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FIELD MISSION REPORT ON PROMOTION OF INDUSTRIAL INFORMATION NETWORKING IN BOTSWANA, ETHIOPIA, GHANA, LIBYAN ARAB JAMAHIRIYA, SIERRA LEONE AND ZIMBABWE*

Prepared by

UNIDO Secretariat**

* This document has not been edited.

** Based on the work of Yusef K. Mazhar, UNIDO Consultant.

V.89 62433

Explanatory notes

The following abbreviations are used in this report:

AGRIS	Agricultural Information System
BDC	Botswana Development Corporation
BTC	Botswana Technology Centre
BTIS	Botswana Technical Information Service
BOCCIM	Botswana Confederation of Commerce, Industry and Manpower
CARIS	Caribbean Information System
COMFAR	Computer Feasibility Analysis Report
CSIR	Council for Scientific and Industrial Research
CZI	Confederation of Zimbabwe Industries
DAPIT	Development and Application of Intermediate Technology
ECA	United Nations Economic Commission for Africa
EIS	Exporters Information Service
ESTINET	Egyptian Scientific and Technical Information Network
GHASTINET	Ghana National Scientific and Technological Information Network
HASIDA	Handicrafts and Small Industry Development Agency
IBM	International Busines Machines
IDA	Industrial Development Abstracts
IDAA	Industrial Development Domestic Abstracts
IDDA	Industrial Development Decade for Africa
IDM	Institute of Development Management
IDRC	International Development Research Centre
IIC	Industrial Information Centre
ILCA	International Livestock Centre for Africa
INECA	Industrial Energy Conservation Abstracts
INTIB	Industrial and Technological Information Bank
IPAM	Institute of Public Administration and Management
IRC	Industrial Research Centre
IRI	Industrial Research Institution
ITC	International Trade Centre
LINK	On-line Information Key
MIS	Management Information System
MIST	Ministry of Industries, Science and Technology
MINISIS	Mini Integrated Scientific Information System
NADOC	National Agricultural Documentation Centre
NASTDOC	National Scientific and Technical Documentation Centre
NDB	National Development Bank
NFP	National Focal Point
NIDFO	National Industrial Development and Finance Organisation
NIDRD	National Institute of Development Research and Documentation
PADIS	Pan African Development Information System
PC	Personal Computer
PRU	Project Research Unit
PTT	Post, Telegraph and Telecommunications

RIIC	Rural Industries Innovation Centre
SIDFA	Senior Industrial Development Field Adviser
TIPA	Trade and Investment Promotion Agency
TIPS	Technological Information Pilot System
TTC	Technology Transfer Centre
UNISIST	Universal System for Information in Science and Technology
UN	United Nations
UNIDO	United Nations Industrial Development Organization
UNDP	United Nations Development Programme
URDBS	University Research and Development Services Bureau
WIPO	World Intellectual Property Organization
ZDB	Zimbabwe Development Bank

ACKNOWLEDGEMENT

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EXECUTIVE SUMMARY

Information infrastructure is a key element in strengthening and accelerating the process of industrialization, and in recent years information has increasingly been recognized as a major commodity and as a valuable national resource, and information transfer has become an important field of activity.

In line with UNIDO's strong emphasis on industrialization in Africa, INTIB's African regional network is being extended by the project "Promotion of Industrial Information Networking Among Selected African Countries" (XA/RAF/88/684), which will add 11 new National Focal Points (NFPs) of Botswana, Burundi, Ethiopia, Ghana, Libyan Arab Jamahiriya, Madagascar, Mali, Morocco, Rwanda, Sierra Leone and Zimbabwe to the existing 10 by the end of 1989.

The Secretary of the General People's Committee for Strategic Industries, Misurata, Libya, has excellent computer and information background and is fully backing the information development with immediate plans for a main Industrial Information Centre (IIC) to cater for both light and strategic industries. A vast area is earmarked with good facilities and accessibility on the ground floor of the same Ministry building complex. The General Secretary (Undersecretary) informed the mission that this was the suggested venue of the INTIB focal point.

The Ghana national focal point of INTIB has not yet been finally officially defined and notified to UNIDO. However, the Secretary of Industries, Science and Technology informed the mission that a decision had been taken to locate the focal point of INTIB at Council of Scientic and Industrial Research (CSIR), Accra, Ghana.

The INTIB focal point does not exist at the moment in Sierra Leone. In this regard, specifically the following decisions have to be taken:

a) Whether the Ministry of Industry will undertake to host the focal point in a similar fashion as the case of the National Agricultural Documentation Centre (NADOC), providing space possibly in Youyi building, if available and making accessible local staff, funds etc.

or

b) Accepting that an institution as NADOC undertakes to install the focal point. However, in this case there must be a specific commitment that the devices are offered not only to NADOC projects but to the industry as a whole. NADOC should also intime expand its premises to allow its own growth and that of the INTIB focal point.

The Ethiopian INTIB focal point has been installed in the Ministry of Industry . This first step needs further follow-up as specific individuals have not been named, but the work will apparently be followed up among other activities in the Ministry.

INTIB focal point, Ministry of Industry and Technology, Harare, Zimbabwe has yet to activate its activities. Continuous staff attendance is necessary, thus more than one person is needed on full time basis. Building up of the international and then local data bases is a must. Local information must be stored after a complete working language of all INTIB data bases is ensured.

The INTIB focal point in Botswana has not as yet been finally placed though the alternatives were presented in the final reporting at the Ministry of Commerce and Trade, where the vital prerequisites for success in decision making, location, staffing, equiping and accessibility were pointed out. The decision could be made for location within the Ministry or outside in an associated organisation such as Botswana Technology Centre (BTC), provided the prerequisites are met.

INTRODUCTION

1. The supply of information at the national level in particular for the priority sectors identified by the Lagos Plan of Action is essential for the success of the industrialization of Africa. The process of selection on technology as well as equipment requires two basic prerequisites, namely information on alternatives and the capability for choice among alternatives. Considering the comparatively small size of manufacturing firms in many African countries and their relative inexperience, many of them can neither afford to maintain information units of their own nor in fact do they have even information on where information will be available.

2. Under its Industrial Development Decade for Africa (IDDA) program UNIDO has been stipulated to intensify activities in Africa related, in particular, to technological advisory services and information exchange systems. Information infrastructure is a key element in strengthening and accelerating the process of industrialization, and in recent years information has increasingly been recognized as a major commodity and as a valuable national resource, and information transfer has become an important field of activity.

3. In this connection, INTIB has been carrying out a project entitled "Establishment, strengthening and promotion of linkages between national, regional and sub-regional industrial technological information services in Africa and with INTIB" (RP/RAF/85/621) since mid-1985 covering 10 countries, namely, Algeria, Cameroon, Cote d'Ivoire, Egypt, Kenya, Nigeria, Senegal, Tunisia, United Republic of Tanzania and Zambia. Sub-networks of INTIB have been established, which consist of national focal points as well as national nodes responsible for industrial and technological information activities.

4. In line with UNIDO's strong emphasis on industrialization in Africa, INTIB's African regional network is being extended by the project "Promotion of Industrial Information Networking Among Selected African Countries" (XA/RAF/88/684), which will add 11 new National Focal Points (NFPs) of Botswana, Burundi, Ethiopia, Ghana, Libyan Arab Jamahiriya, Madagascar, Mali, Morocco, Rwanda, Sierra Leone and Zimbabwe to the existing 10 by the end of 1989.

5. Conceptually, the network consists of INTIB focal points and INTIB nodes, comprising institutions such as industrial and technological information service organizations, chambers of commerce, federations of industries, associations of small and medium industries, national productivity centres, R+D institutions, engineering consultancy firms, development banks, technology transfer promotion organizations, agencies for the marketing of research results, etc.

6. The main responsibilities of INTIB Focal Points can be summarized as follows:

- To serve as national clearing-houses for technological and industrial information, receiving UNIDO publications regularly and acting as depositories for UNIDO documents;

- To co-ordinate the INTIB Industrial Inquiry Service as well as the industrial extension service of the national nodes;

- To survey information needs of INTIB users at the national level;

- To collect and process industrial and technological information in the data bases supplied by INTIB;

- To identify as well as recommend potential national nodes to INTIB;

- To participate in activities organized by INTIB aimed at increasing co-operation among focal points; and

- To identify industrial training opportunities within the country as well as abroad and inform the national nodes.

7. The project's national experts had surveyed and prepared a report on the existing and potential national industrial and technological information systems and services as well as their needs. A listing of the national reports can be seen in the notes of the report.

8. In order to assess the situation on technology and industry information in the country, required for planning and implementing the programme on INTIB networking, a field mission was sent to Libyan Arab Jamahiriya (17-21 May 1989), Ghana (21-24 May 1989), Sierra Leone (24-28 May 1989), Ethiopia (28 May - 2 June 1989), Zimbabwe (2-6 June 1989) and Botswana (6-10 June 1989). The mission team consists of Dr. Yusef K. Mazhar, UNIDO expert on industrial and technological information services and a staff member of UNIDO/INTIB.

9. The main objectives of the mission were to:

(a) assess the existing and potential information systems, services and networks in the countries;

(b) assess national focal points of INTIB on their specialized field of industrial and technological information activities;

(c) assess existing and potential users of industrial and technological information based on their specific needs and priorities;

(d) assess the nature of information services required from the INTIB in detail as well as modalities of linkages and communications with INTIB headquarters; and

(e) advise on expansion of the existing industrial and technological information service systems, including selection of software and hardware as well as assessment of manpower requirements and training needs for the information systems.

GENERAL COMMENTS AND RECOMMENDATIONS

10. After visiting the six countries, the following general comments can be made:

i) The overall awareness for the usefulness of industrial information is still limited. Industrial and technological information is not yet considered the contributing factor to industrial and technological development.

ii) Industrial and technological information, ranging from hard core manufacturing information needed by the producers, to project related information, to development oriented information, means different things to different people.

iii) Information banks have a general appeal to decision makers, planners and industrialists. There is, however, little knowledge on the capabilities and limitations of such banks.

iv) Most countries have been exposed to other information and documentation systems and data banks. Notable are AGRIS in the agricultural research area and the scientific and technological systems and networks, which are active and cater for the scientific community as well as the academic community.

v) The ministerial structure varies in many countries with Ministry of Industry, Strategic and Light Industries, Commerce and Industry and Industry and Technology. These variations influence the type and needs for industrial and technological banks.

vi) There are notable differences in the Government systems between planned economies and free economy systems in these countries. The relative contribution of the public or state industrial sector versus the contribution of the private sector is an important factor determining the kind of information needed and the ideal location of an information data bank as INTIB.

vii) The decision whether to locate INTIB close to or in a Ministry, close to the decision maker or in an associated organisation or closer to the final user is a strategic decision to which some parameters have developed. These parameters could include, among others, that an INTIB focal point should:

(a) Have full support and top priority by the Government;
(b) Be locally financed to include core local staff, not less than three (3) persons with an average of around six (6) for smaller countries but with no upper limit;
(c) Be self-sufficient in basic office material, filing systems and transportation;
(d) Be completely and easily accessible to the final users;
(e) Be kept up to date with INTIB data banks and information;

(f) Ensure good basic and continuous training for staff; and
(g) Where possible supplement the INTIB focal point with a UNDP-UNIDO project as the IDDA project is just a modest start.

viii) Governments should be urged to make final decisions of the location of INTIB focal point within industry. Even if this is a final Government selection, UNIDO should make serious efforts in correctly advising an industry location. Other suggestions should be critically evaluated to avoid misplacing the INTIB focal point as a result of personal opinions.

ix) UNIDO should provide positive assistance in starting and supporting the first phases. A "kit" is proposed containing full documentation, supporting literature and data base diskettes with accurate user friendly instructions. Whenever possible a staff member or consultant should be available at start up.

x) Periodic programme missions, if possible, could monitor progress and offer assistance as the data bases develop, keeping the INTIB data bases in line with headquarters updating.

xi) More important for Governments is to consider UNIDO information to INTIB as a basic start. They should not restrict themselves to these inputs but add their local information in the basic data banks as well as developing new ones according to the specific and characteristics of the country.

xii) The INTIB focal point in each country should be considered only a start. The other nodes should be quickly developed. Suitable nodes can be started in the general organisations, supervising groups of similar companies in planned economies, e.g. textile industry organisations or corporations and metal industry organisations or corporations. Where groupings of private sectors exist, federations of industry, confederations of industry, etc. can be very important nodes. The other nodes may include technology transfer centres and active extension service private or governmental organisations. Handicrafts and/or small scale institutes or centres and active women groupings giving extension services can all contribute.

xiii) Though international communications is possible in some countries having sophisticated PTT systems, most countries will have either censorship, technological or budgetary restrictions on this type of communications. Therefore, traditional post, pouch, telex and telefax should not be discarded or neglected until such sophisticated systems are fully operational. Present IBM Screen Mail services (electronic mail) should be tested for accessibility from the field and alternatives be investigated for working practical solutions.

