. km, and an approximate population of 88.5 million. English is the official language and its currency unit is the Naira. The exchange rate as at the time the mission was undertaken was ₦20 to 1 US $.

The main foreign exchange earner is petroleum while other contributors are the agricultural and mining sectors.

Communication Systems

The communication facilities namely: telephone, telex and Satellite, Fax, radio and postal services function fairly well. There is a good network of road, air and sea ports. The railway system runs north-south of the country.

Resources Endowment and Level of Development

The available raw materials include agro-based products such as sorghum, maize, sugar, wood, cassava, cotton, hides and skin rubber, cocoa and palm oil. Most of these are fully processed locally using about 60% local technology and 40% foreign technology. Other raw materials include the non-metallic minerals like kaolin, feldspar, barytes, limestone, gypsum, marble, bentonite, mica, dolomite, coking-coal, various types of clays and sands. There is also a wide-range of metallic minerals such as iron ore, tin, gold, gemstones, bauxite, uranium, copper, etc. Some of these metallic and non-metallic minerals are processed locally. Industrial capacity utilization is however generally low.

Problems of Development and Utilization of Local Raw Materials

The major problems include; absence of a virile local technology base, lack of capacity for exploitation due to financial constraints, inadequate technical expertise, inadequate R&D facilities, poor funding of research, inconsistent government policies, poor implementation of policies, low incentives for raw materials development, inadequate in-flow of investment capital, non-completion of strategic projects like the Petrochemical Phase II and Liquefied Natural Gas (LNG), Iron and Steel industry, Aluminium Smelter Plant etc. which are vital to raw materials development.

National Plans for the Resolution of the Problems

The plans include the completion of the Petro-chemicals phase II project, Liquified Natural Gas (LNG), the Ajaokuta Steel Plant particularly the flat sheet section, and the revitalisation of the Nigeria Machine Tools (NMT) Oshogbo, the aluminium Smelter Plant, beneficiation of Itakpe Iron Ore, among others.

R &D Breakthroughs

The breakthroughs include the development of animal vaccines, storage technologies, plant propagation techniques and tissue culture, development of sorghum as substitute for malt in the beverage industry ; local production of pharmaceutical grade starch and pharmaceutical grade kaolin. A lot of progress has been made in the area of spare parts and component fabrication.

Requirement for Regional Cooperation

In the agricultural sector there is need for cooperation in the areas of bio technology and process technology. Much of the vast deposits of minerals are yet to be exploited. Joint venture investments in mining and minerals processing are desired.

Industrial Sectors

There are ten industrial sectors namely:

- Food, Beverage & Tobacco
- Textiles, Wearing Apparel & Leather
- Base Metal, Iron & Steel and Fabricated Metal products
- Motor Vehicle and Miscellaneous Assembly
- Domestic and Industrial Plastics and Rubber
- Electrical and Electronics
- Wood and Wood Products including Furniture
- Chemicals and Pharmaceuticals
- Pulp, Paper and Paper Products, Printing and Publishing
- Non-Metallic Minerals

Strategic Resource-based Industries that should be established

Various establishments surveyed have indicated some of their greatest expectations in terms of government creating or promoting the right environment for the development of relevant strategic resource-based industries, or indeed getting itself involved where the degree of capitalization is beyond the capacities of individual enterpreneurs or firms.

In the agricultural sector, the strategic industries that require development include:

- Sugar and other sweeteners
- Starch derivatives
- Flavourings and fragrances
- Long fibre pulp
- Long staple cotton fibre, and
- Biotechnology.

For the mineral sector, they include:

- Lead and Zinc processing (with silver inclusions)
- Titanium Dioxide Production
- Increased iron ore exploration, mining and development

and others include:

- Production of specialized steel
- Alloy steel production
- Aluminium sheet production
- Production of electronic components
- Nuclear reactors for energy development.

Institutions Relevant to Raw Materials Development

- Raw Materials Research and Development Council, Abuja.
- National Metallurgical Development Centre, Jos.
- Federal Institute of Industrial Research, Oshodi, Lagos
- National Veterinary Research Institute, Vom.
- National Institute for Pharmaceutical Research and Development, Abuja.
- Forestry Research Institute of Nigeria, Ibadan.
- National Institute for Chemical Technology, Zaria.
- Nigerian Building and Road Research Institute, Ikoyi, Lagos.
- Nigerian Institute for Oceanography and Marine Research, Victoria Island, Lagos.
  Cocoa Research Institute of Nigeria, Ibadan.
- Institute for Agricultural Research and Training, Moor Plantation, Ibadan.
- Nigerian Stored Products Research Institute, Ilorin.

- Nigerian Institute for Oil Palm Research, Benin
- Rubber Research Institute of Nigeria, Iyanomo, Benin.
- Institute of Agricultural Research, Samaru, Zaria.
- National Cereals Research Institute, Badeggi, near Bida.
- National Root Crops Research Institute, Umudike.
- Projects Development Institute, Enugu.
- National Institute for Medical Research, Yaba, Lagos
- International Institute for Tropical Agriculture, Ibadan.

Specialized Libraries

- Geological Survey Library, Kaduna.
- National Metallurgical Development Centre Library, Jos
- Raw Materials Research and Development Council Library, Abuja.
- National Institute for Pharmaceutical Research and Development, Abuja
- National Veterinary Research Institute Library, Vom.
- Nigerian Mining Corporation Library, Jos.
- Central Medical Library, Yaba.
- Federal Institute of Industrial Research Library, Oshodi, Lagos.

INFORMATION OUTFITS VISITED IN NIGERIA DURING THE PRELIMINARY FACT FINDING MISSION

Table V

S/N	Information Outfits	Information facilities	Compatibility	Type of Information stored	Communication System	Mode of Information Dissemination	Beneficiaries	Manpower and Training	Additional Requirements (Facilities)
1.	Nigerian Metallurgical Development Centre, Jos	Mainframes, Mini and Micro Computers		On exploration, exploitation and development of raw materials for the steel industry such as mineral processing, refractories, metals foundries		Telephone, Telex, Publications	Industries, R&D departments, the general public	Experts in various fields of mineral exploitation. Training is mainly provided locally except for a few staff that are sent abroad for specialized training	Hardware, Software, Communication network.
2.	Nigerian Mining Corporation, Jos			Information on mining, processing, smelting, procurement and disposal of all minerals.		Brochures, Leaflets Conferences, Seminars and Workshops.	Researchers, Government and private agencies, International organizations	Experts in the fields of mineral processing, mining etc as well as administrative staff are mainly trained locally	Hardware, Software, communication network
3.	National Veterinary Research Institute, VOM	PCs, mainframes and minis		Form studies, Animal health, leather processing, veterinary medicine, livestock production, fish, forestry, microbiology.		Manual, through publications e.g. newsletters, books etc.	Universities, Government establish-ments, Researchers	Specialized manpower is available in the areas of animal health, vet. medicine, forestry, etc. Local training as well as special purpose training programmes aborad is provided for the staff.	Hardware, Software

4.	Federal Ministry of Agriculture, Water Resources and Rural Development	PCs, mainframes and Minis.		Agriculture and Livestock, forestry, Land and Water Resources, Fisheries		Manual, through books, journals and periodicals	Public and private sectors	Training is provided mainly locally for the staff who are mostly agricultural and computer experts	Hardware, Software and Communication network.
5.	The Nigerian Export Promotion Council			Information on non-oil exports cocoa beans, butter and cakes; cashew nuts, commodity exchange.		Manual through journals and financial newspapers & Telephones	Seven overseas countries such as the United Kingdom, America, Cote d'Ivoire, Saudi Arabia, Belgium, Poland, Switzerland, exporters manufacturers; chambers of commerce and industry.	Experts in trade and trade related matters are trained both locally and abroad. About 10 experts are currently available.	Hardware Software and Communication network.
6.	National Institute for Pharmaceutical Research and Development			Pharmaceutical Technology and pilot dry production. Medicinal chemistry and quality control. Medicinal plants & Traditional medicine. Pharmacology, Toxicology, Pharmaceutical microbiology		Manual, especially through publications and journals.	Researchers Universities and industries.	About 145 personnel most of which are specialized in pharmacy and other related fields; training is provided locally and abroad in specialized areas.	Hardware, Software and Communication network.

7.	Ajaokuta Steel Company Ltd.			Information on Steel production and its raw materials mainly limestone coking, coal, iron ore, Dolomite and Refractory clay		Telephone, Journal, Newsletters and Workshops	Universities, Students and metallurgical institutions	Specialized manpower trained abroad and locally.	Hardware, Software and Communication network.
8.	Nigerian National Petroleum Corporation			Oil/mineral resources process technologies, expertise available	Telephone Telex, Fax	Publications, bulletins, seminars, workshops, Reports and leaflets.	Business community in the crude oil sector, corporate planners, Government and the public		Hardware, Software Communication facilities.
9.	Delta Steel Company	IBM PC with 20 MG. Software such as D-Base IV Lotus 123 Word processor		Steel raw materials suppliers and users process technology.	Telephone Mailing system.	Bulletins, publications and correspondence	Government, International and private agencies		Hardware, Software specialized libraries.
10.	International Institute of Tropical Agriculture (IITA)	VAX Computer hardware, Software such as BASIS, ORACLE	With local Area Network (LAN)	Agriculture, production of Food crops, soil and land management, personnel matters and library services.	Telephone Telex, Telefax, mailing system.	Publications such as books, articles pamphlets, reprint	Farmers, Researchers, Government Agencies, Entrepreneurs and the public	Agricultural scientist, Researchers; Training in Agronomy, soil science Extension services etc.	Hardware and Software
11.	Federal Institute of Industrial Research, Oshodi (FIIRO)	IBM compatible, Mini-Micro CDS/ISIS		Research findings, process technologies	Telephone, Telex mailing system	Bulletins, Brochures, Adverts, Trade Fairs & Exhibitions	Scientists, Investors, Business Entrepreneurs		Hardware, Software, Communication facilities, manpower and training
12.	Nigerian Machine Tools			Research finding, Raw Materials suppliers	Telephone	Publications, seminars and workshops	Researchers Investors, Entrepreneurs		Hardware, Software Communication facilities, manpower and training

12.	Institute of Agriculture Research and Training, Moore Plantation, Ibadan.			Research finding, Agriculture	Telephone	Leaflets, bulletins	Farmers, Agriculturalists, Scientists	60 technical and non-technical staff.	Hardware, Software communication
14.	Manufacturers Association of Nigeria.			Trade Information, raw materials	Telephone Mailing System	Publications, general correspondence	Industries, Consultants, Government Agencies and the public.		Hardware, Software, communication
15.	Raw Materials Research and Development Council	Mini and Micro computers, Dummy terminals, plotter, printers, file server, laptops, Dos, UNIX DBASE IV,FOXBASE, AUTOCALD, ORACLE, COBOL, LOTUS, VENTURA WORK PROCESSING, etc.	IBM and compatibles, Data General	Materials based sourcing, Availability, utilization, Resource persons, Machinery & Equipment, Commodity survey, Directory of companies, Investment packages, Project Base, Library Information.	Network (LAN), Mailing system, Telephone, fax.	Public Awareness	Research Institutes, Industrialists, Prospective investors, etc.	Expert in System design and programming, Data Analysis, operators and Data Entry staff.	Hardware, Software and Wide Area Network.

SENEGAL

PREAMBLE

Senegal with its capital in Dakar is situated on West Africa between Mauritania and Mali on the north, Guinea and the Atlantic Ocean on the south. The country has a population of 7 million and a landmass of about 197,161 km^2. The official language is French and currency unit is the CFA. Exchange rate as at the time of mission was 255 CFA to 1 US $.

Communication System

There are telephones, FAX, Telex, radio, Television, postal service and a well-developed road network linking Senegal with the neighbouring countries. There is steady and regular electricity supply.

Resource Endowment and Level of Development

Senegal is endowed with both agricultural and mineral resources including millet, groundnut, cassava, cowpea, sorghum, cotton, maize, rice, beans, melon, vegetables, livestock and fish, as well as large range of fruits. The minerals include phosphate, gold, marble, granite, quartzites, gemstones, limestone, uranium, industrial clay and others. Most of the minerals are exported without value-added. The marine resources are exported fresh, or smoked.

Problems of Development and Utilization of local Raw Materials

Some of the problems of raw materials development include lack of investment capital, inadequate exploitation of minerals and lack of agro-chemicals and vaccines to enhance crop and livestock production.

National Plans for Resolution of the Problems

The country has established institutions whose objectives are to produce high-yielding crop varieties, establish crop production systems and develop agro-chemicals, combat crop and livestock diseases. R & D in food technology and quality control are also receiving attention.

R & D Breakthroughs

Production of Phosphoric acid from local phosphate. Development and commercial production of fruit juice concentrate from locally-sourced flower petals. Production of weaning diets from cowpea and maize.

Requirements for Regional Cooperation

Regional cooperation is needed mainly in the area of capital investment, manpower training and mineral exploration among others.

Industrial Sectors

There are nine industrial sectors, namely:

- Food
- General mechanics
- Confectionery
- Construction materials
- Chemicals
- Textiles
- Hydrocarbon
- Energy, electricals and water
- Miscellaneous

Strategic industries

The strategic industries are mainly in Mining and chemical production sectors.

Institutions Relevant to Raw Materials Development

They are:

- Institut Senegalais de Normalisation (ISN): Senegalese Institute for Standardization.
- Institut de Technologie Alimentaire (ITA): Institute of Food Technology.
- Institut Senegalais de Recherches Agricoles (ISRA): Senegalese Institute for Agricultural Research.
- Industries Chimiques du Senegal (ICS): Chemical Industry of Senegal.

Specialized Libraries include:

- CRAT/ARCTIC
- ITA Library
- ISN Library
- SONEPI Library
- ISRA - Institut Senegalais de Recherches Agricoles

INFORMATION OUTFITS VISITED IN SENEGAL DURING THE PRELIMINARY FACT FINDING MISSION

Table VI

S/N	Information Outfits	Information facilities	Compatibility	Information stored	Communication System	Mode of Dissemination	Beneficiaries	Manpower and Training	Additional Requirements (facilities)
1.	Societe Nationale d'Etude et de Promotion Industrielle (SONEPI), Dakar		Their systems are compatible with DIALOG AND AFRICATEL in France; CRIQ in Canada; also the focal point for the G.15, the National Industrial Technical Bank (NITB), Centre for Industrial Development (CID) in Brussels	Information stored in computer, is on technology adaptation, machinery sourcing, sources and cost of raw materials both within and outside the country.	Fax, Modems and Telephones		Industrialists, Researchers, investors		
2.	Centre Regional Africaine pour Technologies (CRAT), Dakar	5 PCs and accompanying printers		Information stored in computer is mainly on member states. They include: technology institutions and resource and exchange personnel, technology formulation and implementation, technical and research matters.	MODEMS were at installation level as at the time of survey	Mainly through publications, diskettes	Mostly member states	The establi-shment has a work force of 26, comprising 10 professionals and 16 auxilliary staff.	

3.	Institut de Technologie Alimenttaire (ITA), Dakar	3 PCs and accompanying printers			Modem and telephone though this was not functional at time of this survey	Publications, telephone	Researchers		
4.	Institut Senegalais de Normalisation (ISN), Dakar			Information stored both manually and on computer on local and international standards	There are facilities for Wide Area Network	Mainly through publications	Industries and researchers		Modem and telephones
5.	Chamber of Commerce, Dakar	3 PCs and 3 Minitels all of which are IBM compatible		Information stored both by manual and computer methods on economic, commerce, industrial and technological subjects			Industrialists, investors, researchers, the organised private sector.		Modem and telephones
6.	External Trade Division, Ministry of Industries & Commerce, Dakar	1 PC, MODEM and telephone	Their system is compatible with the CCI-(NUCED/GATT) Swiss system	Information on trade, raw - materials sources and cost etc.	MODEM and telephone	Mainly through publications, diskettes and MODEM	Investors and researchers, policy makers, external agencies.	There is only one computer analyst working on the system.	3 PCs, MODEMS and Telephones

TOGO

PREAMBLE

Togo with its capital in Lome is situated along the West African Coast. It is bordered on the east by the Republic of Benin, on the west by Ghana, on the north by Burkina Faso and on the south by the Atlantic Ocean. The population is about 3.6 million with an estimated per capita Gross National Product (GNP) of US $390. French is the official language. The currency unit is CFA and the Exchange rate as at the time of the mission was 230 CFA to 1 US $. Fishing and farming are the main occupation of the people.

Communication Systems

There are telephone, telex and FAX and mailing services which are functioning. The road and air transport network require rehabilitation and expansion.

Resource Endowment and Level of Development

The key raw materials include cocoa, coffee, maize, sorghum, cassava, yam, cotton and fruits.

The sorghum and maize are processed for the production of beer, while the maize is also used in the manufacture of baby foods. The cocoa and coffee are exported without value-added, while a small proportion of the cotton fibre is utilized by the local mills. The mineral raw materials are phosphate, marble, and barytes. The crude phosphate is subjected to humid and dry treatment as a way of purification before export, while the marble is processed into bricks and ceramic tiles although some are exported in the crude form.

Problems of Development and Utilization of Local Raw Materials

These include scarcity of investment capital and high level manpower, as well as low level of exploration and exploitation activities.

National Plans for Resolution of the Problems

National institutes have been set up to carry out relevant studies and research into agricultural crop, agro-chemicals as well as research into mineral exploration and exploitation.

R & D Breakthroughs

These include the use of maize four for compounding baby foods, and use of maize and sorghum in the brewing of beer.

Requirements for Regional Cooperation

Regional cooperation is needed in the sourcing of investment capital, development of transport and communication facilities, as well as supply of energy. Exchange of information and manpower should be promoted.

Industrial Sectors include:

- Food, beverage and tobacco
- Textile, wearing apparels and leather
- Wood and wood processing
- Extraction
- Printing and paper
- Chemicals and plastics
- Non-metallic Minerals
- Metallic products
- Metalworks
- Other manufacturing industries.

Strategic Industries are:

- Mining and refractory
- Agro-industries
- Construction

Strategic Resource-Based Industries that should be Established

There is need to establish fertilizer plants to use some of the raw phosphate. This may also be enhanced with the establishment of petro-chemical industries. The iron and steel industries will promote rapid development of other resources.

Institutions Relevant to Raw Materials Development

- National Office for Mining Research (Department of Mines and Geology).
- Institute of Nutrition and Food Technology
- National Institute for Food Crops

Specialized Library

- ORSTOM

INFORMATION OUTFIT VISITED IN TOGO DURING THE PRELIMINARY FACT FINDING MISSION

Table VII

S/N	Information Outfits	Information Facilities	Compatibility	Information stored	Communication Systems	Mode of Information Dissemination	Beneficiaries	Manpower and Training	Additional requirement
1.	ORSTOM	Hardwares include 20 PCs of Micros and IBM compatibles, with UNIX operating system. Software such as Texto is used.	Local network	Agriculture, agronomy demography, personnel management, raw materials prices	E. Mail electronic system and on-line telephone links.	Bulletins, newsletters, magazines, leaflets	Private sector, industrial establishment, investors, researchers / research organizations and the public	The organization has a well trained and highly motivated manpower.	Hardware, Software, manpower, communica-tion facilities.

UGANDA

PREAMBLE

Uganda is a land-locked country in East Africa bordered on the north by Sudan, on the south by Tanzania, on the east by Zaire,Rwanda and Burundi, and on the west by Kenya. The capital city is Kampala and the population is about 16 million. English is the official language and the unit of currency is Ugandan Shilling.

Agriculture accounts for about 70% of the GDP and over 95% of merchandise exported. The performance of the agricultural sector is the key determinant of the economic growth of Uganda; the major crops are coffee, cotton, and tea. Other agricultural resources include livestock and fisheries.

Communication System

There are functional telephone, telex, fax and mailing services. Electricity supply is quite adequate, while road and air transport network require expansion and improvement.

Resource Endowment and Level of Development

The agricultural raw materials include coffee, cotton, tea, tobacco, sesame seeds, marine products, cocoa, pineapples, groundnuts, vanilla, ginger, sunflower, wheat, rice, barley, cashew nuts and hides and skins. Most of the agricultural crops are processed before export. The mineral raw materials are copper, phosphate, gypsum, limestone, kaolin, diatomite, graphite, marble, silica sand, iron ore, tin, barytes, gold and asbestos. The once prominent copper industry has dwindled significantly.

Problems of Development and Utilization of Local Raw Materials

The major problems are scarcity of investment capital for exploration and explcitation of minerals, inadequate technical expertise, R & D facilities, and inadequate communication network.

National Plans for Resolution of the problems

In the mining industry the plan is to embark on increased geological mapping, and evaluation of Uganda's mineral and petroleum deposits. Mining code and legislation for attracting private investments, and exploration especially small scale mining have been put in place. In addition the Mining Act will be revised and a booklet on the investment prospects will be produced. There are plans for the following:

extraction of cobalt from pyrites stockpiles which consists of tailings from copper mining; encouragement of gold mining and marketing; rehabilitation of the existing hydro-electrical stations; investigation of the possibility of joint ventures with the private sector.

Requirements for Regional Cooperations

Regional cooperations are needed in the areas of joint foundry and forging facilities.

Industrial Sectors

- Fruit and vegetable products
- Manufacture of beverages and tobacco
- Manufacture of textile, garment and wearing apparel
- Manufacture of leather products and foot wear
- Manufacture of wood and cork products
- Manufacture of paper, and articles thereof
- Printing, publishing and allied industries
- Manufacture of industrial chemicals, fertilizers, paints and other products
- Manufacture of drugs, medicines and other toilet preparations
- Manufacture of rubber and plastic products
- Manufacture of pottery, china ware, earthware, pre-fabricated houses and other non-metallic products.
- Basic metal industries
- Manufacture of fabricated metal products and tools
- Manufacture of machinery, electrical appliances and apparatus.
- Strip building, repairing and assembling of vehicles and bicycles
- Manufacture of professional and scientific equipment, photographic and optical goods
- Other manufacturing industries.

Strategic industries

The strategic resource-based industries that are urgently needed are spare parts manufacture, cotton based industries, iron and steel, chemical and pharmaceutical, petro-chemical, fertilizer and mining.

Specialized Libraries

- Ministry of Commerce, Industry and cooperatives Library
- Ugandan Manufacturers Association Library.

INFORMATION OUTFIT VISITED IN UGANDA DURING THE PRELIMINARY FACT FINDING MISSION

Table VIII

S/N	Information Outfits	Information Facilities	Compatibility	Information stored	Mode of Information Dissemination	Beneficiaries	Manpower and Training	Additional requirement
1.	Ugandan Manufacturers Association Library, Kampala	Hardwares such as IBM PS 51, Mackintosh II, Softwares like D-Base III, Micro soft, Excel	Compatible with PTA's TINET and UNIDO'S INTIB	On raw materials, process technologies, quantity and quality of products, personnel and Labam force	Mailing System, Newsletter, Bulletins, Diskettes	Manufacturers, Entrepreneurs, Government planners etc.	3 Librarians with M. Sc, 1 Data entry Clerk.	Hard and soft ware, communication, facilities, manpower
2.	Ministry of Industry, Cooperatives and Commerce Library, Kampala	Not available		On raw materials, Trade and General information	Mailing system, Bulletins, leaflets	Manufacturers, Entrepreneurs, the public	2 Librarians with M.Sc and B.Sc. respectively	Hard and software, communication facilities, manpower
3.	Geological Survey and Mines, Entebbe	IBM hardware CDS/ISIS software	Compatible with Pan African Network for Geological Information System (PAGIS)	Geological data, types of minerals and their extent of deposit	Newsletter, Bulletins leaflets, diskettes	Miners, Manufacturers, business community, the public, Government policy makers.	Geologist, Mineralogists	Hard and software, communication facilities, manpower
4.	Ministry of Agriculture, Animal Industry and Fisheries, Entebbe	IBM hardwares		Agricultural resources	Newsletters, leaflets, bulletins, mailing system	Farmers, public, Government agencies and policy makers	No information available	Hard and Software, communication and manpower, facilities.

ZAMBIA

PREAMBLE

Zambia is a land-locked country covering an area of 752,614 km^2 and surrounded by eight countries namely Zaire, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia and Angola. Its capital is Lusaka. Its elevation is in form of a plateau, at 1,300 metres above sea level, with bearings of 10-18 degrees south of the equator. Zambia has an estimated population of 8.6 million. The official language is English and currency unit is the Kwacha. The major economic activities are Mining, Agriculture, Fisheries and Commerce. The dominant commodities are maize, soyabean, tobacco, fruits, coffee, tea, cotton, copper, gold, gemstone, coal etc.

Communication System

The telephone system is fairly efficient but does not as yet employ the digital switching system, hence it is prone to failure and jams. Possibilities exist for the use of leased lines for data transfer to remote areas or within the metropolitan areas. It is not certain if Zambia has a satellite earth station for international data transfer. Currently, external communication through telephone is routed via London.

The Telephone, Telex and Fax and postal services work fairly well. The road and air transportation is adequate for the current demand. Electrical power which is derived from water is fairly steady.

Resource Endowment and Level of Development

The raw materials resources include: Cotton-seed and fibre, tobacco, tea, coffee, gemstone, copper, cobalt, lead zinc, limestone, marble, coal, graphite, soda ash, talc, gold, silver, iron ore, clay, maize, etc.

The textile industry is highly developed, while copper is the main foreign exchange earner. Other minerals are mined on a limited scale.

Problems of Development and Utilization of Local Raw Materials

Mining equipment are capital intensive, and ability to procure the latest technology and efficient equipment are major constraints. In the agricultural sector, perennial drought and plant diseases have resulted in low crop yields.
Government is seeking assistance from the international community to help combat these problems.

R & D Breakthroughs

In the Building and Industrial Mineral Unit of the National Council for Scientific Research, the use of coal briquette in clay stove has been developed.

In the Food Technology Research unit these are breakthroughs in soft drink production using various fruits, wine from masuku fruits and beer from cereals like maize.

Requirement for Regional Cooperation

There is need to promote exchange of information between Zambia and other countries in the area of resource availability, process technology, as well as research and development. Cooperation is also desired in the area of manpower development and training.

Industrial Sectors

- Food, Beverage and Tobacco
- Agriculture, Hunting, Forestry and Fishing
- Mining and Quarrying
- Manufacturing
- Electricity, Gas and Water
- Building and Construction
- Transport, Storage and Communications
- Chemicals
- Agro & Agro-allied - Clothing and Garment
- Finance, Insurance, Real Estate and Business Services
- Wholesale and Retail, Restaurant and Hotel.

Strategic Industries

- Mining Industry
- Textiles
- Fruit and Vegetable processing
- Tourism

Institutions Relevant to Raw Materials Development

- National Council for Scientific Research, Lusaka
- Building and Industrial Mineral Research Unit, Lusaka
- Food Technology Research Unit, Lusaka
- Radioisotopes Research Unit, Lusaka
- Materials Testing Unit, Lusaka
- Cartographic and Locational Analysis Unit, Lusaka
- Water Resources Research Unit, Lusaka
- Technical Services Unit, Lusaka
- Livestock and Pest Control Research Centre (LPRC), Chilanga
- Tree Improvement Research Centre (TIRC), Kitwe.

