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FIELD MISSION REPORT
ON THE INDUSTRIAL AND TECHNOLOGICAL
INFORMATION SYSTEMS
IN NIGERIA, ZAMBIA, TANZANIA, KENYA AND EGYPT*

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** Academy of Scientific Research and Technology, Cairo, Egypt.

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TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>ii</td>
</tr>
<tr>
<td>Abstract</td>
<td>iv</td>
</tr>
<tr>
<td>I. Conclusions and recommendations</td>
<td>1</td>
</tr>
<tr>
<td>II. Introduction and background information</td>
<td>11</td>
</tr>
<tr>
<td>III. Objectives of the mission</td>
<td>12</td>
</tr>
<tr>
<td>IV. Outputs of the mission</td>
<td>13</td>
</tr>
<tr>
<td>V. Activities of the mission</td>
<td>16</td>
</tr>
<tr>
<td>VI. Action programme (Follow-up)</td>
<td>18</td>
</tr>
<tr>
<td>Annex</td>
<td></td>
</tr>
<tr>
<td>I. Documents used during the mission</td>
<td>21</td>
</tr>
<tr>
<td>II. Questionnaire</td>
<td>23</td>
</tr>
<tr>
<td>III. List of specialists consulted</td>
<td>26</td>
</tr>
<tr>
<td>IV. Abbreviations and addresses</td>
<td>30</td>
</tr>
<tr>
<td>V. Schedule of meetings</td>
<td>34</td>
</tr>
</tbody>
</table>
PREFACE

The supply of information at the country level in particular for the priority sectors identified by the Lagos Plan of Action is crucial for the success of the Industrial Development Decade for Africa. The position in this regard at present needs considerable improvement. Several African countries do not have an industrial information system themselves and in many cases where they have such facilities they are mostly in the nature of documentation services. They also suffer from lack of adequate resources to obtain on a systematic basis information from external sources.

According to the UN General Assembly Resolution 3507 the Industrial and Technological Information Bank (INTIB) was established in 1980 to facilitate and accelerate industrial and technological information flow to developing countries for the selection of alternative technologies and equipment and to reduce the preparation time of feasibility studies.

At present INTIB helps to the creation of national industrial and technological information systems and network in Nigeria, Zambia, Tanzania, Kenya and Egypt, which have been selected as a part of the IDDA programme and was provided with technical assistance to strengthen its national information system.

By establishing links with INTIB selected personnel in the information systems and services could also be made familiar with the methods of collecting processes and disseminating problem-oriented information to industry. This process will also result in other advantages. The flow of information among the strengthened national information system and services can be promoted and links also established with possible regional mechanisms, such as the African Regional Centre for Technology (ARCT).
The persons contacted (see Annex III) included officials responsible for development in the field of industrial and technological information existing and potential users of information, as well as specialists like engineers, documentalists and programmers, etc.

Acknowledgements are made to the UNIDO staff members Messrs. V. Podshibyakin and H.W. Pack for the excellent organization and briefing of the mission.

The mission is grateful to the UNDP officers in Lagos, Lusaka, Dar-es-Salaam, Nairobi and Cairo for their kind co-operation and assistance which facilitated the success of the mission. The mission is also thankful to Mr. F.A. Shonubi from the Nigerian Society of Engineers, Mr. J. Banda from Village Industry Service, Mrs. W.N.A. Nyonyi from Tanzania Industrial Research and Development Organization, Mr. P.B. Imende from Kenya Industrial Research and Development Institute and to Dr. M. El-Toukhy from Academy of Scientific Research and Technology, whose briefing, reference materials and organizational efforts proved to be of great assistance to the mission.
ABSTRACT

The report is the result of a mission to information systems and services in Nigeria (October 19 - 27, 1985), Zambia (October 28 - November 2, 1985), Tanzania (November 4 - 9, 1985), Kenya (November 10 - 17, 1985) and Egypt (November 18 - 22, 1985).

The mission was intended to assess the existing and potential information systems and services, to assess national focal points of INTIB in these countries, to assess existing and potential users of industrial and technological information based on their specific needs and priorities and also to assess the nature of information services required by the INTIB in detail and communication with INTIB headquarters.

Needless to say, the identification of national focal points of INTIB in these African countries was the most important task of the mission.

The following national focal points are proposed:

- in Nigeria:
  Federal Institute of Industrial Research, Oshodi (FIIRO);
- in Zambia:
  Small Industries Development Organization (SIDO);
- in Tanzania:
  Tanzania Industrial Research and Development Organization (TIRDO);
- in Kenya:
  Kenya Industrial Research and Development Institute (KIRDI);
in Egypt:

The Egyptian National Scientific and Technical Information Network (ENSTINT).

The first part of the report presents conclusions and recommendations of the mission and the second part presents recommendations dealing with INTIE follow-up activities.

The report is supplemented by the questionnaire prepared by UNIDO Secretariat with summary information of the various information systems and services visited (see Annex II).
I. CONCLUSIONS AND RECOMMENDATIONS

1. Even the brief acquaintances with situation in the information systems and services of several African countries show that under the present conditions establishment of industrial systems and services cannot occur spontaneously. Establishment here is now fully dependent upon global factors, local factors being weak and poor. The driving force of any information system and services is to be found outside the African continent. The global factors adversely affecting backward economies call for the introduction of the objective behaviour of African countries for reliance on the principle of planning. The objectives of Lagos Plan of Action outline the only way to cushion the devastating impact of global factors on African countries.