11. In UNIDO, INTIB should be fully supported as INTIB's headquarters strength and weaknesses will be reflected in the country focal points. It is proposed to strengthen UNIDO-INTIB headquarters that

(a) The section should be fully supported with some more staff, permanent and short time. Two main directions should not be neglected, i.e. information specialists and computer/systems specialists;

(b) Should the proposal (a) be difficult, field projects should be used to strengthen headquarters capabilities. Systems, a thesaurus, " INTIB kits" etc. could be developed this way;

(c) INTIB should aspire to a better direct communications system as an independent entity to fulfil present aspiration for good direct accessibility when INTIB focal points install their hardware and modems;

(d) The Industrial Development Abstracts (IDA) should be kept up to date with a revised thesaurus and sent them out first to INTIB focal points and then, if possible, to nodes. Microfiche should be promoted and be readily available. Future IDDA projects could consider microfiche readers as was the case of the PCs in the first and second IDDA/INTIB projects;

(e) The INTIB should be well promoted in IDDA programme and any other "regional activities" as financing is sometimes easier; and

(f) Attempts should be made to maintain English/French information directories and duplication of documents to maintain co-ordination. It should also be mentioned that Portuguese speaking countries should not be forgotten. Arabic as a UN language used in North Africa could also be useful.

FINDINGS OF THE MISSION

LIBYAN ARAB JAMAHIRIYA

12. Libyan Arab Jamahiriya was embarked on an ambitious industrialisation development programme with a series of industrial development plans. The first plan was from 1975 to 1980 and the second from 1980 to 1985. From 1986 to 1990 follow-up was emphasized on projects which were not yet terminated. It is planned for a third Five-Year Plan from 1991 to 1995.

13. Industry employs nearly 50,000 persons in over 300 plants around the country in about 50 companies. For the future, around 150 industrial projects are under implementation with 65 further projects under study. The predominant sector is still food (34.6 per cent) followed by textile and leather (16.8 per cent) and metal and engineering are the emphasis for the future (18 per cent).

14. Industry had a General Secretariat (Ministry) up to recent reorganization, which divided industry into strategic industries and light industries. At the moment, this reorganisation is still being implemented with separate new locations and distribution of staff. The strategic industries can be considered the basic metals, iron and steel, engineering, electronics, building materials, chemicals, etc. and the light industries as textiles, leather, food, furniture, etc.

15. In spite of the reorganisation, information centres exist in both the Light Industries Secretariat (3 persons) and the Strategic Industries Secretariat (7 persons). Some basic equipment is available in the form of PCs, limited in the case of light industries but with over 10 units in the strategic industries information centre, where considerable enthusiasm exists for the INTIB project and where substantial assistance has been provided by the Iron and Steel Complex, Misurata.

16. The Secretary of the General People's Committee for Strategic Industries has excellent computer and information background and is fully backing the information development with immediate plans for a main Industrial Information Centre (IIC) to cater for both light and strategic industries. A vast area is earmarked with good facilities and accessibility on the ground floor of the same Ministry building complex. The General Secretary (Undersecretary) informed the mission that this was the suggested venue of the INTIB focal point.

17. A visit to the Industrial Research Centre (IRC) showed that a comprehensive library exist with a good collection of studies, surveys, feasibility studies and some UNIDO publications. The library and information centre work under the Dewey Classification System and have well equiped impressive faciiities. The library is still to be computerised in the near future. IRC maintains an industrial inquiry service in various industrial sectors. The Iron and Steel Complex, Misurata, would be one of the potential users of INTIB services as well as a major contributor to the INTIB national focal point activities in the country. The management expressed their full support for the INTIB focal point programme in the country.

18. The following assessments could be made:

(a) The existing information systems at the Secretariats (light and strategic) are at their very early stages, but are in principle established having a venue, some basic hardware like PCs and necessary peripherals, including modems for communication as well as a small core staff of qualified seconded personnel. The systems depend on company data for the Ministry; no services are available to any users. A network is, however, planned to include the companies, the Industrial Research Centre and other associated institutions. A huge potential exists depending primarily on the backing of the two industry Secretariats and the engagement of full time qualified personnel.

(b) INTIB activities have not yet started as the focal point was not specified. However, the mission spent considerable time with the Industrial Information Centre (IIC) staff to spell out the expected inputs and outputs of the planned INTIB focal point. This was received with full understanding and enthusiasm with many queries on hardware, software and working experience. Some of the INTIB data bases have been installed at the Strategic Industries Information Centre and their use was demonstrated to the staff.

(c) The existing users of the industry secretariat information centre are primarily the secretariat decision makers. Information is used for follow-up and reporting. No evidence was found of other users within industry and this was pointed out to the local responsible persons.

(d) The information services required do not exist at the moment, but discussions showed they could, as spelled out in the local consultant's report _1/, including management, marketing, manufacturing, technical and technological. It is, however, obvious that the stated requirements have still to be motivated.

(e) The following could be advised for the existing system:

i) A plan could be drawn up to include existing ideas of the Secretariat and the staff. It would also be advisable to issue a Secretariat decree on the plan and organisation of the Industrial Information Centre and the network.

ii) Inform UNIDO about the final location of the INTIB focal point and persons responsible.

iii) Complete the installation and start up of the equipment purchased: PCs (50), printers, modems, etc. Attempts should be made for some networking to reach optimum use of PCs and printer combinations. The information centre should be isolated and defined as such word processing activities should be separated.

iv) An extensive recruitment program should be embarked up to strengthen the Industrial Information Centre and INTIB focal point. A minimum effective number of skilled staff should be on full time service. Seconded staff can only be in addition to the minimum 15 full time staff. This does not exclude strengthening the light industries and strategic industries units if they continue operation.

v) Embark on a series of training courses at different levels of sophistication from introductory information courses to computer systems. At the same time, appoint and train at least five industrial information specialists (engineers, chemists, etc.)

vi) Specify outside expertise available locally or on international or bilateral level which should be contacted for.

vii) UNIDO could be entrusted with the formulation of a project either as funds in trust or UNDP country programme with cost sharing to implement assistance in expertise, consultants, programmes and training locally and abroad.

19. In general the situation can be considered very promising with considerable committment at Secretariat level and enthusiasm on staff level. The required plans, decrees and implementation could start immediately and the local network for industrial and technological information service should include:

a) The main Industrial Information Centre (all industry);

b) The Strategic Industries Information Centre;

c) The Light Industries Information Centre;

d) The co-operatives; and

e) Other local bodies (planning and local government in the future).

Recommend that b) and c) should be connected to the Executive Boards of the Iron and Steel, Engineering and Electronics industry and eventually the companies.

20. The INTIB focal point should be selected on the basis of

a) Decision of the Secretariat;

b) Where the location is near to the decision makers;

c) Where full support (financial, organisation, facilities, etc.) is given;

d) Where access is available to present and future users;

e) Geographically central and accessible by industry and close to industry concentration; and

f) Full telex, telefax, international and local telephone systems.

List of persons and institutions visited in Libyan Arab Jamahiriya

Dr. Sathy Hamad Bin Shatwan	Secretary People's General Committee for Strategic Industries P.O. Box 18308, Misurata Telex: 30240 KHAFIFA LY Telefax: 29847
Eng. Amin Helmy Kamel	Secretary People's General Committee for Light Industries P.O. Box 18308, Misurata Telex: 30240 KHAFIFA LY Telefax: 29847
Mr. Abdalla El Mangoush	Director Information Department People's General Committee for Light Industries
Mr. Ayad el Azaby	General Secretary (Undersecretary) People's General Assembly for Light Industries
Mr. Amhamed Hageg	Undersecretary Strategic Industry General Director People's General Assembly for Strategic Industries
Mr. Siddig A. Sholan	Director Public Relations and Co-operation Department Misurata
Dr. Abdallah I. Fadel	General Director Industrial Research Center P.O. Box 3633, Tripoli Telex: 20038 Telefax: 690028

Mr. Saleh Shaker	National Coordinator for Industry United Nations Industrial Development Organization P.O. Box 358, Tripoli Telex: 20582 UNDEVPR LY

Executive Board of Iron and Steel Complex, Misurata

Dr. Muftah Ali Azoza	Chairman of the Management Committee Iron and Steel Complex, Misurata P.O. Box 17858, Misurata Telex: 30149 and 30150
Mr. A.M. El Magdub	General Manager Technical
Mr. A.A. Sasi	Computer systems and Telecommunications Manager
Mr. S.M. Belazi	Industrial Engineering Manager
Mr. A.M. Abo Mais	Production Planning and Control Manager
Mr. S.S. Elbrrani	Programmer Planning and Follow-up Bureau
Mr. I.M. Mohamed	Programmer Planning and Follow-up Bureau

Information Centre/Strategic Industries

Mr. Idris Sasi El-feghi	Hardware Engineer/Manager
Mr. Abir Sayed Mustapha	Programmer
Mr. Eman El Mangush	Programmer
Mr. Hussein el Ayesh	Industrial Promotion Officer
Mr. Salem El-Akhtel	Data entry operator
Mr. Abdul Adem El Jack	Operator

Information Centre/Light Industries

Mr. Yousef Erfieda	Maintenance manager
Mr. Rayid Lagha	Programmer
Mrs. Mona Elithe	Programmer
Mr. Ibrahem Baawo	Librarian
Ms. Fatma Elmangosh	Documentalist
Mr. Ibrahem Waffa	Documentalist

Equipment available in Strategic Industries Information Centre

60	IBM PC	- 35 IBM-AT 25 IBM PS/2 60 model
65	LQ Printer	- 60 LQ 2550 5 LQ 1000
11	Modems	- 1 Hayes 5 Amstrad 5 Philips

Software available in Strategic Industries Information Centre

Dos V3.3
CDS/ISIS
Lotus 1-2-3, Report Writer
WordPerfect
Arabstar
Compilers (cobol, fortran, dBase IV)

Equipment available in Light Industries Secretariat

Information Department - 5PCs (3 IBM-AT, 1 IBM PS/2-60 and 1 COMPAQ)

In other departments under control - 4 PCs

GHANA

21. The mission arrived in Ghana on 21 May 1989 and met with the local consultant, Mr. Villars who had prepared a comprehensive report on the "Situation on Industrial and Technology Information in Ghana"_2/. The reporting in Ghana will therefore not duplicate the basic background information. It should be noted that Ghana has set up an impressive number of institutions in science and technology.

22. Notable is that under the Council for Scientific and Industrial Research (CSIR) five National Sectoral Technical Committees have been set up since 1986 to outline plans and policies. The Committees are on Agriculture, Fisheries and Forestries, Health and Medicine, Industry and Technology and Social and Natural Sciences. The Technical Committee on Industry and Technology has subcommittees on eleven subsectors (food, mining, wood, textiles, machine tools, electricity and electronics, leather, energy, water and standardisation.