Specialized Libraries

- University of Zambia Library
- City Library - National Library
- Preferential Trade Are (PTA) Secretariat
- Ministry of Commerce and Industry

INFORMATION OUTFIT VISITED IN ZAMBIA DURING THE PRELIMINARY FACT FINDING MISSION

Table IX

S/N	Information Outfits	Information Facilities	Information stored	Communication System	Mode of Information Dissemination	Beneficiaries	Manpower and Training	Additional requirement (facilities)
1.	Central Statistical Office (CSO), Lusaka	100 Unit of IBM PS/2 micro computers and general EPSON printers	Demographic survey, trade, production and commodity prices statistics	No facilities like modems, Fax for easy communication of leaflets and publications	Diskettes and tapes as well as production of leaflets and publications.	Government planning agencies, Industries, Universities and other institutions of higher learning	Skilled manpower not adequate, In house training and overseas training being undertaken to upgrade skill of existing staff	Upgrading of hardwares to modern ones. Need for networking facilities in order to facilitate communication with counterpart agencies at national sub-regional and regional level.
2.	Preferential Trade Area (PTA), Lusaka	About twelve Units of IBM/Macintosh Micro computers with printers	Production and trade statistics.	No facilities like modem, Fax for easy communication with counterpart agencies.	Diskettes and tapes	Industrialists and subscribers in the twenty-two PTA member countries.	Skilled manpower not adequate	Upgrading of Hardware Facilities. Need for networking facilities and Modems for easy communication
3.	Ministry of Finance, Lusaka, Zambia	A main frame and several units of IBM Micro computer with printers	Some information on Government financial transaction and for preparation of payrolls.	No facilities for easy communication	Diskettes and Tapes	Government Agencies	Skilled Manpower	Need to upgrade hardware to modern ones. Need for Modems, Fax etc. for easy communication.
4.	Zambian Association of Chambers of Commerce and Industry (ZACCI) Lusaka, Zambia	One Unit of IBM Micro computer with printer	Trade Statistics	No Communication facilities	Diskettes and tapes, leaflets and publications	Industrialists and government agencies	Skilled manpower not adequate	Need to acquire more hardware and network arrangement.

ZIMBABWE

PREAMBLE

Zimbabwe is bordered on the north by Zambia, on the south by the Republic of South Africa, on the east by Mozambique, and on the south west by Botswana.

The population is about 10 million, with Harare the capital, hosting about 1 million. Other major cities with high population density include, Bulawayo, Gweru and Mutare. Although Zimbabwe is a nation of mixed races, English is the official language and currency unit is the Zimbabwean dollar.

The main economic activities are in the areas of agriculture, mining and manufacturing. Main crops are maize, wheat, cotton, tobacco and sugar.

Communication System

The telephone system is fairly efficient but requires rehabilitation. The telephone in the city of Harare is currently being upgraded to digital system. There is also what is referred to as SIMNET, Zimbabwe Packet Switching Data Network Services which is used to connect a server in Zimbabwe to another server anywhere around the globe using the satellite earth station in Harare.

Telex, FAX and postal services are efficient, while road and air transportation facilities are satisfactory. Electricity supply is steady, although the current prolonged drought poses a threat to effective power generation.

Resource Endowment and Level of Development

The major raw materials are tobacco, cotton, tea, coffee, maize, wheat, sorghum, barley, soyabeans, sunflower, groundnuts, sugar, livestock, precious metals, gold, silver, cobalt, platinum, industrial minerals, coal, gemstones and iron ore.

Problems of Development and Utilization of Local Raw Materials

- Drought problems resulting in low crop yield in agriculture.
- Plant and animal diseases and pest control
- Foreign exchange sourcing for purchase of equipment an technology.

In addressing these problems, government has stepped up the construction of dams and drilling of boreholes and has also embarked on research and development work on drought-resistant crops.

R & D Breakthroughs

Research efforts in the Tobacco Research Board (TRB) has resulted in the breeding of disease resistant varieties, as well as the development of new technologies for tobacco processing.

The Department of Veterinary Sciences has also made significant advances in disease and pest control.

Requirement for Regional Cooperation

Regional cooperation is needed in the area of exchange of technological information on equipment, process and products. There is also need for cooperation in manpower training and development, as well as in sourcing investment capital.

Institutions Relevant to Raw Materials Development

- Department of Research and Specialist Services
- Department of Veterinary Services
- Agricultural Research Trust
- Tobacco Research Board
- Research Council of Zimbabwe (RCZ)
- Scientific and Industrial Research and Development Centre (SIRDC)
- Remote Sensing Centre
- Earth Sciences Centre

Industrial Sectors

- Manufacturing
- Food, Beverage and Tobacco
- Agriculture, Hunting, Forestry and Fishing
- Mining and Quarrying
- Textiles
- Clothing and Footwears
- Wood and Furniture
- Paper and Paper products

- Chemical and Petroleum products
- Non-metallic Mineral products
- Metals and Metals products
- Transport Equipment
- Others - leather, scientific equipment, photographic, equipment.

Strategic Industries

- Textiles
- Mining Industry
- Tobacco
- Iron and Steel
- Pharmaceuticals and Chemicals
- Fruit and Vegetable processing
- Tourism

Specialized Libraries

- Ministry of Commerce and Industry Library
- Ministry of Agriculture Library
- Zimtrade Library
- CSO - Central Statistical Office Library
- CZI - Confederation of Zimbabwean Industries Library
- ZNCC - Zimbabwe National Chamber of Commerce Library

INFORMATION OUTFIT VISITED IN ZIMBABWE DURING THE PRELIMINARY FACT FINDING MISSION

Table X

S/N	Information Outfits	Information Facilities	Compatibility	Information stored	Communication System	Mode of Information Dissemination	Beneficiaries	Manpower and Training	Additional requirement (facilities)
1.	Central Statistical Office (CSO), Harare	Some IBM Micro computers with printers		Demographic survey data, trade and economic statistics	No facilities like MODEM, Fax for easy communication with counterpart agencies	Diskettes and tapes, leaflet and publications.	Government Planning Agencies, Universities, Industries, research establishments	Skilled manpower not adequate, upgrading of skill through on-the-job and external training	Need to expand hardware facilities and to upgrade to a network
2.	Technology Information Pilot System (TIPS)	Digital equipment corporation Micro VAX computer and general IBM compatible micro computers; some of these are networked to the VAX using NOVELL network software	Compatible with regional and international systems such as Trade Information Network (TINET), Statistical Office of the European Communities (EUROSTAT) Eurotract and TOPIC databases	Databases of foreign trade, statistics, media on raw materials production, technologies and request for business opportunities	MODEM and Fax facilities are used to enhance communication with counterpart agencies.	MODEMS, Fax, Electronic Mailing System, Diskettes and tapes, leaflet and publications.	TIPS offices and subscribers around the world as well as government agencies and industries in Zimbabwe and other countries in the sub-region.	TIPS has a pool of trained qualified manpower	Just adequate for current service being provided.
3.	Zimbabwe Trade Network (ZIMTRADE), Harare	Several IBM Micro Computers and 386 DX 33 MHZ and 486 DX 33 MHZ PC network serves E-Mail facility, printers and scanners.		Production and trade figures, information on raw materials technologies and business opportunities	Zimtrade is on the process of acquiring MODEM and Fax to enhance communication	E-Mail, Diskettes and tapes, leaflet, journal and other publications.	Industries, government agencies policy makers and planners, research institutions and higher institutions.	Need to acquire skilled manpower	Need to provide facilities for networking operation.
4.	Confederation of Zimbabwe Industries (CZI) and Zimbabwe National Chamber of Commerce (ZNCC) in Harare.	No computer facilities		Information and data are collected on industrial activities of members, linkages between industries, information on raw materials trade, marketing and business opportunities		Production of leaflet, journal, newsletters and other publications.	Members of CZI and ZNCC, other professional associations, government agencies research institutions etc.		

ANALYSIS OF FINDINGS

SCORING CRITERIA

The assessment of the ten countries visited was based on six distinct criteria which were scored as follows:-

	CRITERIA	SCORES (%)
1.	Computer facilities/capabilities, hardware, software, networking systems and configurations.	30
2.	Information gathering and distribution capability - communication facilities including satellite, manpower and organizational set-up	20
3.	Institutional framework and logistics of operations - private, government or both, international involvement, mandate, source and level of funding, level of coordination and cooperation.	20
4.	Raw material endowments - types, level of development, utilization outlets, research and development facilities and activities.	15
5.	Geographical location within regional setting - centrality at continental level, and strategic location at regional level.	10
6.	Political stability	5
	TOTAL	**100%**

COUNTRY EVALUATION

On the basis of the listed criteria and corresponding score, detailed in table XI, the following order of ranking emerged:-

Table XI

CRITERIA/SCORES

Country	Raw Materials availability and Development	Information facilities	Information gathering and dissemination	Institutional framework and logistics	Geographical location	Political stability	Total Scores	Position
	15	30	20	20	10	5	100	
EGYPT	12	23	15	14	4	4	72	1st
GHANA	9	16	13	14	7	3	62	4th
GUINEA	5	7	5	8	6	3	34	9th
KENYA	9	16	11	11	6	3	56	5th
NIGERIA	12	20	12	13	8	3	68	2nd
SENEGAL	9	21	14	14	5	4	67	3rd
TOGO	7	9	9	11	7	3	46	7th
UGANDA	8	7	8	6	6	3	38	8th
ZAMBIA	8	13	9	9	5	3	47	6th
ZIMBABWE	9	15	11	12	5	4	56	5th

CONCLUSION

The ten countries visited were ranked as stated in Table XI based on the identified criteria on page 53.

It was however observed during the preliminary fact-finding mission that there exists within the African continent very strong sub-regional groupings based on language and trade affiliations.

It was therefore considered expedient to exploit this existing grouping for effective data collection and dissemination.

Hence it is proposed that four sub-regional centres should be established with one of them doubling as the Regional Coordinating Centre.

From the assessment, Egypt, Nigeria, Senegal and Kenya ranked highest and were therefore considered for the final assessment mission. This mission is aimed at identifying the institutions within the countries capable of hosting the raw materials information centres.

CHAPTER THREE

FINAL ASSESSMENT MISSION

PREAMBLE

The final assessment mission undertaken to Egypt, Senegal, Kenya and Nigeria was aimed at identifying the most suitable institution within each country in terms of Hardware, Software, Communication facilities and manpower for housing the Raw Materials Information Centres at the sub-regional level as well as being the regional coordinating centre.

In doing this, the existing information and communication facilities in the institutions visited, their manpower capability in the area of information technology, management and dissemination were taken into consideration. The number of the institutions visited during this mission was based on the appraisal of the report of the preliminary fact finding mission.

Interviews and discussions were held based on guided questionnaires with relevant personnel (Annex II), as well as assessment of their information facilities through demonstration sessions.

The mission also visited UNDP field offices in the four countries, in order to understudy the information system operating within the UNDP. It is hoped that the finding will assist in the selection of a system that could be harmonized with other International Systems (Annex IV).

PROFILES OF INSTITUTIONS

EGYPT

Ministry of Industry Information Centre

1. Hardware configuration

- Computer systems

TABLE XII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK
ICL	MG	1	2966	33MHz	4MB	200MB
IBM	MultiTask PC	1	80486	25MHz	100MB	100MB
IBM	PC	8	80386 - DX	25MHz	32MB	32MB
IBM	PC	1	80486	33MHz	80MB	80MB
HP	MPE	1	HP3000 CPU		N/A	N/A
AT&T	PC	3	80386	25MHz	40MB	40MB
QUARTO	PC	1	80386	33MHz	100MB	100MB

* Most of the available floppy PC drives are 1.44/1.2

- Printers and scanners: The printers include HP Laserjet III, EPSON models, IBM pro-printers and STAR NR15 and scanners.

- Others: A number of terminals either stand along or are corrected to one of the platforms with UPS as back-up. There are plans to acquire a new UNIX machine of NCR and IBM models.

- Operations: The mainframe houses most of the huge data generated while the multi-task PC connects the work stations and the mainframe. Also, the HP3000CPU facilitates the processing of data in the workstations. The 486 PCs, and the multi-task system serves as database server, workstation and back-up to the mainframe.

2. Networking and Communication facilities. Both LAN and WAN using NOVELL, MODEMS and leased telephone lines facilitates data capture and dissemination. In addition, the Electric-mail (E-Mail) enables the centre to interact and exchange information with other databases in Europe and at the national level.

3. Software. These include Novell, Netware, Quattro, MS-DOS, dBase III, SPSS, other statistical packages, and a number of commercial softwares. There are other developed softwares adopted for specific tasks in management.

4. Databases. The institution's locally developed databases include, among others, profiles of industries, industrial products and standards, import and export of industrial raw materials and finished products, process technology, industrial consultants, personnel management and staff salaries.

5. Users The main users are government ministries, organized private sector, investors, exporters, importers, consultants, researchers, manufacturers and the general public who access the information through diskettes exchange and publications.

6. Manpower. There are 12 programmers/system analysts and other support staff involved in data collection, verification and entry. The organization has an established in-house training programme, as well as specialized overseas training in electronic engineering and graphics. There are, however, problems of high turnover of trained personnel attracted by better conditions of service elsewhere.

7. Back-up and Maintenance. Data back-ups are on tapes and diskettes which are kept in fire proof safes on and off site to ensure data safety. Hardware back-up systems and UPS are provided to ensure continuity of operation. The services of external hardware suppliers are engaged for system maintenance.

The Egyptian Geological Survey and Mining Authority (EGMA)

1. Hardware configuration

- Computer systems

TABLE XIII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK
AR&T 3PL 310	MultiUsers	1	N/A	N/A	2MB	72MB
IBM	Multiusers PC	1	33HMz	33MHz	4MB	100MB
AT&T	PC	6	80386	20MHz	1MB	40MB
AT&T/NCR	PC	7	80286 80386	12-20MHz	1-2MB	40-80MB

- Printer and scanners: The types of printers include EPSON models and HP Laserjet IIP. There are no scanning facilities.

- Others: There were seven terminals with plans to expand to twenty-four.

- Operation: There were multi-user operating systems with PCs serving as workstations. The databases are stored in the multi-user system.

2. Network and Communication facilities: Leased telephone lines constitute the main outlet and inlet, of data and information between the institution's data bases and external databases, particularly those in the Ministry of Petroleum and Mineral Resources. Other communication modes include Fax, Telex and publications such as maps, bulletins, journals and reports. Although, some of the workstations are connected, the development of Local Area Network (LAN) or Wide Area Network (WAN) has not yet been undertaken. There are no facilities at present for E-mail services.

3. Softwares. The operating system softwares used include UNIX, SCO NEXIC, DOS-5.0, Database softwares: BRS, Fox-Base, dBase III, GIS, ERDAS: the application softwares include Lotus, Quattro and Graphics. Acquisition of Novell for LAN is in progress.

4. Databases: The local data bases developed by the institution include those on minerals, mining companies, equipment and publications in the earth-sciences.

5. Users: The main user of the information is the Ministry of Petroleum and Mineral Resources. Others include mining companies, investors, consultants, researchers and training institutions, and the general public. Most of the output are in the form of hard copies such as periodicals and maps.

6. Manpower. The Technical manpower capacity consist of few programmers/analysts, with majority of the staff only capable of carrying out data entry and word-processing. There is therefore the need to develop more manpower in the area of data processing, graphics and software engineering.

7. Back-up and maintenance. Tape and diskette are copied and duplicated in order to ensure data safety. Maintenance and servicing works are carried out both internally and through contracting firms. There is, generally, inadequate back-up arrangement for power supply.

The Egyptian National Scientific and Technological Information Network (ENSTINET)

1. Hardware configuration

- Computer systems

TABLE XIV

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK
AT&T B2W	MINI	1	WE-32000	2MB	340 MB	5
AT&T 382	Super-Micro	1	WE-32000	2MB	100MB	8
AST	PC	1	80486	8MB	660MB	10
ZEOS	PC	1	80386	8MB	550MB	10
PS2/50	PC/MCA	1	80286	1MB	20MB	1
Lap-Top	PC	1	80286	1MB	40MB	1
AST	PC	1	80386	1MB	40MB	2
Data-Mini	PC	1	80386	2MB	120MB	2
PS2/65	PC/MCA	1	80386	2MB	120MB	1
AT&T 381	PC	8	N/A	500KB	20MB	1
Data 80	PC	10	80286	1MB	40MB	2
Super AT	PC	5	80286	1MB	40MB	1
Mandax	PC	1	80386	4MB	200MB	2
Mandax	PC	2	80386	4MB	40MB	2

* NA = Not available

- Printers and scanners: There are several types of printers which include HP Laserjet, HP Laserjet III, STAR NR15, STAR NB24, Data product, Epson DFX/5000, Rugged-Writer, IBM Pro-printer and IBM-Graphic printer. There are facilities also for scanning.

- Others: These include terminals such as Hardcopy console, WYSE 50 and CIT, CD-ROM Reader of Phillips, Hitachi and Pioneer Juke Box make, CD-Rom Readers Usage of various makes are available. Furthermore, there are back-up power supply systems of Isoguard and Accupower make.

- Operation: There are mini and super-micro, as well as PCs platform. The former contains most of the databases while the PCs serve as workstations and servers. These are mainly the 486 and 386 with high disk capacities. Furthermore, the servers are also used as back-up for the mini and super-micros.

2. Networking and communication facilities

Both LAN and WAN are in place using MODEMS, CD-ROM, on-line and off-lines, as well as X.25 cabling systems. These interact with national and international subscribers and databases. The organization is a National Focal Point connected through its LAN to several nodes in government ministries, government/agencies, universities and research institutes in Egypt. Through its WAN, it has connections with databases in Europe, America and the Middle-East using leased and dedicated telephone lines. The E-mailing system enhances fast communication between the institution and its subscribers in addition to Tele-Fax and Voice-Fax services.

3. Softwares

The softwares include CDS/ISIS, GIS, Graphics, Lotus, Novell Netware, PADIS, PGI, NLM, Unesco IIP, PRS, dBase III and IV, and many softwares developed in-house for specific database management and applications.

4. Databases

There are many databases developed and maintained by the institutions. These include databases in bibliography for science and technology, on professional associations in Egypt, resource persons in the area of scientific and technological research. The institution also accesses information from both national and international databases, especially in scientific and technological fields from universities, research institutes and vendor organizations. Besides, ENSTINET serves as focal point for several international organizations like UNIDO, UNDP, WHO, UNCTAD, FAO, and also cooperate with many more organizations world wide.

Users

The major users/subscribers are the research and training institutions, consultants, decision-makes, planners, publishers, authors, professional bodies and individuals. The use of E-mail and Voice-Fax facilities the quick delivery services offered by the institution to its subscribers. Furthermore, there are newsletters, bulletins, journals and reports published and circulated at intervals to disseminate information to users.

Manpower

There are about thirty-five officers on full-time employment with ENSTINET, and a small number on part-time. Some of these staff are well-trained as programmers/analysts responsible for data processing, storage, retrieval and information dissemination. There seem to be a satisfactory level of coordination and understanding between departments and their staff. However, there are problems of staff exit due to better conditions of service offered elsewhere.

Back-up and Maintenance

Duplication of tapes and diskettes is undertaken to ensure data safety. Hardware option facilities and UPS of 45 - 60 minutes duration are provided to ensure uninterrupted operations. Arrangement for servicing and in-house/contracting routine maintenance are adequate and satisfactory.

The Cabinet Information and Decision Support Centre (IDSC)

1. Hardware configuration

Computer systems

TABLE XV

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
IBM ES9121	Main-frame	2	-	-	32MB	27GB	-
IBM Compatible	Mini	4	80486	33MHz	16-32MB	1-4GB	1.2 and 1.44MB
IBM/NCR/ AT&T/ Mackintosh	Pcs	1300	80286 80386 80486	12-33 MHz	1-4MB	40-400MB	1.2-1.4MB

- Printers and scanners: There are several types of printers such as DOT Matrix and IBM 3835 and IBM 6262 - 012 models with a speed of up to 80-page per minute and 1300 line per minute respectively. Scanners, digital Cameras, as well as audio facilities.

- Others: There are other peripherals which include: Tapes and disk drives, UPS, terminals and work stations which have been put in place to enhance the operational efficiency of the centre.

- Operation: There are three operating platforms consisting of the tower platform housing the mainframes with the high data storage capacity, the mini/super micro computer platform consisting of several INTEL 80486 based processors set up databases communication, and voice/fax servers coupled together with the aid of bridges in an inter-networking arrangement, and the PCs used as intelligent workstations to access the servers in the network. This operating arrangement makes it possible for the platform to give backup to another.

2. Networking and Communication Facilities:

About 4 LAN connectivity integrating the main databases of the centre and the WAN operating connectivity using bridges, servers, PAD and other communication equipment, make it possible to access and transmit data and information. This is done through several on-line and off-line transmission systems, more especially using the X.25 cabling network. There are connections with local, national and international data sources and users. Users without computers can also access information using Voice-Fax facilities. Some of the national and international database organizations connected to IDSC include, ENSTINET INTERNET, COMPASS and FRCU. In addition, the institution is linked to thirty-three ministries and twenty-seven Governorates in Egypt. Internationally, IDSC is represented in over sixty-one countries and accesses data from about one hundred and seventy countries with about seventy of them accessing data and information from the Centre. Furthermore, the Centre accesses data and information from over thirty-nine international data banks. Electronic mailing system is also being operated to disseminate information and receive requests from subscribers.

3. Softwares. Wide-range of softwares are used including UN softwares, GNES softwares, PASCAL, FORTRAN, ISP, FOX, UNIX, dBase III and IV, Lotus, Clipper PAS, SPSS, GIS, NOVELL, IBM Application, Harvard, Graphics, Case Engineering tool, IEF, BMS, IMA, UNCTAD A.D. System, Commonwealth system. In addition in house software development is being pursued vigorously to enhance these efforts

4. Databases. The local data-bases developed and maintained by the Centre are many. The major ones include data-bases for the National identify card, Debt Management, Trade-Net, Decision Support, Pyramid Technology. Each of these consists of several sub-databases.

5. Users: The main users include the private sector, individuals, central and district governments, researchers, consultants, exporters, importers and the international community. The Centre serves a wide range of users which has led to the up-grading of one of its organs - the TRADE-NET to operate as a semi-independent body on a commercial basis. The mode of communication with users include Fax, Voice-Fax, Tele-Fax. Other forms of information dissemination are newsletters, periodicals, bulletins etc, that are published frequently and distributed to users. There are minimum problems at peak period of enquiries due to availability of many 'on' and 'off' line transmission systems. Moreover, a 24-hour Voice-Fax service is maintained to receive requests and make quick response to clients.

6. Manpower. A pool of high level technical and managerial manpower totalling two hundred and forty with majority possessing post-graduate degrees presenting exists. To sustain the level and calibre of manpower, the conditions of service are attractive compared to what obtains in the civil service or similar organizations. Furthermore, there are several on-the-job/and in-house training programmes that are conducted regularly and in some cases, staff engage in refresher courses abroad in software development and hardware maintenance.

7. Back-up and maintenance. Several data backups are stored regularly on tapes and optical disks and kept both on site and off-site in powerful safes. Power back-up includes the use of high voltage UPS, and stand-by power generating plant. Adequate in-house and contract servicing and maintenance arrangements are available for both hardware and software on 24-hour basis. Down time is reduced to the barest minimum.

KENYA

Ministry of Commerce and Industry, Industrial Registration Division

1. Hardware configuration

- Computer systems: There are seven IBM Compatible microcomputers with the following configuration:

TABLE XVI

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK	CO-PROCESSOR
Hyundai	PC	2	80386	33MHz	4MB	200MB	1.2 & 1.44	80387
Hyundai	PC	2	80386	33MHz	4MB	100MB	1.2 & 1.4	80387
Hyundai	PC	3	80386	33MHz	4MB	100MB	1.2 & 1.4	-

Printers and scanners: The printers include HP Laserjet III, EPSON LE1170 and EPSON FX850. No available information on scanners.

- Others: There are seven emerson UPS as power back-up systems.

- Operation: The main operation is carried out on one of the 200 MP hard disk storage capacity computer systems, while the second one having identical configuration with the main unit is designated as a backup system. All the other five machines are used for data entry and editing. After editing is completed, the data from each of the data entry stations are then transferred to the main system via diskettes, where they are merged before final sorting, processing and reporting.

2. Network and communication facilities. There are no network communication facilities as most of the systems are standing alone.

3. Softwares: The application software used were designed by a UNDP expert along with the local programmers in the Ministry of Commerce and Industry. The programming language used is dBASE IV and the local programmers currently carry out software maintenance.

4. Database. Data on industries are captured and stored on the computer.

5. Users: The potential users are industrialists, investors etc. It is intended that information would be disseminated to them through reports and pre-printed outputs from the systems. There is no facility for an on-line information retrieval by users.

6. Manpower. There are four analysts and three trained statisticians who are assisted by some data entry operators.

7. Back-up and Maintenance. Data back-up is made regularly to an external tape streamer system attached to the main system. In case of emergency or failure of the main system, the tape system can be detached and then attached to the back-up microcomputer system, and the data restored unto it. The UPS provides power back-up lasting for several minutes. Besides, there are arrangements with suppliers and computer firms for servicing and maintenance.

Kenyan Industrial Research and Development Institute (KIRDI)

1. Hardware configuration

- Computer systems: The Institute has forty-four microcomputers, forty of which are for training beginners in microcomputer concepts. The forty computers were donated by the Japanese government. The remaining four are used in the information centre for gathering industrial information.

  A set of two additional computers were expected to be installed in March, 1993. These would have a networking and communicating capability and are expected to be equipped with a Novell Network Programme and a modem.

The configuration of the systems are as follows:

TABLE XVII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
Hyundai	PC	1	80286	12MHz	1MB	40MB	1.2
ICL	PC	1	80386	16MHz	1MB	40MB	1.2 & 1.44
Clone	PC	2	8088	4.7MHz	640kb	20MB	360KB
HP	PC	1	80486	25MHz	4MB	400MB	1.2 & 1.44
ICL	PC	1	80386	25MHz	4MB	80MB	1.2 & 1.44
Toshiba	PC	40	8088	4.77MHz	256KB	-	360KB

- Printers and scanners: There are two printers made up of EPSON Laser SQ 5000 and EPSON FX 1050. No information on scanners was available.

- Others: There was no available information on UPS. .

- Operation: The main operation is currently being carried out on the ICL 386 microcomputer, which houses the databases that are currently in use. The other three microcomputers are used for storage of some other databases. The operation is still very rudimentary as there was no apparent data processing standards being adhered to. For example there is no sufficient backup facility provided. However, there is a plant o install a server computer that will house all the data bases and would also have a communication and a back-up facility. The proposed hardware is supposed to be networked along with the existing microcomputers and also connected to other international databases via a modem and a communication line.

2. Networking and communication facilities

There are no communication networks existing currently. The only means of data exchange is through tape and diskette copying and posting, as well as through copies of hard information materials conveyed through postal services. KIRDI hopes to develop an on-line system for faster exchange of information. In realizing this goal, the institute hopes to effect networking with

national, regional and international information networks in relevant areas of interest to the institute. In addition, the institute hopes to create databases in the area of engineering, textile and fibres processing.

Softwares: The application software used in the internationally recognized and UNIDO supplied library information system CDS/ISIS. This programme facilitates the storage and retrieval of relevant databases. There are other available softwares such as Word Perfect, Lotus 123, Wordstar and dBASE IV.

4. Databases: The databases currently maintained by the institute are as follows:

- Profiles of Industrial Enterprises Databases (PIED) which gives important information on several aspects of Kenyan Industries, such as the company's history, top company executives, profits and turn over and general performance of the company.

- KIRDI Information and Documentation Services Database (KIDOS) which is a bibliographic information of scientific publications in the Institute's library.

- Industrial Machinery Suppliers (IMSD) which is a database that supplies the name, address, physical location of companies supplying various types of industrial machinery and spare parts.

- The Kenyan Industries Directory (KEIN) which is a database that supplies information on the type of industry, investment equities, location of industry, raw materials used, markets of final products, and production capacities.