2. Main problems faced by the organizations in Nigeria, Zambia, Tanzania, Kenya and Egypt on information field are following:

Nigeria
- lack of statistical and patent information;
- lack of hardware and software to process and analysis data;
- lack of adequate training for professional staff;
- shortage of basic resources, such as funds and staff.

Zambia
- local market can't satisfy demand for the right technical and general literature on small industries;
- industrial information is often scattered in different formats;
- shortage of professional staff;
- lack of equipment to use in publications;
- lack of acquisition of information documents;
- lack of sources of information;
- lack of transport for disseminating information.
Tanzania
- creation of telecommunication links between information bodies;
- acquisition of up-to-date information material;
- lack of trained manpower;
- lack of computer equipment;
- formulation of situation specific information answers;
- small collection of different databases;
- response time from some countries is very long;
- collection of information from the metal industries;
- lack of general information policy in the country.

Kenya
- lack of computer equipment;
- shortage of trained (qualified) manpower;
- lack of information on availability of appropriate technologies, machinery and markets;
- lack of enough funds for expansion and improvement;
- lack of enough trained personnel;
- limited information material;
- lack of effective utilization of available information of the information centres by users;
- complete absence of an organized information system and service.

Egypt
- lack of enough funds for computer equipment;
- high turnover of qualified staff due to small salaries.

3. A preliminary study of the existing information systems and services in the organizations and institutions shows that the structure of the INTIB national network in the considered enterprises could be follows:
Nigeria

National Focal Point:
- Federal Institute of Industrial Research, Oshodi (FIIRO)

Focal Points:
- Manufacturers Association of Nigeria;
- Nigerian Industrial Development Bank;
- Nigerian Society of Engineers;
- Federal Ministry of Science and Technology;
- National Library of Nigeria;
- Ministry of Industries.

Zambia

National Focal Point:
- Small Industries Development Organization (SIDO)

Focal Points:
- National Council for Scientific Research - Documentation and Scientific Information Centre;
- Technology Development and Advisory Unit of the University of Zambia;
- Institute of African Studies of the University of Zambia;
- Ministry of Agriculture;
- Development Bank of Zambia;
- Zambia Industrial and Commercial Association;
- Zambia Bureau of Standards;
- National Food and Nutrition Commission.

Tanzania

National Focal Point:
- Tanzania Industrial Research and Development Organization (TIRDO)
Focal Points:
- Tanzania Industrial Studies and Consulting Organization (TISCO);
- Ministry of Industries and Trade;
- Institute for Production and Innovations;
- National Institute for Productivity;
- Metal Engineering Industries Development Association;
- Tanganyika Development Finance Company Ltd.;
- Small Industries Development Organization (SIDO);
- Tanzania National Scientific Research Council (TANRi5).

Kenya

National Focal Point:
- Kenya Industrial Research and Development Institute (KIRDI)

Focal Points:
- National Council for Science and Technology;
- Industrial Development Bank Ltd.;
- Kenya National Chamber of Commerce and Industry;
- Ministry of Commerce and Industry (Information and Documentation Section);
- Industrial and Commercial Development Corporation;
- Kenya Industrial Estates Ltd.;
- Agro-chemical and Food Company Ltd.;
- Egerton College;
- East Africa Industries Ltd.;
- Directorate of Industrial Training;
- Ministry of Transport and Communications;
- Kenya Bureau of Standardization;
- Kenyatta University - Appropriate Technology Centre.
Egypt

National Focal Point:
- Egyptian National Scientific and Technical Information Network (ENSTINET) - The Academy of Scientific Research and Technology

Focal Points:
- Egyptian Documentation and Information Centre for Agriculture (EDICA);
- Centre for Educational Technology (CET);
- Engineering and Industrial Design Development Centre (EIDDC);
- National Information and Documentation Centre (NIDOC).

4. Examination of the existing information systems shows that they often have bilateral and international co-operation. Among the participants of the co-operation one can find:

Nigeria
- Central Bank of Nigeria;
- Federal Institute of Industrial Research;
- Federal Ministry of Science and Technology;
- Nigerian Institute of Architects;
- Federal Office of Statistics;
- Nigerian Association of Chamber of Commerce, Industry, Mines and Agriculture;
- British Library;
- Tropical Production Institute, London;
- AGRIS;
- INIS;
- Multi-sectoral Information Network.

Zambia
- SIDO Library;
- National Standard Bodies;
- International Standard Organization;
Africa Region Standard Organization;
Institutional Libraries in Zambia;
Rural Information Service;
University of Zambia;
National Scientific Council for Research;
INTIB;
Zambia Broadcasting Services;
Canadian Broadcast Service;
Socially Appropriate Technology International Information Services (SATIS).

Tanzania
- Tanzania Industrial Studies and Consulting Organization;
- Small Industries Development Organization;
- University of Dar-es-Salaam Libraries;
- Tanzania Industrial Research and Development Organization;
- Bureau of Statistics;
- National Scientific Research Council.