23. A UNISIST National Committee became the National Committee for Information and Documentation. CSIR has a central reference and research library which the team visited. It stocks basic textbooks, reports and some UNIDO publications though a rehabilitation and updating effort would be necessary. Library and information services are provided by limited staff. Ghana Science Abstracts are prepared and circulated.

24. Industrial development began in the late 1950's with state enterprises, parastatals and private sectors, including the small-scale industries. Based on import substitution, it was soon to suffer considerable under utilisation due to the absence of continuous foreign currency needs.

25. The following assessments could be made:

(a) The national focal point of INTIB has not yet been finally officially defined and notified to UNIDO. However, the Secretary of Industries, Science and Technology informed the mission that a decision had been taken to locate the focal point of INTIB at CSIR. Mr. Villars was instructed to take care of this. The national network could include the Ministry of Industries, Science and Technology which has no established point but is close to the main decision makers. The Technology Transfer Centre (TTC) which has a number of PCs as well as a newly installed international line and a modem was under installation by UNIDO. The Ghana Investment Centre has information on investment projects and could be a user and provider of information. There is no established line of contact at the moment with GHASTINET or Council for Scientific and Industrial Research. The Ghana Industrial Holding Corporation could also be a node as a user and provider of industrial and technological information.

(b) Existing users of industrial and technological information needs are still limited. The main users still appear to be within the scientific community, basically for research work. Users within the CSIR community as Industrial Research Institution (IRI) are still limited and due to communication problems, there is little

communication between the industrial community and the information sources. The TTC has completed information on technology agreements within the country and useful information is available mostly for reporting services. There is also direct communication with Investment Centre to keep information up to date. TTC had just started to use the Technology Supply Data Base which was introduced by the mission. It was also suggested that the available local technologies at TTC could be included in this data bank, at the moment they are in report form. IRI has also considerable experience in locally developed technologies (biogas, food, etc.) which should be also included.

(c) Expectations are high from INTIB, though most organisations met did not have a clear concept that INTIB could provide. This was identified by the mission and this will no doubt reflect on the future nature of information services. The Secretary of Industries, Science and Technology had definite views on his expectations which were mainly directed at the course of development and possibly the economy of Ghana. They emphasised the cocoa, timber and building materials industries. Discussion in a long meeting with the Secretary showed his complete belief in the usefulness of information and INTIB. As the INTIB sets more exposure, information needs will increase and it should be from both the scientific and technological community and industry.

(d) Modalities, linkages and communication to headquarters have to be developed further. At the moment CSIR is aware of INTIB. The TTC has a more working knowledge of UNIDO because of a UNDP project which has assisted the Centre. The CSIR has yet to develop its communication facilities. It should however to be expected that congested international lines will not facilitate headquarters communication during peak hours. Local communications should also improve to ensure easy communication.

(e) The existing industrial and technological service system could be of course improved and expanded. Noteworthy is that the basic elements exist i.e. Council for Scientific and Industrial Research (CSIR), Industry Research Institution (IRI), specialised centres as food, water resources, energy etc. This means that the efforts can be made in the direction of better telephone connections, installation of more hardware and communications systems. If CSIR should chose to locate the INTIB focal point on its direct premises, considerable investment should be made in suitable venue, well conditioned and fit out. Direct, local and international telephone lines, modem and computer hardware and software should be made available. Staff will have to be assigned and trained. A lucrative compensation system should be introduced to ensure attraction and retention of qualified staff. This should be done as soon as possible even though plans for a separate location are now underway again. The mission visited the planned new premises which are well planned and spacious. Should this facility be completed it would accommodate INTIB as well as GHASTINET for which it was originally planned. The outfitting of such a large facility will need considerable expenditure, perhaps not readily available, therefore INTIB location should be considered as a two stage process with temporary immediate location and future location.

26. The following recommendations could be made.

(a) In any case all the nodes suggested should be connected together on a preliminary arrangement, which would allow free flow of information;

(b) Then a Decree from the Secretary should spell out the authorised final nodes and their terms of reference and qualification;

(c) UNIDO should be informed officially of the INTIB nodes location and authorised persons;

(d) Personnel recruitment for both computer qualified as well as for information;

(e) Training programs within the country for recruited personnel;

(f) Incentive systems set up; and

(g) International expertise, where necessary.

List of persons and institutions visited in Ghana

Dr. Francis Acquah	Secretary Ministry of Industries, Science and Technology (MIST) P.O. Box M.39, Accra Telex: 666875
Mr. A. Adu	Secretary Council for Scientific and Industrial Research (CSIR) P.O. Box M.32, Accra Telex: 2001 STAR GH Cable: "SCIENCES"
Mr. E.K. Aggrey	Liaison officer of the CSIR
Dr. M.N.B. Ayiku	Co-ordinator Technology Transfer Centre (TTC) CSIR
Mr. J.A. Villars	Librarian CSIR
Mr. Stephen Osei-Yeboah	Project Officer Ghana Investments Centre P.O. Box M.193, Accra Telephone: 665125-9

Mr. Charles M. Brown	Librarian Ghana Investments Centre
Mr. O. Kwesi Dzidzienyo	Project Anthropologist Development and Application of Intermediate Technology (DAPIT) P.O. Box M 402, Accra Telephone: 667891
Mr. S.K. Batra	Consultant to TTC Systems Engineering and Cybernetics Centre Tata Consultancy Services Shakar Bhavan, 3rd floor Fateh Maidan Road Hyderabad-500 004 Telex: 0425-6645 TCSH IN

SIERRA LEONE

27. The mission visited Sierra Leone and on the basis of the local consultant's report_3/ and discussion with the SIDFA, a visit itinerary was drawn up to include Government, development institutes and UNDP projects. The visits gave the team considerable insight into the workings of the economy, the mining and manufacturing sectors and the constraints that existed.

28. Basically the mining sector, diamonds and bauxite, is the main activity. Iron ore mining was discontinued recently. The manufacturing sector has still to be developed but a number of establishments are working in the woodsawing and furniture production, using good quality hard woods.

29. The Ministry of Trade and Industry has been split recently into Industry and Trade. The Ministry of Industry is still very much in the process of reorganising and establishing its new identity. It is found on one floor of the Youyi building.

30. The Bank of Sierra Leone (Central Bank) was visited as well as the National Development Bank who are both striving to develop the industry sector. Large projects as Bauxite mining have direct agreements with western conglomerates, in this case ALU Suisse. There have their industrial and technological information units. The traditional smaller manufacturing industry has no clear organized source of information.

31. The general communications situation is not adequate at the moment with ailing telephone systems. This will however apparently be soon repaired as an EEC financed project is on the doorsteps. Only when this is completed, will there be proper communication.

32. Power is a major problem with continuous interruption and a large proportion of Sierra Leone establishments are using generators. Fuel supply, both gasoline or kerosene, is not regular. Outside international calls are almost impossible. The INTIB concept should, therefore, be turned down to more basic communication systems at least at the beginning.

33. A number of PCs exist in many locations and the Institute of Public Administration and Management (IPAM) through UNDP and other sources have set up a computer room where students and applicants from local banks and companies have been trained. This facility could no doubt train any local staff singled out for the INTIB focal point operation.

34. As a result of the World Bank and other recommendations the National Industrial Development and Finance Organisation (NIDFO) was set up to help private small- and medium-sized enterprises. They are well located, furnished and assisted by a UNDP/UNIDO project. This institution, NIDFO, should certainly develop and improve the small- and medium-scale manufacturers scene. With an enthusiastic and dynamic management they have expressed interest in hosting the INTIB focal point

35. Contact with the manufacturing industry revealed little knowledge of information through data banks, but there was a strong need for practical information on production processes, machine specifications and products design.

36. A visit to the Mano River Union working on a subregional basis in industry (glass bottles plants, communication, roads etc.) showed interest also in the INTIB. A data base and information project had also been previously requested to UNDP.

37. The country program of UNDP has a large number of projects and the Resident Representative was very helpful in discussing INTIB and the various operations for the proposed focal point. At Fourah Bay College, the University Research and Development Services Bureau (URDBS) as the consulting arm of the University was also very interested in INTIB. They work on a commercial basis.

38. The following assessments could be made:

(a) The existing information systems, services and networks in the country are in their initial stages. However, the National Agricultural Documentation Centre (NADOC), a unit within the Ministry of Agriculture, Natural Resources and Forestry is very well developed with an impressive venue in Youyi building. This is National CARIS/AGRIS input centre. This shows that an information unit could work within a ministry if properly planned and supported. NADOC grew out of a United Nations Project. Fourah Bay University library is reasonably well stocked but caters to the University needs. The British Council is the main sole supplier of books and periodicals. There is a limited potential in the future.

Provided considerable support is given and the overall telephone communications systems improve, the small size of manufacturing activity and the individual information systems of the tobacco, mineral and mining activities are not restrictive factors. Network attempts should be put off at the moment and manual information exchange should be sufficient.

(b) The focal point does not exist at the moment. Sources of information (statistical macro) are available at Central Statistics Office; some data is available in the banks whether at Bank of Sierre Leone, NDB, or the commercial banks, particularly in sectors where financing has been provided. Technical or technological information exists primarily in the University.

(c) Existing users of information are the banks for economic and project financing. They, however, rely on the investor to search for what information he may need for the feasibility study. Manufacturing is not aware of the possibilities of industrial and technological information supply. They obtain what little that can be tapped from acquaintances, the market and the vendors of equipment and machinery. Little is available in bookshops. Should INTIB become operational a need will no doubt be immediately generated. NIDFO could be an important user once it starts project implementation. The traditional Query and Answer Service (Industrial Inquiry Service) at INTIB would be very beneficial as an instrument of information transfer to Sierra Leone industry. The industrial survey at NIDFO should be able to identify the small- and medium-size enterpreneurs.

The Ministry of Industry should, of course, gradually fulfil its industrial development role.

(d) At the moment the nature of information services required from the INTIB could be of general nature according to the actual needs. How INTIB is presented will determine the kind of services it will be asked to provide. Should the Ministry of Industry develop its activities, UNIDO information in the different sectors of industry in the form of reports and studies will be very valuable for industrial planning.

The different banks can make use of the industrial profiles prepared by UNIDO through INTIB. Of course, once the focal point is operational the available packages, LINK Data Base, Technology Supply Data Base (Offer of technology, Joint venture opportunities and Requests of technology), Industrial Development Abstracts (IDA), Industrial Development Domestic Abstracts (IDAA), Directory of R+D Institutions, INECA (Industrial Energy Conservation Abstracts), Node data base, etc. could be made available according to local priority.

Modalities, linkages and communications with INTIB headquarters should be handled gradually. At this stage modems and international lines can not be considered, but mail, diskettes and reports could serve the purpose backed by telex and possible facsimile in the future.

(e) The design of the information service system should ensure good premises (one or two rooms), air-conditioned with a good filing system as it is proposed to stock more information than is normally needed because of difficulties of accessing information from Vienna.

39. Specifically the following decisions have to be taken.

a) Whether the Ministry of Industry will undertake to host the focal point in a similar fashion as the case of the National Agricultural Documentation Centre, providing space possibly in Youyi building, if available and making accessible local staff, funds etc.

or

b) Accepting that an institution as NADOC undertakes to install the focal point. However, in this case there must be a specific commitment that the devices are offered not only to NADOC projects but to the industry as a whole. NADOC should also intime expand its premises to allow its own growth and that of the INTIB focal point. The management must also be prepared to finance this activity and provide air-conditioners and furnishing.

c) In any case, equipment to be delivered under XA/RAF/88/684 should be chosen to be compatible to local conditions (NCR is the main representation, Olivetti and IBM presence; all at minimal maintenance facilities). An uninterrupted power system for a minimum 6-8 hours storage capacity is a must.

d) Attracting staff might be a problem and an incentive scheme is highly recommended. The focal point must be installed where staff can be engaged and retained.

e) Training should not be a problem either at IPAM or in conjunction with a local consultant or dealers. Training abroad may also be arranged under projects.

f) Finally, it is highly recommended that a UNDP project supports the INTIB focal point if the Government wants to support a strong and continuing information system. INTIB will provide only the initial international infrastructure on which a UNDP financed project could be based. Though this may be premature, the Resident Representative was briefed and is in complete understanding of the issues involved and the need to help the country's development.