5. Users. The potential users are industrialists, investors etc. It is intended that they would get the information disseminated through reports and pre-printed outputs from the systems. There is no facility for an on-line information retrieval by users.

6. Manpower: There is one Analyst/Programmer assisted by three Data Entry Operators.

7. Back-up and maintenance: No back-up method was specified. Servicing and maintenance works were carried out by the private computer firms.

Kenyan External Trade Agency (KETA)

Hardware configuration

- Computer systems

TABLE XVIII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK	CO-PROCESSOR
Tulip	PC	1	803868X	16MHz	1MB	40MB	1.2	-
IBM M50	PC	1	80286	10MHz	1MB	30MB	1.2 & 1.44	-

- Printers and scanners: These include one HP Laserjet IIIP, and an IBM Pro-printer. There are no scanning facilities.

- Others: Some other components include one UPS of APC 600VA and a Telex machine.

- Operation: The main operation is carried out on the ICL 386 microcomputer, which houses the databases that are currently in use. Three microcomputers are used for storage of some other databases. The operation is still very rudimentary as no apparent data processing standards are being adhered to. For example, there is no sufficient back-up facility provided. However, there is a plan to install a server computer that would house all the databases and would also have a communication and a back-up facility. The proposed hardware is supposed to be networked along with the existing microcomputers and also connected to other international databases via modem and a communication line.

2. Networking and communication facilities:
There are no facilities for network communication at present. Network interaction is carried out through exchange of tapes and diskettes, as well as hard copies of information and data documents. However, there are plans to introduce the use of communication facilities to enhance data capture capability.

3. Softwares: The application software used is the internationally recognized and UNIDO supplied library information system, CDS/ISIS. This programme facilitates the storage and retrieval of relevant databases. There are other available softwares such as Word Perfect, Lotus 123, Wordstar and dBase IV.

4. Databases: The databases currently maintained by KETA are: Trade Information Network (TINET), which is a database of the TPA; and the Trade Information Database of ITC.

5. Users: The potential users are industrialists, investors etc. It is intended that they would get the information disseminated through reports and pre-printed outputs from the systems. There is no facility for an on-line information retrieval by users.

6. Manpower: The Agency has one external consultant and two data entry operators.

7. Back-up and Maintenance: No data back-up method was specified. However, the UPS in place gives power back-up to the micro-computer. There is an arrangement with some computer firms for servicing and maintenance.

Kenyan Bureau of Statistics (KBS)

1. Hardware configuration
   - Computer system:

TABLE XIX

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK
IBM M50	PS/2 PCs	130	80386 & 80326	10 - 25 MHz	1 - 2MB	30/40MB

The Bureau benefits from the services of the Government Computer Services Unit for most of its data storage and speedy processing.

- Printers and scanners: Few printers mainly of EPSON 1050 model and equivalent are used, but scanners are not currently available in the Bureau.

- Others: There is no available information on UPS.

- Operation: The bureau operates stand-alone systems which are located in the district offices where data from the enumeration areas and clusters are gathered and entered. The rest of the systems are housed in the headquarters where data from the forty-six districts are edited and processed. At the headquarters, some of the systems are installed in strategic locations like the Customs Department, Immigration Department etc, for ease of data capture and entry. These are serving as databases. Huge data storage is carried out on the Main Frames through transfer from diskettes to tapes.

2. Networking and communication facilities:

There were no network and communication facilities in the Bureau. Data communication involves physical transfer of diskettes, and information dissemination is in the form of hard copies of data and information materials.

3. Softwares: These are mainly statistical packages like SPSS, Lotus, dBase III and IV.

4. Databases: The types of databases developed and maintained include that of Population and Social Statistics, Immigration and Tourism, Agriculture, Commerce and Industry, Education, Custom Tariffs, etc. Some of the information and data are acquired from other national database sources, especially in the form of print materials and diskettes.

5. Users: These are mainly government departments and agencies responsible for planning, policy formulation and project execution. Others include training institutions, research institutes, commercial organizations, trade organizations and individuals.

6. Manpower: There was the problem of staff exit due to better conditions of service elsewhere. Consequently, the Bureau adopted a policy of encouraging their economist, sociologists, statisticians, etc, to be computer-literate through in-house and on-the-job training. There are therefore no specific experts in computers.

7. Back-up and maintenance: Diskettes and tapes copying is employed to safeguard data safety. The systems are operating as stand-alones, so that if there is a breakdown of a system, the disk is switched to another system. There were problems with power supply and alternative sources of power to the systems such as the provision of a generating plant are not in place. Maintenance services were rendered by private computer firms.

Government Central Computer Services Unit

1. Hardware configuration
   - Computer systems

TABLE XX

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
IBM 370/138	MF	1	N/A	N/A	N/A	560MB	*8 Floppy
IBM 43331	MF	1	N/A	N/A	N/A	940MB	*8 Floppy
IBM	Mini	N/A	N/A	N/A	N/A	N/A	
N/A	Pcs	320	80286 80386	N/A	1 - 2 MB	30/80MB	

* **These systems were down.**

Note however, that plans were underway to acquire another main frame to be supplied by TADEM. The machine has a disk capacity of 895MB. Other component parts of the new supplies will include 8 line printers, 3 telecom. sets, 3 tape drives, 5 disk drives, 16 terminals, and 4 Central Processing Units (CPU).

- Printers and scanners: Two printers model IBM 1403 - 1200 lpm and one of IBM 3203 - 1600 lpm are already in place. No information about scanners.

- Others: One UPS is maintained, which gives power back-up for 5-15 minutes. There are 11 tape drives, several terminals, 18 disk drives, 6 diskette readers.

- Operation: The unit operates both MFs, Minis and PCs but one of the MFs is down and also the Minis are also down. The main frames provide storage of huge data and speedy data processing. The PCs and Minis are used as servers, as well as back-up for databases. Most of the PCs are used for data entry and editing, since they are housed in government ministries and parastatals.

2. Networking and communication: Although there are modem/telephone connections with six zonal centres across Kenya, only the one in Mombassa is claimed to be functioning. Thus, the network was not operational.

3. Softwares: The main softwares used include SPSS, Lotus 1233, Wordstar, United Nations (UN) System, system softwares, dBase III and IV.

4. Databases: These include information database on salaries, employment records, tariffs and trade, migration data, government legislation, etc.

5. Users: Since it is a servicing unit, the users are mainly government ministries and parastatals. Plans are underway to enable the unit undertake commercial services.

6. Manpower: The staff are mainly trained in data entry and editing with few capable of programming and analyzing data. There seems to be limitations too in manpower development for networks, computer science, and software development. The unit maintains three shift mailing arrangement at its headquarters while its employees also handle its systems located in the various ministries and parastatals. The unit provides short training programmes for government officers, and on-the-job training for its staff.

7. Back-up and Maintenance: Tapes and diskettes are duplicated for safe keeping of data. In the event of an MFs breaking down, there are nearby sister agencies possessing identical systems which could be used pending repairs. There is a UPS put in place to give a power back-up for a short period of 5 to 15 minutes.

NIGERIA

National Data Bank (NDB)

1. Hardware configuration

- Computer systems

TABLE XXI

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
NCR 32/8000	Mini	1	3 of Motorolla 68000 series	N/A	3 of 8MB each	5 of 450MB each	8 floppy drive
NCR	PC	1	80486	33MHz	N/A	400MB	1.44MB
NCR	PC	5	80386SX	25MHz	1MB	150MB	1.44MB
NCR	PC	4	80286	12MHz 25MHz	1MB	40MB	1.44 and 1.2MB

- Printers and scanners: The main printer is a line printer series with a speed of 600 lpm. Smaller printers of EPSON LQ 1050 and equivalent are available. There is no information on scanners.

- Others: There is a UPS model EPS 2000 which gives a power back-up to the mini-computer system. Also, a stabilizer is cabled to the source of power in order to regulate power fluctuations. Also, there are two tape drives, a data cartridge, and a graphic terminal.

- Operation: There were three platforms consisting of the Tower, Mini and the PCs. The tower contains the main data storage and processing systems linked with the Mini and its server. The PCs constitute an alternative back-up system to the mini set-up. The PCs are stand-alones, except the one serving as administrator's workstation. Data gathering is through inputs from the contact persons in government ministries and agencies followed by verification and editing before entries are made. The main system housed in the tower was not being used to store or process data.

2. Networking and communication facilities:
There were no network or data communication facilities as at the time of the visit.

3. Softwares: The main softwares used include SPSS, Graphics, UNIX, dBase IV, Oracle, PASCAL, PSS, Smart, Wordstar, and in-house developed softwares.

4. Databases: Databases are developed to serve the needs of the productive sectors of the economy, as well as assist policy-making organs with data and information to guide decision-making. The types of databases therefore include those of money and banking, petroleum database for the Nigeria national Petroleum Corporation, (NNPC), manufacturing database for Manufacturers Association of Nigeria (MAN), Price and Pricing indices of commodities and products, Education, Health, National Income and Population Database.

5. Users: The potential users include governments and their agencies, the organized private sector, International organizations and Donor Agencies, the World Bank and International Monetary Fund.

6. Manpower: There is a visiting consultant assisting in the setting-up of the equipment, one project officer, two programmers, one Data base Administrator, ten Data Entry operators, and six Word processing staff.

7. Back-up and maintenance. Tape and diskette copying and storage on different platforms assist in data safety and management. There are UPS to give power back-up to the systems. A maintenance arrangement with NCR is in existence.

The South Investment, Trade and Technology Data Exchange Centre (SITTDEC)

1. Hardware configuration

   - Computer systems

TABLE XXII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
IBM compatible	PC	1	80386SX	25MHz	2MB	40MB	1.2/1.44
DEC	Mini Vax 5800	1	RISC based	25MHz	32MB Minimum	N/A	1.2/1.44

- Printers and scanners: There are two printers of EPSON LQ 1050 model. Scanners are yet to be introduced.

- Others: Other facilities include two modems and leased telephone lines to serve as links for communication.

- Operation: The systems are yet to be networked. Data entry is currently the main activity which takes place on the 386 SX system. Plans are underway to acquire a DEC SMP Mini Vat 5800 system to be used as a server, while the existing 386 will serve as a back-up system to the new one. This is in preparation for the commencement of operation as a South Investment, Trade and Technology Data Exchange Centre (SITTDEC) Node.

2. Networking and communication facilities: Some of the communication facilities for network such as modem have been procured, but not yet installed.

3. Softwares: The main softwares include Lotus, dBase IV, SPSS, Oracle and UNIX.

4. Databases: Proposed databases include trade and investment, raw materials, process technologies, country profiles, laws on investment, import and export, incentives and tariffs in the G.15 member countries.

5. Users: The users are industrial and commercial organizations, especially in the G.15 member countries, investors, financial institutions, consultants, researchers and public institutions.

6. Manpower: There is a Computer Manager who is a trained programmer, and one network specialist.

7. Back-up and maintenance: There is a UPS which provides a power back-up. Maintenance arrangements are made with local suppliers of the systems.

Raw Materials Research and Development Council

1. Hardware configuration

Computer systems

TABLE XXIII

MODEL	TYPE	QUANITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
DG-AVION	MINI	1	N/A	25MHz	64MB	3.6GB	1/44 drive
IBM Compatible	PC	1	80386 SX	33MHz	8MB	250MB	1.44/1.2
IBM Compatible	PC	1	8486 SX	33MHz	8MB	240MB	1.4/1.2
IBM Compatible	PC	8	80486 SX	33MHz	4MB	170MB	1.5/1.2
IBM Compatible	PC	7	80386 SX	25MHz	2 MB	120MB	1.4
Tulip (IBM Compatible)	PC-XT	15	8088	4.77MHz	640KB	20MB	360KB
Tulip (IBM Compatible)	PC-AT	10	80286	16 MHz	1MB	80MB	1.2

- Printers and scanners: There are 15 Brother matrix printers, 7 laser printers and 3 scanners. 6 Epson FX-1050, 2 Epson 1170, 5 Scanners, 1 Plotter and 1 QMS Colour Printer.

- Dummy Terminals Pheripheral: Back-up power is provided with the use of 18 KVA Stabilizer (nulec) and UPS (600 VA) to support all the computer systems in case of power failure. There are 10 dummy terminals which are hooked to mini Aviion, 1 Plotter, 5 Data switch as well as 22 of 80486SX or 80386 all of which are hooked to mini Aviion and installed in 22 RMRDC liaison offices throughout the country.

- Operation: Data on raw material endowment, technology, research and development findings and processes are gathered and stored in the Council's Library. These data eventually will be entered into the Computer for easy retrieval. The method of data exchange is through newsletters, publications and upon request.

2. **Networking and communication facilities**

Brief description of RMRDC-NET (Raw Materials Research and Development Council Network).

Local Area Network (LAN)

RMRDC-NET is the Raw Materials Research and Development Council Network. RMRDC-NET links all the computing resources within the Council's headquarters in Abuja. These systems are logically and physically connected by software and cables. The technology used is based on Local Area Network (LAN) using the Thick Ethernet Cable as the backbone. It provides for future expansion as well as reliability, easy management and maintenance.

RMRDC-NET allows any user using a workstation or dummy terminal connected through a NOVEL Netware or XENIX Server to access the main HOST System (DG-UNIX) called the RMRDC-SERVER.

The RMIS resides in the main HOST system and it is developed with an ORACLE which resides in Relational Database Management software.

RMRDC-NET has about 50 nodes and allows for future expansion of the network using different protocols such as IP, IPX, SPX to access servers.

Users can login to the main host (DG/UNIX), XENIX Server and Novell Servers and can do file transfer and share data/resources over the Network.

Wide Area Network (WAN)

Finally, the Council has twenty six (26) computer systems in her Liaison Offices in the Country. Plans are on the way to link al the States Liaison Offices and some identified institutions and other research centres in the coming financial year (1996).

3. Softwares: The operating software are UNIX, ZENIX, NOVELL NETWARE, MSDOS, PASCAL, C, FORTRAN, COBOL, Dbase IV and Foxbase. In addition, ORACLE is the RDBMS used to develop and maintain the database on the server. Several other databases exist such as WORD PERFECT 5.1, LOTUS 123, FOXBASE, VENTURA/PAGEMAKER, AUTO CAD, CD ISIS, SPSS, ACCESS, HARVARD GRAPHICS, EXCEL, etc.

4. Databases: The main database is Raw Materials Information System (RMIS). RMIS is developed with ORACLE relational database on UNIX as the underlying operating system. Other applications designed and developed include Project Management Information System (PMIS), Personnel Information System (PIS), Payroll systems, General Ledger, Inventory Control and Cash book Management systems.

5. Users: The main-users are entrepreneurs, managers of industry who wish to avail themselves of research findings on raw materials that are required in their industry.

6. Manpower: There are four programmers, over twenty-one data-entry staff, four Librarians and four data analysts.

7. Back-up and Maintenance: Back-up are mainly done with cartridge, tapes, diskettes as well as back-up server. The in-house staff with a computer outfit support all the hardware and software maintenance in the Council's headquarter and her liaison offices.

National Population Commission (NPC)

1. Hardware configurations

- Computer systems

TABLE XXIV

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
NCR	PC	40	80386SX	16MHz	N/A	40MB upwards	1.44/1.2MB
DEC Vat 6000-510	Mini Vax	1	RISC based	25MHz	25MB min.	N/A	1.2/.44MB

- Printers and scanners: There are four HP Laserjet IIIsi printers and two other DEC lasers. In addition, there are line printers with fast output and four scanners for cartographic work.

- Others: (UPS, etc): There are ample power back-ups facility which include adequate UPS and a power generating set.

- Operation: Population and demographic data are gathered by enumerators from all over Nigeria and are entered into the micro computer for subsequent transfer onto the micro vax system for analysis and printing. In addition to the PC, there are six VT330 terminals hooked to the microvax which facilitate data entry.

2. Networking and communication facilities: There is a wide area network facility provided to link the seven data processing centres of the commission. The use of modems and leased lines would facilitate this arrangement.

3. Softwares: Apart from the operating system which is MS-DOS, the data entry software used is IMPS, which is a UN recommended software for data entry.

4. Database: The databases which are being developed are demographic databases for population and planning.

5. Users: The main users are government and its agencies.

6. Manpower: There are six systems analysts/programmers, five statisticians, one consultant and a systems engineer. In addition, there are several data entry operators numbering over 100, working three shifts per day.

7. Back-up and maintenance: Off-line back-up is on disks and tapes and are kept in fireproof safe both on and off site. There is an in-house engineer who sees to the maintenance on an emergency basis. However, the services of the hardware suppliers is engaged for regular maintenance.

Federal Institute of Industrial Research, Oshodi (FIIRO)

1. Hardware configurations

Computer systems

TABLE XXV

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
IBM Compatible	PC-XT	8	8088	4.77MHz	640KB	20MB	360KB
IBM Compatible	PC-AT	2	80286	8HMz	1MB	20MB	1.2 & 1.44

- Printers and scanners: There are five EPSON LQ850 printers and three EPSON GQ3500 laser printers in use. There are no scanning devices available. At the time of the visit most of the printers had one problem or the other.

- Others: (UPS, etc): For power back-up, there are seven Topax 1Kva UPS available. Only two of them were functioning.

- Operation: Information on technology, research, development efforts and processes are gathered from various sources and from internal research findings and are stored in the computer and also in documents at the institutions library. The method of data exchange is currently through newsletter or other publications and is available upon request to would-be inquirers.

2. Networking and communication facilities: All the micro computers currently work as stand-alone equipment, although there has been an attempt in the past to connect them in a LAN. There has been a modem connection to provide access to international databases but all these have broken down. Some assistance is being expected from UNDP to revitalize these equipment.

3. Softwares: The operating software is mainly MS-DOS although past attempts have been made to use a network operating system to link the PC. These are no longer in use. Other softwares are dbase, desktop publishing software, CDS-ISIS, Lotus, Wordstar, Cobol.

4. Databases: The databases currently maintained by the institution include STEP (Scientific, Technological and Economic Publications), CASE (Current Awareness Service on Economy) PAIR (Patent Information Retrieval) PIPE (Products and Industry Profiles) CAPSTA (Colorants, Additives and Preservatives), DADNTC (Data on Available Nigerian Technology).

5. Users: The main-users of FIIRO databases are entrepreneurs, management staff, engineers, technologists, researchers as well as institutions who need industrial information.

6. Manpower: There are two computer analysts and four information scientists/programmers. In addition, there are other data entry operators and one computer engineer.

7. Back-up and maintenance: Data back-up is mainly on diskettes. There are no tape back-up facilities. Some hardware maintenance is performed by the computer engineer although the institute relies on the services of external computer vendors for hardware maintenance.

Centre International du Commerce Exterieur du Senegal (CICES)

1. Hardware configurations
   - Computer systems

TABLE XXVI

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
Silicon Valley	PC	3	80386	20MHz	2MB	80MB	1.44 & 1.2MB
Clone	PC	1	80286	10MHz	640KB	40MB	1.2 & 1.2MB
Doll	PC	1	80386	20MHz	2MB	80MB	1.2 & 1.4MB
IBM/PS/250	PC	4	80286	10MHz	640KB	30MB	1.44MB
IBM XT	PC	1	8088	4.77MHz	640KB	20MB	360KB

- Printers and scanners: There are four printers of EPSON FX 1050 model. There are no information available on scanners.

- Others: Power back-up is provided with four American Power Conversion UPS attached to those PC that obviously need them.

- Operation: Information on trade and investment opportunities are gathered through questionnaire method, and then entered into the computer system. The method of data exchange with other regional-focal points is through diskettes.

2. Network and communication: Most of the systems are operating on a stand-alone basis. Four PC are hooked together with Novell Netware in a LAN environment. This network is based in the finance department and used only to share data. There are no communication facilities put in place to enhance networking. There are however, plans to pursue this in the future, when the new projects take off.

3. Softwares: These include SPSS, Lotus, dBase III and IV and other adopted softwares modified for specific tasks, such as accounting, etc.

4. Databases: These include Trade and Investment opportunities database which provides information on products, tariffs, supply and demands, prices, inflation, etc. and Bibliographic and Publication Database which provides information on published works, books, journals, bulletins etc.

5. Users: The main users are commerce and industry organizations, export and import companies, government agencies, international organizations, research organizations and individuals.

6. Manpower: There is one informatics officer, four data entry operators and some other temporary data clerks.

7. Back-up and Maintenance: No information was provided on this.

Institut de Technologie Alimentaire (ITA)

1. Hardware configurations
   - Computer systems

TABLE XXVII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED	RAM	HARD DISK	FLOPPY DISK
Quinax	PC	1	80286	10MHz	640KB	90MB	1.2 & 1.44
IBM P8 2	PC	1	80286	10MHz	640KB	30MB	1.44
Ogivar	PC	1	80386SX	25MHz	4MB	100MB	1.2 & 1.44

- Printers and scanners: There are three printers of EPSON LQ 1050 model, each attached to a system. There are no information available on scanners.

- Others: Power back-up is provided to each of the system by a 600va UPS.

- Operations: The systems are used mainly for data storage and word processing. The institute has a modem which enables it to access international databases such as Telesystem of France and CRAT of Senegal, however, the modem connection was not functional at the time of the visit. There are plans through assistance of a Canadian Institute to acquire 4 additional systems to facilitate the use of the LAN project.

2. Networking and communication facilities: Although, the three systems housed in the Institute are not connected, the bibliographic database system can access information from Telesystem (France) and CRAT in Senegal using telephones and modem. There are plans to expand the network capability of the Institute. There are no facilities for E-mail services.

3. Softwares: The softwares include the UNIDO supplied library information system software, CDS/ISIS, Windows, dBase softwares, Lotus and Excel - CB.

4. Databases: The databases currently maintained by ITA are mainly scientific research database and bibliographic database on technology application.

5. Users: The main users are researchers, consultants, industries, international agencies and private individuals.

6. Manpower: There are two science-based information scientists and audio-visual experts. Some other project staff are involved in data entry and retrieval.

7. Back-up and maintenance: Back-up are usually stored in diskettes, as there are no tape back-up facilities. There are no adequate provisions for in-house maintenance. The systems are maintained through private firms.

African Regional Centre for Technology (ARCT)

1. Hardware configurations

   - Computer systems

TABLE XXVIII

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED (MHz)	RAM	HARD DISK	FLOPPY DISK
Austin	PC	2	80386	33	4MB	100MB	1.2 & 1.44
Zeos	PC	3	80386SX	20	1MB	40MB	1.2 & 1.44
Infogold	PC	4	80286	10	640KB	40MB	1.2 & 1.44
Microway	PC	1	8088	4.77	640KB	20MB	1.2 & 1.44
Infogold	Server	1	80386	33	4MB	200MB	1.2 & 1.44

- Printers and scanners: There are three Panasonic KX P1180, some EPSON printers and a Laserjet IID printer. There are two scanners, one of them with color capabilities.

- Others: Power back-up is provided by six 600VA UPS, and two Micropac SX500/Sx100 UPS connected to micro computers that require them.

- Operations: A Zeos 386SX houses the databases, another 386SX server has two workstations connected to it. Ten additional stand-alone systems are used for training.

2. Networking and communication facilities: The centre can assess UNIDO - Vienna through Electronic mail (E-mail), and links with other organizations, in Europe, Africa, and America through Packet switching SENPAC lines. The organization being a regional centre for technology in Africa is a focal point where all other centres such as KIRDI of Kenya, FIIRO of Nigeria, etc., are expected to have computer and data communication links. They have a mandate to develop a network between these centres in Africa.

Currently, communication remains largely through diskettes and hard copies. Plans to up-grade the network and communication capabilities are already at an advanced stage, with the assistance of UNDP.

3. Softwares: These consist mainly of wordperfect, CDS/ISIS Quattro, dBase IV and Lotus. Others include UNIDO developed softwares, and in-house developed softwares for management uses.

4. Databases: The centre has databases on regional information on technology application, and food technology research. The databases provide information on energy research, food technology, directory of researchers and scientists in Africa, directory of research and development organization in Africa, etc.

5. Users: The potential users of Information disseminated by ARCT are consultants, students, researchers and international organizations.

6. Manpower: There is a systems analyst and two information analysts. They are assisted by project staff numbering about twenty-seven.

7. Back-up and maintenance: Data back-up is possible through the use of tapes which exist on the system configuration. The local maintenance arrangement is considered satisfactory.

Societe Nationale D'Etudes et de Promotion Industrielle (SONEPI)

1. Hardware configurations
   - Computer systems

TABLE XXIX

MODEL	TYPE	QUANTITY	PROCESSOR	SPEED (MHz)	RAM	HARD DISK	FLOPPY DISK (MB)
HP	Database server	1	80486	33	32MB	667MB	1.2 & 1.44
Clone	Network serer	1	80386	33	8MB	200MB	1.2 & 1.44
Clone	PC	8	80386	25	4MB	80MB	1.2 & 1.44

- Printers and scanners: There is one HP Laserjet II Printer and two EPSON LQ-1050 printers. In addition, there is also one optical OCR for scanning maps, diagrams etc.

- Others: There are integrated power back-up stabilizer facilities available to sustain power in the server.

- Operations: A database server HP9000/17 is connected to HUB 10B which feeds the workstation systems. Through ports, the database server is linked to the network server to access other databases in the network using TCP/IP software, modem and X.25 arrangement. Users can access the database housed by the database server through PSTN and X.25. The HUB 10B is also linked to the network server to enable local users access data from the network databases in a client/server driven arrangement.

Networking and communication facilities: The modem and all the necessary cabling have just been completed to enable both the WAN and LAN become operational. This will facilitate communication with G.15 member countries. Efforts to subscribe to the Senegalese telecommunication company (SENPAC) to acquire telephones lines including the X.25 are currently underway. This will also give way to voice-Fax and E-mail services to be introduced in the near future, as these form part of the short-term plans of the institution. At present, data exchange is carried out through diskettes, and data collection through questionnaire.

Softwares: The application and operating softwares include Topic Database Builder (4 user lincense), Topic Database Access (4 user licence), Topic Retrieval chart for HP, OPICQL for DOS (4 units), Image Viewer (4 units), Lotus POSP, CDS/ISIS and Statistical Analysis System. Others include Banyon Views, Banyon Mail, PC Print, PC-CP with Routing, Asyne PC Dialing, Network and Intruder Management. The Institution uses a D-Base IV programming language.

Databases: The databases include that of raw materials and their sources, producers and users as well as feasibility studies, technologies, patents, potential project promoters. Through a wide area network, it is planned that SONEPI would be linked to other databases especially in the G.15 member countries.

Users: The target users are entrepreneurs, business and commercial organizations, government agencies, manufacturers, financial institutions, research organizations and consultants (foreign and local).

Manpower: The staff strength include a visiting consultant from SITTDEC headquarters (who was there to assist in the installation of computer and communication facilities over a period of one month), one computer manager for the SITTDEC programme, (also the information specialist), a system analyst, an industrial engineer, and a statistician.

Back-up and maintenance: The HP 9000/817 system has an inbuilt battery that gives power back-up for about 15 minutes. Data safety back-up is also provided by SITTDEC headquarters where data from all the focal points are copied in diskettes and transferred onto tapes for storage and retrieval. Maintenance works are carried out by computer firms who are also the suppliers of the systems.

1. Service Commerciale de la Direction du Commerce

Table XXX

Model	Type	Quantity	Processor	Speed	Ram	Hard Disk	Floppy	Co-processor
Datas	Micro	1	8086	25 MHz	4MB	150 MB	1.2 & 1.44	

- **Printers and Scanners:** There is one HP Laserjet III printer. No scanner is available.

- **Others**: There is a UPS which supports the system power with back-up for about 20 minutes duration. There is a MINITEL telefax connected to two terminals that facilitates communication with other databases.