Kenya
- African Regional Organization for Standardization;
- British Standards Institution;
- National Council for Science and Technology;
- Kenya Industrial Research and Development Institute;
- Kenya Bureau of Standards;
- Industrial Development Bank;
- Industrial and Commercial Development Corporation.

Egypt
- Egyptian Documentation and Information Centre for Agriculture (EDICA);
- Centre for Educational Technology (CET);
5. The recommendation; with regard to the national information systems stem immediately from their basic tasks and functions. Generally, the main tasks of the national information systems consists in providing necessary industrial and technological information for specialists occupied in the spheres of management, R and D, production and operation, services and trade, i.e. practically in all branches of economy. On the basis of this main task before the national information systems, the latter's functions can amount to the following main orientations:

- Preparing and assigning primary industrial information;
- Stock-taking and registration of industrial and technological information via formal and non-formal channels;
- Selection, systematization, storage and retrieval of primary documents (creation of information retrieval system);
- Primary documents processing;
- Communication of industrial and technological information to users;
- Organization and functioning of the information systems;
- Management of these information systems.

6. The function of preparing and assigning primary industrial information should ensure in putting the entire information into the system and selecting the most effective and economical channels for information transmission.

7. The industrial information stock-taking and registration should meet the recommendations which provide for a strict distribution of recording registration functions between information bodies which are part of the respective systems and also carrying out the measures guaranteeing the complete accession of the recorded industrial information sources. The function of stock-taking and registration should provide for monitoring and a maximally complete recording and co-ordination of the registration
of the industrial and technological information created both within the
framework of the national information systems and beyond it and
transmitted via both formal and non-formal channels.

8. Selection, systematization, storage and retrieval of primary
documents should meet the recommendations ensuring the creation of
information retrieval systems and reference retrieval facilities for
them. This function should provide for the possibility of their
accurate, complete, rapid, convenient and economical retrieval for a
further utilization of the respective information by users.

9. The primary documents processing should be in accord with the
recommendations providing for non-recurring analytico-synthesetical
processing of industrial information in terms of the latter's content.
This function should provide for bibliographic processing, annotating,
abstracting, indexing and extraction of factual evidence from documents
with the view to the organization of data bank in various subject areas
and also industrial information synthesizing.

10. In communicating the industrial and technological information to
users, provision should be made for a multiple and multi-goal utilization
of the results of the non-recurring information processing. This
function should provide for communication, retrieval and communication in
any mode of the system's work, and namely in the "enquiry-answer" mode,
in the mode of selective dissemination of information and in the
information publications mode. And in case of each mode one should
observe the requirement of communicating information in the form of
primary documents, (abstracts, annotations, bibliographic descriptions),
evidence extracted from primary documents, and also in the form of
synthesized industrial and technological information analytical and
comparative reviews, references, etc.).

11. The organizational pattern and functioning of the industrial
information system should ensure the improvement of the organizational
principles and methodological basis of information work with a view to
creating a clear-cut and impressive information system. This function
should be implemented on the basis of the existing theoretical, economic and juridical fundamentals, and also methodological, organizational and procedural principles involved in the functioning of the system.

12. The management of the national industrial information systems should ensure the co-ordination of information work in various areas of activity, planning of R and D on the industrial data problems, raising the qualifications, and training of workers for information bodies.

13. The national industrial information systems should ensure information transmission both via formal and non-formal channels. The formal channels include the organizationally formalized and constantly operating communication channels and the main kinds of documents, such as books, articles, patent descriptions, reporting and standard-type technical documentation and also documentation about industrial goods. The non-formal channels of communication include those in which the main role is played by scientists, specialists and engineers themselves, and which do not possess organizationally formalized and constantly operating interaction mechanisms: oral interventions at conferences, meetings, symposia, talks, correspondence, exchange of preprints and impressions, and also documents, such as protocols of tests, acts about reception of equipment, etc.

14. One of the recommendations with regard to the national information systems consists in putting the flows of information transmitted via formal and non-formal channels into a better order. For this purpose it is necessary to unify and standardize the forms in which information is presented with a view to its subsequent recording by machine-systems; to develop a normalized series of information carriers (including machine-carriers on punched tapes, magnetic tapes and discs, microfilms and microfiches); and also to develop a normalized series of industrial and technological information transmission methods, including the standardization of interfaces between computers and communication channels. This should make it possible to achieve a necessary speed, completeness and effectiveness of transmission of the entire industrial and technological information and also to achieve the inter-systems exchange of information at the computer level.
15. One of the major recommendations with regard to the national industrial information systems consists in ensuring the compatibility between all the links which are part thereof. Compatibility is achieved by the commonness of their organizational structures, the uniformity of information retrieval language, the interface of the technical facilities, the uniformity of mathematical support, the single procedure for industrial and technological information collection and processing and the unification of documentation and information coding.

16. The complex of technical facilities as used in the national information systems should ensure the processing of information flows on standard carries and solve the following basic tasks:

- automated input of information into computers;
- information processing with the aid of computers and calculating and punched-card equipment;
- information storage and automated retrieval;
- automated output of information from computers;
- transmission of computer information to the system's subscribers;
- information copying and duplication.