List of persons and institutions visited in Sierra Leone

Mr. Srinivasan Pattoo	Chief Technical Adviser GOSL/UNDP/UNIDO project National Industrial Development and Finance Organisation(NIDFO) Ltd. P.O. Box - 1011 16, Charlotte Street Freetown Telex: (998) 3299
Mr. A. Richards	Director General National Industrial Development and Finance Organisation(NIDFO) Ltd.
Mr. Rameshwar P.Srivastava	Training Advisor Central Statistics Office Towe Hill, Freetown Telephone: 26748
Dr. M. Tin	Chief Technical Advisor National Statistics Office
Mr. M.S. Raman	National Accounts Advisor National Statistics Office
Ms. Olabisi Taylor	Deputy Director of Planning Central Planning Unit Ministry of Development and Economic Planning Freetown Telex: 3584 MINDEV SL

Mr. J.O. Benjamin	General Manager NCR Ltd.
Mr. Claudius J. Thomas	Local consultant Lecturer,Department of Economics Fourah Bay College Freetown Telex: VISINT (SL) 3520
Mr. M.S. Fofana	Agricultural Economist Bank of Sierra Leone P.O. Box 30 Freetown Telephone: 26501
Mr. J.S. Bangura	Assistant Director Bank of Sierra Leone
Mr. T.K. Davies	Director Developmenat and Finance
Mr. Onder Yucer	Resident Representative United Nations Development Programme (UNDP) UN House 43 Siaka Stevens Street P.O. Box 1011, Freetown Telex: 998-3299
Mr. M.H. Kamali	Senior Industrial Development Field Adviser (SIDFA) UNDP, Freetown
Mr. Santos A. Conten	Director of projects National Development Bank Ltd. (NDB) Leone House 21/23 Siaka Stevens Street Private Mail Bag Freetown Telex: 3589 NATDEV
Dr. O. Davidson	Director University Research and Development Services Bureau The University of Sierra Leone Private Mail Bag, Freetown Cables: UNISAL, Freetown
Mr. Unisa Sesay	Librarian The National Agricultural Documentation Centre Youyi Building, Brookfields Freetown

Mr. Patrick Elliot	Head Development Planning and Statistics Mano River Union
Mr. Justin Bangura	Agro Industry Section Mano River Union
Dr. S.M.B. Kanu	Deputy Director Economic Affairs Division Mano River Union
Mr. Elliot	Institute of Public Administration and Management (IPAM), Freetown
H.E. Ambassador Samir Mukhtar	Ambassador of Egypt Embassy of Egypt, Freetown
Mr. H.A. Jaward	Managing Director Modern MetalFurnitureCo. P.O. Box 94, Freetown Telex: 3356

ETHIOPIA

40. Manufacturing industry, administered by the Ministry of Industry, is divided among a number of state corporations. The state organisations under the Ministry of Industry are set up as legal entities to conduct business in manufacturing and marketing. The corporations supervise the establishments which are considered economic units engaged in predominantly one kind of economic activity, usually in a given location. Share companies also exist in which the Government is a majority shareholder. The private sector covers manufacturing establishments owned and run by private enterpreneurs employing 10 or more persons, using power driven machines.

41. The main corporations are Ethiopian food, chemical, printing, cement (building materials), metal works, textiles, beverages, leather and shoes, wood works and tobacco.

42. The mission visited the Ethiopian Cement Corporation, National Textiles Corporation and the National Chemical Corporation as sample users and providers of information. Also visited were the Ministry of Industry itself, the Ministry of Mines and Energy, the Handicrafts and Small Industry Development Agency (HASIDA), the Science and Technology Commission and the Ethiopian Telecommunications Authority to enquire about local and foreign voice/data communication possibilities.

43. The Ethiopian industrial sector has the advantage of the clear cut division of industrial activities which facilitate the determination of information needs.

44. The Ministry has a well developed computer section (see organisational chart) with excellent computing facilities covering all statistical and performance data of the different corporations and establishments (factories). Annual data is up-to-date and is also in English.

45. Monthly reports are sent in written report form to the Ministry and are then processed in the system. This Management Information System (MIS) has installed HP 150 II PC, IBM/XT and HP 3000/37X computers. These are planned to be expanded. Industrial, Scientific or Technological data is not stored though the library which holds around 1000 titles and some periodicals uses MINISIS software since January 1989. About one quarter of the titles have been stored in the MINISIS system.

46. The corporations have modest specialised technical libraries, comprising some textbooks, manuals, limited journals and project studies and reports. In some cases, copies of complete project documentation and detailed drawings were kept. Main users in the corporations are the technical staff within the corporation and some visitors from the establishments or factories. HASIDA is designed to cater to the small-scale industries, handicrafts and cooperatives. None of the above-mentioned corporations have attempted any computerization of information, but some have plans to establish integrated information and documentation units.

47. The following assessments could be made:

(a) The existing information systems, services and networks in the country are in their initial stages. The industrial infrastructure is, however, well planned and established, to be further developed. The local consultant's report_4/ shows the presence of the first phase of a three-phase five-year management information system. The survey mentioned by the consultant's report covered 256 manufacturing industries which are under the supervision of different ministries, and noted that around two-thirds had some form of industrial and technological system.

Apart from the Ministry's computerised Management Information System, the corporations have not as yet embarked on this project. The network is thus not yet in place.

Industrial and technological services remain mainly confined to the specialised libraries in the corporations and some establishments (factories). In the corporations, some sector related manuals, textbooks and limited journals are available. No abstracting is made. There is a lack of technical articles and essential references. Some standards exist, but none of the corporations visited had complete standards in their field of activity. Persons met were aware of this deficiency but stated that funds and access to information sources were scarce and difficult to obtain. There is definitely limited communications to the outside industrial and technological information international networks.

Information services are lacking in the corporations with no visible system of providing new information to the manufacturing establishments (e.g. newsletters, lists of new publications, abstracts and pertinent articles). They depend basically on the scanty manufacturers information, usually only for operational purposes. Walk in service is provided by librarians in the one room library space. Microfilming and microfiche are not used, but encyclopeadias and basic manuals have been purchased. No photocopy service is available and the user should take notes.

The potential, is, however there and with the introduction of INTIB, supported by an overall programme, the services can be improved considerably provided funds are made available and directives issued within a long-term plan. Directives should comprise the whole system from Ministry to manufacturing facility.

(b) The INTIB focal point has been installed in the Ministry of Industry (see organisational chart). This first step needs further follow-up as specific individuals have not been named, but the work will apparently be followed up among other activities in the Ministry. One member of the staff has been trained in the use of INTIB data bases during the Workshop for UNIDO/INTIB National Focal Points on Industrial Information Networking and Co-operation, Moscow, USSR, 30 May - 3 June 1989. However, diskettes supplied on the INTIB data bases were not installed. This is probably because of lack of authority and limited storage capacity. INTIB work should now there be given official priority, well supported at the highest level. Data bases provided are:

Technology Supply Data Base (OFFR/REQT/VENT)
Node data base with 550 records
Industrial Development Abstracts (IDA)
Industrial Development Domestic Abstracts (IDDA)

These were installed during the mission s stay.

Corporations are not yet aware of the INTIB focal point but this could be gradually developed. No user inquiries have been received at the INTIB focal point and this service should be well studied that the system is accessible. Some of the staff of corporations seemed at first reluctant to approach the Ministry on information; so some form of outreach system will be needed. The main outreach (extension) service is, of course, at HASIDA and information is even available in Amharic. A connection between the focal point, corporatiaons and HASIDA is very desirable.

(c) The existing users of industrial and technological information of the Ministry of Industry are within the Ministry itself. Presently, the library seems to provide users with basic information and the MINISIS is used to some extent to locate the needed subject matter. Reports stored in the library provided another source of information. However, each department maintains its own files. Now that the INTIB data banks have been installed during the mission, it is expected that they will be used. There is a strong link between the Computer Division and the Technology Division. This Division is very interested in establishing files and a data bank for its work which comprises screening technology, know-how agreements and revising technologies that are included in industrial project agreements.

It should be also noted that Ethiopian Science and Technology Commission is very well placed (location) and is well organised by a UNDP project. The MINISIS system is well in place with books, numerous periodicals and a good collection of scientific publications, but the unit is well suited to catering for technology information needs. NASTIDOC also maintains the UNIDO Industrial Development Abstracts, AGRIS and WIPO documentation. A minicomputer, HP 3000, with many terminals serves users. A locally developed form is used for the introduction of data into the system. International access is to be Rome-based Frascaty data base.

Basic staff exist and more will be trained in ESTINET in Egypt. NASTDOC is aware of INTIB and is ready to co-operate with the Ministry of Industry, INTIB focal point. It is important to mention that NASTDOC will also have a number of nodes, one of which is planned to be in the Ministry of Industry. Microfilming/microfiche facilities exist and it was proposed that NASTDOC could purchase UNIDO's Industrial Development Abstracts Data Base on tape to run on the HP 3000 minicomputer. Potential users of INTIB will also benefit if they need information from NASTDOC. It is, however, doubtful whether INTIB will reach this stage of development without a new project with inputs in expertise, equipment and training.

PADIS should also be considered as a source of information, though primarily directed towards African development information. It has its scientific and technological information sources.

Potential users of industrial and technological informatioin could have any of the previously mentioined sources at their disposal. INTIB should, therefore, concentrate on the industrial areas aimed at serving the industry. These potential users should be from the Ministry, corporations and manufacturing establishments. It is the consultant's belief that making these information sources available will generate demand by the industry users, who are often geared to manufacturers and suppliers who appear to them as the sole source of useful information.

(d) The information services required from INTIB in light of the previously described information scenario would be to steer a clear course from existing data system and sources and not waste valuable time or capacity in duplication. The available UNIDO-INTIB packages now installed should be useful. However, where abstracts exist a basic collection of pertinent copies should be readily available at the Ministry.

Modalities and linkages to UNIDO headquarters will be no doubt effectively possible. The mission visited the ECA where it was ensured that international linkage could be made. Modems could even be supplied from the local communications authority. Examples were cited of the PADIS, ECA, International Livestock Centre for Africa (ILCA) and others who had trouble free linkages on subscription basis. The Ministry of Industry was made aware of this service which could be of great use. However, traditional methods should not be taken lightly; a great deal of information should be passed down in document form, diskettes and possibly tapes. The pouch and SIDFA's office should not be neglected as channels of communication.

(e) The expansion of the existing industrial and technological information system as a whole in Ethiopia should proceed in a number of directions:

i) The strengthening of the INTIB focal point with its available data bases by more staff at the Ministry, more training and fellowships and the completion and updating of what has been installed;

ii) Delivery and installation of the project PC with eventual installation of a modem (local modem should be seriously considered); and

iii) Linkage of the INTIB focal point at the Ministry to the corporations as soon as possible. This could be done in phases with the first phase being simply having a corporation focal point and persons, to a next phase of manual information exchange to a final possible modem connected PC to PC dialogue if this is possible. This must be preceeded by purchase of PCs in all corporations and their installation and operation.

Linkages to the manufacturing establishments would be rather ambitious due to geographical dispersion and present microwave linkage in some cases.

It should be, however, noted that the flow of statistical and performance reporting information will always be getting priority, and there is no reason why industrial and technological information could not be handled along these communications lines.