- **Operation:** The system serves as a file server, as well as a worstation. Data gathering is largely through questionnaire, but diskette exchange with international and local agencies facilitate the build-up of databases. The system is connected to other databases in France and Senegal, especially with chambers of commerce and Trade Information outfits. Plans are underway for the system to be linked with ITC Geneva through assistance of the Swiss Government.

2. **Networking and Communication facilities:** through leased telephone lines and modem the institution is networked to trade and commercial organization within and outside Senegal. Its on-line SENEPAC connection links it with MINITEL in France which opens another gateway to other international databases. Besides, there are exchanges of diskettes with other inforamtion centres, especially inthe Francophone countries, at interval of about two weeks. Plans are underway to expand the network communication to include the ITC, Geneva.

3. **Software**: These include dBases IV programming software, CDS/ISIS and UNCTAD Trade Analysis System, Lotus and SPSS software, COMM/ICC, MNS and Communication software.

4. **Databases:** The databases maintained by the institution included that of bibliographic database on trade and commerce, legislations and documentations on trade since the colonial period in Segenal, as well as international trade laws, trade analysis and information, and exchange/Banque Centrale de l'Afrique de l'Puest (BCEAO) trade matters. It has network communications with other local and international databases.

5. **Users:** The main beneficiaries include industrial organisations, chambers of commerce and commercial enterprises, investors and financial institution, both foreign and local, including the BCEAO member countries.

6. **Manpower:** There was a trained documentalist in-charge of the system and formerly assisted by an economist and a data-entry operator. There were plans to re-engage the two assistants.

7. **Back-up and Maintenance:** Data back-up is mainly through diskettes which are kept at several locations. Power back-up is provided through a UPS lasting about 20 minutes. Maintenance is through contract arrangement with the suppliers of the system.

INSTITUTIONAL CAPABILITES

Taking cognisance of the set-up in international information centres, institutions visited were ranked on a set of criteria, their weighting and point scoring as shown in Table XXXI:

Table XXXI **Description of Criteria and Point Scoring**

S/N	CRITERIA	MAIN CHARACTERISTICS/ PARAMETERS	WEIGHTING OVER 100
1.	Hardware	Basic hardware equipment and configurations, hardware capabilities, network and communication facilities, E-mail facilities, back-up and maintenance, printing and scanning facilities, etc.	30
2.	Software	Types of software used, compatibility and software development capability.	15

3.	Communication capabilities, Manpower and Organiasational set-up	Basic manpower capacity and capability, organisational set-up, training and development, data capture ability, and state-of-the-art informatics technology applications, service conditions and other job incentives.	35
4.	Upgradeability and Expandability	Minimum requirement in terms of facilities and manpower to facilitate upgrading and expansion of the centres.	10
5.	General	Mandate of the institution, general performance and level of preparedness to face challenges/task, general conditions of services staff motivation and working relation; types of projects/programmes executed and or currently executing, etc, level of coordination and strategies for planning and implementation of projects/programmes.	10

THE SCORING

On the basis of the above guidelines/parametres, the institutions in each of the countries were scored, as in Table XXXII.

Table XXXII **INSTITUTIONAL CAPABILITIES**

Country Institutions	Hardware (30)	Software (15)	Manpower (35)	Upgradeability/ Expandability (10)	General Relevance (10)	Total (100)	Position
EGYPT							
i. IDBC	24.7	13.3	28.7	9.0	7.3	83.0	1st
ii. ENSTINET	22.0	11.3	25.3	7.3	7.3	73.6	2nd
iii. GEOLOGICAL SURVEY	16.0	8.0	20.3	5.3	5.7	55.3	4th
iv. MIN. OF INDUSTRY	20.0	8.7	21.0	6.0	6.0	61.7	3rd
KENYA							
i. KETA	13.7	6.3	19.3	5.3	5.7	50.3	3rd
ii. IND. REGISTRATION	13.7	7.3	19.3	5.3	5.7	51.3	2nd
iii. KIRDI	14.7	6.3	19.3	6.3	7.0	53.6	1st
iv. STATISTICS(KBS)	13.3	5.3	20.0	2.7	3.7	45.0	4th
NIGERIA							
i. NATIONAL DATA BANK	18.0	8.0	19.0	6.7	6.3	58.0	2nd
ii. SITTDEC	13.0	6.0	16.5	5.0	7.0	47.5	5th
iii. FIIRO	14.0	6.7	19.3	5.3	6.3	57.3	3rd
iv. RMRDC	18.7	9.0	23.7	7.0	8.0	66.7	1st
v. NATIONAL POPULATION COMMISSION	19.7	6.0	22.0	6.3	3.3	57.3	3rd
SENRGAL							
i CICES	14.3	6.0	15.0	3.7	4.7	43.7	4th
ii CRAT	18.3	9.0	21.0	5.7	6.3	60.9	2nd
iii ITA	13.0	5.0	14.0	3.0	6.3	41.3	5th
iv SONEPI	21.0	10.7	23.3	7.0	6.7	68.7	1st
v COMMERCE	17.0	8.3	18.7	5.3	6.0	53.3	3rd

EGYPT

The high scores recorded by all the four institutions in Egypt show a general commitment to the development of facilities for information gathering and dissemination. Two of the institutions, IDSC and ENSTINET have demonstrated high capabilities to house the North African Sub-regional Centre. However, IDSC has greater strength in hardware, software and manpower, and as such has been scored highest.

KENYA

The level of scores by institutions in Kenya is generally low. The major limitations are in the hardware facilities and manpower capability. Nevertheless, KIRDI, has emerged as the highest scoring institution based on better hardware facilities, upgradeability and general relevance to raw materials inforamtion management. It therefore, qualifies to house the East African Sub-regional Centre.

NIGERIA

There is a close pattern of scoring of the institutions visited. Although the general performance is on the average, RMRDC qualifies to house the West African Sub-regional Centre for English speaking countries based on its higher scores in software, manpower, upgradeability of facilities and general relevance to raw materials information management

SENEGAL

The total scores by each of the five institutions assessed in Senegal shows a marked difference. The major limitations are mainly in hardware and network communication, as well as the upgradeability and expandability of the facilities. Two of the institutions namely CRAT and SONEPI have the highest points, based on their hardware and manpower capabilities. SONEPI scoring highest among all the institutions was found to be the most suitable to house the sub-regional centre for the francophone countries

CONCLUSION

The results of the evaluation of the institutions visited as earlier discussed show that the four sub-regional centres for the RMIS should be located as follows:

i.	North Africa	-	IDSC in Egypt
ii.	East African	-	KIRDI in Kenya
iii.	West African	-	RMRDC in Nigeria
iv.	Francophone	-	SONEPI in Senegal

Although the four institutions that have qualified to house the centres, emerged from a long process of assessment, two more centres could still be established within the region to effectively reach out to all members of the G.77. In this regard, two centres to be located in Central and Southern Africa should be considered.

CHAPTER FOUR

STRUCTURE OF THE PROPOSED RAW MATERIALS INFORMATION SYSTEM (RMIS)

Mission Statement

In order to provide a clear grade to the successful implementation of the RMIS, a mission statement has been formulated thus:

TO FOSTER AND PROMOTE INFORMTION ON RAW MATERIALS BY PROVIDING RELEVANT, AUTHORITATIVE AND ACCESSIBLE INFORMATION TO GOVERNMENTS, ORGANIZATIONS, CORPORATIONS AND INDIVIDUALS OF THE G.77 NATIONS WITH A VIEW TO STRENGTHENING NATIONAL CAPABILITIES FOR PLANNING, INVESTMENT PROMOTION AND ATTAINMENT OF SELF RELIANCE.

RANGE OF SERVICES FOR THE RAW MATERIAL INFORMATION SYSTEM (RMIS)

In pursuance of its mandates, the RMIS will be an information services centre for member countries. The service coverge would be from the initiation of an enquiry to the successful completion of the process. Inits simplest form, it may be the initiation of an enquiry like an NFP to find out the top twenty raw material produced among several countries. This would be sent to RMIS through any of its information service centres where the databases would be searched and a rsponse sent back to the initiating NFP. This constitutes the process of initiating and completing the transaction.

The RMIS would be providing its services in two modes, namely off-line and on-line services. During the first two - three years, most of the services would be provided off-line where users would not be directly connected to the dearth of expertise and experience for searching on-line databases, and the distance between member countries. The language to be employed in undertaking these searches may be easy to learn, but the techniques of making efficient and authoritative searches would take time to learn. During the early stages of learning, a searcher may be on-line for hours but may not get anything significant at the NFP's operations.

To overcome this difficulty, enquires would initially be operatot-assisted under which the NFP's would be making enquiries in the natural language to the RMIS headquarters by electronic mail (E-mail), telex or facsimile. The responses to these queries would then be sent to the NFP's electronically (by E-mail), or by other means.

At a later stage, subsets of the databases may be sent to NFP's on CD-ROMs to allow for local searches to be made. This would reduce costs and make the information readily available at the local environment. Where the National Focal Points already have the telecommunication infrastructure in

place, the NFPs may opt to connect direct to the RMIS central computer systems at the regional centre or to the nearest sub-regional centre. In this situation query language being used for searching the databases would be taught to the NFP staff to allow them interface directly with the RMIS databases. In addition, computer-assisted learning tools would be provided to allow the NFP's teach their employees.

THE PROPOSED STRUCTURE

In developing a dynamic information system, it is imperative to carefully decide the approach to adopt. After the first assessment mission, it became clear that a distributed data processing approach should be adopted in order to ensure the success of the project. In this approach rather than concentrate all the information processing in one regional centre, where all the demand of the region would be met, a three tier structure to serve the needs of the region is proposed as follows:

i. Regional Coordinating Centre (RCC)
ii. Sub-Regional Centre (SRC)
iii. National Focal Points (NFP)

The three tiers which are expected to maintain interdependent relationships would function to provide relevant infroamtion to countries, institutions and individuals in their respective areas of coverage.

Relationship with the Network

The RMIS is being established to provide services to potential users of information on raw materials development and utilization. The fulfilment of this role would be fostered if the potential users are sufficiently aware and sensitive to the existance of the facilities available and could access such information as and when required. It is necessary therefore, to determine the roles of each of the centres as follows:

The roles of the Regional Coordinating Centre

The major roles of the coordinating centre are to:

- receive updates from all sub-regional centres, serving as reservior for all data in Africa;
- establish access and links to all major information hubs of the world e.g New York, UN/US agencies; Vienna/Paris (Europe), Malaysia/Delhi/Tokyo (Asia/Far East), Colombia (Latin America) and other agencies around the world;
- make data avialable to the sub-regional centres in terms of training, technology support on hardware, software and data gathering especially at inception;
- stimulate interest and growth within the sub-regional centres in the use of data;

- disseminate information within the network through seminars and workshops, publications, etc with a view to educating potential users;
- act as a back-up centre to other sub-regional centres;
- provide voice/fax service as an altenative for data transfer; and
- act as a catalyst for the identification, planning and promotion of projects in member countries by providing
  advisory services that are consistent with the objectives of the RMIS.

The roles of the Sub-regional Centres

The major roles of the sub-regional centres are to:

- liaise with identified national focal points in each member state within the sub-region;
- developed the culture for information gathering, storage and dissemination.
- advise member states regularly on the need for data gathering and dissemination;
- liaise with the coordinating centre to set up plans and programme,· aimed at facilitating data gathering and
  dissemination;
- solicit the cooperation of government of member states in this regard;
- receive updates from all national focal points and serve as reservoirs for data in the sub-region;
- transmit relevant data to the coordinating center regularly;
- mainain unbroken access and link with both the coordinating centre and all NFPs;
- provide support to the NFP in the areas of training, technical support on hardware, software, data gathering;
- stimulate interest in the use of data and disseminate information by conducting seminars and workshops
  with a view to educating potential users;
- act as a back-up centre to other sub-regional centres, and
- provide voice/fax service as an alternative for data transfer.

The roles of the National Focal Points (NFPs)

The major roles of the NFP are to:

- identify potential sources of information on raw materials;
- maintian an unbroken link with the sub-regional centres in order to fecilitate data transmission;
- gather data nationally to feed the sub-regional centres;
- undertake updating of information on a regular basis;

- draw action plans to ensure the smooth running of the information network; such plan would include
  training and technical support on hardware, software and data gathering especially at set-up time and
  delegate such functions to be sub-regional centre if need be and whenever practicable;
- solicit the cooperation of the government, its agencies and other bodies, such as the chambers of commerce
  and industry and various business and trade associations for data gathering;
- provide information for national requirements (Annex V);
- stimulate national interest in the use of data, and publicize available information through seminars and
  workshops;
- provide back-up services to neighouring NFPs, and
- provide voice/fax service as an alternative for data transfer.

ORGANIZATION, STRUCTURE AND MANAGEMENT OF THE INFORMATION NETWORK

To ensure the smooth operation of the RMIS, it is important to define the structural framework under which the centres would operate. The report proposes two scenarios on staffing of the centres and their corresponding organograms as shown in tables XXXIII and XXXIV and figures 2,3 and 4.

Scenario 1 considers an ideal staff strength for the centres while scenario 2 presents the minimum staff required to keep the centres functioning.

The staff requirement, qualification and functions are stated to guide staff selection and recruitment. The lines of reporting are well defined to facilitate administrative effectiveness, remove areas of conflict and to promote the overall objective of the project.

RECRUITMENT AND TRANING REQUIREMENTS

The manpower requirements at the various levels are contained in Table XXXIII and XXXIV. In view of the fact that the proposed centres would be housed in existing outfits, it is envisaged that some existing staff would be re-assigned to work at the proposed information centres at all levels. The advantages of doing this is that the operation of the centre would take off immediately. In all cases, the staff being deployed must have the minimum prerequisite qualification for the position. The rest of the positions would then be filled through fresh recruitment exercise. Furthermore, it is necessary to provide separate office accommodation for the designated information centres at all levels. Similarly, staff who may have been re-assigned to work in the new centres should be totally free from their previous duties and reporting lines of responsibilities. In this way, unnessary friction would be totally removed. It must be borne in mind that the success of locating the information centres in existing outfits would depend on

cooperation and mutual adjustments. Efforts must be made at the onset to ensure cooperation of all parties, otherwise the project may be adversely affected.

TRAINING

It would be expected that the positions of the computer operators, data control clerks, etc be filled from within the existing outfits that would hist the centres. Further training would be required and arranged for staff at the sub-regional or coordinating centre level. It is not just enough to recruit good staff; proper training that is production-oriented is desirable. It would therefore be expected that the consultant who would serve as the head of the project would ensure that his staff are properly exposed during the take-off period.

Furthermore, because of the repidly changing nature of the offerings of computer technology, it is important to establish an adequate training centre in each of the sub-regional centres to provide on-going training to the to the NFP's. Each NFP can then avail itself of these training programmes.

The training programme would include aspects such as computer hardware operations and maintenance, application software usage, operating systems, LAN/Metropolitan Area Network (MAN)/WAN including client/server technology, conducting searches and responding to queries, management appreciation courses, etc. The fees to be charged for these courses should be minimal but enough to offset the direct cost of running the training centre(s).

PROPOSED STAFFING REQUIREMENTS OF THE RAW MATERIAL INFORMATION CENTRES

Table XXXIII

S/N	DESIGNATION	REGIONAL COORDINING CENTRE	SUB-REGIONAL CENTRES	NATIONAL FOCAL POINT
1.	Director	1	-	-
2.	Consultant	1	-	-
3.	Deputy Director	1	-	-
4.	Asst. Director	3	3	-
5.	Chief Programming Officer	-*	3	1
6.	Training Officer	1	3	
7.	Programming Officer	-	6**	1
8.	Analyst/Programmer	3	3	1
9.	Documentalist/Inform. Scientist/ Librarian	1	5	-
10.	Admin. Officers	2	6	-
11.	Finance Officers	2	6	
12.	Data Entry Operator	4	6	
13.	Other Support Staff	4	6	2
14.	Maintenance	1	3	1

* On fixed contract terms for specific periods

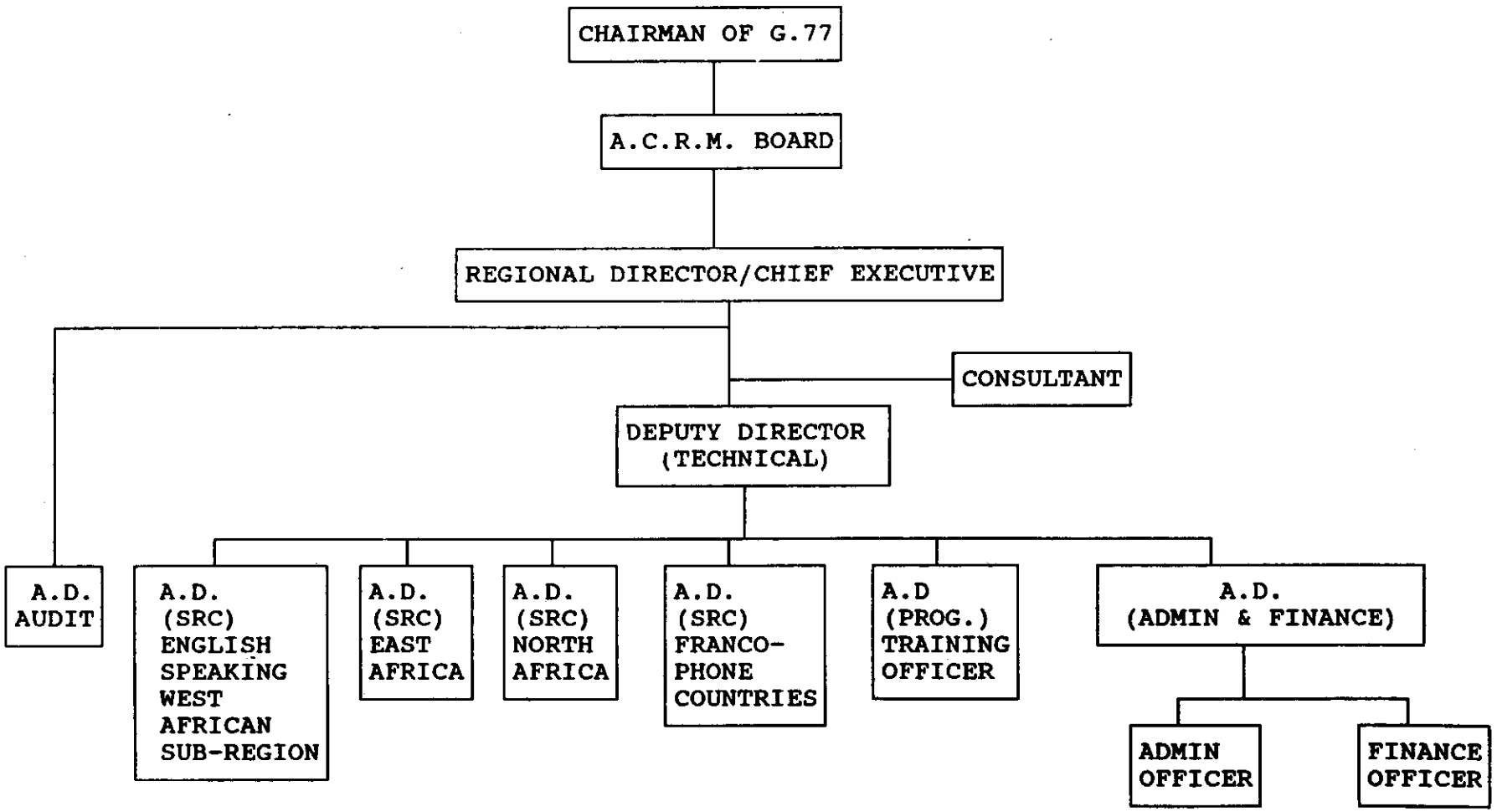
** One officer for a maximum of 10 NFPs. The number of countries (NFP) joining the centre will dictate recruitment of programme officers.

MINIMUM STAFFING REQUIREMENT OF THE RAW MATERIALS INFORMATION CENTRES

TABLE XXXIV

S/N	DESIGNATION	REGIONAL COORDINATING CENTRE	THREE SUB-REGIONAL CENTRES	NATIONAL FOCAL POINT
1.	Coordinator	1	3	1
2.	Consultant	1	3	1
3.	Analyst	5	9	3
4.	Training Officer	1	-	-
5.	Support Staff	1	3	1

PROPOSED ORGANIZATIONAL STRUCTURE OF
REGIONAL COORDINATING CENTRE
(Scenario 1.)



PROPOSED ORGANIZATIONAL STRUCTURE OF THE SUB-REGIONAL CENTRES
(Scenario 1)

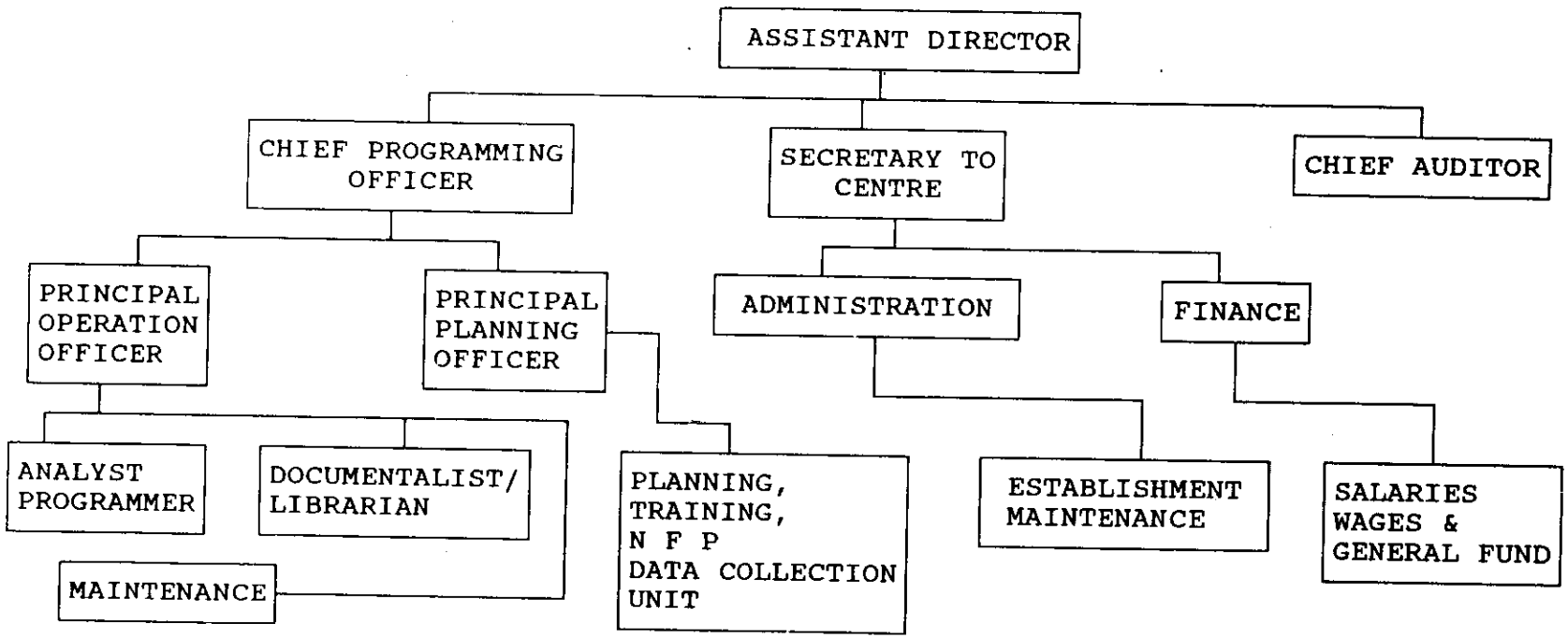
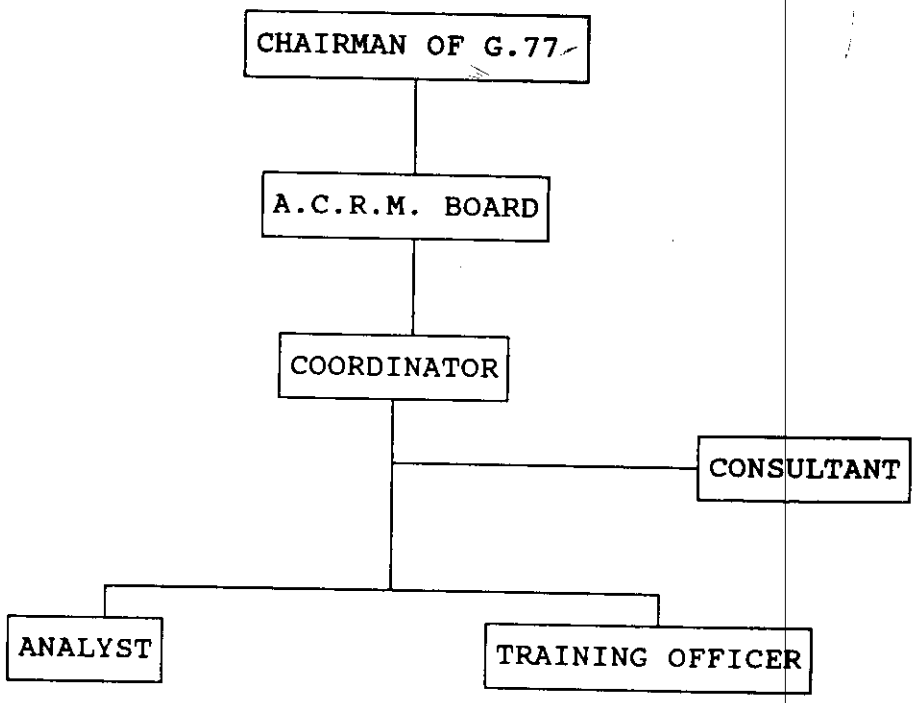


Fig 4: PROPOSED ORGANIZATIONAL STRUCTURE OF THE COORDINATING AND SUB-REGIONAL CENTRES

(Scenario 2)



STAFF FUNCTIONS

REGIONAL DIRECTOR OR COORDINATOR

There shall be a Regional Director who would be the Chief Executive, and responsible for the day-to-day running of the regional centre, as well as coordinating the sub-regional centres. The Regional Director will be answerable to the Chairman of G.77 through the ACRM Board. In this regard, the Regional Director/Coordinator maintains a dotted line of reporting through the ACRM Board to the Chairman of G.77. The ACRM Board will however, vet the performance of the Regional Director/Coordinator. The responsibilities of the Regional Director/Coordinators shall include:

i) formulation of plans and strategies for the organization in line with the objectives of the ACRM in setting up the regional centre;
ii) procurement and installation of the take-off facilities with the assistance of the project consultant and donors;
iii) translation of the mandates of the RMIS into concrete action;
vi) selection and recruitment of staff for the Regional Coordinating and Sub-regional Centres;
v) Setting up of suitable operating environment;
vi) establishing systems and operating standards for meeting the demands of potential users;
vii) stimulating awareness and growth on the use o data from the centres;
viii) development of future requirements based on the perceived need of the current users, and
ix) other matters as may be assigned by the office of the Chairman of the G.77 and the ACRM Board.

DEPUTY DIRECTOR

There shall be a Deputy Director to assist the Regional Director in the performance of his duties. Other functions of the Deputy Director would include:

i) coordination of the sub-regional centres;
ii) supervision of the work of the departments and the sub-regional heads, and
iii) carrying out other duties assigned to him by the Regional Director.

ASSISTANT DIRECTOR, SUB-REGIONAL CENTRE

There shall be an Assistant Director who shall be the overall head of the sub-regional centre. His responsibilities would include:

i) day-to-day running of the centre;
ii) effective linkage with the National Focal Points within the sub-region, and
iii) translation of the mandates of the RMIS into concrete action within the sub-region.