17. Taking into consideration the above-mentioned INTIB's mission could recommend using hardware of kind "IBM PC" and software of kind BDS/ISIS. In that case UNIDO in further will provide for supporting in installation of hardware suggested and dissemination CDC/ISIS among INTIB focal points of developing countries.

18. The national industrial information systems of these countries should be based on the principle of the national combination of the centralized and decentralized approaches to the process of collection, storage, generalization, processing, retrieval, issuing and dissemination of the industrial and technological information. The impact of the negative features of each approach can be minimized only if the advantages of both approaches are utilized in the system to a maximal extent.
19. The centralization in constructing the national industrial information systems makes it possible to pursue a single general state policy with regard to the main questions when the tasks of the developing and improving information systems are being solved; and it ensures the necessary co-ordination between the individual links of the systems and their organizational, technological (methodological), mathematical (programmatic) and technical compatibility.

20. The decentralization in disseminating makes it possible to organize information provision for any categories of users in accordance with their demands and needs and to implement the principle of the direct communication between any user and any information body which is part of the national industrial and technological information system.

21. As far as a national information policy is concerned we can be said that the national authorities need to consider the establishment of national industrial and technological information system based on a network of information centres as a keystone of economic development. Since the establishment of the national information system is a long-term, complex and expensive enterprise, it has to be designed and implemented under the auspices of the Government.

II. INTRODUCTION AND BACKGROUND INFORMATION

22. The Lagos Plan of Action and the Final Act of Lagos proclaimed the 1980s to be the Industrial Development Decade for Africa. Its qualitative and quantitative objectives as specified in the Lagos Plan of Action envisaged regional self-sufficiency and self-sustained growth, the achievement by the African countries of a 1.4 per cent share in the world's industrial production output by 1990.

23. More to the point, it was also programmed that by the mid of the Decade, the basis was to be set up for the development of key industries indispensable for the achievement of self-reliance. The final resolution of the Fourth General Conference of UNIDO on the Industrial Development
Decade for Africa asked UNIDO to improve and intensify its assistance to African countries in their priority actions for the preparatory phase (1982-1984) and in identifying, formulating and carrying out projects during the implementation phase (1985-1990) of the programme of the Decade.

24. The supply of information at the country level in particular for the priority sectors identified by the Lagos Plan of Action is crucial for the success of the Industrial Development Decade for Africa. The position in this regard at present needs considerable improvement. Several African countries do not have an industrial information system themselves and in many cases where they have such facilities they are mostly in the nature of documentation services. They also suffer from lack of adequate resources to obtain on a systematic basis information from external sources. INTIB provides an international infrastructure on which they could draw upon to strengthen themselves by establishing links with INTIB selected personnel in the information systems and services could also be made familiar with the methods of collecting processes and disseminating problem-oriented information to industry. This process will also result in other advantages. The flow of information among the strengthened national systems and services can be promoted and links also established with possible regional mechanisms such as ARCT. The preparation of industrial profiles and information packages by INTIB could also be oriented towards the needs identified in Africa.

25. It is against the above background that the mission has carried out its activities, made the present consolidated report including recommendations for INTIB and African information co-operation.

III. OBJECTIVES OF THE MISSION

26. The main objective of the expert mission under the contract RP/RAF/85/621/11-59, was to assist selected countries of Africa in the establishment of INTIB national focal points as well as in strengthening national information systems and services and carry out in these countries the following duties:
(a) assess the existing and potential information systems, services and network;
(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 by the INTIB in detail as well as modalities of linkage and communication with INTIB headquarters;
(e) ad-hoc advise on redesigning or expansion of the existing industrial and technological information service system including selection of software and hardware as well as assessment of manpower requirements and training needs for the information systems.

IV. OUTPUTS OF THE MISSION

27. The end-users of the industrial and technological information in these countries in question can be classified as follows: engineers, economists, programmers, project managers, whereas institutional users are: development banks, development corporations, colleges, institutes, university researchers, information and documentation centres, R and D organizations, etc.

28. The main sources of information requested are: information of alternative technologies, project materials, marketing data, factographical and bibliographical data, characteristics of new materials and up-date equipment, technical reports, market development trends, etc. The basic industrial and technological information expressed by users are concerned with: design of new products, manufacturing the product, development manufacturing equipment, establishment of flowsheets, selling and servicing the products, collection and processing of technological information of innovations and improvements, standard specification, and expert requirements.

29. Many of the industrial and technical users are vitally interested in receiving primary technical documentation, on-line access to data bases,
the creation of both selective information dissemination and current awareness service and also in the establishment of data bases in their fields of activities.