List of persons and institutions visited in Ethiopia

Mr. Tadewos Hargeworic	Vice Minister - Development Ministry of Industry P.O. Box 704, Addis Ababa
Mr. Petros Kasahun	Head Documentation and Information Centre Ministry of Industry
Mr. Sirak G. Yohannes	Project Manager Computer Center Ministry of Industry
Mr. Fekadu Adhanom	Systems Analyst and Programmer In-charge of Production Database Ministry of Industry
Mr. Ketema Samuel	Systems Programmer In-charge of Manpower Database Ministry of Industry
Ms. Nitsuhwork Atanaw	Head Library and Documentation
Mr. Demissachew Assefa	Head Technology Policy and Research Department Ministry of Industry
Mr. Menna Tewahade	General Manager Ethiopian Cement Corporation P.O. Box 5782, Addis Ababa Telex: 21308 ET - CEMENT
Mr. Afework Wogayehk	Chief DocumentationCentre Ethiopian Energy Commission
Mr. Mohammed Nassi	Head Ethiopian Energy Commission
Mr. Fikre Hugiaha	Deputy General Manager (Planning and Projects) National Textile Corporation

Mr. Debede Wubishef	Head R+D Division National Textile Corporation P.O. Box 2436, Addis Ababa
Mr. Asrat Bulbula	Head Planning Department National Chemical Corporation P.O. Box 5747 Addis Ababa
Mr. Yeshitla Dibaba	Head Administration and Training Department National Chemical Corporation
Mr. Dawit Ade	Librarian National Chemical Corporation
Mr. Melaku Belay	Division Manager Maintenance and Coordination Ethiopian Telephone Authority P.O. Box 1047, Addis Ababa
Mr. Gelaneh Taye	Chief Radio and Transmission Branch Ethiopian Telephone Authority
Mr. Abebe Negash	Head Engineering Department Handicrafts and Small-scale Industries Development Agency (HASIDA), Addis Ababa
Mr. Vladimir Stimec	Technical Design Advisor HASIDA
Mr. Daniel Adera	Head of Cooperative Promotion Department HASIDA
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Mr. Gorfu Asaefa	Head Information Processing Division National Information and Documentation Centre
Prof. Soodursun Jugessur	Chief Science and Technology Unit Natural Resources Division United Nations Economic Commission for Africa P.O. Box 3005, Addis Ababa Telex: 21029 UNECA ET

Figure 1 : Ministry of Industry Organization Chart

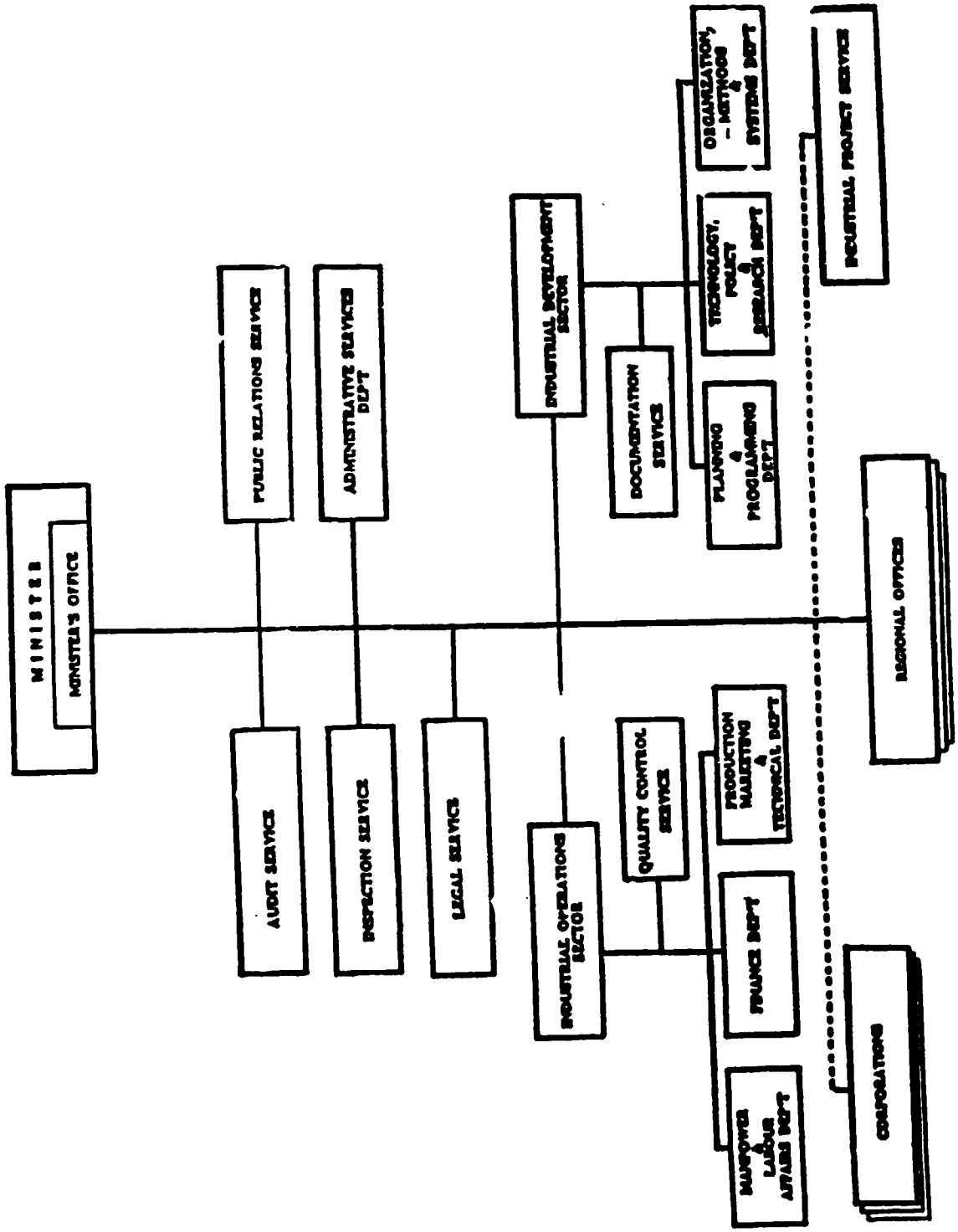
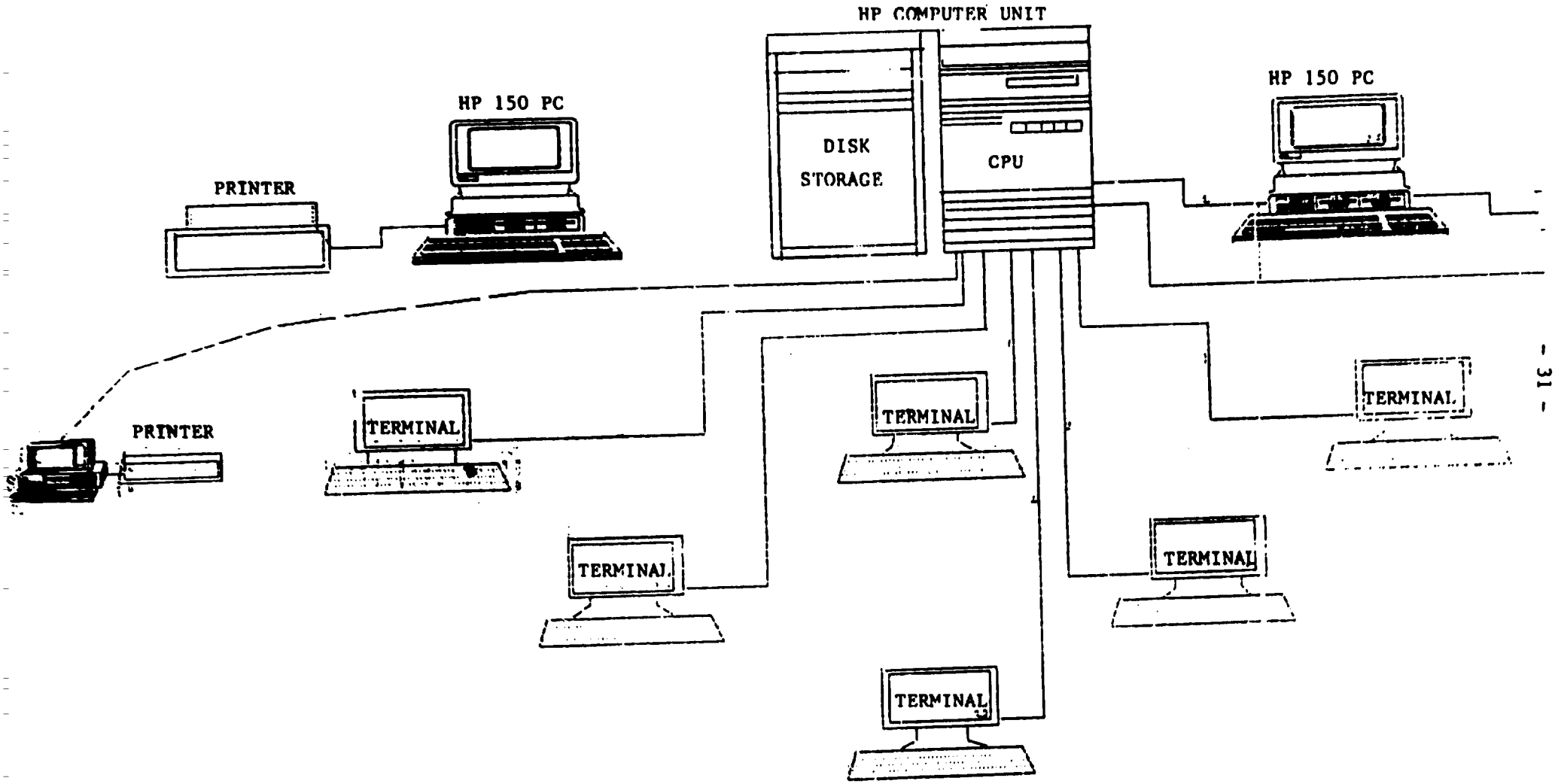


Figure 2 : MINISTRY OF INDUSTRY COMPUTER HARDWARE



ZIMBABWE

48. Zimbabwe has a well developed manufacturing and industrial base providing a good potential for an industrial data base. The many manufacturing enterprises if properly informed and instructed could be the potential users. The Development Plan _5/ has assigned a central role to manufacturing by promoting use of locally available resources, import substitution, expanding existing new industrial operations, decentralising and promotion of small-scale industries and co-operatives.

49. The mission visited the Ministry of Industry and Technology, where the Permanent Secretary supervised 3 main departments headed by Deputy Secretaries, namely Planning, Policy and Technology, Operations, Administration and Finance. Main discussions were held within the Planning, Policy and Technology Divisions under the Deputy Secretary and the Undersecretary (Technology) - see organizational chart. The INTIB focal point is located here and a meeting was held with the Assistant Secretary, Transfer of Technology and the Officers-in-Charge. The unit (INTIB focal point) though specified had not yet effectively started. The person assigned was unfortunately not available.

50. The program of the mission was planned to include the Zimbabwe Development Bank (ZDB), the Confederation of Zimbabwe Industries (CZI), Exporters Information Service (EIS) and the Technolgy Information Pilot System (TIPS). A visit to industry was made at the request of the mission and a chocolate Candy Co. and a group of food products and coffe manufacturers were visited.

51. The Ministry of Industry was well aware of the workings of the INTIB focal point as the decision for location has been taken. A staff member had also attended the Third Meeting of the INTIB Advisory Group in March 1989 at Vienna. Staff members will also be sent to Nigeria for the next INTIB training event. However, did not see the activity at the Ministry, but were assured that works would start and preparations were under way.