CHIEF PROGRAMME OFFICER (NATIONAL FOCAL POINT)

There shall be a Chief Programme Officer at each National Focal Point who would be responsible for:

i) collection and processing of data on raw materials within the country;
ii) transmission of such data to the appropriate sub-regional centres, and
iii) retrieval and dissemination of relevant data to organizations, individuals, investors, etc within the country.

THE CONSULTANT

In order to facilitate the smooth take-off and continuous running of the proposed centres, a project consultant for each sub-region should be appointed to serve for an initial period of two years to ensure the day-to-day running of the sub-regional centre and direct the needs of the member states within the sub-region. His schedule of duties would include:

i) provision of technical assistance for setting up the system at all levels;
ii) provision of assistance to member states in the art of data gathering, processing and disseminating through seminars, visits, etc.
iii) setting up access levels and assigning passwords and user identities;
iv) identification and training of in-house staff who would be able to take over at the end of his tenure;
v) identification of data back-up sites for sub-regional centres in case of system failure;
vi) identification of requisite and suitable expertise to work in the centres, and
vii) liaising with the chambers of commerce and other relevant bodies in these areas to ensure success.

OTHER STAFF

The skills and expertise of the staff of the centres namely: programme officers, analysts etc, would be required to address the following areas:

i) day-to-day running of the computer system;
ii) resolution of operational faults;
iii) capturing and delivering information on the users, and
iv) other duties assigned to them by the sub-regional heads and the chief programme officer.

After due consideration to staff of the existing outfits who could be employed to work for the RMIS project, all other established positions should be filled by advertisement.

PROPOSED STAFF AND QUALIFICATIONS

Director:

The proposed staff of the Centres and minimum qualification for employment are stated thus:

Qualification: A good first degree in computer science/technology, information science, management science or related disciplines with a minimum of 12 years cognate working experience in an information management organization. A post-graduate qualification will be an added advantage.

Deputy Director:

Same as Director but with 10 years cognate experience.

Consultant:

A good first degree or equivalent in computer technology, electronic engineering, or data processing. He should have a minimum of 15 years cognate experience. A good knowledge of hardwares, softwares, communication networks is very essential. Awareness on current developments in computer and communication technology is very relevant. A post-graduate qualification and evidence of previous consultancy services rendered will be an added advantage.

Assistant Director

A good first degree or equivalent in management sciences, information sciences, operational research, statistics, computer science or related disciplines with a minimum of 10 years cognate experience.

Programming Officer

A good first degree or equivalent in information science, computer science/technology or any other related discipline. He should have a minimum of 7 years cognate experience in similar projects.

Analyst/Programmer

A good first degree or Higher National Diploma in computer science, information system or network with a minimum of 3 years working experience in a similar organization.

Documentalist/Librarian

A good first degree or equivalent in information science, library science or management information system or any other related discipline with at least 2 years working experience in a similar project.

Data Entry Operators:

A first degree or equivalent in computer science, management science, operational research, statistics or any other related discipline with 1 - 2 years working experience.

Training Officer

A good first degree or equivalent in computer science, networks, communications or any other related field. He should have five years of training experience in the relevant fields and be capable of matching ideas of both computers, communications, electronics and general information technology. Ability to demonstrate practical ideals through applications will be necessary.

SCHEME OF SERVICE FOR THE RMIS

It is proposed that the RMIS should maintain a separate scheme of service in which very clear criteria and guidelines are provided for staffing and remuneration.

In view of the proposal to house the various centres in an existing outfit, the staffing should be clearly separated in order to provide for adequate responsibilities, avoid conflict, and for the objectives of the RMIS to be realized. In this respect, staff movement to the RMIS project would be allowed, on secondment basis for a maximum period of four years renewable after the first two years, after which such staff would be allowed to decide on retaining their services permanently with the RMIS project or otherwise. Also, staff salaries and allowances should be consistent with what obtains in similar UN agencies or regional information centres. For the consultant to the RMIS, his appointment shall be on contract basis for a maximum period of four years renewable after the first two years.

Lines of Reporting

The lines of reporting are as stipulated in the organogram provided in figures 2, 3 and/or 4. It is imperative to stipulate some guidelines for the day-to-day running of the centre to ensure that the objectives of setting it up are realized. At the regional level, the Director is the Chief Executive Officer who is answerable to the Chairman of the G.77 through the ACRM Board on matters of policy and accountability. A Deputy Director would assist him in the discharge of his responsibilities as provided in Figure 2. The Deputy Director will have direct supervisory roles over the sub-regional centres.

The Consultant to the RMIS is also answerable to the Chairman of the G.77 through the ACRM Secretariat only on specific projects for which he is mandated. The Director and Consultant are to work closely as their roles are complementary.

The sub-regional centres will be headed by Assistant Directors, who will act as Chief Executives of the sub-regional centres and have full responsibilities for the daily running of the centres. They will report to the Deputy Director at the headquarters.

RMIS CONCEPTUAL FRAMEWORK

The RMIS which will be similar conceptually to some international information outfits and will comprise of three basic elements, namely: the database storing the information, the application systems and technology platform used to deliver the services.

The database comprises two distinct groups, the textual and free-format database, and the numerical and transaction based Database Management System (DBMS). The free-format, textual database would be stored in native format (i.e. in ASCII or word processor formats) and would be searched using key words, Boolean operators, or concept sensitive queries. Documents obtained from these searches would be sent to the NFP concerned if proven to be significant. The numerical and transaction-based DBMS would be stored and processed using a suitable statistical package such as SAS in SPSS.

COMPUTER SYSTEMS AND THE NETWORK

The Regional Coordinating Centre computer system will be based on a local area network (LAN) and follows the Open System Interconnect (OSI) standards. This is important as the systems have to survive the very rapid changes taking place in information technology today. In addition, the centre will be using client/server technology by which the main system will be handling the storage and management of data and the personal computers (PC) connected to the network performing all the search processes.

This scheme will allow the Regional Coordinating Centre to dramatically increase the volume of information processed without having to resort to installing large mainframes.

Connections to the sub-regional centres and NPFs would be via gateways or dial-up modems. In addition, RMIS would accept queries sent via E-mail, telex, facsimile or through the post. Distribution of information would similarly use all available technologies dependent upon urgency, volume, geographic distance and cost.

Basic Network Configuration

A reliable networking solution is essential as it is the means of communication between the various levels of the information network.

REGIONAL COORDINATING CENTRE

The regional coordinating centre will be equipped with the following minimum hardware and software facilities for smooth operation.

Database server

A UNIX based pentiun with at least 64 megabyte (MB) main memory and as much as 6 gigabyte (GB) of hard disk storage and speed of at least 100MHz and with an adequate tape back-up system, multi-media capabilities, "5.25" and "3.5" drives, super VGA, colour monitor, enhanced keyboard, etc.

Network server

The client-server solution will be implemented using a network communication server of a Pentiun based computer with a minimum of 64 MB RAM memory and 2 gigabytes (2MB) of hard disk storage and speed of at least 100 MHz. It will hold the electronic mail (E-mail), printer sharing and/or voice/fax facilities. The network software should be BANYAN VINES (Virtual Network System) which uses UNIX as a platform for its network operating system. There will also be an intelligent communication card configured to provide gateway for X.25 and synchronous dial-up modem connections with at least 9600BPS.

Workstations

There would be at least 12 PCs of minimum 486/DX4 class with at least 16 megabyte (MB) of main memory. A minimum of 740MB of disk storage and speed of at least 80 MHz used as workstations connected to the network performing all the search processes.

The PCs will have a mixture of French, Arabic and English keyboard orientation to cater for diversity in languages within Africa.

Other Accessories

Other hardware that may be required are CD-ROM reader, full page scanners for text and images, matrix printers and laser printers and multi-medias.

Software

The main application system recommended is the latest version of ORACLE which should have a text and image storage/retrieval system that allows information to be stored in the database as a free format and for easy queries. There is need to obtain a group software license from the manufacturers of all the softwares for multiple site installation so as to reduce cost.

There would be need to purchase other application softwares e.g. spread sheets, statistical analysis, word processor, desktop publishing, window '95, etc.

SUB-REGIONAL CENTRE

The sub-regional centre will be equipped with the following minimum hardware and software facilities:

Database server

A UNIX Pentium based with at least 64 MB RAM, 6MB of disk storage and tape backup and speed of at least 100MHz

Network server

A pentum based computer with 64 MB RAM, 2GM of hard disk. BANYAN vine. with X.25 and dial-up modem (PSTN) Electronic. Mail/Printer sharing capabilities and ICA card for connectivity and multi-media capabilities.

Workstations

8 PCs of 486 DX4 computer with at least 16 MHz memory, 740 MB disk storage and with at least speed of 80MHz.

Others:

Same as in regional coordinating centre.

Software

Same as in regional coordinating centre.

NATIONAL FOCAL POINT

At the NFP, a minimum of two workstation PCs are required of the 486 DX66 Class with 16MB main memory, 740MB of disk storage, for keeping the database.

Depending on the availability of funds and the level or volume of data searches, there may be need to use the workstations as both database and network server, in which case, a dial-up modem or X.25 facility may have to be installed to enable linkage with the sub-regional centre. Alternatively, dada transfer could take the form of movement of data using CD-ROM or diskettes where dial-up/X.25 is not available.

Furthermore, as the volume of data at the NFP get larger, the configuration may then approach that of the sub-regional centre.

Others

Keyboard would be in French, Arabic and English depending on need. Other hardware would include CD-ROM, text and image scanner, printers (lasers and matrix). A suitable UPS and power stabilizer may be required considering the erratic nature of power in Africa.

BASIC NETWORK CONFIGURATION FOR INFORMATION CENTRES

TABLE XXXV

	REGIONAL	SUB-REGIONAL	FOCAL POINT
Database Server	**UNIX based pentium with at least 64 MB RAM of memory, 6 GB of disk storage tape backup. Speed at least 100 MHz**	**UNIX Pentium based with at least 32 MB RAM, 3GB of disk storage and tape backup and speed of at least 100MHz**	2 PC, of 486 DX 66 computer with at least 16 MB memory 740 MB disk storage. Asynch dial-up modem.
Network server	**A pentium based computer with at least 64 MB RAM, at least 100 MHz of speed, 2 GB hard disk BANYAN vines with X.25 and dial-up modem (PSTN) Electronic mail/printer sharing capabilities and ICA card for connectivity and multi-media capabilities.**	**A pentium based computer with 64 MB RAM, 2GM of hard disk. BANYAN vines with X.25 and dial-up modem 9PSTN), Electronic. Mail/Printer sharing capabilities and ICA card for connectivity and multi-media capabilities.**	2 PC, of 486 DX4 with at least 16MB of RAM, speed of 80 MHz, 740MB of hard disk storage, Asynch dial-up modem.
Workstations	12 PCs of 486 DX4 Computer with speed of at least 80 MHz and 740MB of hard disk storage and at least 16 MB RAM of memory	8 PCs of 486 DX4 computer with at least 16 MB memory, 740 MB disk storage and with at least speed of 80MHz.	2 PCs of 486DX4 computer with at least speed of 80MHz, 740MB of disk storage or more. Asynch dial-up modem

Keyboard would be in French, Arabic and English depending on need. Other hardware would include CD-ROM, text and image scanner, printers (lasers and matrix). A suitable UPS and power stabilizer may be required considering the erratic nature of power in Africa.

INFORMATION CAPTURE AND DELIVERY

INFORMATION CAPTURE

For information to be useful, it must have the following attributes:

i) **Subject matter:** The subject matter that information is addressing should be on the availability of raw materials, location, quantity, processing technologies and investments in raw materials conversion.

ii) **Extent of information:** The extent of information stored would depend upon the volume and the advantages of keeping the information in full or in part. For some, such as proprietary information on technology processes, only an abstract of the information shall be kept.

iii) **Value:** The information must be of value to the users. Value is a subjective attribute and what may be valuable to one user may not be of much value to another. Information must be prioritized in terms of its value to most users. However, this does not mean that information that may not be of value to many users would be left out, it would just be further down the queue during the capture process.

iv) **Relevance:** Closely associated with value is the relevance of the information to the user. If the information is relevant to the users, then it would be captured as early as possible.

v) **Location:** The location and the feasibility of capturing information should be critically considered to ensure cost-effectiveness.

vi) **Reliability:** The data has to be reliable in order to ensure confidence and continuous patronage.

vii) **Timeliness:** Timeliness is crucial in response to client demands in order not to render data obsolete, and makes search for information relevant.

ove all, there is need to ensure that the information and the services provided are focussed on the mbers' needs i.e. it must be client-driven.

PES OF DATABASES

Trade Databases: Containing trade opportunities where bids to sell or buy raw materials can be broadcasted. Market information shall include country profile (including risk analysis where available), industry sector analysis, company profiles, and resources and contacts.

ii) **Investment Database:** Containing information on investment opportunities, incentives and invitations to participate in projects, joint-ventures and others. Information on international operations including foreign exchange rates, technical standard abstracts, legislation and regulations summaries, licensing requirements and restrictions, commodity control and prohibition list, customs and excise regulations, abstracts, tariff rates and concessions, trade statistics, etc.

iii) **Technology Databases:** Containing rules and regulations on patent registration, register of technology projects in the G.77 countries, technology for sale, and promoted technologies.

iv) **Industrial inputs Databases:** Could be established showing not only descriptions of the raw materials offered, but electronic photo images of the products (animated if needed).

The extent of information storage would cover full text, abstracts, references, etc. It is envisaged that 70 - 80% of the information stored in databases would be text, i.e. documents such as directory of raw materials, producers and users of raw materials profiles, lists of importers and exporters, etc. The rest of the data would be formatted data such as trade statistics, prices of commodities, etc. Besides storing information in its own databases, RMIS would be arranging to have access agreements with other ACRM information service centres. Each National Focal Point is expected to capture, store and disseminate information on subjects reflected in Annex V.

MODALITIES FOR DATA CAPTURE

Once the value, relevance and feasibility of capturing the information have been decided, information on ownership of the documents becomes important. Initially RMIS would be capturing public domain information i.e., information that is generally available to the public. Thus, questions on privacy and security of data are less important. However, as RMIS starts capturing proprietary information such as details of specific technologies or processes, these questions start to assume great importance.

The other issues to be resolved are the technology mechanisms and the software applications to be used in capturing the data. Often the data is available as published documents. The question then arises whether equipment to scan the documents are available locally, otherwise they would require to be keyed in manually. This has implications on manpower resources, lead times to capture information, equipment costs, maintenance and other factors. Data capture software has to be evaluated to minimize the amount of manpower required and the accuracy of the data captured.

Thus, the physical capture of information will depend on where the information is currently kept. Often, the information is already written in some form of magnetic media such as cassettes tapes, magnetic tapes, diskettes or CD-ROM. In these instances, it is only a matter of posting any of these to the regional coordinating centre for the information to be transferred to its databases. Where the volume of data is small and the geographic distance to the regional centre is short, the data can be transmitted over the

telecommunications network, sometimes after suitable format conversion. Where the information is in printed form, the document will need to be keyed-in manually or scanned. After this process the information can be transmitted or posted to the regional coordinating centre. Where the sub-regional centre and NFP do not have the manpower or the equipment to input the information, the source documents (or copies) may be sent to the regional coordinating centre to be scanned and edited.

PROPOSED IMPLEMENTATION PLAN FOR ESTABLISHING RAW MATERIALS RESEARCH AND DEVELOPMENT INFORMATION SYSTEM

S/N	PERIOD	ACTIVITY	ACTION BY
1.	January, 1996	Submission of feasibility report to the Office of the Chairman of G.77	RMRDC
2.	February - March, 1996	Perusal and Acceptance of report by the Office of the Chairman.	Office of the Chairman of G.77 and RMRDC.
3.	March - April, 1996	Circulation of report to all G.77 countries	RMRDC
4.	April - May, 1996	Sensitization of Donors and Fund mobilization for project.	Office of the Chairman of G.77
5.	May, 1996	Organization of sensitization workshop on proposed project.	RMRDC
6.	June - August, 1996	i) Identification and preparation of office space for the information system; ii) Recruitment of core staff and consultant for the Regional Coordinating Centre.	ARCM Secretariat Office of the Chairman of G.77 and ACRM Secretariat/ Board
7.	September - October, 1996	i) Preparation of detailed 3-year Action Plan; ii) Setting up operational modalities and standards of data collection and dissemination	Staff of the Regional Coordinating Centre & Consultant
8.	November - December, 1996	i) Opening of Tenders; ii) Procurement and Installation of Information management and communication equipment.	Office of the Chairman of G.77, ACRM Secretariat and staff of the Regional Coordinating Centre.

9.	January - February 1997	i) Identification and preparation of office spaces for the sub-regional centre; ii) Recruitment of consultant and staff of sub-regional centres iii) Promotion of Information dissemination services.	Regional Coordinating Centre and Host Country. Office of the Chairman of G.77 and Regional Coordinating Centre Regional Coordinating Centre
10.	March, 1997	Orientation for sub-regional staff members	Regional Coordinating Centre
11.	May - August, 1997	Opening of Tenders; Procurement and Installation of Information Management and Communication equipment	G.77/Regional Coordinating Centre and sub-regional Centre.
12.	September - December, 1997	i) Training of sub-regional staff; ii) Functioning of sub-regional offices; iii) Promotion of information dissemination services;	Regional Coordinating Centre Sub-regional staff + Consultant.
13.	January - February 1998	i) Visits to the NFPs situated within the sub-region. ii) Identification and positioning of NFPs key staff.	Consultant + sub-regional staff and host countries.
14.	March - May 1998	i) Procurement and distribution of information management and communication equipment to NFPs ii) Training of NFP staff;	G.77/Regional Coordinating Centre and Sub-regional staff. Consultant/Sub-regional staff.

15.	June 1998	i)	Full operationalization of the Regional Network.	Regional Coordinating Centre
		ii)	Marketing of Information dissemination services.	Sub-regional centres and National Focal Points.

FINANCIAL PLAN

The financial plan for the Raw Materials Research and Development Information System is designed to ensure efficiency and effectiveness and to enable the system sustain itself after a few years of successful operation.

Proposed Budget

Budget has been proposed, as well as the plans for making the RMIS self-sustaining in future. The budget provides for capital cost for procurement of information hardware facilities, software, provision of suitable office facilities, equipment and training, and recurrent cost for hiring suitable staff, administrative overheads and maintenance.

Equipment Cost

The equipment costs have been computed on the assumption that they would be purchased from a central point and directly from the manufacturer. The figures are based on current price quotations from computer journals. All prices are in US Dollars. See details in Annex VI.

Staff Salaries

Salaries for the national staff and the consultant have been based on the prevailing UN rates to ensure staff commitment.

Revenue Generation

The established information system should be managed in a way that would enable the centres to generate their own revenue in order to complement the money that is being made available for its take off. The ultimate goal is to make the RMIS self-sustaining after the first three years of operation.

The major source of revenue would be through the wide range of information that would be made available to organizations, investors, industrialists, etc, through the National Focal Points. The NFP's in this regard shall be the primary sources of information at the national levels.

To facilitate the fund generation-drive, efforts should be made to encourage the ACRM member countries to identify and set up their respective NFP's that would operate within the RMIS network.

In order to advise on charges for services to be rendered by the centres and augment the revenue accruable to the centres realistically, there may be a need for a short study to be commissioned after the first year of operation of the centres.

DIVERSIFICATION FUND FOR AFRICA'S COMMODITIES: A POSSIBLE SOURCE OF FUNDING THE RMIS PROJECT OF THE GROUP OF 77

The feasibility study proposed was to considered the possibility of creating fund for diversification of Africa's commodity sector. A facility would be established or provision made in an existing financed institution, preferably in an existing regional fund or bank such as the African Development Bank (ADB). This is because ADB has an administrative capacity to reach all the African countries, and also enjoys close links with the World Bank, UNDP, specialized agencies of the United Nations and bilateral donors. ADB also works with both the public and the private sections.

The feasibility of the establishing a diversification fund had made a case for diversification of Africa's production structure and exports. In the first instance, the region relies solely on very few commodities for a large share of its export earnings, thus exposing the countries to increased risks of fluctuation in export earnings. Secondly, the exports of the commodities have been at a standstill and will likely face poorer prospects in future. Thirdly, diversification is an appropriate strategy for transforming the regional economies since it promotes agro-industries and processing of raw materials. This will lead to the development of the tertiary sectors needed for expanded trade (e.g transport, communications, finance and banking).

Diversification in itself involves three dimensions, Firstly, it involves the promotion of vertical diversification such as processing of commodities with a view to adding more value. Secondly, it involves horizontal diversification of production such as introducing new crops or new varieties/qualities of traditional crops. Thirdly, diversification also implies the development of new end-uses of traditional commodities. Additionally, export diversification need not necessarily be for the world market but could be for a regional or sub-regional African market. However, most African Countries have relatively small domestic markets and may likely look more to the external markets, both within the region and outside, for possibilities to diversify.

THE CASE FOR FUNDING

The Action Committee on Raw Materials (ACRM) of the Group of 77 was set-up inter alia to:-

i) formulate appropriate programme of actions and strategies that would enable developing countries to accelerate the processing of their agricultural raw materials, textile, raw materials, non-metallic minerals, ferrous and non-ferrous metals into usable and tradable products WITH VALUE ADDED.

ii) achieve the 25 per cent share in World Industrial output by the year 2000 as stated in the Lima Declaration and Plan of Action.

iii) enhance South-south cooperation in the areas of commodities, marketing and distribution of raw materials in their primary and processed forms in order to improve their terms of trade and ensure increased foreign exchange earnings from transport.

On the other-hand, the Raw Materials Information System, a project executed by the Office of the Chairman of G.77 is expected to strengthen the ACRM with capacity to stimulate the exploitation, development and processing of local raw materials as input to the local industries of member countries and for export through a functional information system. The system will also provide technical, advisory and extension services to industries and prospective investors on local raw materials.

The criteria for selecting the diversification project proposals for financing their pre-investment phase under the United Nations Feasibility of establishment of a Diversification Fund for Africa's Commodities, has the following amongst others:-

- Projects should involve the sustainable diversification of the commodity sector including agriculture, fisheries, forestry and minerals (excluding fuels);

- projects should promote horizontal diversification (into other commodities); vertical diversification into the processing of commodities; or new end-uses;

A careful consideration of the objectives of the ACRM and the terms of Reference of the RMIS indicates that the Raw Materials Information System project falls within the above criteria.

CONCLUSION & RECOMMENDATION

The United Nations General Assembly after having considered the report of the Secretary-General on the need for and feasibility of establishment of a diversification fund for Africa's commodities, along with other reports, adopted some resolutions on this issue. It decided to convene and reconsider the proposal for the fund on the basis of background documents to be prepared by the Secretary-General and intensive consultations with some concerned and interested States, together with relevant financial institutions and some United Nations agencies. They also decided to determine, on the account of the conclusions of those consultations, on the appropriate action to be taken to strengthen support for the diversification of African economies during the resumed forty-eighth session of the General Assembly.

12.0 It is therefore highly recommended that the funds for execution of the RMIS of the Group of 77 be sourced from the diversification fund. Follow-up activities on the development arising from the consideration of the establishment of this fund by the General Assembly should be undertaken. Details on the administration of the funds and other funding arrangements should also be studied.

INDICATIVE BUDGET COVERING DONOR CONTRIBUTION TO THE RAW MATERIALS RESEARCH AND DEVELOPMENT INFORMATION SYSTEM AT THE SUB-REGIONAL LEVEL (IN US DOLLARS)

	PROJECT COMPONENTS	TOTAL	YEAR ONE	YEAR TWO	YEAR THREE
A.	**Salaries of Personnel**				
1	Regional Director	58,240	16,000	19,200	23,040
1	Consultant	108,000	36,000	36,000	36,000
1	Deputy Director	47,026	12,120	14,544	20,362
6	Assistant Directors	258,586	71,040	85,248	102,298
1	Chief Programme Officer	39,196	10,750	12,930	15,516
1	Chief Administrative Officer	39,196	10,750	12,930	15,516
1	Chief Auditor	39,196	10,750	12,930	15,516
4	Principal Officers	146,765	40,320	48,384	58,061
4	Training Officers	146,765	40,320	48,384	58,061
2	Analysts/Programmers	66,976	18,400	22,080	26,496
2	Librarian/Documentalists	66,976	18,400	22,080	26,496
6	Data Entry Operators	47,175	12,960	15,552	18,663
	Total staff Salaries	1,064,097	297,810	350,262	416,025
B.	**Logistics**				
i.	Information Technology Equipment/computer, printers, Communication equipment and Library equipment	2,550,000	350,000	1,400,000	800,000
ii.	Vehicles	160,000	40,000	80,000	40,000
iii.	Office Furniture/Fixtures/ Equipment	120,000	30,000	60,000	30,000
	Estimated Total Assets Cost	2,830,000	420,000	1,540,000	870,000

C.	**Local Training of Staff, Seminars and Workshop**	106,411	29,781	35,027	41,603
D.	**Staff Travel**	75,000	30,000	25,000	20,000
E.	**Administration Support Cost**				
	Stationery/Communications	20,000	5,000	10,000	5,000
	Maintenance of facilities	100,000	10,000	50,000	40,000
	Insurance	100,000	20,000	50,000	30,000
		401,411	94,781	170,027	136,603
F.	**Counterpart Funding to be Supplied by Host Countries**				
	Office Accommodation	500,000	70,000	280,000	150,000
	Electricity, Water, Telephone and related services	40,000	8,000	16,000	16,000
	Other Expenses	200,000	40,000	95,000	65,000
	TOTAL COUNTERPART BUDGET	740,000	118,000	391,000	231,000
	ESTIMATED BUDGET FOR RMIS	5,035,508	930,591	2,451,289	1,653,628

SUMMARY OF BUDGET

It is important to note that proposed budget estimate of $5,035,508 is expected to cover the equipment costs and other expenses of forty-five centres for three years as scheduled below:

Phases	**Budget**	**Centre(s)**
Year One	930,591	Regional Coordinating Centre + one Sub-regional Centre
Year Two	2,451,289	Three Sub-regional Centres + Twenty National focal points (5 NFP per Sub-regional Centre).
Year Three	1,653,628	Twenty National Focal Points (5 NFP per Sub-regional Centre).