30. Estimates of information staff, technical and financial resources are as follows:

**Information staff:**

<table>
<thead>
<tr>
<th></th>
<th>Nigeria</th>
<th>Zambia</th>
<th>Tanzania</th>
<th>Kenya</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>76</td>
<td>20</td>
<td>20</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Supporting personnel</td>
<td>152</td>
<td>13</td>
<td>13</td>
<td>157</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

**Nigeria**

WANG PC X 2, SIRIUS

**Zambia**

MEPAS, COMMODORE, IBM PC

**Tanzania**

Texas Instrument (on-line terminal), Apple III; WANG-2200; Apple IIE X 2

**Kenya**

IBM PC, SPECTRUM ZX, ICL ME 29/87, IBM SYSTEM 34, IBM PC 526, WANG PC X 4

**Egypt**

(not known)

**Software**

**Nigeria**
COBOL, RPG, BASIC, LOTOS

Zambia
COBOL, BASIC

Tanzania
BASIC, COBOL, ALGOL

Kenya
CDS/ISIS, BASIC, COBOL

**Yearly budget** (in US dollars)

<table>
<thead>
<tr>
<th></th>
<th>Nigeria</th>
<th>Zambia</th>
<th>Tanzania</th>
<th>Kenya</th>
<th>Egypt</th>
</tr>
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<tr>
<td>US$</td>
<td>250,000</td>
<td>300,000</td>
<td>55,000</td>
<td>185,000</td>
<td>*</td>
</tr>
</tbody>
</table>

* Data not available.

31. The following INTIB contributions are expected:

- financial assistance towards acquisition of documentary sources;
- sponsorships for international courses and meetings;
- acquisition of all INTIB publications;
- participation of INTIB in establishing industrial and technological information systems;
- financial support of information projects;
- technical information in 20 sectors of INTIB information activity;
- acquisition of information in the field of standards and patents;
- acquisition of computers compatible with IBM PC and APPLE II, III;
- organization of joint pilot projects;
- all possible assistance in improving the industrial and technological information systems.
V. ACTIVITIES OF THE MISSION

32. An inventory of industrial and technological information systems in these countries include the information systems in the following organizations:

**Nigeria**
- Nigerian Society of Engineers;
- National Library of Nigeria;
- Federal Ministry of Science and Technology;
- Federal Ministry of Industries;
- Nigerian Industrial Development Bank;
- Manufacturers Association of Nigeria;
- Federal Institute of Industrial Research, Oshodi.

**Zambia**
- Development Bank of Zambia;
- National Food and Nutrition Commission;
- Technology Development and Advisory Unit of the University of Zambia;
- Small Industries Development Organization (SIDO);
- Zambia Bureau of Standards;
- Agricultural Engineering Section of Ministry of Agriculture;
- Village Industry Service.

**Tanzania**
- Tanzania Industrial Research and Development Organization;
- National Institute for Productivity;
- Tanganyika Development Finance Company Ltd.;
- Metal Engineering Industries Development Association;
- Tanzania National Scientific Research Council;
- Tanzania Industrial Studies and Consulting Organization.
Kenya
- National Council for Science and Technology;
- Kenya Industrial Research and Development Institute;
- Industrial Development Bank Ltd.;
- Kenya National Chamber of Commerce and Industry;
- Commercial Development Corporation;
- Egelton College;
- East Africa Industries;
- Appropriate Technology Centre of Kenyatta University;
- Kenya Bureau of Standardization;
- Ministry of Commerce and Industry - Information and Documentation Section;
- Ministry of Transport and Communications.

Egypt
- Egyptian National Scientific and Technical Information Network of the Academy of Scientific Research and Technology (ENSTINET);
- Egyptian Documentation and Information Centre for Agriculture;
- Centre for Educational Technology;
- Engineering and Industrial Design Development Centre;
- National Information and Documentation Centre.

33. Shortage of co-ordination and bilateral links between the information systems presented above are recognized by officials who are responsible for industrial and technological information system. Therefore the creation of communication links between information systems is a very important task to be done.

34. Absence of national industrial and technological information policy is considered by information specialists as the main constraint which makes the information system establishment impossible.
35. While the INTIB national industrial and technological information network is being built attention should be given to the problems of creation of telecommunication links in these countries, as, at present, these links are very poor. The INTIB national network is proposed as a result of the mission.

36. Bilateral links between the countries' information systems and their co-ordination leave much to be desired. The importance of strengthening bilateral links and co-ordination in this area is widely recognized by the professional staff dealing with the industrial and technological information systems.

37. There is a poor statistical structure in the country. The organizations are therefore faced with collecting data for its various operations: traditional statistics such as gross output, value added, employment, wages and salaries, production indices, etc., as well as compilation of published statistical information, such as input-output tables, industry census, annual survey of industries, etc. are often requested by industrial and technological information end-users of having information systems.

38. During the discussions according to selection of hardware and software for information systems, ad-hoc advises were given by the mission. It was recommended for the INTIB focal points to install hardware compatible with DMB PC and software of kind CDC/ISIS.

VI. ACTION PROGRAMME (FOLLOW-UP)

39. The creation of INTIB national focal points network is co-operated with a problem of computerization of the INTIB focal points. Computerization could be started on a time when not of all focal points have their computers or utilize ones. It should be rather understood as a development strategy in which each member state focal points could take part increasing its involvement according to its needs and available funds.
40. The development strategy should be a general frame of co-operation aimed at final computerization of national focal points. Taking into consideration the cost effectiveness trend of computerized information systems the computerization of INTIB focal points in African countries seems inevitable. Nevertheless in the initial stage of the development strategy the basis for information exchange and search must be established.

41. The target of the initial stage of the development strategy should solve three problems:

- What kind of classification system of industrial information must be in accordance with INTIB activities?
- What minimum set of data must be in accordance with INTIB activities?
- What will be computer format of the data according to the computer in INTIB unit in UNIDO Secretariat?