52. The Zimbabwe Development Bank (ZDB) had a number of projects and exercised good identification and project feasibility techniques. Microcomputers are used by the Bank; Lotus 1-2-3 and WordPerfect packages are most commonly used. COMFAR is known and sometimes partially used and has been described as superfluous in some aspects especially for medium and smaller projects. Foreign currency is provided by the Bank, but is not adequate and many projects were working well under their design capacity. The mission mentioned aspects of INTIB, namely, the Industrial Development Abstracts, Technology Supply, Energy Data Base etc. which the management found to be useful when made available.

53. The CZI were well equipped with data on their members and numerous studies had been prepared on the different industrial sectors, their performance and loading/efficiency. A loaned microcomputer was used for analysis of financial performance. CZI mentioned that the INTIB data bank would only be effective and find acceptance from the private industry if information/requests was kept confidential as such requests could indicate future project ideas which enterpreneurs kept secret in fear of competition or the ideas taken over by the public sector.

54. Accessibility to the Ministry seemed also a sore point with fears experienced as to the easy accessibility. It was also ensured that CZI would be a good INTIB node. It could however be an important element in the network.

55. The food industry after noting INTIB s activities stated that food technology and food processing information would be greatly appreciated. There was a lack of knowledge about standards, references of food technology and manufacturers/suppliers of equipment. Packaging materials were the main problem area with difficulties in obtaining import currency quotas and restricted sources of suppliers. INTIB's contribution to any of those problems would be welcome. Technological Information Pilot System (TIPS) was providing valuable service in the technology area. The overall situation can be summarised by an expanded industrial base with numerous manufacturing units, depending on personal direct contacts to obtain their technological needs from more advanced industries in the immediate vicinity or overseas.

56. The following assessments can be made:

(a) Existing information systems are in the form of small libraries in the production units or small documentation centres. At the enterprise level, taking the case of the food industry, periodicals, reports, manufacturers information and some important standards exist. These standards can be B.S. (British) or South African Standards Bureau with some knowledge of AKSO (African) though these standards are presently completely inadequate. Producers working with outside partners or technology have manufacturing or process instructions or guidelines.

Development banks have compiled their basic reference books and numerous project related reports.

The UNIDO Newsletter is received by some organizations. There is still no evidence of any INTIB information parred on. International/commercial data banks are not known. CZI, however, possess a great deal of local knowledge and information by virtue of its activities and industry requests.

The potential is good if the many enterprises be reached. Exporters Information Service (EIS) is computerized and active, which is a proof that if a need is generated INTIB information will be appreciated.

(b) INTIB focal point has yet to activate its activities. Continuous staff attendance is necessary, thus more than one person is needed on full time basis. Building up of the international and then local data bases is a must. Local information must be stored after a complete working language of all INTIB data bases is ensured.

(c) The existing users in all locations visited depend on their own in-house facilities. They have yet to appreciate the use of data bases outside their premises. Potential users will be the Ministry of Industry and Technology itself and to a very large extent other Government departments and CZI if sufficient accessibility and confidentiality is ensured. Private industry, to some extent, will also be a potential user, provided the nature of information, is directly useful. A coupled extension service would be more effective to go to private industry. All sectors of manufacturing exist from food, textiles, chemical to iron and steel and heavy manufacturing of structures, vessels, and rolling stock/transport equipment for road and rail.

(d) All INTIB data bases could be useful. The inquiry service should, however, not be neglected as this could be a source of valuable information for specific questions. The energy sources data bank will also be of interest in Zimbabwe. It seems, however, necessary to cover specific industry areas that exist in the country.

Food industry could be one of the areas as well as the engineering industries which are distributed in Harare and the second largest city Bulawayo. It is also perhaps advisable to select priority industry sectors not only in Zimbabwe but in other countries installing INTIB focal point data bases. It should also be considered whether or not the INTIB data bases be accessible directly at CZI to enable direct and quick access. In this case, co-ordination should be made with the focal point at the Ministry.

International calls are easy and the PTT promises easy access for data transmission. The cost versus time factor should, however, be always considered before taking a final decision. The pouch could be used for all transmittal of some important answers. The UNDP office, however, in Harare is not always easily accessible.

(e) The existing focal point should be activated as soon as possible to play its role. Staff must be full time with enough to man INTIB, on a continuous basis, both for in-Ministry work and from the industry, public or even private users. Two to four persons will be needed and the hardware promised should be sent and a maintenance contract for an initial two years at least be drawn up. A uninterrupted power system should also be supplied. Training should start for the new staff, and it is strongly recommended that a UNIDO-UNDP financed project be started to supplement INTIB's small contribution. Actually a mini size of project and a minimum level of activity is necessary for the success of the project. The present nucleus made possible by project XA/RAF/88/684 is relatively small to ensure the necessary momentum. In-house technology information requirements could alone absorb the full capacity of INTIB in its present planned capacity.

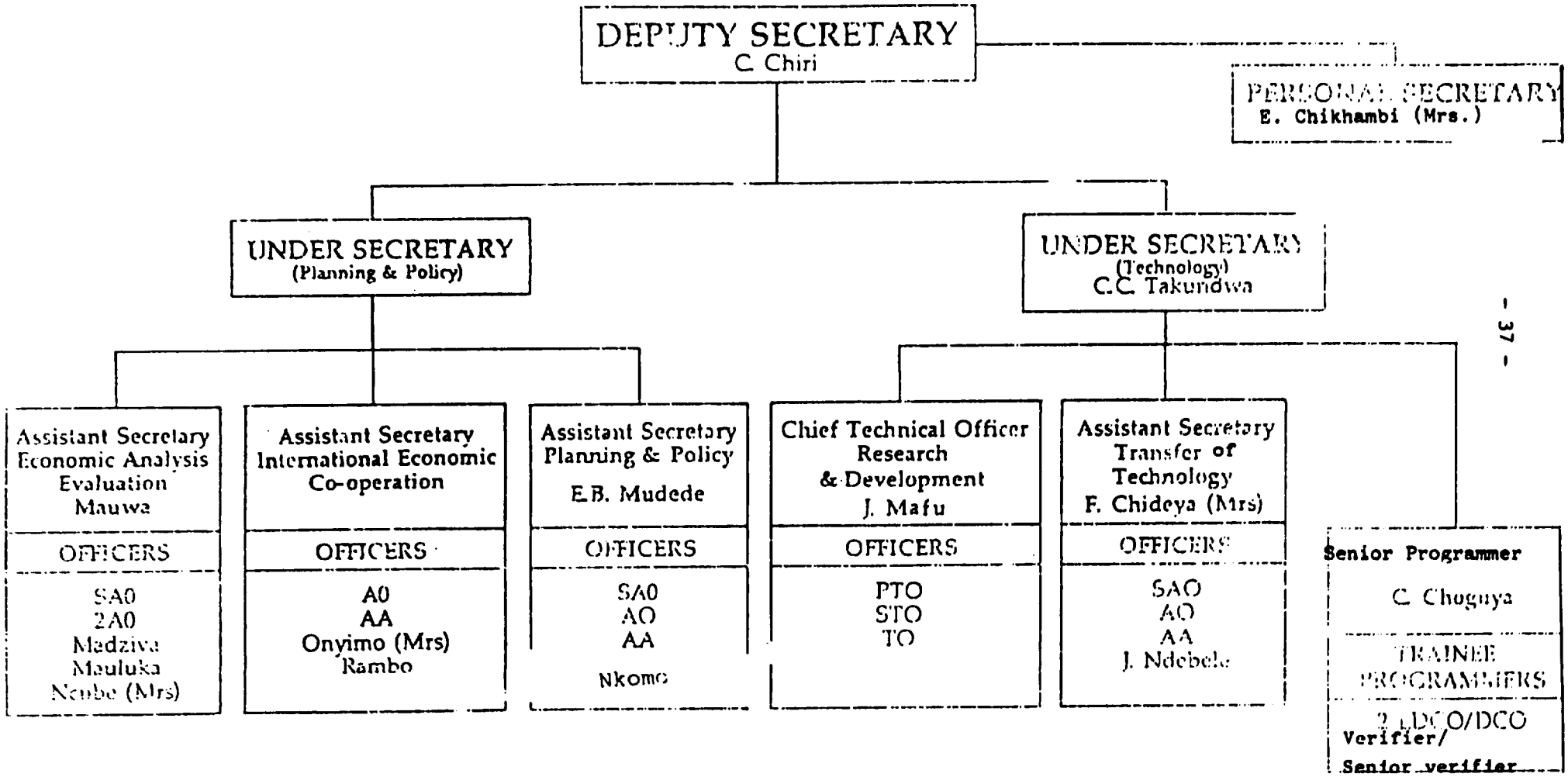
List of persons and institutions visited in Zimbabwe

Mr. J. Ndeble	Senior Administrative Officer Ministry of Industry (MIT) and Technology P.O. Box 8434, Causeway, Harare Telex: 22716 IT ZW
Mr. J. Mafu	Chief Technical Officer Ministry of Industry and Technology
Ms. F.Z. Chideya	Assistant Secretary Transfer of Technology Ministry of Industry and Technology
Mr. S.B. Mangena	Local consultant 406, The Rembrandt 22 Colqouhoun Street, Harare Telephone: 722083
Mr. Mike Humphrey	Chief Economist Confederation of Zimbabwe Industries (CZI) Industry House 109 Rotten Row P.O. Box 3794, Harare Telex: 2073 ZW
Dr. Hassan Gadelhak	Ambassador of Egypt Embassy of Egypt, Harare
Mr. Ohib a El Soukkary	Counsellor Embassy of Egypt
Mr. R. Jaravaza	Finance Manager Zimbabwe Development Bank (ZDB) 6th floor, Legal and General Building Cnr. Julius Nyerere Way Bamker Avenue, Harare Telex: 6279 ZDB ZW
Mrs. Ariadni Psillos	Managing Director Crystal Candy (Pvt.) Ltd. 12 Burnley Road Workington, Harare Telex: 4758 ZW
Mr. Leo Diamondis	Company Secretary Crystal Candy (Pvt.) Ltd.

Mr. Calude M. Chokwenda	TIPS National Executive Director Technological Information Pilot System (TIPS) Box 4362, Harare Telex: 26129 IPS ZW
Mr. Eric Pollard	Marketing Manager TIPS
Mr. P. Chigumira	Divisional Director Technical and Projects Cairns Holdings Ltd. Upton Road, Ardbennie P.O. Box 1813, Harare Telex: 4623 ZW
Ms. Creon Nicolaidis	Director Space Age Products (Pvt.) Ltd. 54 Edison Crescent Graniteside, Harare
Mr. Giovanni Dadaglio	ITC - Senior Trade Information Adviser c/o Exporters Information Service Private Bag 7732, Causeway Harare Telephone: 736703

Figure 3:

PLANNING POLICY & TECHNOLOGY DIVISION



BOTSWANA

57. The INTIB mission visited Botswana and after discussions with the Ministry of Commerce and Industry, a programme of visits was drawn up. The program included meeting a number of top officials at the Ministry, including the Permanent Secretary. The objectives of the mission were clarified. At the Ministry some time was spent with the Trade and Investment Promotion Agency (TIPA) who had developed useful material and publications on industrial activity in Botswana and had been working within the premises of the Ministry. A comprehensive data bank had also been operational for some time. TIPA had been assisted by ITC and had plans for a local area network on Trade and Investment_6/.

58. The Project Research Unit (PRU), a UNIDO/UNDP project was also located on the premises and assisted projects by some feasibility studies, also using UNIDO's COMFAR in some cases, though only parts of it. Two IBM-XTs were available for the small staff (2) attached to the unit. Project studies could take between 3 to 6 months.