The Total for these three years = $5,035,508

INDICATIVE BUDGET COVERING DONOR CONTRIBUTION TO THE RAW MATERIALS RESEARCH AND DEVELOPMENT INFORMATION SYSTEM AT THE SUB-REGIONAL LEVEL (IN US DOLLARS)

The budget on pages 166-167 covers the cost of equipment and other expenses of forty five centres for three years. (For details & clarification, see SUMMARY OF BUDGET on page 167)

PROJECT COMPONENTS	TOTAL	YEAR ONE	YEAR TWO	YEAR THREE
A. Salaries of Personnel				
1 Assistant Director	43,097	12,000	14,097	17,000
1 Consultant	108,000	36,000	36,000	36,000
1 Chief Programme Officer	39,196	10,750	12,930	15,516
1 Chief Administrative Officer	39,196	10,750	12,930	15,516
1 Chief Auditor	39,196	10,750	12,930	15,516
1 Principal Officer	36,691	9,691	12,000	15,000
1 Training Officer	36,691	9,691	12,000	15,000
1 Analyst/Programmer	33,488	9,000	11,488	13,000
1 Librarian/Documentalist	33,488	9,000	11,488	13,000
1 Data Entry Operator	7,863	1,663	2,500	3,700
Total Staff Salaries	**416,906**	**119,295**	**138,363**	**159,248**
B Logistics				
i) Information Technology Equipment/Computer, Printers, Communication Equipment and Library Equipment	1,000,000	500,000	200,000	300,000
ii) Vehicles	60,000	30,000	20,000	10,000
iii) Office Furniture/Fixtures/ Equipment	30,000	15,000	5,000	10,000
Estimated. Total Assets Cost	**1,090,000**	**545,000**	**225,000**	**320,000**

C Local Training of Staff, Seminars & Workshop	40,000	20,000	10,000	10,000
D Staff Travel	30,000	10,000	15,000	5,000
E Administrative Support Cost				
Stationeries/Communications	8,000	3,000	2,500	2,500
Maintenance of Facilities	40,000	5,000	15,000	20,000
Insurance	40,000	20,000	10,000	10,000
Total (C.D.E)	**158,000**	**58,000**	**52,500**	**47,500**
F Counterpart Funding to be Supplied by Host Country				
Office Accommodation	35,000	10,000	10,000	15,000
Electricity, Water, Telephone & Related Services	20,000	10,000	5,000	5,000
Other Expenses	20,000	10,000	5,000	5,000
Total Counterpart Budget	75,000	30,000	20,000	25,000
TOTAL ESTIMATED BUDGET FOR 1 NO. SRC + NFPs	**1,739,906**	**752,294**	**435,863**	**551,748**

GENERAL RECOMMENDATIONS

The findings indicate that the establishment of a Raw Materials Research and Development Information System are both feasible and highly desirable at this stage of the economic development of Africa. The questionnaires which were issued during the course of this assignment and various on-the-spot assessments gave credence to this confidence. Already some forms of data have been captured through various old and current projects in various institutions across the continent. What is lacking is the coordination to harness these efforts together with a view to promoting the flow of information among member nations.

Centralized or distributed computing

When developing an information system which is subject to rapid growth, it is imperative to carefully decide whether to use a centralized computer system or a number of smaller computer systems based within the operating units that the system is meant to serve. The choice open is between the establishment of a centralized regional centre servicing all the demands of the region or the installation of several computers distributed within the sub-region and member states that they are meant to serve. After the first assessment mission, it became clear that the distributed data processing approach should be adopted. Further findings indicate that there is a greater sense of allegiance by member states to the various sub-regions they belong to in Africa. State groupings within a sub-region identify with each other more than with other states outside their sub-region. The reason being that sub-regional groupings have cultural affiliations as socio-cultural and economic interactions have existed all along even before the colonial era.

Secondly, it was discovered that the official language of the country also plays a major role in the type and extent of interactions between states. Languages are generally known to be a means of communication, and an essential factor in the dissemination of information. The major languages used officially for business transactions in Africa are mainly English, French and Arabic. In order to ensure greater participation and for business to take place smoothly, information must be available in the language that can be best understood by those involved in the transactions.

These factors go a long way to further buttress the need to adopt the distributed data processing approach. Consequently, rather than have one regional centre for the whole of Africa, there should be at least four sub-regional centres to meet the needs of member states around them. In order to facilitate this approach,

processing of data would commence from designated national focal points of each member state before it is sent to the sub-regional centre and finally to the coordinating regional centre. After a careful examination of the regional groupings in Africa and in line with the factors earlier enumerated, it is hereby recommend that:

1. **Sub-region**

Africa should be divided into four sub-regions with each having an information centre as follows:

i.) North Africa and Arabic speaking states

Cairo, Egypt

Algeria

Chad

Egypt

Libya

Morocco

Sudan

Tunisia

ii.) East and Southern African st.

Nairobi, Kenya

Angola

Botswana

Comoros

Djibouti

Ethiopia

Kenya

Lesotho

Malawi

Mozambique

Madagascar

Swaziland

Somalia

Tanzania

Uganda

Zambia

Zimbabwe

iii.) French speaking countries

Dakar, Senegal

Benin

Burkina Faso

Burundi

Cameroon

Cape Verde

Central Africa Republic

Congo

Cote D'Ivoire

Equitoria Guinea

Gabon

Guinea

Conakry

Guinea-Bessau

Mali

Mauritania

Mauritius

Niger

Rwanda

Sao Tome & Principe

Seychelles

Togo Zaire

iv.) English West African Countries

Abuja, Nigeria

Gambia

Ghana

Liberia

Nigeria

Sierra Leone

The centre should be situated in the stated cities as they have been found to have the largest concentration of data processing facilities in the region they belong. A centre for Southern Africa may be considered consequently in view of the political stability that has been achieved in the sub-region.

2. **Communication**

The essence of this project is to create the ability to make data available to every member state. In order to achieve this goal, it is imperative to have a good communication infrastructure. With 12% of the world's population but only 1.4% of its telephone lines, it is obvious that Africa does not have adequate communication facilities.

Therefore, each country is to be encouraged to develop its telecommunications facilities to either have a Public Switched Telephone Network (PSTN) or the X.25 packet data switched system which is preferable because of its speed and reliability.

3. **Information Centres**

In view of Nigeria's leading role in the ACRM and its hosting of the headquarters, it is recommended that both the sub-regional centre and the regional coordinating centre be sited in Nigeria.

Furthermore, each member state within each of the sub-region would be required to establish a national focal point which will be equipped with micro-computers and data collection and dissemination of information. The coordinating centre would take advantage of the ACRM National focal points in the G.77 member states.

4. **Administrative Structure**

The Regional Coordinating Centre shall be directly responsible to the Office of the Chairman of the Group of 77 through the ACRM Board, while the Sub-regional Centres shall report directly to the Regional Coordinating Centre. The Coordinator of the Regional Coordinating Centre shall serve as a member of the ACRM Board.

5. **Procurement of Equipment**

Because of the fluctuations in the local conditions of each member state, and the attendant general inflationary trends in Africa on imported items such as computers and electronics, it may be quite

cheaper if computer equipment are purchased directly in bulk from the manufacturer. The equipment should be procured based on the specifications of this report, and set up at the sub-regional or coordinating centre before being distributed to member states to enable them start functioning without delay. The support of the governments of the member states would be solicited to ensure that the equipment are imported duty free into the respective states.

6. **Organization and Staffing**

In order to fulfil its role effectively, the centres at each level (coordinating, sub-regional or national focal point) should be able to deal with and relate to the needs of the users that access its databases. It is therefore desirable that at the onset of this project, each centre should be set-up with a view to being self-supporting in its day-to-day running. One major factor that would facilitate this, is the recruitment and appropriate training of staff for each centre. In order to make for self-sufficiency, staffing proposals are recommended on pages 103-111 for consideration based on available funds for the project.

7. **Recruitment and Training**

It is expected that the positions of the computer operators, data control clerks, etc, be filled from within the existing outfits that would host the centres. Further training could be arranged for them at the sub-regional or coordinating centre level. For the senior positions, there may be need to recruit suitable staff from outside the existing outfits. The skills, expertise and expected roles are addressed under staff functions on pages 101-102.

In view of the specialist nature of the project, it is recommended that at the onset, and for each of the sub-regional centre a consultant be engaged. He would be charged with the initial take-off of the project and the identification and grooming of someone to take over from him. Allowance is made for a period of not more than 3 years to enable the consultant complete his mission and effect a proper handing-over.

Furthermore, because of the rapidly changing nature of computer technology, it is important that each of the sub-regional centres provide training to the member states they serve.

8. **Lines of Reporting**

It is important for the centre to have its line of reporting as distinct from that of its host institution.

9. **Implementation**

The best approach to the implementation of this project is to start by setting up the coordinating centre first as a model to other sub-regional centres within a maximum period of six months. The coordinating centre from onset should also establish a link with the major information hubs of the world. Then the sub-regional centres would be established with links to the coordinating centre. Lastly, member states would be made to link up to their respective sub-regional centres through the national focal point.

10. **Library**

While the use of computers and communication equipment provide the fastest and most modern means of information exchange, it is recommended that technical libraries be attached to the coordinating and sub-regional centres.

Such libraries should be equiped with photocopiers, micro-fishes, etc. The functions of the libraries should include the following:

i) storing concise and useful technical information, and

ii) undertake documentation and distribution of investment information

11. **Funding**

The raw materials and development information centres shall be funded for the first three years by the UNDP and other bodies as may be identified by the Chairman of G.77 countries. Donor funding would cover equipment procurement and personnel costs.

Member states shall contribute some subscription fees towards the up-keep of the Sub-regional and Regional Coordinating Centres. Thereafter, the centres should aim at generating adequate revenue in pursuit of a policy of self sustenance. The various information centres shall aggressively market their services and work out an acceptable sharing formula for revenue generated from information supplied to clients.

Countries hosting the sub-regional information centres shall be expected to provide some counterpart funding towards the initial take-off of the project.

ANNEX I - **Questionnaire for Preliminary Fact Finding Mission**

ESTABLISHMENT OF RAW MATERIALS INFORMATION SYSTEM

The attached questionnaire is aimed at facilitating establishment of a **RAW MATERIALS INFORMATION SYSTEM** for Africa. It would therefore be very helpful if you could supply answer to the questions very accurately and promptly.

For ease of understanding the questionnaire has been divided into:

Section A - for Industries and other Manufacturing outfits

Section B - Government Institutions, Regional and International Agencies; Manufacturers Associations, Chambers of commerce

Section C - Information facilities

You are please requested to fill section A & C or B & C as you find it appropriate.

Thank you.

SECTION A

QUESTIONNAIRE FOR INDUSTRIES AND OTHER MANUFACTURING OUTFITS

1. Name of Country.....
2. Population.....
3. Name of Establishment.....
4. Contact Address.....
5. Organizational Structure.....
6. Industrial Sector to which you belong.....
7. Key Raw Materials required.....
   - types.....
   - quantities required per annum.....
   - availability (seasonal or all year round).....
   - prices.....
   - uses.....
8. Sources of Industrial inputs.....
   - imported.....
   - locally purchased but foreign origin.....
   - locally available and locally converted.....
9. Degree of processing of primary raw materials-
   - Exported as primary raw materials.....
   - Locally process using
     a. Local Technology.....
     b. Foreign Technology.....
   - Processed locally into what form?.....
   - What quality?.....
   - Any existing National Product Quality Specifications?.....
   - Any Quality Control Agencies?.....
   - Any National Standard Organization?.....

10. Problems encountered in Raw Material development and conversion (Tick appropriate problem applicable)

Exploration.....

Exploitation.....

Funds.....

Technical Expertise.....

R & D.....

Multi-national politics & conspiracy.....

Level of industrial development.....

Local bias for imported goods.....

Others.....

11. State reasons for such problems.....

.....

.....

12. Would the existence of a Raw Materials Research and Development Information System have any effect on the problem?.....

- Positive or Negative effect (state which).....
- Explain reason for this effect.....

13. Sources of industrial machinery & spare parts

- Locally fabricated.....
- Imported..... .....
- Indicate preference and state reasons.....

.....

14. What is the existing relationship between Raw Materials Suppliers and Users?.....

- Does supply meet the demand?.....
- Is quality acceptable?.....

15. Do raw materials suppliers have cohesive associations?.....

- If yes, give number and names of associations.....
- If no, state reasons.....

16. What is Government's short term, medium and long term plan for developing existing strategic raw materials int eh country?.....

17. Identify the strategic resource-based industries that should be established in your country to bring about the anticipated industrialization in the country.....

List them.....

.....

.....

18. What areas of regional cooperation on raw materials do you advocate?.....

*Please use additional sheets for your answers if the need arises.

SECTION B

QUESTIONNAIRE FOR GOVERNMENT INSTITUTIONS, REGIONAL AND INTENTIONAL AGENCIES, MANUFACTURING ASSOCIATION, CHAMBERS OF COMMERCE ETC.

1. Name of Country.....
2. Population.....
3. Name of Establishment.....
4. Contact Address.....
5. Organizational Structure.....
6. Mandate of the Organization.....
7. Number of Industrial Sectors in the Country.....
8. Names of Industrial Sector.....
9. Existing key industries (in each sector).....
10. Key Raw Materials required per sector.....
    types of raw materials.....
    quantities required per annum.....
    availability (seasonal or all year round).....
    prices.....
    uses.....
11. Sources of raw materials.....
    Imported.....
    Locally purchased but foreign origin.....
    Locally available and locally converted.....
13. National Reserve of the raw materials.....
    .....
14. Degree of processing of primary raw materials
    - Exported as primary raw materials.....
    - Locally process using
        a. Local Technology.....
        b. Foreign Technology.....
        Processed locally into what form?.....
    - What quality?.....
    - Any existing National Product Quality Specifications?,.....

Any Quality Control Agencies?.....

Any National Standard Organization?.....

15. Problems encountered in Raw material development and conversion (Tick appropriate problem applicable)

Exploration.....

Exploitation.....

Funds.....

Technical Expertise.....

T & D.....

Multi-national politics & conspiracy.....

Level of industrial development.....

Local bias for imported goods.....

Others.....

16. State reasons for such problem.....

.....

17. Major breakthroughs in R & D in your organization or any other organization you know of.....

18. What is the degree of import substitution within the sector?.....

19. What is the existing relationship between Raw Materials Suppliers and Users?.....

- Does supply meet the demand.....
- Is quality acceptable?.....

20. Do raw materials Suppliers have Cohesive association?.....

- If yes, give number and names of associations.....
- If no, state reasons.....

21. What is Government's short term, medium and long term plan for developing existing strategic raw materials in the country?.....

22. Sources of industrial machinery & spares parts

- Locally fabricated.....
- Imported.....
- Indicate preference and state reasons.....

23. Identify the strategic resources-based industries that should be established in your country to bring about the anticipated industrialization in the country.

- List them.....

.....

.....

24. Would the existence of a Raw Materials Research and Development Information System have any effect on the problem?.....

- Positive or Negative effect (state which).....
- Explain reason for this effect.....

25. What areas of regional cooperation on raw materials do you advocate?.....

.....

*Please use additional sheets for your answers if the need arises.

SECTION C

QUESTIONNAIRE ON INFORMATION FACILITIES

1. Name of Organization.....
2. Organization structure.....
3. Contact structure.....
4. Available Manpower.....
5. Types(s) of information sought & stored:

   Local of foreign.....

   (e.g) inventory of available raw materials.....

   - location and quantities.....
   - process technologies.....
   - expertise available.....
   - qualities of products.....
   - research findings.....
   - raw materials suppliers, users.....
   - others.....

   Is stored information currently being used?.....

   Do people seek information different from what is stored.....
6. Medium of storage:
   - Manual or computerized.....

     (if computerized, state configuration of the Computer system e.g Hard ware and soft ware)
7. What organization, institutions and sectors are presently benefitting from the existing information system?.....
   - List them.....
8. How strategically paced is the system in discussion?
   - publicity.....
   - accessibility.....
   - communication network available (e.g satellite, telephone etc.)
   - Is your system compatible with other existing system
     i) in the country?.....
     ii) internationally.....

iii) If so which ones.....

9. What is the vehicle of dissemination of information between Raw Materials Researchers, Developers, Producers and Users.....

10. Is there any existing medium for regional awareness of the available information?.....

11. Can the present system expended?.....

12. What facilities and infrastructures urgently needed for this expansion?
    - Hardware.....
    - Software.....
    - communication network.....

13. Are there specialized libraries in your country?.....
    - Give names and addresses.....
    - What information do they store?.....

14 Would cooperation in the ares of manpower development and exchange of expert personnel be useful.....

*Please use additional space if the need arises

ANNEX II **Questionnaire for Final Assessment Mission**

GUIDELINES FOR ACCESSING FACILITIES FOR PROPOSED ACRM COMPUTER CENTRE

Available Manpower

State the organogram of the centre showing clearly people's functions

Hardware Configuration

Specify the type of hardware in place

Are they standalone PC, what connectivity exist?

Is it PC, mini or mainframe based?

Is there a Network, Multiuser, Hybrid configuration?

If network, is it server based?

How many servers exist?

Are servers specialized i.e Database, Communication (Gateways/Bridges), Print servers?

What Network Topology exist (Star, Point to point, Distributed) ?

What Access Method is used?

How many nodes exist?

What operating System - Novelle, Banyan Vines, 3 Con etc?

What about reliability and fault tolerance of LAN?

What estimates of throughput can one get on the system ?

Are there peaks or is the load evenly distributed?

How does the system handle peaks?

What effect does peaks have on the users?

Do you have scanners?

Are they full page scanners?

Do you have optional character renders software or in what form are data entered into the system?

Application Software

What software is used for the application?

Are there specialized libraries. Are they created locally or part of an international library/database?

Where was the software/library developed? Locally or from another source-obtain source?

In what form or with what tool is the database store i.e relational database?

What is the database structure like? Any examples of the database dictionary?

Do you use query language or what query language is used?

How easy is the tool; to learn, to use?

Is there any training program or online tutorials or helps available for users of the system?

What security features is built into the application?

How does the system prevent unauthorized access?

Does the system report unauthorized access?

Capacities

Specify volumes of data the system can store, now and in the future without any expansion.

What are the medium of storage?

How dependable are they?

Data Capture

How is the reliability of Data at source is ensured?

What editing is done to data after initial entry before it is allowed into the public domain (database)?

What form does the data then take at the time of dissemination or in what form is data passed to the user.?

Beneficiaries from the System

What Organizations benefit from the data from the system ?

How are the beneficiaries connected or how accessible is the information?

What is the medium of access; physical, enquiry from terminal at selected stations, via satellite, via telephone, via modem/fax ?

What level of access do the users have? Are there restriction as to what they can have access to?

Who or what defines the extent of information to be accessed ?

What types of information is often sought by the users which are not stored?

Communication

Does the country have a satellite earth station?

What means of external communication is used or exist?

Are messages or data for transmission coded?

If not can it be coded/decoded?

What reliability can be built into the transmission to safeguard the integrity of the data?

Electronic Mail

What type of E-mail is used?

Does it have facility to compose and edit, send and receive, forward mail with comments, print messages creation of distribution lists, delete messages (max messages it can handle), attach file for word processing, message filing and storing, certify and confirm receipt?

Expansion

Can system be expanded or what expansion plan exist ?

What is required for expansion of

hardware

software

communication

libraries ?

Cooperation

What manpower development program exist between users/member and neighbours ?

Any exchange of experts?

Maintenance and Back-up

What Back-up and maintenance support exist on hardware/software ?

Were there existing outfits that are capable of handling the hardware and software maintenance?

How have they been living up to demands and expectations ?

What experience have they found out from their dealings with them ?

What back-up arrangements are available to such organizations within or abroad?

ANNEX III - MAJOR USES OF AGRICULTURAL AND MINERAL RAW MATERIALS

AGRICULTURAL RAW MATERIALS

NO	AGRICULTURAL RAW MATERIALS	DERIVABLE PRODUCTS
1.	Cocoa	Cocoa-Butter, Body creams, Lotion, Animal Feeds, Wines
2.	Oil Palm/Groundnut/Coconut	Vegetable Oil, animal Food Cake, Paints, Soap, Cosmetics
3.	Rubber	Rubber Lumps, Sheet, Crumbs
4.	Cassava	Starch and its derivatives, Modified Starches, Alcohol and Chips
5.	Maize	Animal Feeds, Starch Pectin, Alcohol, Adhesives, Sugars, Oil, corn Flakes
6.	Tomato/Pawpaw	Puree, Juice, Jam
7.	Plantain/Banana	Flour, Beverages, Chips, Jams, Liquor, Soft and Alcoholic Beverages, Bread
8.	Oranges/Pineapples	Fruit Juice Concentrate Essential Oils Flavourings
9.	Mango	Juice, Jam, Jelly, Beverages, Liquor
10.	Coffee	Beverages
11.	Sugar Cane	Sugar and Derivatives, Bagasse, Molasses
12.	Sorghum	Malt, Animal Feed
13.	Millet	Animal Feeds, Alcohols
14.	Wheat	Bread, Confectioneries, Brewing for Alcoholic Drinks
15.	Soyabean	Soy Oil, Soy sauch, Soya Bean Meal, Milk
16.	Cashew Nut	Food condiments, Oil resin, Varnishen, Jam Galleon, Alcoholic and Non-Alcoholic Beverages
17.	Cotton	Yarn Fibre, Cotton Seed Oil, Cake
18.	Kenaf	Sack, Carpets, Pulp
19.	Sheanut	Butter, Engine Lubrication, Cosmetics
20.	Benniseed	Oil, Pats, Feeds
21.	Tobacco	Cigars, Cigarette
22.	Kolanuts	Soft Drinks, Stimulants
23.	Tea	Beverages

24.	Timber	Furniture, Pulp and Paper etc.
25.	Potato (Irish/Sweet)	Chips, Starch, Alcohol
26.	Gum Arabic	Gum
27.	Sunflower	Oil, Soaps, Feeds etc.
28.	Rice	Alcohol, Bran
29.	Citrus	Juice, Beverages
30.	Rama Fibre	Jute Bags
31.	Palm Wine	Yeast, Wine Bottling, alcohol
32.	Fish	Fish Meal and Fish Canning
33.	Livestock	Meat, Dairy
34.	Raphia Palm	Alcohol
35.	Citrus	Citric Acid, Juices, Essential Oils, Flavour
36.	Cashew	Nuts, Juice, Oil
37.	Coconut	Fibre Mat, Jute Bag, Copra, Oil, Cake, Perfumes, Brooms
38.	Acacia	Tannin
39.	Eucalyptus	Sweet, Confectioneries, Perfumes, Medicine
40.	Locust Beans	Locust Beans, Condiments, Drinks
41.	Neem Tree	Insecticides, Local Drums, Gum.

MINERAL RAW MATERIALS

NO	MINERALS	INDUSTRIAL USES
1.	Asbestos	Primary, for fibres - spinning asbestos cement and 7 group fibres
2.	Asphalt	Road paving materials, over 905 of roads are made of asphalt
3.	Bauxite	Used as an aluminum ore and in the manufacture of refractory products, albuminous chemicals and abrasive
4.	Barytes	Glass, Ceramics, TV Tubes, Pyrotechnics, oxygen source, used as weighing agent in drilling mud (96%)

5.	**Boron (Minerals & Chemicals)**	Glass and related products - glass fibre insulation, textile grade glass fibre, borosilicates and other specialty glasses, ceramic, fruits and glasses. Soap, detergents, production of borohydrides and metal alloys used as reducing agent by paper and pulp, chemical and pharmaceutical producers and byplaters to reduce and remove toxic heavy metals
6.	**Bromine (EDB) -**	Production of ethylene dibromide (lead scavenger in gasoline), calcium bromide, flame retardants and methyl bromide
7.	**Chromite**	Used in the metallurgical industry (43%) and production of chrome chemicals and refractories. Chemical industry uses chromite for the production of sodium and potassium bichromate which are the feed stack of a wide variety of chrome chemicals used in such applications as manufacturing chromium metal pigments and plating materials, and in leather tanning and timber preservation. Production of basic refractories supplied in granular material form (gumming and ramming mixes, motor and cement) and brick shape (chrome and chrome - magnesite bricks). Chromite bearing refractories are used in the construction and maintenance of industrial furnace of the steel, glass, cement industries etc. Chromite is also used in foundry molding sands.
8.	**Clays**	Very wide range of uses which are discussed separately
9.	**Diatomite**	Used as absorbent, oil well cementation, pesticide carriers, oil spill absorbent, anticking and acid refining
10.	**Dimension stones (Granite, slate,limestone Marble)**	Used as decorating, ornamental or facing stones in the building industry. The raw materials for the steel, glass and refractory industries, Crushed and sized raw dolomite used as feed stone for lime kilns to produced lime which is an important raw materials for BOF Steel production and in glass container and insulator glass fibre manufacture. Dolomitic quick lime is an excellent neutralizing and clay stabilishing agent. Dried and calcined dolomite and valued as neutralizers for industries and agriculture, as fillers for asphalt and resinous coatings and as sulphur absorbent in coal burning.
11.	**Fourspar**	Used as a neutral flux by the steel industry and manufacture of hydrofluoric acid (HP) which is a basic chemical in the manufacture of refrigerants, aerosols, aluminum fluoride, artificial cryolite, elemental fluorine. Flourspar is also used by the ceramic industry in glass manufacture, making fiberglass insulation, welding rod coatings, enamels and miscellaneous fluxes.
12.	**Glouconite**	Agricultural purposes (fertilizers), products for waste treatment plant
13.	**Graphite**	Foundry and refractory industries
14.	**Industrial Sand Silica and**	Used in the glass, foundry, abrassives and oil and gass industries. In the latter industries, they are used as propping agents, gravel packing and in cement
15.	**Iodine**	Pharmaceutical, animal feed supplements (mainly for cattle) catalysts, stabilizers (as in nylon precursors) ink and colourants, photographic

		equipment/films, sanitary and industrial disinfectant.
16.	Iron Oxide Pigments	Used in the automotive and construction industries and as coatings for a wide range of products. Also used in the production of ferrites, magnetic tape, magnetic ink and colourants for plastics, rubber, paper, textiles, glass and ceramics. It is also used in the manufacture of industrial chemicals, animal feeds and fertilizers, foundry sand, cosmetics and jeweler's rouge.
17.	Kyanite	Used int the refractory industries for refractory shapes and specialties to counteract the shrinkage upon fring of clays. kyanite is also used as a source of alumina in any high alumina refractories.
18.	Lime	Used in the steel industry and as a fluxing agent. it is used in the manufacture of chemicals (specially for water treatment) and in buildings and soil stabilization.
19.	Limestone	Used as aggregates in all types of construction and manufacture of cement, aglime, lime, flux stone, rigrap railroad ballast chemicals, etc.
20.	Lithium	Used in the aluminum, chemical and lubricating rease industries, Lithium hydroxide is used for multipurpose greases and batyllithium for synthotic rubbers. Lithium ores and carbonates are used in the ceramic, and battery industries. In the latter. It is used as lithium metal and salts.
21.	Magnesite	production of refractory manesis bricks, caustic calcined magnesia for fertilizer and animal feed use
22.	Manganese	Used in the steel industry (90) and in diverse application including primary batteries, trace mineral additives, nonferrous metallurgy, electronics and catalysis
23	Mica	Wet ground mica is used to reinforce solvent and aquerous system paints or increased weather ability, durability, greater resistance to moisture and atmospheric corrosion. Wet ground mica is also used as an excellent filler and reinforcing agent as a mold lubricant in molded rubber products and in wall paper finishes. Miscellaneous uses include additives to caulking compounds, lubricants, greases, silicon, release agents and dry powder fire extinguisher. Dry ground mica is used as an extender and filler in gypsum plasterboard jointed compounds and a sa filler in asphalt products, pipeline enamels, mastic, cements, plastics, adhesives, texture paint and plaster, Dry ground mica is increasingly becoming popular as an additive in oil well drilling mods where the mica flakes platy nature helps seal walls, preventing circulating fluid loss. Sericite mica used mainly in the plasterhobard joint compound industry and minor uses in the paint, bricks and oil well fluid industries. Sheet mica is used primarily by the electronics industry in vacuum tube capacitors and communication devices