42. It is necessary to solve these three strategic problems at the international level. It should be prepared as the result of official expert group recommendations (concerning the first and the second problems). The second expert group recommendations (computer specialist group) should propose the solution for the third problem taking into consideration ISO standards in the field of exchange data by magnetic tapes, discs and on-line access.

43. Stage one could start with one operating central computer in INTIB headquarters answering the national focal points requests and disseminating information according to the established profiles. In this case INTIB has to assist African countries in the information service manpower building.

44. Stage two begins when besides the INTIB computer there are other computers in national focal points but without on-line links between them. It is necessary to note that all other national focal point without computers, implement activities as in stage one.
45. In stage three all national focal points have computers connected on-line to the INTIB computers. As a result for the national focal point in stage three no mailing is needed and files of INTIB and focal point computer could be reached and exchanged. It should be noted that other national focal point could work at the same time in stage two or one.

46. It is necessary to note that computerization of national focal points is last step in the process of ordering the flow of information, because before purchasing of a computer system, a detailed study should be undertaken to determine its configuration and software requirements.
ANNEX I

Documents Used During the Mission

I. General Documents


II. Nigeria


III. Zambia


2. The University of Zambia, Technology Development and Advisory Unit Handbook.


IV. Tanzania


3. The Institute of Production Innovation (IPI), a link between the Faculty of Engineering and Tanzanian Industry (FOE).

4. Institute of Production Innovation, University of Dar-es-Salaam.


V. Kenya

1. Kenya Industrial Research and Development Institute, by Katambo Wakano, Nairobi.

VI. Egypt

ANNEX II

Industrial and Technological Information Bank
IDDA Project (RP/RAP/85/621)

Questionnaire

Objective: Assess existing/potential information service institutions/organizations and their activities

Name of Institute/Organization: Country:

Address of Institution/Organization: Telex/Cable:

Telephone/Telefax:

Nature of Institution/Organization: Public/Private/Semi-private

Name of Director/Interviewee:

Year of Establishment:

Objectives/Functions of Institution/Organization:

Number of Information staff:

Professionals:
Supporting personnel:
Information Service Activities:

List of Publications: Quarterly/Yearly Publications:

Industrial Inquiry Service (Sectors/Inquirers/Source of Answers/
Number of Inquiries/Character):

Extension Services:

Selective Information Dissemination/Current Awareness Service:

Ad-hoc Advisory Services:

Source of Fund: Government/Private

Budget for Information Activities:

List of Hardware/Software:

Main Problems Faced by the Organization on Information Field:

Contents of Advice Given by UNIDO Experts:

Comments to be as INTIB Nodes by Institution/Organization:

Linkage with Other Information Institutions/Organizations:
List of Demand/Needs of Information Users:

Linkage with INTIB:

   Industrial Inquiry Service
   Possible Areas:
   Ways and Means:
   Trainings/Seminars/Workshops Conducted by the
   Institution/Organization
   Expectation from INTIB:
   Ad-hoc Service Request and Project Document:

Industrial Information Policy:

Non-Focal Points for Co-ordination Request:

Recommendations to Government:
### ANNEX III

**List of Specialists Consulted**

**Nigeria**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng. A.O. Faluyi</td>
<td>President, Nigerian Society of Engineers</td>
</tr>
<tr>
<td>Dr. T.I. Obiaga</td>
<td>Director, Industrial Science and Energy Research</td>
</tr>
<tr>
<td>Mr. Simeon B. Aje</td>
<td>Director, National Library of Nigeria</td>
</tr>
<tr>
<td>Mr. G.O. Akajiobi</td>
<td>Assistant Director, Industrial Data Bank and Investment</td>
</tr>
<tr>
<td>Mrs. O.W. Ajayi</td>
<td>Controller P and D Department, Nigerian Industrial Development Bank</td>
</tr>
<tr>
<td>Mr. Uzoz E. Okeke</td>
<td>Assistant Director, Manufacturers Association of Nigeria</td>
</tr>
<tr>
<td>Mr. R.O. Sodipe</td>
<td>Chief Research Officer, Federal Institute of Industrial Research, Oshodi</td>
</tr>
</tbody>
</table>