59. A visit to the Botswana Technology Centre (BTC), founded in 1979 as a non-profit organisation funded mainly by the Government of Botswana, revealed a well stocked library concentrating on technology, including practical applications and appropriate technology. BTC has an information unit called the Botswana Technical Information Service (BTIS) which operates the technical library and disseminates technical information to institutions country wide_7/. Monthly radio programmes are also broadcasted reaching rural areas. A good inquiry service is provided for specific requests. BTIS has good contacts with different local and foreign information sources. BTC has several personal computers and well qualified information/computer personnel.

60. The Botswana Confederation of Commerce, Industry and Manpower (BOCCIM) is open to subscription, representing an unusual cross section of the business, trading and manufacturing community. No information centre as such exists in BOCCIM, but the names and addresses of all members could be a useful source of information for the INTIB focal point. Training fellowships are also channeled through BOCCIM and local courses have been run.

61. A Women's Affairs Unit was visited in order to ascertain information needs due to the role of women in the society. The unit could certainly benefit from the other institutions in the country, including BTC and Rural Industries Innovation Centre (RIIC).

62. Visiting a sample textile manufacturer did not reveal management's awareness of the usefulness of industrial information. The manufacturer visited took a narrow minded approach to obtaining the needs by buying machinery, including a great deal of second hand equipment, copying and trial and error. A certain professional secrecy was felt in discussing the role of such data banks as INTIB.

63. The Agricultural Research Unit in Sebele was an interesting comparison for the data bases available to agriculture, including AGRIS.

64. To determine the needs of large projects the Sua Pan Coordinator was visited. This gigantic project will produce salt and soda ash. This joint venture project will also have outside financing. Machinery and technology is entirely from abroad, so no need was felt at first for any information from INTIB. Discussions convinced management that UNIDO country studies, documents, etc. could be of assistance to the project and they could make use of INTIB and the focal point in the future. This could also be useful for future manpower development and running of the project. This gigantic project with competent firm negotiation and increased local content could boost local industry and even create new manufacturing industry. As mining was the country's main economic activity, it was felt that discussions with this sector would be beneficial. A visit was, therefore, made to a small diamond polishing company using imported smaller diamonds. The plant was not fully loaded due to the lack of raw diamonds. Employment was less than 100, but could reach 250 persons if operates at full capacty.

65. Arupa house with its diamond sorting was a fascinating and well organized activity. Nearly 15 million carats of raw diamonds provide the mainstay of the economy.

66. Thought should be given to the equipment in the mining activty and whether local manufacturing of mining equipment at least for transportation and handling (conveyors, carts, dumptruck bodies etc.) could be gradually developed, Earnings from this vital industry could be ploughed back into the economy to provide industrial and manufacturing job opportunities.

67. A single sided economy (as was the case of the small oil rich Arab countries) could suffer from world demand or fluctuations in price.

68. The Bank of Botswana is a useful source for economic and financial information, so is the National Institute of Development Research and Documentation (NIDRD) for development, environmental and energy information.

69. At the request of the mission, a visit was arranged to the Botswana Development Corporation (BDC) where many manufacturing and other projects have been financed. Projects include tanneries, cement, poultry and metal fabrication. A number of PCs have been installed and are used for financial analysis. Industrial estates and factory shells have been financed. Links have been established with the African Project Development Agency in Nairobi.

70. BDC could greatly benefit by INTIB and the focal point in their work of identifying, planning, studying and implementation of projects. Management expressed their wish for collaboration with UNIDO and INTIB.

71. The following assessments could be made:

(a) There are a number of existing information systems and services in the country. BTC, as mentioned, provides information on technologies which it monitors and test, as well as coordinates the technological development of Botswana to the benefit of all. BITS

through its technical library disseminates the technical information to institutions around the country, thus providing a useful service. The other provider of services is the Rural Industries Innovation Centre (RIIR) whose range of windmills, ploughs, seed planters and other equipment is a useful addition to the technological scene.

On the development information scene, BITS provides valuable information and services of trade and investment. RIIR also is building up information on development aspects, the environment and energy.

Networks can not be said to exist, but BITS and RIIR have plans.

(b) The INTIB focal point has not as yet been finally placed though the alternatives were presented in the final reporting at the Ministry, where the vital prerequisites for success in decision making, location, staffing, equiping and accessability were pointed out. The decision could be made for location within the Ministry or outside in an associated organisation such as BTC, provided the prerequisites are met.

(c) The existing users of industrial information are represented at the moment by Botswana Development Corporation (BDC), its companies and projects, the individual medium-sized establishments, possibly also through BOCCIM, and the large industries on national scale if an awareness is established and useful services are provided. The industrial areas around Gaborone and Francistown house many industries who could make use of INTIB's activities.

The technological information users have at their disposal BTC and RIIR. Both can actually be users and providers of INTIB's technological information. Technologies developed in Botswana, of which there are several should be immediately communicated to UNIDO-INTIB to be put into the data bases. Actually, Botswana has a good basic institutional set up for present and potential users. However, BTC should establish outreach and extension services to industry. They should go out on a special program and not wait to be approached. This could be a UNDP-UNIDO or bilateral project.

(d) The INTIB focal point will need to be well equiped to serve a demanding industry oriented to asking for practical usable information. International data will serve the larger projects and the UNIDO studies should be available to a large extent. Technology data should flow freely and be used for and by RIIR, BTC and any other institutions as the Women's Affairs Unit and even volunteer organisations. Availability of information will generate the kind of services required. The mission reviewed INTIB's data banks with many potential users and the general consensus was that they could be useful if readily available.

Linkages to UNIDO headquarters could be ensured by traditional methods of normal and special postage services. International telephone linkage is very efficient. No digital exchanges exist at present. Authorities are not aware of the IBM Screenmail Service. Telefax is widely and easily used.

(e) The existing technological services and systems form a good basis for the future. The systems, individualistic in nature, should be connected as soon as possible. This could be done with simple co-ordination and correspondence. BTC director has plans for a network and is requesting assistance to study the feasibility of a network. IDRC, Canada, has and is providing advice on information systems and network for the future. A UNIDO expert in this area would be appreciated by BTC's director. The Ministry would support the idea. At the final meeting at the Ministry of Commerce and Industry, the findings and recommendations of this report were presented. The mission was asked to elaborate them in the final report. The Ministry will then make its decision based on the report and recommendations as to the final decision of the focal point location, possibly at the Ministry proper or at BTC.

UNDP was advised on the mission and they positively arranged and contributed to the program, also attending the final session, where a possible UNIDO-UNDP financed project to bolster INTIB's activities was discussed. A figure of US $100,000 to 150,000 was discussed for expertise, training and complementary hardware and software.

List of persons and institutions visited in Botswana

Mr. P.M. Matsetse	Permanent Secretary Ministry of Commerce and Industry Private Bag 004, Gaborone Telex: 2674 TRADE
Mr. E.I. Matenge	Deputy Permanent Secretary Ministry of Commerce and Industry
Mr. H.B. Mahloane	Ministry of Commerce and Industry
Mr. Sheikh	ITC - Technical Adviser Ministry of Commerce and Industry
Mr. Maung Maung	Ministry of Commerce and Industry
Ms. Gabaipone M. Masire	Local consultant P.O. Box 41013, Gaborone Telefax: (267) 356866
Mr. Karl Muller	UNDP Programme Officer Barclays Bank Building 2nd Floor, P.O. Box 54 The Mall, Gaborone

Mr. J.B.S. Diaphaha	Managing Director The Botswana Technology Centre (BTC) Private Bag 0082 Gaborone Telex: 2928 BD
Mr. Gosta Harryson	Industrial Adviser BTC
Ms. D. Gairawy-Stayers	Information Specialist BTIS
Mr. Victor Meeussen	Systems Engineer BTC
Mr. Neil Currie	Director Botswana Confederation of Commerce and Industry and Manpower (BOCCIM) Gaborone
Mr. Issaac Elitas	Research Unit Ministry of Agriculture Sebele
Mr. Ludas Gakale	Research Unit Ministry of Agriculture Sebele
Mr. Mogami	Director Sua Pan Project Coordinator
Mr. G. Mojaphoko	Sua Pan Project Coordinator
Mr. S. D. Williams	Principal Government Mining Engineer Ministry of Mineral Resources Department of Mines Private Bag 0049 Gaborone Telex: 2503 BD Telefax: 352141
Mr. derek Hudson	Director Bank of Botswana
Mr. J.M. Lesindi	Country Director - Botswana Institute of Development Management (IDM) P.O. Box 1357, Gaborone Telex: 2429 BD
Mr. G.H. Cusins	Senior Consultant/Lecturer (Computer Education) IDM

Mr. Michael E. Lewis	Manager Projects Department Botswana Development Corporation Ltd. Mmanaka Road P.O. Box 438, Gaborone
Ms. Laketch Dirasse	Advisor Strengthening the Women's Affairs Unit and NGOs Ministry of Labour and Home Affairs Women's Affairs Unit UNDP P.O. Box 54, Gaborone Telex: 2412 BD
Mr. Abdul Khonat	Director Algo Industries (Pty.) Ltd. P.O. Box 1795 Plot 14401-2 Gaborone West Industrial Sites, Gaborone Telex: 2868 BD
Mr. Verbeeck J.	Diamond Manufacturing Co. Gaborone

NOTES

_1/ A. Magdub, "Survey on Industrial Information of the Libyan Industry", Misurata, May 1989.

_2/ J.A. Villars, "The Situation on Industrial and Technology Information in Ghana", Accra, 4 May 1989.

_3/ Claudius J. Thomas, "Report on Industrial and Technological Information Situation in Sierra Leone", May 1989, Freetown.

_4/ Dimissachew Assefa and Petros Kasahun, "A Report on National Industrial and Technological Information Survey", May 1989, Addis Ababa.

_5/ S.B. Mangena, "Proposal of a Zimbabwe Industrial and Technological Information Bank (ZINTIB)", May 1989.

_6/ A list of publications, including a Guide to Investment, Manufacturing Directory, Trade Directory, Investors Handbook.

_7/ G.M. Masire, "A Report on National Industrial and Technological Information Survey", May 1989, Gaborone. April 1989.

Annex 1

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

May 1989

QUESTIONNAIRE

Objective: identify and assess existing industrial information needs, users and facilities

Instructions:

1. Try to answer the questions shortly and precisely; when in doubt about the meaning of a question, consult Ms./Mr. , tel.:

2. Often, the answer consists in choosing one or more options from many. Indicate relevant option(s) by putting a mark (e.g. a cross) in the apprppriate box. If none of the options is applicable, add items according to your knowledge.

3. Questions irrelevant to your institution should be skipped.

Thank you for your co-operation.