24.	Natural Abbrasives Garnet, tripolit, special silica stone, corundum etc.	Generally used for grinding although natural abrasive have been largely replaced by artificial abrasive such as fused alumina, silicon carbide and man-made diamond
25.	Nepheline	Used in glass container manufacture with lesser quantities in flat pressed, and blown glass as well as glass fibre
26.	Syenite	Used as a principal alumina source and a substantial alkali and silica values' contributors in the glass industry. Other uses include vitrifying and fluxing agents in ceramics, and in paints and plastics as well as extender and filler.
27.	Olivine	Used for the production of course aggregates and as a burden supplement for nonferrous foundries furnace and foundry sand.
28.	Perlite	Used for the production of filter acids, plaster and concrete aggregates, horticultural products, low temperature insulation, masonry and cavity fill insulation, and fillers
29.	Phosphate rock	Monthly used for fertilizer production and chemicals
30.	potash	Fertilizer and chemicals
31.	Pyrophylice	Used in the refractory, ceramic, insecticide and others including roofing, coating and chemical compound industries. In the eramic industry, pyrophyilite is used in wall tile, electrical porcelain, structural clay facings and technical ceramics.
32.	Quartz	Crystal, mainly in electronic application and minor amounts used for producing fused quartz specimen jewelry and optical application.
33.	Rare Earths (Main source is monazite)	Used in the manufacture of alloys
34.	Salt	Used in the chemical industry especially, the chlorine and caustic soda sector, agriculture water treatment, metal production
35.	Soda Ash	Used mainly in the glass and chemical industries especially, for sodium-based chemical and detergent in manufacture.
36.	Sodium sulphate	used in the detergent, pulp and paper and glass industries
37.	Staurolite	Used as an abrasive medium and in cement manufacture as a source of iron and aluminum
38.	Strontium	Used in the manufacture of TV tube glass, pyrotechnic materials, purifying zinc, ferrites, paints, pigments and fillers
39.	Structure mineral (sand gravel, crushed rocks etc)	Mainly used for mortar and concrete production. Other uses include roads, rail roads agriculture, riprap, fillers, and chemicals generally
40	Sulfur	Used in the production of Agricultural chemicals/fertilizers, organic and inorganic chemicals. Sulfur is also used in mining and petroleum refining

41.	Titanium minerals	Used in production of titanium dioxide pigments, titanium metal welding (ilmenite, rutile) rock coating; titanium dioxide pigments are used in the production of paints, varnishes, lacquers, paper, plastics rubber, and ceramics
42.	Talc	Used in the cosmetic and paint industries
43.	Vermiculite	Used in the construction industry and direct to steel fireproofing
44.	wollastonite	Substitute for short fibred asbestos. It is also used in the paint and ceramic industries
45.	Zeolites	Used as a substitute in the production of carriers for fungicides and suspension agent in liquid fertilizers.
46.	Zircon	Used in the foundry, ceramic and refractory industries. Subsidiary uses include production of welding rods, abrasive and zirconium based chemicals
47.	Spdumene	Ceramics glass fluxes, flame colorant, Absorption refrigeration greases, high strength glass
48.	Rock salt	Miscellaneous chemicals (30%), rayon (17%), pulp and paper (8%) metals (8%) detergent etc.
		Miscellaneous chemicals including organic (83%) pulp and paper 13% water treatment
		Ammonia synthesis, miscellaneous chemicals, metallurgy
		Miscellaneous chemicals, glass, metallurgical, soaps
		Road treatment, dust suppression
49.	Sylvite (K Cl)	General chemicals, fertilizers, detergents (see above)
50.	Beryl	Fluorescent tubes, TV tubes, glass ceramics
51.	Limestone	Caustic soda manufacture effluent and water treatment
52.	Anhydride	Fertilizers (36%), chemicals (26%) petroleum refining (2%), pigments (9%) metallurgical
53.	Magensite	Refractories general chemicals, fertilizers, cement
54.	Celestit	Glass, ceramics, pyrotechnics
55.	Bastnaesite Monazite, Xenotime	Glass colourantes, polishing powders TV tubes, lighter flints, arc carbon, catalysts, phosphors, ceramics stains, camera lenses. Metal production, special chemicals
56.	Rutile	Pigments, titanium metal, water proofing agents
57.	Chromite	Chromium chemicals electroplating baths, oxide

58.	Pyrolusite	Dry batteries. soap (dryers), fertilizers, glass enamels catalysts
59.	Colomanite	Detergent, fluxes
60.	Bauxite	Water treatment chemicals, fluoculants, dye mordants, refractories catalysts
61.	Quartz, Silica	Adhesives cements, deffoculants, soaps. Organic chemicals (silicone fluids and rubbers)
62.	Caliche	Fertilizers, general chemicals
63.	Phosphate rock	Fertilizers, detergents food stuffs, organic chemicals, water treatment chemical
64.	Brimstone	Fungicide, insecticide resourcing agent, solvent
65.	iron Pyrits	See above
66.	Galena	Storage batteries, Electrical Cables, Ammunition, Pipes, Pigment in paint and ceramic industries
67.	Sphalerite	Coating steel products and Die-casting alloys with lead, copper, manganese and aluminum for various industrial applications.
68.	Cassiterite	Tin plating for food canning and decorative industries. Hardening of copper and lead in Alloys etc.
69.	Columbine	High temperature alloys for jet engines, Gas turbines and rockets. Also used in Vacuum Tubes and Radio Valves
70.	Chalcopyrite	Copper plating colnage, various alloy
71.	Iron Ore	Steel production. Also alloyed with Manganese, Nickel, etc to produce Nickel etc to produce high quality steel
72.	Gold	Coinage, and high technology applications
73.	Molybdenite	Alloy in iron and Steel Plants; in chemical industries as Dyes, catalysts and lithographic inks.

ANNEX IV UNDP INFORMATION SYSTEMS

UNDP Dakar

Model	Type	Qty	Processor	Speed	Ram	Hard disk	Floppy
IBM	PS/2 M60 File Server	1	80286	10MB	10MB	1GB	1.44
IBM	PS/2 80 File Server	1	80386	20Mhz	8MB	1GB	1.44
IBM	PS/2 55SX	17	80386SX	16Mhz	4MB	40MB	1.44
IBM	PS/2	24	80286	10Mhs	1MB	30MB	1.44

Printer: There is an estimated number of about 25 matrix and laser printer.

Software: There are several application software including FOAS for accounting and Finance, FOAST for field office and personnel management, FOPPMS for project management. Others are ward perfect for word processing. dBASE III & IV and LOTUS for spread sheet applications.

Communications: The PC are connected in a LAN arrangement using Novelle Netware. In addition there is the E-mial facility connecting the office to other UNDP offices worldwide through X25/SENPAC facility.

Backup: Power backup is through UPS system and data backup is on tape. In house support team is available for minor problem resolution on the LAN and by users. However, the services of the equipment supplier is engaged to provide hardware maintenance services

UNDP Lagos

Model	Type	Qty	Processor	Spreed	Ram	Hard disk	Floppy
ALR	PC File Server	1	80486	33MB	16MB	1.5GB	1.0/ 1.44
IBM	PC	2D	80286	10Mhz	1MB	30MB	1.44
IBM Compa-workstation	PC	30	80386SX	25Mhz	N/A	N/A	1.2/ 1.44

Printer: There is an estimated number of about 40 printers of matrix and laser capabilities

Software: Various applications software are in use those for Inventory management, Financial management, Project management, motor vehicle monitoring as well as those for word processing, database and spread sheet.

Communication: The PCs are connected using Novelle Netware. These is E-mail facility within the office and via Dialcom and SITA to New York where all UNDP offices worldwide.

Back-up: Power back-up is mainly through UPS system attached to systems that require them. Data back-up is mainly through a IGB tape streamer attached to the server. There is plan to install a back-up server. There is an in-house support group for the equipment and user support. The services of equipment supplier is engaged to provide maintenance support

UNDP Nairobi

Model	Type	Qty	Processor	Speed	Ram	Hard disk	Floppy
1BM Compact-tible	PC File Server	1	80486	33Mhz	32MB	1GB	1.2/ 1.44MB
*	PC Workstation	47	80386SX	25Mhz	4MB	N/A	1.2/ 1.44MB
1BM	*	8	80286	10Mhz	N/A	N/A	1.44MB

Printer: Estimated number of 25 matrix and laser printers

Software: Office software are used including work perfect, database and spreadsheet software. Other applications include POWER for the program section and some others for personnel/payroll, accounting and finance application.

Communication: There is a small Novel network used by the finance department and the proposed major network which will be connected using Novelle Netware. Both network will be integrated for efficiency. There is E-mail facilities through Dialcom system but ultimately hope to use SITA facility to link up to UNDP offices worldwide with the aid of KENPAC.

Back-up: Power back-up is achieved using appropriate UPS systems which can sustain power for various lengths of period after power failure. Data back-up is through magnetic tapes which are then kept in fireproof sate. There is some in-house expertise for equipment support but the services of equipment suppliers are enganged to perform equipment maintenance.

UNDP Cairo

Model	Type	Qty	Processor	Speed	Ram	Hard disk	Foppy
1BM Compac-tible	PC File Service	1	80486 33Mhz	16MB	1GB		1.2/ 1.44
*	PC Workstation	1	80386	25Mhz			
*	*	16	80486SX		20Mhz		
*	*	12	80386SX		20Mhz		

Printer: 25 printers of EPSON model and a couple of Laser printers

Software: Various application and office automation software are in use. They include world perfect, spreadsheet like excel and lotus, dBASE and specialized software for payroll, personnel, leave, cash management etc.

Communication: The PCs are connected using Novelle Netware in a LAN environment with a bus topology. There is no wide area network yet although palsy are underway to provide such. However they currently have a E-mail through Egypt NET as a bridge to UNDP offices world wide.

Back-up: Power back-up is mainly through a couple of UPS connected to critical systems that require them. Data back-up is through tape and keep in fireproof safe. There is a back-up generating set to the whole building in case of power failure. Equipment suppliers are engaged for equipment maintenance.

ANNEX V **EXPECTED INFORMATION IN RMIS DATABASES**

i. Types of existing agricultural raw materials
ii. Locations where they are grown and available quantities in tonnes
iii. Area put under cultivation for each crop
iv. Agronomic conditions for optimal yield
v. Types of existing mineral resources
vi. Location and nature of occurrence
vii. Probable estimates and proven reserves
viii. Level of exploitation, exploration and mining acts
ix. Present uses of raw materials within the country
x. Present uses of raw materials in other countries
xi. Possible uses of the existing raw materials
xii. Types and capacities of industries, existing raw materials can support
xiii. Available process technologies and raw materials processing equipment available within the country
xiv. Available process technologies and raw materials processing equipment available else where (particularly the G77 countries) that could be acquired under technical agreement
xv. Existing engineering capabilities within the country particularly in terms of equipment design and fabrication
xvi. Existing manpower and organizations in raw materials development
xvii. Types and sources of their raw materials input
xix. Types of imported inputs, quantities and countries of origin
xx. Specification of utilized industrial inputs
xxi. List of industrial sectors and identified sectoral problems
xxii. Types and form of export
xxiii. Present research and development activities on raw materials
xxiv. Possible strategic local resource-based industries that should be established to form the bedrock of industrial development within the country
xxv. Existing investment and raw materials policies

ANNEX VI **EQUIPMENT LIST AND CATALOGUE COST**

Typical configuration

1. **Regional Centre**

2 x 80486DX/66 Type Microcomputer having	
. 66MHz DX Microprocessor	
. 4MB RAM, 120MB Tape Unit	
. 1 x 5.25* 1.2MB Diskette Drive	
. 1 x 3.5* 1.44MB Diskette Drive	
. 170./650MB Hard Disk	
. Enhanced 101 Keyboard	
. 14* SVGA Color Monitor	
. 1.2 KVA UPS, Modem (9600) Fax	55,000
. EPSON LQ1170, EPSON FX870	35,000
Database Server	35,000
Miscellaneous**	35,000
Library Facilities	25,000
Freight	---
	185,000

Network Server

Communication Server

(**) Language Translators -

Software

2. **Sub-Regional Centre**

2 x 80486DX/66 Type Microcomputer having		A UNIX based pentium with at least 6.4MB(RAM)
. 66MHz DX Microprocessor		- speed 100 MHz
. 4MB RAM, 120MB Tape Unit		- 6 megabytes of harddisk storage
. 1 x 5.25* 1.2MB Diskette Drive		- 250 tape unit
. 1 x 3.5* 1.44MB Diskette Drive		- 1 x 5.25" 1.2MB disk drive
. 170./650MB Hard Disk		- 1 x 3.5" 1.44MB disk drive
. Enhanced 101 Keyboard		Enhanced 10 Keyboard
. 14* SVGA Color Monitor		1.4" SVGA colour monitor
. 1.2 KVA UPS, Modem (9600) Fax	35,000	KVA UPS, Modem (9600)
. EPSON LQ1170, EPSON FX870	35,000	
Database Server	15,000	
Miscellaneous**	15,000	

FREIGHT	100,000	

3. **Member State**

2 x 80486DX/25 Type Microcomputer having

. 66Mhz DX Microprocessor

. 4MB RAM, 120MB Tape Unit

. 1 x 5.25* 1.2MB Diskette Drive

. 1 x 3.5* 1.44MB Diskette Drive

. 80MB Hard Disk

. Enhanced 101 Keyboard

. 14* SVGA Color Monitor

. 1.2 KVA UPS, Modem (9600) FAx	15,000
. EPSON LQ1170, EPSON FX870	5,000

FREIGHT	20,000

ANNEX VII MEMBERS OF THE FEASIBILITY STUDY TEAM

1. Dr. (Mrs) O. A. Aribisala
2. Dr. A. T. Onosode
3. Dr. A. Abdukadri
4. Mr. K. Ogunlana
5. Mr. S. B. Olaniyan
6. Miss O. Idowu
7. Mr. K. B. Ajoku
8. Miss G. T. Beka
9. Dr (Mrs) F. Bogunjoko

ANNEX VIII

INDIVIDUALS AND INSTITUTIONS CONSULTED DURING THE PRELIMINARY FACT FINDING MISSION

In the various countries visited in the course of this survey, many individuals and institutions were consulted which cut-across industries, ministries and parastatals, institutes and centres as well as organized private sector organizations. External agencies and individuals were also consulted.

EGYPT

1.	Dr. Nabil A. Khalil Chairman and Managing Director	Alanein Petroleum Co., 10, Shehal Street Mohandseen - Giza Phone 3481157, Telex 22814 APC.
2.	The President	Academy of Scientific Research & Technology, 101 Kasi A1 Ainy Street, Cairo
3.	The vice President	" " "
4.	Ahmad Abdel-Bassit, Director,	Egyptian National Scientific and Technology Information Network, 101 Kasir Al-Ainy Street, Cairo, Fax 3547807
5.	Seif El-dim Rasheed, Deputy Director	" " "
6.	Itaten Al-Zorkani	The Cabinet Information and Decision support centre, 11 (A) Hassan Sabry Street, Zamalek, Cairo Tel, 750829, Tlx 9394 WAZRA UN, Cairo

7.	Ishak Sourial,	" " "
8.	Professor A.A Abdul Azim	Central Metallurgical Research and Development Institute, P.O Box 87, Helwan Tebbin - Helwan Cairo, Telex 23116 UN, Fax 790898, Cairo
9.	Professor (Dr) Kazaza Yusuf, Director	" " "
10.	Engr. N.A. Abdel-Kerim Chairman	Mining and Refractory\ Holding Co. Telex 22578, MARIC UN, Fax 02/3557916
11.	Dr. Ahmed Alif Dardir Chairman	Egyptian geological Survey and Mining Authority, 3 Salah Salem Street, Cairo, Telex 22695 CEOSU. UN, FAX 820128, Tel 831672
12.	Dr. A.S Shaaban Director	Egyptian Geological Survey and Mining Authority Laboratories, Awkaf Post, Dokki-Cairo, Tel 700551
13.	Amr Abd-El Halim	Commercial Attache, Ministry of Economy and Planning, 96 Ahmed Orabi Street, El-Mohamdesseen Tel 3471890/99
14.	Mohammed Shawky Hamza	Commercial Council, Information Department Commercial Representative, Cairo, Ministry of Economy and planning, 96 Ahmed Orabi Street, Cairo

15.	Mohammed M. Khali Morsi	Attache, Department of International Depuration for Development Ministry of Foreign Affairs, Cairo Tel: 720008
16.	N. A. Adewale Senior Councellor	Embassy of Nigeria, 13 Sharia Gabalaya, Zamalek-Cairo, Tel 3406042, 3417894
17.	Mohammed Doba	Councellor, " "
18.	Sharifat	Secretary to the Resident Representative, UNDP, World Trade Centre Building, Cairo
19.	Under-Secretary	Ministry of Agriculture and Irrigation
20.	Staff in the Computer Unit	Ministry of Industry Headquarter

GHANA

1.	Dr. Kark Asmah International Economics	Ministry of Foreign Affairs
2.	Mrs Baaba Sekeyi Director	Ministry of Agriculture
3.	Mr. Samuel Oke	
4.	Mr. Charles Abaka Director	Ministry of Finance International Economic Relations Division

5.	Mathew Tawish Ababio Forest Resources Utilization Analyst	Ministry of Lands and Natural Resources
6.	Mr. J. D. Attafuah Snr. programme Officer	Ministry of Energy
7.	Mr. Allan P. Adkirackor Trade Information Analyst	Ministry of Trade and Tourism
8.	Mrs H. G Woanyah Ag. Director (Technical)	Ministry of Industries
9.	Mrs Alice Menka Deputy Chief Industrial Promotions Officer (DCIPO)	" "
10.	Mr Adu Frimpong Principal Industrial Promotions Officer	" "
11.	Mr. R. Tandor Industrial Promotions Officer	" "
12.	Mr. G. O. Kesse Director	Geological Surveys Depatment
13.	Mr. Kobina Beecham, Director	Ghana Investment Centre
14.	Mr S. Osei - Yaboah Snr. project Officer	" "
15.	Mr. E.B Ashong-Lartey Asst. project Officer	" "

16.	Mr. P. K Akomaning Deputy Executive Director	National Board for Small Scale Industries
17.	Dr. R.G.J Burtler Director-General	CSIR Secretariat
18.	Mr. A. Adu	" "
19.	Mr. J.E.M Bartels	" "
20.	Dr. A.M Goka	" "
21.	Mr. K. K. Eyeson, Director	Food Research Institute
22.	Mr. Seewu Noamesi Research Officer	" "
23.	Mr. Fred Djokoto	Industrial Research Institute
24.	Mr. J. A. Villars, Director	GHASTINET
25.	Mr. W. A. Dankwa Publicity and Marketing Officer	" "
26.	Mr. M. S. Owiredu Production Manager	" "
27.	Dr. Peter C. Acquah Director	Mineral Commission
28.	Mr. Ben Aryee, Mineral Director	" "
29.	Mr. Albert A. Owusu Executive Director	Astek Industries

30.	Mr. L. A. Odotei Ag. General Manager/project Director	GIHOC Pharmaceutical
31.	Mr. J. Enyimbili Commercial Manager II	" "
32.	Mr. Clement Djameh Production Manager	ABC Brewwry Limited
33.	Mr. R. D Damptey General Manager (Administration)	Tema Food Complex Corporation
34.	Mr. J. A. Abbam	" "
35.	Mr. E. Imbeah-Amoakuh Executive Secretary	Association of Ghana Industrialists
36.	Mr. George Andoh Management Consultant	Chamber of Commerce
37.	Miss Gertrude Amsah Snr. Trade Information Officer	Ghana Export Promotion council
38.	Mr. Solomon Akpata UNDP Resident Representative	UNIDO
39.	Mr. Sami Miettinen UNIDO Programme Officer	"
40.	Mr. T. Olufunso Olumok Minister	Nigerian Embassy

GUINEA

1.	Mr. Rene C. Guiraud Assistant Resident Repre- tentative (Programme)	UNDP
2.	Dr. Djiguiba Sy Savanna Deputy Director (DNCI)	Ministry of Foreign Affairs & Cooperation
3.	Mr. ahmed Tidiana Kane Head of International Corps Division (DNCI)	" "
4.	Mrs. Oumou Diallo Projects Officer	" "
5.	Mr. Abdourama S. Kama Head of Industries Section	Ministry of Industries Small and Medium Enterprises
6.	Mr. I. s. Camara, Director	Bureau for Strategic Studies Marketing and Mining
7.	Mr. Joerg C. Dux Head of programmes	UNIDO
8.	Mr. P. L. Oyedele Ambassador	Embassy of Nigeria
9.	Mr. A.A Koko Counsellor	" "
10.	Mr. A. W. Tyoden First Secretary	" "
11.	Mr. Mohamed S. Fofana Secretary General	Chamber of Commerce Industry and Agriculture

12.	Mr. Lansana Fofana Head of P.D.E Division	" "
13.	Mr. Morlaya Toure Secretary for Admini- stration and Finance	Ministry of Agriculture and Animal Resources
14.	Mr. Manual Sanchis Fernanadez, Director of Administration and Finance	Gunea Cement Company
15.	Mr. Jules Soua Dore Director of Admin.	SALGUIDIA
16.	Mr. Aliou Mairie Diallo Director of Commercial Unit	" "
17.	Mr. Sekou Sangare Secretary-General	" "
18.	Mr. Mohammed L. Conte, Director	Department of Agriculture
19.	Mr. Abdourahame Bah Deputy Director	" "
20.	Mr. Mamadi Camara Head of Plant Protection Division	" "
21.	mr. Moriba Sasoadoume	Agricultural Production Division
22.	Mr. Mamadi Conde, Director	SPSA
23.	Mr. Sako Alpha Head of Computer Unit	"

24.	Mrs Marylene Spezzati Deputy Resident Representative	UNDP
25.	Mr. Eugene I. Kolie Administrative Officer	EGUIMAT Tile Factory
26.	Mr. Mare Mansare Production Manager	" "
27.	All Senior staff and Head of programmes	UNDP/UNIDO Programme Unit

KENYA

1.	His Excellency the Nigerian High Commissioner	The Nigerian High Commission Nairobi
2.	Mr. E. N. Ndekhedekhe	" "
3.	Ambassador Sirma, Director	African Affairs, Ministry of Foreign Affairs
4.	The Deputy Resident Representative	UNDP, Nairobi
5.	Mr. Stefano Bologna Country Director	UNIDO, Nairobi
6.	Mrs Isabella Henin Spindler, Industrial Investment Expert	UNIDO, Operating from Ministry of Industry Agro-Industrial Division
7.	Prof. Wojciech M. Hiibner	UNIDO Consultant on Cement Industries

8.	Mr. Henrik Carlsen	" "
9.	Mr. John W. Kuria, Chief Executive	Kenya Association of Manufacuturers
10.	Mr. Raphael N. Omusi, Officer	Kenya National Chamber of Trade Commerce and Industry
11.	Mr. Peter G. Muiruri Executive Editor	Official Jounal of the Kenya National Chambers of Commerce and Industry
12.	Dr. R. O. Arunga, Director	Kenya Industrial Research and Development Institute (KIRDI)
13.	Mr. Paul B. Imende Librarian	Kenyan Industrial Research & Development Institute (KIRDI)
14.	Mr. Charles Otiso Orina Ag. Deputy Registrar of Industries	" "
15.	Mr. Mwanaoangoro Chief Industrial Officer	Ministry of Industries
16.	Mr. Daniel Omondi Ogolla, Head	Iron and Steel and Construction Division, Ministry of Industries
17.	Engr. M.M Nsomo Head Agro-Industrial division	" "
18.	Mr. Nwangi	Ministry of Industry Pharmaceutical sub-sector

19.	Ms. Lucy Waruingi	UNDP Kenyatta Conference Centre, Nairobi
20.	Insteel Industries Ltd	P.O Box 78161, Nairobi
21.	Steel Billet Castings Ltd	P.O Box 45371, Nairobi
22.	Pharmaceutical Sector	P.O Box 30418, Nairobi
23.	Sunflag Textile and Knit wear manufacturers Limited	P.O Box 41627, Nairobi
24.	E. A. Packaging Industries Limited	P.O Box 30146, Nairobi
25.	Midco Textile (E.A) Ltd	P.O Box 18160, Nairobi
26.	Industrial Registration Division. Min. of Industry	P.O Box 30418, Nairobi
27.	KIRDI-Leather Development Corporation	P.O Box 30650, Nairobi
28.	Kenyan Industrial Research Development	P.O Box 30650, Nairobi
29.	Kenya Association of Manufacturers	P.O Box 30225, Nairobi
30.	Kenya National Chamber of Commerce and Industry	P.O Box 47024, Nairobi
31.	UNIDO Consultants Cement	Kenyatta International Conference Centre. Nairobi

NIGERIA

1.	Mr. A. O. Olatokun	Federal Ministry of Agriculture, Rural Development & Water Resources Wuse Area 3, Abuja
2.	Mr. Ijegbe	Nigerian Export Promotion Council, Area II, Wuse Abuja
3.	Engr. I. K. Awe (AGM production)	Ajaokuta Steel project Ltd, Steel City, Ajaokuta Kogi State
4.	Engr. Abdulrahman, Ayeni (M.D)	Nigerian Mining Corporation 7th Floor, Federal Secretariat P.M.B 2154 Jos, Plateau State.
5.	Dr. A. G. Lamorde (Director)	National Institute for Veterinary Research , Vom, Near Jos, Plateau State
6.	Dr. Gamaniel Shinju	National Institute for Pharmaceutical Research & Development, Idu Industrial Area, P.M.B 21, Abuja
7.	U. E. Okeke (Ag. Director)	Manufacturers Association of Nigeria, 37, Marina St. Unity House, Lagos
8.	F. O Brimmo (Coporate Dev. Manager)	Cadbury Nigeria Plc Isheri Road, Agidingbi Ikeja, Lagos
9.	I. O Famuyiwa (Chief Chemist)	Berger Paints Nig. Plc. Oba Akran Avenue, Ikeja Industial Estate P.M.B 210 Ikeja

10.	Mr. B. B. Maisumari	Federal Ministry of Commerce, Trade & Tourism Garki, Abuja
11.	Hon. Minister	Federal Ministry of Industry and Technology, Federal Secretariat, Garki, Abuja
12.	Director	Federal Insitute of Industrial Research, P.M.B 21023, Ikeja, Lagos
13.	Dr. Stephen M. Lawani (Director of Inf. Services)	International Institute of tropical Agriculture Oyo Road, P.M.B 5320, Ibadan
14.	Prof. B. O. Adelana (Director)	Institute of Agricultural Research & Training, Obafemi Awolowo University, Moor Plantation, P.M.B 5029, Ibadan
15.	Group Managing Director	Nigeria National Petroleum Corporation, 7 Kofo Abayomi Street, Victoria Island, Lagos
16.	J. B. Effiong (Planning Manager)	May & Baker Nig. Plc 3/5 Sapara Street Industrial Estate P.M.B 21094, Ikeja
17.	Managing Director	Delta Steel Company Ltd., Ovwian Aladja, P.M.B 1220 Warri
18.	Managing Director	Nigerian Machine Tools Limited, Km 8, Ikirun Rd., Oshogbo
19.	Chairman	National Planning Commission, Planning Office, Federal Secretariat, Ikoyi, Lagos
20.	Director-General	Nigerian Institute of Social & Economic Research, Ibadan/Oyo Road P.M.b 5, U.I Post Office, Ibadan
21.	Executive Secretary	Economic Community of West African States, 6, King George V Road P.M.B 12745, Lagos

22.	Director General	Raw Materials Research and Development Council, Maitama District, P.M.B 232, Garki, Abuja

SENEGAL

1.	Mr. Thiendella Tanor Fail (Director General)	ASACE
2.	Mr. Abibou Sy Head of Import/Export Unit	External Trade Division
3.	Mr. Robert Niouky Head of Projects Unit	" "
4.	Mr. Pape Momar Diop Head of Documentation Unit	" "
5.	Mr. Mamadou Mustapha Mbenge (Director)	Department of Works and Equipment
6.	Mr. Aly Dembele (Director)	National Director and Energy, Mali
7.	Mr. Alassane Diallo (Secretary-General)	Senegalese Company for Phosphates of Taiba
8.	Mr. Michale William Nageri (Information Scientist)	CRAT
9.	Mr. Mouhamadou Diop (Director-General)	ITA
10.	Dr. Amadou Dembele (Director of Projects and Development)	"