**Zambia**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. B. Chilesia</td>
<td>Technology Development and Advisory Unit, The University of Zambia</td>
</tr>
<tr>
<td>Mr. Vamoer</td>
<td>Executive Director, National Food and Nutrition Commission</td>
</tr>
<tr>
<td>Mrs. J. Mapoma</td>
<td>Chairman, Village Industry Service</td>
</tr>
<tr>
<td>Mr. Likulunga</td>
<td>Head, Promotion Division, Development Bank of Zambia</td>
</tr>
<tr>
<td>Mr. G. Tembo</td>
<td>Head, Agriculture Engineering Section, Ministry of Agriculture</td>
</tr>
<tr>
<td>Name</td>
<td>Position and Organization</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mr. S.A. Mwambazi</td>
<td>Director, Zambia Bureau of Standards</td>
</tr>
<tr>
<td>Dr. C.O. M. Ngandwe</td>
<td>Director, Small Industries Development Organization (SIDO)</td>
</tr>
<tr>
<td>Mr. Mushipi</td>
<td>Head, Documentation Centre, National Council for Scientific Research</td>
</tr>
<tr>
<td>Mr. Humphrey J. Samuchapi</td>
<td>Chief Executive, The Zambia Industrial and Commercial Association</td>
</tr>
<tr>
<td>Dr. S. Moyo</td>
<td>Director, Institute for African Studies, University of Zambia</td>
</tr>
<tr>
<td>Mr. E.L. Kamuzora</td>
<td>Director General, Tanzania Industrial Studies and Consulting Organization</td>
</tr>
<tr>
<td>Mr. J. Harbison</td>
<td>Chief Technical Advisor, Tanzanian Industrial Research and Development Organization</td>
</tr>
<tr>
<td>Mr. A.J. Chillumanga</td>
<td>Director, Planning and Research Section, Ministry of Industries and Trade</td>
</tr>
<tr>
<td>Mr. W.C. Kasenga</td>
<td>Executive Director, Chamber of Commerce</td>
</tr>
<tr>
<td>Mr. E. Th. Protzen</td>
<td>Technical Manager, Institute of Production Innovation</td>
</tr>
<tr>
<td>Mr. K.Y. Dachi</td>
<td>Managing Director, National Institute for Productivity</td>
</tr>
<tr>
<td>Mr. A.U. Kibona</td>
<td>Studies and Research Manager, Tanzania Investment Bank</td>
</tr>
<tr>
<td>Mr. Ake. Schilstrom</td>
<td>Chief Consultant, Metal Engineering Industries Development Association</td>
</tr>
<tr>
<td>Mr. D.G. Mbuya</td>
<td>Director, Project Appraisal, Tanganyika Development Finance Company Ltd.</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Mr. L. Magai</td>
<td>Director Training and Ext. Service Small Industries Development Organization</td>
</tr>
<tr>
<td>Mr. Mteleka</td>
<td>Deputy Head Science and Technology Department Ministry of Planning</td>
</tr>
<tr>
<td><strong>Kenya</strong></td>
<td></td>
</tr>
<tr>
<td>Dr. Robert O. Arunga</td>
<td>Director Kenya Industries Research and Development Institute</td>
</tr>
<tr>
<td>Mr. P. N. Omusi</td>
<td>Director Kenya National Chamber of Commerce and Industry</td>
</tr>
<tr>
<td>Mr. B. W. Maina</td>
<td>Manager Research and Appraisal Division Industrial Development Bank</td>
</tr>
<tr>
<td>Dr. F. J. Wagati</td>
<td>Secretary National Council for Science and Technology</td>
</tr>
<tr>
<td>Mr. John P. N. Simba</td>
<td>Executive Director Industrial and Commercial Development Co-operation</td>
</tr>
<tr>
<td>Mr. A. M. Shikhule</td>
<td>Operations Manager Kenya Industrial Estates</td>
</tr>
<tr>
<td>Mr. K. S. Shenoy</td>
<td>General Manager Agro-Chemical and Food Company</td>
</tr>
<tr>
<td>Dr. Mutuku Nzioki</td>
<td>Director Technology Department Egelton College</td>
</tr>
<tr>
<td>Mr. J. B. Wambura</td>
<td>Technical Director East Africa Industries</td>
</tr>
<tr>
<td>Mr. George K. N. Mengua</td>
<td>Directorate of Industrial Training</td>
</tr>
<tr>
<td>Mr. H. H. O. Awuor</td>
<td>Chief Materials Engineer Ministry of Transport and Communications</td>
</tr>
<tr>
<td>Mr. F. B. Maiko</td>
<td>Deputy Director Kenya Bureau of Standards</td>
</tr>
<tr>
<td>Dr. Herick Othieno</td>
<td>Director Appropriate Technology Centre</td>
</tr>
</tbody>
</table>
Egypt

Prof. Dr. Mohammed M. Kamel
President
Academy of Scientific Research and Technology

Prof. Dr. Mohammed B. Fayez
Director
National Research Centre

Prof. Dr. Ali Ali Hebeish
Director
ASRT President Office

Prof. Dr. Yousef Khalil Mazhar
Director
Engineering and Industrial Design Development Centre

Mr. Ahmed Abdel Bassit
Director
The Egyptian National Scientific and Technical Information Network

Eng. Maissah El Mahdy
Director
Engineering and Industrial Design Development Node

Eng. Ibrahim Zaki
Director
Agricultural Documentation and Information Centre

Ms. Hodda Sharawy
Director
Information Section
National Information and Documentation Centre