I. GENERAL DATA ABOUT YOUR INSTITUTION

1. Name:

2. Address:

3. Telephone: Fax: Telex: Cable:

4. Name of the director and/or interviewee:

5 Type of institution:

☐ information center ☐ library

☐ archives

other:

6. Objectives/Functions of the institution:

7. Yearly budget:

8. Name of the mother organization, if any:

9. Name of the supervising ministry or another governmental body:

II. RESOURCES AND INFORMATION ACTIVITIES OF YOUR INSTITUTION

1. Number of information staff (e.g. documentalists, librarians, information officers, information-retrieval programmers, etc.)

   professionals:

   supporting personnel:

2. Equipment and software (in use; planned for 1990):

   (a) computers (give full configuration):

   (b) information-retrieval and text-processing software packages:

   (c) machines for photocopying and micrographying:

   (d) other:

3. Information service activities:

   (a) names and domains of the subject-oriented and document-oriented information systems utilised at your institution (e.g.: tractors' spare-parts databank, bibliographic system on unpublished scientific reports):

   (b) type of information activities

(c) type an approximate volume of the primary documents used (put numbers into boxes rather than crosses):

- ☐ published
- ☐ unpublished
- ☐ periodicals (journals, newspapers, etc.)
- ☐ monographs (books, handbooks, etc.)
- ☐ statistics
- ☐ standards
- ☐ authority regulations
- ☐ business catalogues
- ☐ factual databases (specify names and domains):

- ☐ films/video tapes

other:

(d) type and approximate volume of secondary documents used

- ☐ catalogue cards
- ☐ abstracts journals
- ☐ newsletters
- ☐ bulletins
- ☐ bibliographic databases (specify names and domains):

other:

(e) processes performed on primary documents:

- ☐ classification
- ☐ indexing
- ☐ abstracting
- ☐ translating
- ☐ analyzing/evaluating/repackaging
- ☐ factual databank establishing (specify names and domains):

other:

(f) processes performed on secondary documents:

☐ cataloguing (manual/computer catalogue establishing and maintenance)

☐ translating ☐ retrieval ☐ editing

☐ disseminating

☐ bibliographic database establishing (specify names and domains):

other:

(g) information language(s) used:

☐ Dewey Decimal Classification

☐ Universal Decimal Classification

☐ thesaurus

☐ key-words

other:

(h) inquiry service:

number of queries per month:

character of queries (subjects):

sources used for answering:

form and means of quering:

☐ verbal ☐ written ☐ on-line

other:

form of answering:

☐ verbal ☐ written ☐ SDI

other:

(i) distribution of languages of primary documents (put percentages into boxes rather than crosses):

☐ English

☐ French

☐ German

other:

(j) list of publications issued by your institution and their circulation

4. Users

(a) approximate number of users per month:

(b) types of users (put either absolute numbers or percentages into boxes rather than crosses):

☐ policy makers

☐ administrators (managers)

☐ development engineers

☐ factory supervisors

☐ researchers

☐ consultants

☐ sales managers

☐ workers

☐ teachers

☐ students

other:

5. Needs of users

- ☐ management
- ☐ products
- ☐ production
- ☐ technology transfer
- ☐ finance
- ☐ markets
- ☐ employment
- ☐ legislation
- ☐ spare-parts
- ☐ raw-materials
- ☐ quality control
- ☐ patents
- ☐ standards
- ☐ skills training
- ☐ utilisation of R & D results

other:

6. Applications of computers, if any

- ☐ creating databases and/or databanks
- ☐ handling databases and/or databanks
- ☐ SDI
- ☐ library service

other:

6. Information supporting activities carried out at your institution

- ☐ training of information specialists
- ☐ training of users
- ☐ research in the field of information

other:

7. Linkages between your institution and other domestic and foreign organizations

domestic:

foreign

- ☐ UNIDO
- ☐ UNESCO
- ☐ FAO
- ☐ WHO
- ☐ FID
- ☐ IFLA
- ☐ ISO
- ☐ ISTIC (in Moscow)

other:

III. MISCELLANEOUS DATA

1. Requirements of your institution for specialized

(a) information manpower:

(b) equipment:

(c) software:

(d) other:

2. Main problems faced by your institution:

- ☐ lack of qualified personnel
- ☐ lack of equipment
- ☐ lack of space
- ☐ shortage of funds

other:

3. Expectations from UNIDO, if any

- ☐ expertise on:
- ☐ consulting on:
- ☐ technical assistance concerned with:
- ☐ access to UNIDO information resources:
- ☐ equipment:
- ☐ software:
- ☐ training:

other:

INTIB PROGRAMME: AN OVERVIEW

I. INTRODUCTION

Some ten years ago, following United Nations General Assembly Resolution 31/183 on the establishment of a network for the exchange of technological information as well as the Vienna Programme of Action on Science and Technology for Development UNIDO has carried out a number of action-oriented activities to facilitate and accelerate a greater flow of information to INTIB users.

The approach of the Secretariat in providing a broader base for its operations through the development of a network of national/regional focal points and the elaboration of the UNIDO Industrial and Technological Information Programme was approved and endorsed by UNIDO IDB.

Within this context, during the last three years UNIDO has re-oriented the activities of INTIB. They include:

Generation of industrial information through better and more efficient use of the existing information systems in the organization (INDIS (IDA/LINK) Energy Information System (EIS), TIES, INPRIS);

Improvement of the Industrial Inquiry Service with greater emphasis on networking through establishing and supporting INTIB National Focal Points and Nodes;

Introduction of modern data processing techniques in INTIB and its NFP and training staff in their effective use;

Establishment and development of specific data bases;

Incorporation of the INTIB concept in UNIDO's Technical Assistance Programme to provide assistance in formulating national industrial information policies, building-up and strengthening national and regional information infrastructures and networks, promoting new information technologies, such as on-line connections and use of electronic mail, creating industrial data banks, and training and up-grading information specialists.

In addition, UNIDO's first attempt to standardize the approach to information exchange, in a network environment, was recently launched – the European INECA network (Industrial Energy Conservation Abstracts) – designed to record, exchange and disseminate factual information related to the activities of a number of sectoral focal points. Nine countries and forty institutions are associated in the first stage of this network.

The approach taken in the INECA network has now been transferred to the subject of clean technology, a subject of great importance to both developed and developing countries.

The Constitution of UNIDO as a Specialized Agency ascribes various functions to UNIDO in assisting developing countries, and most of these functions require the back-up of industrial and technological information. In addition,

the Constitution specifically states that the Organization shall "serve as a clearing house for industrial information and accordingly collect and monitor on a selective basis, analyze and generate for the purpose of dissemination, information on all aspects of industrial development on global, regional and national as well as on sectoral levels including the exchange of experience and technological achievements of the industrially developed and developing countries with different social and economic systems".

The role played by information in the selection and application of specific technologies and in the formulation of policies and strategies for industrial and technological development has become more crucial in the context of technological exchange.

The period 1990–1995 will be a critical phase in the industrial and technological development of developing countries. New technologies will broadly affect industries and services, the organization of production and the pattern of comparative advantage. Technological advances in fields such as biotechnology, micro-electronics, telecommunications, new materials, fine chemicals, marine industrial technology, energy and manufacturing technology bear far-reaching implications for the industrial and technological development of developing countries.

So, the problem is not only one of an increasing volume of diverse information, but also of the capacity to enjoy access to it through modern information transfer techniques and to analyze it so as to turn it into an effective decision-support resource.

That is why, industrial and technological information services are an important component of UNIDO's new programme approach to development and transfer of technology.

II. REVIEW OF INTIB ONGOING ACTIVITIES

The Industrial and Technologicl Information Bank (INTIB) including UNIDO's Industrial Inquiry Service, is the major mechanism through which UNIDO transmits reliable and continuous information to developing countries. Today INTIB provides a comprehensive service offering a combination of on- and off-line information, technical assistance, access to data bases and several series of related publications. Its overall task is to compile and disseminate information requested by developing countries and to help strengthen their own industrial and technological information systems. INTIB will search in any field of industrial technology but concentrates on technologies and equipment for 20 selected industrial sectors. INTIB also cooperates with other UN organizations to develop specialized information systems and data bases.

INDUSTRIAL INQUIRY SERVICE

The INTIB Industrial Inquiry Service (IIS), popularly known as UNIDO's mail order technical assistance, is a developing country industry's link with both the wealth of information maintained by UNIDO as a whole and the large number of data banks and information sources around the world to which UNIDO has access. INTIB's objective is to ensure a quick, easy flow of information to people who require it when selecting technology. Compared to most other , bibliography-dominated, information services, IIS is nearly unique in providing concrete, practical packaged information for industrial enterprises in response to specific queries and needs.

INFORMATION SYSTEMS AND DATA BASES

Technology-related information is held by UNIDO in the following systems and data bases:

The Industrial Information System (INDIS) is a computerized form of the Industrial Development Abstracts (IDA), UNIDO-generated information held as some 17,000 titles and abstracts. Some 100 new entries each month; covers technical and other reports, feasibility studies, working papers presented at UNIDO meetings etc. Access is on-line. Available in micro-computer form and on tape for mainframe computer. We plan to make the data base available in the near future on CD-ROM.

The On-Line Information Key (LINK) information-generated outside UNIDO through Industrial Inquiry Service—directories of research and development institutions for specific topics or sectors such as metallurgy, non-ferrous metals, industrial biomass, solar energy, sugar by-products and fruit and vegetables. Available in printed and micro-computer form.

Technological Information Exchange System (TIES)—information abstracted from technology transfer agreements of the participating countries. The information is only accessible to institutions offering similar data on a confidential, reciprocal and mutually beneficial basis.

Energy Information System—on-line data base with an established thesaurus of energy key-words. It contains periodical reports on UNIDO's energy activities.

Technology Supply Data Base—offers of technology, joint venture opportunities and requests for technology. 50 institutions from 35 countries contribute technology profiles to the data base. Available in micro-computer form.

Petrochemicals and pharmaceuticals data bases—initial stage of development—information on products, processes and raw materials.

Through INTIB, inquirers from developing countries may also gain access to other UNIDO data bases, namely:

UNIDO Statistical Data Base—central reference point for statistical data in the manufacturing sectors; information on 80 countries.

Investment Promotion Information System (INPRIS)—computerized data files:

- Project file—data on over 3,000 industrial investment project proposals in developing countries;
- Investor file—a directory of over 3,900 public and private enterprises;
- Bank file—directory of some 600 development finance institutions;
- Institution file—ministries of industry, investment promotion agencies etc.;
- Sponsor file—developing country firms potentially interested in redeployment possibilities;
- Country investment profiles—general country data.

Expert Roster for Industry—data base on individual experts in various industrial sectors;

Purchase and Contracts Data Base—information on manufacturers/suppliers of equipment in various industrial sectors and on engineering consulting companies and their services;

External Data Bases—access to bibliographic and directory-type data bases through the VIC Library.

NETWORKING, ADVISORY SERVICES, TRAINING AND TECHNICAL ASSISTANCE

INTIB technical assistance develops linkages and communications with end users in developing countries and enhances their capabilities in the systematic handling of industrial information. It also promotes the availability and utilization of technological information in decision-making processes in industrial development, in which technology selection plays an important role.

End-user linkages enabling exchange and transmission are organized as an INTIB network made up of national focal points (NFPs) and nodes—information sources specializing in industry and technology—chambers of commerce, associations of small and medium industries, research and development institutions, engineering consulting firms, development banks, technology transfer promotion agencies etc. Plans are in hand to link NFPs and nodes on-line with UNIDO. For this purpose, INTIB initiated and successfully implemented projects for DPRK and Mongolia in establishing on-line access to different world-wide data bases including UNIDO's own; for various countries in Europe and Africa in introducing electronic mail techniques using IBM INS network, UN ICC and GEISCO. INTIB assistance is also used to encourage and develop national industrial information policies and to train industrial information specialists. INTIB advises developing country institu-

tions and policy-makers on technological information and organizes training workshops.

INTIB also encourages and helps developing countries to set up their own industrial and technological data bases, either nationally or regionally, providing expert advice and assistance.

JOINT PROGRAMMES AND CO-OPERATION AGREEMENTS

INTIB is engaged in joint programmes and co-operation agreements with specialized information systems of United Nations agencies, for example with the United Nations Environment Programme (UNEP) in its International Referral System for Sources of Environmental Information, with the United Nations Development Programme (UNDP) in the Technological Information Pilot System, with International Labour Organization (ILO) in a joint publication on Technical Memoranda and with the Food and Agriculture Organization of the United Nations (FAO) in the International Information System for the Agricultural Sciences and Technology. There are other joint programmes include one with the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the Energy Conservation Technology Information Exchange System, with the World Intellectual Property Organization (WIPO) in the patent information system and with the International Atomic Energy Agency (IAEA) in the International Nuclear Information System.

INTIB also co-operates with ITC, WHO, ECE, ISO, IDRC and FID and on a regional level with ICSTI, APCCT, ARCT, CARIRI, ALIDE and WAITRO.

PUBLICATION PROGRAMME

UNIDO's printed publications supporting and emanating from the development and transfer of technology programme including newsletters, serials and special reports, directories and abstracts.