11.	Mr. Eugene Ngor Faye (Head of Division)	Geology and prospecting Division
12.	Mr. Simon Dioh (Directo)	Department of Industries
13.	Mr. Momar Aly Ndiaye (Honourable Commissioner)	Ministry of Modernization and Technology
14.	Mr. Mbaye Ndoy (Scientific Director)	ISRA
15.	Mr. W. O. Baiye	Embassy of Nigeria
16.	Mr. Ibrahim Cisse (Head of Information and Industrial Training Dept.	SONEPI
17.	Mr. Fode Seck Director of International Organization	Ministry of Foreign Affairs
18.	Mr. Tahirou Bodian (Head of Oceanographic Division)	Department of Fisheries
19.	Mr. Moussa Diop (Departmental Officer incharge of Industrial Linkages)	"
20.	Mr. Cheik Kano (Director)	ISN
21.	Mr. Abdoulaye Diouf (Engineer and Divisional Head)	"
22.	Mr. Mor T. Kane (General Secretary)	SPIDS

23.	Mr. Souleymane Seck (General Secretary)	ICS
24.	Mr. Papa Abdoukhadir Mbodj (Director of Supplies)	"
25.	Mr. Mbaye Sougoufara (Director)	Dakar Chamber of Commerce Industry and Agriculture
26.	Mrs Daniele Dieng (Head of Documentation Unit)	" "
27.	Mr. Alassane Niane (Project Officer)	Delegation Aux Affairs Scientifique

TOGO

1.	Mr. Koffi Essaw, Vice Minister	Ministry of Foreign Affairs
2.	Mrs Dela E. Seddoh Director of Economic and Technical Cooperation	" "
3.	Mr. Ofumi Akakpo Head of Multinational Cooperation Division	" "
4.	Mr. Loukoumanou Boukari, Director of Industrial Development	Department of Industries

5.	Mr. Yao Numadi Officer in charge of Standards and Quality Centre	" "
6.	Mr. Kato Koatou Ata, Officer in charge of National Structure of Industrial property	" "
7.	Mr. ayayi Ajayo, Director	Department of Small & Medium Scale Enterprises
8.	Mr. Ekoue K. Assiongbon Director-General	Ministry of Rural Development
9.	Mrs Nadou Gbetie	" "
10.	Mr. Elilim Kofi Nyasenu	" "
11.	Mr. N'Zounou Biniman Pere Director	National Office of Mining Research, (Department of Mines and Geology)
12.	Mr. Yaovi Anatole Agbozouhoue Director for Development and Mining Control	" "
13.	Mr. N. Mikhaioff Chief Technical Adviser	" "
14.	Mr. Akouete Lawson. Statistician	Statistics Division Ministry of Planning
15.	Mrs Amele D'Almeida Computer Analyst	CENET
16.	Mr. Edy Kokouvi Antony Head of Insurance Department	Chamber of commerce Agriculture and Industry

17.	Mr. Emile Yawo Klegbe Head of Food Technology Division	Insitute of Nutrition and Food Technology
18.	Mr. Kossi M. Sedzro Agricultural Engineer	National Institute for Food Crops
19.	Mr. Pagbaya Toyi Mouzou Director in charge of Administration, Research and Developmenf	OTP
20.	Mr. Foligan J Kpadenou Head of commercial Department	"
21	Mr. Ssifou Moukaila Head of Production Department	"
22.	Mr. Daniel Adabra Director-Admin & Finance	SOTOMA
23.	Mr. Yao John Eqguagoo Head of Maintenance Unit	"
24.	Mr. Daniel Kaboe Kloutse Director General	OPAT
25.	Sihode D. Komlan Edoh Director General	SOTAB
26.	Mr. Tetegan Dathevy Director of Finance	SOTOTOLES

27.	Mr. Jean Louis Lierdeman ORSTOM Representative for Togo-Ghana-Benin	ORSTOM
28.	Mr. Thierry Fanchon Telecoms Engineer	"
29.	Mr. Kokou Maurice Devatchagni Computer Analyst	"
30.	Mr. Adogah Onah Deputy Head of Mission	Nigerian Embassy
31.	Mr. Toyin Solaja Counselle/Head of Chancery	" "
32.	Mr. Saddiq O. Akoshi Second Secretary	" "
33.	Mr. Mocktar Sow Expert Assistant	UNIDO

<u>UGANDA</u>

1.	Executive Director	Ugandan Manufacturers Association. P.O Box 6966, Kampala
2.	Mr. Mulwana	" "
3.	Managing Director	Steel Rolling Mills Ltd., P.O Box 4627, Kampala
4.	Managing Director	Rainbow Paints (U) Ltd P.O Box 4627, Kampala

5.	Director	Industrial & Technological Information Services, P.O Box 7125, Kampala
6.	Managing Director	Vitaform (U) Ltd., P.O. Box 2826, Kampala
7.	The Honourable Minister	Ministry of Foreign Affairs, Kampala
8.	Ms. Busulwa: for Commissioner	Ministry of Commerce Secretary Industry and Cooperatives, P.O Box 7125, Kampala
9.	Mr. Langoya Director PIES	Commissioner Project of Commerce and Industry BR/UGA/89/001 Attention Mr. Eidsvig CTA BR/UGA/89/001
10.	Mr. John W. Bunyenyesi Group General Manager	Alam Group of companies P.O Box 464. Kampala
11.	Mr. Tumubweine, Chairman	Ugandan National Chamber of Commerce and Industry, P.O Box 3890, Kampala
12.	Mr. Celenk	CTA DP/UGA/89.001 Geological Survey and Mine, Mineral Development Sector, P.O Box 9, Entebbe
13.	Permanent Secretary	Ministry of Water, Energy, Minerals and Environmental Protection
14.	Permanent Secretary	Ministry of Agriculture, Animal, Industry and Fisheries P.O Box 102, Entebbe
15.	E. O Etima	Department of Planning, Kampala
16.	National Economist	UNDP, Kampala
17.	Nigerian Embassy	Kampala

ZAMBIA

1.	Prof. Sramneza, Director	National Council for Scientific Research, 15302 Chelston, Lusaka Airport Road, P.O Box 310158, Zambia
2..	Head, Information Services Unit	" "
3.	Head, Building and Industrial Minerals Research Unit	" "
4.	The Permament Secretary	Ministry of Science, Tech and Vocational Training P.O Box 50464, Lusaka
5.	The Deputy permanent Sec.	" "
6.	The Permanent Secretary	Ministry of Energy
7.	Director	" "
8.	Director	" "
9.	Director	" "
10.	Mr. Bernard Chisanga Chief Executive Officer	Zambia confederation Industries and Chambers of Commerce (ZACCI) Showgrounds Great East Rd P.O Box 30844, Lusaka
11.	Dev. Babbar, Chairman	Zambia Association of Manufacturers, P.O Box 30036, Lusaka
12.	Mr. Menda D. K. Asst. Director	Sectorial Planning Department
13.	Mr. Dianganio, Director	" "

14.	**Keith Steve Chipako** **Head, Data Processing Unit**	" "
15.	**Hardware Support Unit** **Manager**	" "
16.	**Mr. Mupelwa Sichilima** **Executive Manager**	Preferential Trade Area (PTA) Secretariat P.O Box 30001, Lusaka
17.	**Mr. M. C. Soko** **Director ETC**	National Commission for Development & Planning (NCDP)
18.	Mr. L.S Chinda, Economist	" "
19.	Onder Yucer Resident Representative	UNDP, Zmabia
20.	Kim Jongston	UNIDO, Zambia
21.	High Commissioner	Nigeria High Commission Zambia
22.	Mr. Sanda	" "

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2.	Staff of Data Processing Unit	" "
3.	Mr. F. Bango **Head, International Economic** **Cooperation Section**	Ministry of Industry, Commerce

4.	Mr. Hove Head of Department	National Planning Commission of Zimbabwe
5.	Mr. M. K. Ndiweni Chief Executive	Confederation of Zimbabwe Industries
6.	Mr. Claude M. Chokwenda National Executive Director	Technological Information Pilot System (TIPS) Box 4362, Harare
7.	Dr. J.M.D Saungweme Director	Zimbabwe National Chamber of Commerce (ZNCC) Equity House, Rezende Street, Box 1934, Harare
8.	W. Z Maisiri Dep. Director	" "
9.	George Zata	" "
10.	Mr. M. L. Sifelani Chief Executive	Zimtrade, 4th Floor Kurima House, 89 Baker Avenue P.C Box 2738, Harare
11.	Mike Humphrey Director, Export Develop- ment	" "
12.	Mr. Matiango	Ministry of Mines
13	-	Ministry of Agriculture
14.	-	Ministry of Energy
15.	Miss Gwaringa	Ministry of Finance

16.	Edmud. Bengtsson Ass. Resident Reps.	UNDP, Harare
17.	Brilt Lindgren Jnr. Professional Officer	" "
18.	Mr. Ojerinola Head of Chancery	Nigerian High Commission Harare

ANNEX IX

INDIVIDUALS AND INSTITUTIONS CONSULTED DURING THE FINAL ASSESSMENT MISSION

EGYPT

1.	Ahmad Abdel-Bassit Director	Egyptian National Scientific and Technological
2.	Two Dept. Heads	" "
3.	Dr. M. B. Kaddoh	Information and Decision support Centre (IDSC), (including Trade-Net), 4th Floor, World Trade Centre Building, No 1191 Conish Nile Street Cairo
4.	Tarik Kamel	" "
5.	Hatem Ah-zarkani	Tade-Net c/o IDSC
6.	Ishak Souvial	"
7.	Dr. Ahmaed Aif Dardir	Information Centre, Egyptian Geological Survey and Mining Authority, (EGMA) 3, Salah Salem Street, Cairo Tel: 831671, 83015, TIX: 22695 GEOSU UN: Fax 820128
8.	Ibrahim M. Shalaby	" "
9.	Engineer Shams Salem	Computer Division, Ministry of Industry, 2 Latin America Street, Garden City, Cairo
10.	Reda Farahat	Department of International. Development and cooperation, Ministry of Foreign Affairs, Cairo.
11.	Dr. Adel M. Abdel-Latif	Economic Department, Ministry of Foreign Affairs

Others

12.	Vice-President	Academy of Scientific Research and Technology
13.	Under-Secretary	" "
14.	Ambassador	Embassy of the Federal Republic of Nigeria, Cairo
15.	High Commissioner	" "
16.	Asst. Resident Representative	UNDP, Cairo
17.	Automation Officer	" "

KENYA

1.	Mrs Alambo	Ministry of Commerce and Industry, Kenya
2.	Mr. Nwanaoangoro	" "
3.	Mrs Muturi	Kenyan External Trade Agency
4.	Mr. Ocheang	" "
5.	Mr. Chebii	" "
6.	Mr. Otiso	" "
7.	Mr. Magwaro	" "
8.	Mr. J. R. Nwangeka	Industrial promotion centre
9.	Dr. R. O. Anunga	Kenya Industrial Research and Development Institute, Foreign Affairs Ministry

NIGERIA

1.	Mrs Adebusuniyi Funmi	UNDP, Lagos, Computer Section
2.	Mr. Francis Ukoh	" "
3.	Dr. V. O. Akinyosoye	National Data Bank, Lagos
4.	Mrs Udoh	" "
5.	Mr. Olagunju	" "
6.	the Project Officer	National Data Bank, Lagos
7.	Mr. P. A. Adegboye	National Planning Commission, Lagos
8.	Network Trained Expert	SITTDEC, c/o NDB, Lagos
9.	Dr. D. B. Ayo	Raw Materials Research & Dev. Council, Abuja
10.	Mr. A. Thompson	" "

SENEGAL

1.	Resident Representative	United National Development Programme (computer Section)
2.	Mr. Mamadou Ndoye Diagne	Ministere de l'Industrie du du commerce et de l'Artisanat, Dakar
3.	Mme Fatou Binetou Fall	Centre International du Commerce Exterieur du Senegal (CICES)
4.	Mr. Akouette-Akue	African Regional Centre for Technology
5.	Mr. Pape Gorgui Toure	Societe Nationale Des Telecommunications du Senegal

6.	Director-General	Institute de Technologie d'Alimentaire
7.	Director, Technical Department	"
8.	Mr. Hady Momodou LY	Societe Nationale d'Etudes et de Promotion Industries (SONEPI)
9.	Mr. Papa Marnar Diope	commerciale de la Direction du Commerce
10.	Engr. Machangne Diakhee	SITTDEC Project
11.	Mr. Mohad Azlan Moor	Consultant to SITTDEC

PROFILES OF SELECTED INSTITUTIONS IN COUNTRIES VISITED

EGYPT

1. **THE CABINET INFORMATION AND DECISIONS SUPPORT CENTRE (IDSC)**

The mandate of the organization includes the following:

- to develop information and decision support systems for the cabinet and top policy makers in Egypt
- to support the establishment of decision support centres in existing Ministries and make more efficient and effective use of available information resources;
- to encourage, support and initiate information projects that will accelerate management and technological development of Egyptian Governorate and Ministries;
- to participate in international co-operation activities and agreements in the areas of information and decision support.

The Trade-Net: This houses information networking and dissemination system using latest computer and communication technologies. The services include information on basic socio-economic indicators of both Egypt and about 86 countries; global business opportunities on export, import, tenders and bids; business focus, both national and international, in the area of trade flows, prices, rates, consumption, production, industrial base, trading base, laws and legislation, in the area of intelligence reports, information on market situations, commodity situation, industry situations risk analysis, projection forecast, partnership, etc. In addition, it offers delivery service both on-line and hard copies of reports, newsletter, etc.

2. **Egyptian National Scientific Research and Technology Information Network (ENSTINET)**

- Although the staff are well- trained and highly experienced, they do not seem to be stable as they often find more attractive offers especially in Saudi Arabia.
- occupies a reasonably sufficient space which can accommodate any new project or tasks.
- The following constitutes the mandate of the ENSTINET:
- to assist Egyptian problem solvers and decision makers to access and apply quality data and relevant current information to developmental activities.
- ENSTINET is a system of public information services currently serving the following sectors, Agric Energy, Industry. Health-care, Science and Technology; Reconstruction,

Sociology and Criminology.

- The primary services provided are electronic data base search and document delivery globally using state-of-the-art computer and communication technology.
- the objectives also include promoting information utility and awareness, development of Science and Technology data-bases, facilitating access to information resources at local, regional and international levels, marketing information, and training manpower as well as co-ordination/co-operation with international agencies, etc.
- it is also a focal point for the G15 Member countries

3. <u>Egyptian Geological Survey and Mining Authority (EGSMA) Information Centre</u>

- the Information Centre occupies a very large space in the Headquarters Building. There is adequate space for expansion.
- there are few technical staff to man the computer section but there are many as data entry staff.
- the following constitute the mandate of the Information Centre:-
- the Centre is one of the 18 departments in EGSMA charged with information and documentation;
- the centre takes responsibility of running and developing the EGSMA Library consisting of periodicals, journals, theses, dissertations, textbooks, bulletins, etc in earth sciences;
- the centre houses the EGSMA Computers where all data relevant to the geology of Egypt and its mineral wealth is stored and retrieved.
- the centre also manages the EGSMA Geological Museum as well as publications.

4. <u>Ministry of Industry, Information Centre</u>

- the information centre, including its Computer Systems occupies a large area on the 9th floor in the Ministry's Headquarters. There is space for expansion.
- there are however few technical staff running the Computer Section. Since the condition of service is the same as in the Civil Service, including salary; the staff often leave for more attractive offers elsewhere.
- The mandate of the Centre includes the following:-

- to gather, store, retrieve and disseminate information for industries about resources in the areas of raw materials, manpower, electricity, water, imports and exports, prices and rates.
- keeping records on the requirements, production, management and product standards, etc of Government organizations.
- keeping data on standards released by the Standards Authority and Industrial Inspection Authority.
- undertake some manpower training programme of its staff regarding data gathering, editing and entry.

NIGERIA

RAW MATERIALS RESEARCH AND DEVELOPMENT COUNCIL (RMRDC), ABUJA

The Raw Materials Research and Development Council (RMRDC) was established by decree No. 39 of the Federal Government of Nigeria in 1987; with the purpose of undertaking activities geared towards promoting raw materials acquisition, exploitation and development. The mandates of the Council as embodied in the decree are as follows:-

- to draw up policy guidelines and action programmes on raw materials acquisition, exploitation and development;

- to review from time to time raw materials resources, availability and utilization, with a view to advising the Federal Government of Nigeria on the strategic implications of depletion, conservation or stock-piling of such resources,

- to advise on adaptation of machinery for raw materials utilization;

- to encourage publicity of research findings and other information relevant to sourcing of industries;

- To encourage growth of in-plant research and development capabilities;

- to advise on and device awards or systems for industries that achieve any break-through or make innovations and inventions;

- to organize workshop, symposia and seminars designed to enlighten people on new development and solutions discovered from time to time;

- to consider and advise on special research grants for specific objectives, and

- to consider and advise on any other issue capable of enhancing the objectives of the Council.

Internationally, RMRDC has been identified as the authority in Nigeria on raw materials research and development. The establishment of the Raw Materials Information System (RMIS) has always been one of the important programmes in the RMRDC.

The project includes the establishment of a Computer and Library divisions. The exercise was to enable the Council have a data bank on raw materials so that it would be able to disseminate information on Raw Materials to investors and entrepreneurs. Based on the efforts of the Council, UNDP is assisting RMRDC to strengthen her information network to the tune of US650,000 design.

The Raw Materials Information System (RMIS) is at its completion stage. The system is made up of nine modules which includes the following:

- Raw Materials
- Machinery and equipment
- Research and development
- Research personnel
- Process technology
- Organizational activities
- Mineral resources
- Investment and consultancy
- Joint venture

Library

The support library uses the CDS/ISIS application software on stand-alone systems for its library functions and has records of its holdings in the library module on the network. One thousand (1,000) records have been entered into the module.

External users coming from industries, banks, research institutes, institutions of higher learning and enterpreneurs consult the library for data and information on raw materials and process technologies. The library has acquired over three thousand (3,000) books by the end of 1994. Some of these books were donated by collaborating organisations such as CBI, IITA, CBN, ITC, UNIDO and UNIFEM.

The library maintianed the number of journals/magazines at seventy-six (76) titles while its 5 CD-ROM data bases have been procured. Six agricultural video films were received as gifts from APPROMA of France to boost its audio-visual collection. As part of the information dissemination activity the library distributes the RMRDC Newsletter to all foreign embassies in Nigeria, all Nigerian embassies and missions aboard, foreign academic and research institutes as well as local organisations and many individuals.

NETWORK AND DATA COMMUNICATION LOCAL AREA NETWORK

RMRDC-NET is the Raw Materials Research and Development council Network linking all the computing resources within the Councils Headquarters in Abuja. These systems are locally and physically connected by software and cables. The technology used is based on Local Area Network (LAN) using Thick Ethernet cable as the backbone. It provides for future expansion as well as reliability, easy management and maintenance.

RMRDC-NET allows any user using a workstation or dummy terminal connected through a NOVELLE Netware server or XENIX server to access the main HOST system (DG/UNIX) called the RMRDC-server where Raw Materials Information System (RMIS) resides. The system is developed with an ORACLE Relational Database Management System.

RMRDC-NET has about 50 nodes and allows for future expansion of the network using different protocols such as IP, IPX, SPX to access the servers.

WIDE AREA NETWORK (WAN)

RMRDC has twenty-six (26) computer systems in its liaison offices spread across the Country. These liaison offices, some selected institutions and other research centres are to be linked up in a network in future. This would however depend on the availability of funds.

RMRDC has a corp of documentalists who process data prior to entry into the system.

The Council also serves as the Secretariat of the Action committee on Raw Materials (ACRM) of the Group 77 countries. The Committee which was established in 1987 at the sixth Inter-governmental Follow-up Co-ordination committee meeting of G.77 in Havana, Cuba, has its main objective to promote inter-trade and related services among member states as well as offer direct assistance to industries.

South Investment on Trade and Technical Data Exchange Centre (SITTDEC)

- the National Planning Commission is the focal point for the G.15 in Nigeria. Therefore, one of the Directors (namely the Director, Agriculture and Industry) is also the Director of the Centre. His office is currently in the Commission's Headquarters located phase 2, Federal Secretariat, Ikoyi, Lagos. The centre is however located about 20 minutes drive from the National Planning Commission.
- the centre is housed in the premises of the National Data Bank, occupying a small one-room of about 4 x 6m. There is occute shortage of space for adequate expansion.

The mandate of the centre focusses on the area of:-

- a focal point for the G.15 Member Countries
- to promote data and information exchange on trade between member countries
- to acquire modern computer and communication facilities and use such in data storage, retrieval and dissemination.

National Data Bank (NDB)

- the National Data Bank is a parastatal under the supervision of the National Planning Commission. It is self accounting and has received financial assistance from UNDP to acquire most of its facilities.

- it occupies a sizeable area next to the Federal Office of Statistics. There are spaces for expansion.

- since the organization is a government parastatal, the salary scale of its workers and other service conditions remain the same as in the Federal Civil Service which is less attractive compared to what banks and other private organizations offer to their employees. The technical manpower therefore may not be stable.

- the organization has among other things the following mandates:-

- to source data in nearly all sectors of the economy, welfare, environment, population, resources, production, education, raw materials , process, technology, manpower and training, etc.

- verify data, store, retrieve and disseminate data and information to a wide-range of users including the central, state and local governments and agencies, organized private sector, investors, consultants, planners, researchers, policy-makers, etc.

KENYA

Ministry of Commerce and Industry: Industrial Registration Division

the industrial Registration Division is an arm of the Ministry of Commerce and Industry that liaisons with the Industrial Sector and the Chamber of Commerce.

- the mandate of the Industrial Registration Division includes the following:

- to keep a database on the various industries operating in Kenya;

- to carry out inventory and document information/data on primary raw materials utilization by industries, installed capacities and products of their production processes;

- prepare directory on industries that are to be made available to Chambers of Commerce, Embassies in and outside Kenya.

Kenya External Trade Agency (KETA)

- this orgnization is the focal point on external trade

- it houses currently, the TINET - Trade Information Network for Preferential Trade Area (PTA) of the SADDEC region.

- the mandate of the agency are primarily to:-

- store and disseminate information on trade, both local and foreign;

- document and aprovice information on market reports, trade laws, tariffs, trade statistics, etc.

- liaise with International Trade Council (ITC) in the area of trade.

Kenya Industrial Research and Development Institute (KIRDI)

- KIRDI was established as a corporate body under the Ministry of Research, Science and Technology in 1979.

- it was to operate as a multi-disciplinary institution to conduct research and development in industrial and allied technologies, mining and power resources development.

- the main mandates of the institute among others, are to:-

- provide scientific and technological information that could assist Kenya to attain a significant level of self-reliance in technology and for creating a self-sustaining industrial development process.

- collaborate with other national focal points in the area of information gathering and dissemination.

Kenya Bureau of Statistics (KBS)

Kenya Bureau of Statistics is a department in the Ministry of Planning. However, there is plan for its upgrading to the status of a parastatal. This agency was set up to carry out the following activities:-

- to collect, analyze and disseminate information on social, economic and population matters;

- to back-up government strategies for planning and executing its developmental programmes and policies.
  The information gathered will serve as an appraisal for monitoring the programmes and their impacts on a number of sectors of the economy.

Kenya Government, Central Computer Service Unit

This is a Unit under the Ministry of Finance, with the following mandates:-

- to assist government agencies in their computer services assignment;

- to assist in the preparation of payrolls and salary slips for the ministries;

- type-set government printing needs;

- to work closely with Kenya Central Bank, Office of the President, Ministry of Finance and the Cabinet Office.

SENEGAL

Centre International Du Commerce Extenieur Du Senegal (CICES)

This a government organization with the following mandates:-

- to promote exportation of products from Senegal to the International market;

- to organize and encourage sub-regional trading;

- to compile data and provide information on trade opportunities;

African Regional Centre for Technology

This centre was established under the supervision of the Organization of African Unity (OAU) With 30 member countries out of which 26 maintain the respective Ministries of Science and Technology as the country focal points.

The centre is specifically charged with the following responsibilities:

- to stimulate the awareness of technological development in members states;
- to strengthen the technological capability of its member states;
- to improve the terms and conditions for importation of technology

The following programmes are currently being pursued by the centre:-

- information support services programme funded by UNDP;
- industrial information services programme funded by UNIDO;
- post-harvest technology programme funded by IDRC;
- Energy and Technology - Enterprise Incubation Programme

Institute Technologigues Alimentairs

The main mandate of the institute is to research into the most effective way of utilizing Senegal's agricultural raw materials to obtain agro-industrial inputs.

Societe Nationale D'Ettudes Et De Promotion Industrieue (SONEPI)

SONEPI, established in 1969 by the government of Senegal in collaboration with the private sector has the following as mandate:-

- to provide consultancy and assistance services to the national and foreign economic operators;

- to act as a storage house for information gathering and dissemination

Commerciale De La Direction Du Commerce

This directorate oversees the commercial activities of the nation in the area of information gathering and dissemination. It also liaises with the local and national Chambers of Commerce.

ANNEX XI

COMMUNICATION FACILITIES IN SELECTED COUNTRIES

Communication technology has evolved through many stages from the morse-code to fiber optics transmission employing multi-dual tone frequency communication. With 12% of the world's population it has only 1.4% of its telephone lines, it is obvious that Africa does not have adequate telecommunication facilities. In the four countries selected some genuine efforts have been made to develop their telecommunication facilities to meet acceptable world standards.

Kenya: Kenya has 450,000 lines to date, from 17,000 she had at independence. Efforts are on to digitalise the telecommunication network by over-lay analogue network. Also, mobile Cellular Telephone system will be commissioned by June 1993. Kenya hopes to achieve a 1.5 million direct exchange lines by the year 2000. Kenya has a packet data switched exchange called KENPAC. KENPACE is configured to support the following protocols X.23, X.25, S.25, X.28,/X.29, BSC 3270, SNA/SDLC X.75 and telex interface. it also supports transmission rates from 300 - 9600 bps.

Senegal: Most of the installed telephone lines are in Dakar with over 65,000 lines. Digitalization of the lines is about to be commissioned and the use of mobile Cellular Telephone system is almost completed. The telephone system is fairly reliable and stable although the lines are routed through exchanges in France. Senegal has also set up a packet data switched exchange called SENPAC, and is similarly configured as Kenya's KENPAC.

Nigeria: Nigeria with a population of about 90 million has most of its telephone lines in major cities especially 30 states capitals like Lagos, Kaduna, Abuja, etc. Lagos alone accounts for the majority. Digitalization of the lines has been commissioned in certain areas of Lagos and Abuja and the mobile cellular telephone system is in place. Telephone lines are generally not reliable but with the advent of the digitalized system some reliability is being experienced. Mobile Cellular Telephone System has been commissioned and is reliable. Nigeria is yet to commission a packet data switched exchange but currently relies on leased circuit systems arrangement with some private companies such as SITA for external data transfer.

Egypt

Out of the four countries visited, Egypt seems to have the most advanced telephone/telecommunication network. It has quite a wide range of telephone services thereby making inter-office communication very easy. The lines are predominantly digitalized and the mobile cellular telephone system is available. The telephone lines are generally reliable. Egypt has also set-up and extensively uses the packet data switched exchange for data transfer within the country and internationally.

ANNEX XII

EDITORIAL COMMITTEE FOR THE FINAL FEASIBILITY REPORT

Dr. A. A. Aliyu

Dr. A. K. Abdullahi

Mr. B. A. Aluko

Dr. (Mrs) M. A. Umeagudosu

Dr. H. D. Ibrahim

Mr. H. C.I. Adibe

Mr. K. B. Ajoku

Mr. C. O Okeke

Mrs G. Uko

Miss O. Obe