Dr. Hussein Abdelah
President
Organization for Energy Planning
# ANNEX IV

## Abbreviations and Addresses

### Nigeria

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Address</th>
</tr>
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<tbody>
<tr>
<td>FIIRO</td>
<td>Federal Institute of Industrial Research, Oshodi Blind Centre Road Cappa Bus Stop, P.M.B. 21023 Ikeja Lagos, Nigeria</td>
</tr>
<tr>
<td>Fed. Ministry of Industries</td>
<td>Federal Ministry of Industries Federal Secretariat Complex Phase 1, Room 989, Ikoyi Lagos, Nigeria</td>
</tr>
<tr>
<td>NIDB</td>
<td>Nigerian Industrial Development Bank NIDB House 63/71, Broad Street P.O. Box 2357 Lagos, Nigeria</td>
</tr>
<tr>
<td>NLN</td>
<td>National Library of Nigeria 4 Wesley Street Lagos, Nigeria</td>
</tr>
<tr>
<td>MAN</td>
<td>Manufacturers Association of Nigeria 37 Marina, Unity House P.O. Box 3835 Lagos, Nigeria</td>
</tr>
<tr>
<td>Fed. Min. of S and T</td>
<td>Federal Ministry of Science and Technology 9 Kofr Abayomi Street V.I. Lagos, Nigeria</td>
</tr>
<tr>
<td>NSEPC</td>
<td>Nigerian Society of Engineers Professional Centre Plot PC 11, Victoria Island Lagos, Nigeria</td>
</tr>
</tbody>
</table>

### Zambia

<table>
<thead>
<tr>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>SIDO</td>
<td>Small Industries Development Organization Lusaka</td>
</tr>
<tr>
<td>UNZA</td>
<td>University of Zambia P.O. Box 32379 Lusaka</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>ZINCOM</td>
<td>The Zambia Industrial and Commercial Association Lusaka</td>
</tr>
<tr>
<td>DBZ</td>
<td>Development Bank of Zambia Lusaka</td>
</tr>
<tr>
<td><strong>Tanzania</strong></td>
<td></td>
</tr>
<tr>
<td>TIRDO</td>
<td>Tanzania Industrial Research and Development Organization P.O. Box 23235, Dar-es-Salaam</td>
</tr>
<tr>
<td>TISCO</td>
<td>Tanzania Industrial Studies and Consulting Organization P.O. Box 2850, Dar-es-Salaam</td>
</tr>
<tr>
<td>UTAFITI</td>
<td>Tanzania National Scientific Research Council P.O. Box 4302, Dar-es-Salaam</td>
</tr>
<tr>
<td>MFIDA</td>
<td>Metal Engineering Industries Development Association P.O. Box 5891, Dar-es-Salaam</td>
</tr>
<tr>
<td>IPI</td>
<td>Institute of Production Innovation University of Dar-es-Salaam P.O. Box 35075</td>
</tr>
<tr>
<td>SIDO</td>
<td>Small Scale Industries Development Organization P.O. Box 2476, Dar-es-Salaam</td>
</tr>
<tr>
<td>NIP</td>
<td>National Institute for Productivity Ohio Shee, P.O. Box 2021</td>
</tr>
<tr>
<td>TIB</td>
<td>Tanzania Investment Bank Samora Avenue P.O. Box 9373, Dar-es-Salaam</td>
</tr>
<tr>
<td>TDFL</td>
<td>Tanganyika Development Finance Company Ltd. TDFL Building, Ohio/Upanga Road P.O. Box 2478</td>
</tr>
<tr>
<td><strong>Kenya</strong></td>
<td></td>
</tr>
<tr>
<td>KIRDI</td>
<td>Kenya Industrial Research and Development Institution P.O. Box 30650, Nairobi</td>
</tr>
<tr>
<td>Acronym</td>
<td>Name and Address</td>
</tr>
<tr>
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</tr>
<tr>
<td>KNCCI</td>
<td>Kenya National Chamber of Commerce and Industry &lt;br&gt;P.O. Box 47024, Nairobi</td>
</tr>
<tr>
<td>IDB</td>
<td>Industrial Development Bank &lt;br&gt;National Bank Building &lt;br&gt;Harambee Avenue &lt;br&gt;P.O. Box 44036, Nairobi</td>
</tr>
<tr>
<td>NCST</td>
<td>National Council for Science and Technology &lt;br&gt;P.O. Box 30623, Nairobi</td>
</tr>
<tr>
<td>MCI</td>
<td>Ministry of Commerce and Industry &lt;br&gt;P.O. Box 30418, Nairobi</td>
</tr>
<tr>
<td>ICDC</td>
<td>Industrial and Commercial Development Corporation &lt;br&gt;P.O. Box 45519, Nairobi</td>
</tr>
<tr>
<td>K.I. ESTATES</td>
<td>Kenya Industrial Estates Ltd. &lt;br&gt;P.O. Box 78029, Likoni Road, Nairobi</td>
</tr>
<tr>
<td>KITI</td>
<td>Kenya Industrial Training Institute &lt;br&gt;P.O. Box 74494, Nairobi</td>
</tr>
<tr>
<td>MOTCO</td>
<td>Ministry of Transport and Communications &lt;br&gt;P.O. Box 11873, Nairobi</td>
</tr>
<tr>
<td>KBS</td>
<td>Kenya Bureau of Standards &lt;br&gt;Mombasa Road &lt;br&gt;P.O. Box 54974, Nairobi</td>
</tr>
<tr>
<td>ATC</td>
<td>Appropriate Technology Centre &lt;br&gt;Kenyatta University &lt;br&gt;P.O. Box 43844, Nairobi</td>
</tr>
<tr>
<td>Egypt</td>
<td>Academy of Scientific Research and Technology &lt;br&gt;101, Kaser El Ainy Street, Cairo, Egypt</td>
</tr>
<tr>
<td>ASRT</td>
<td>The Egyptian National Scientific and Technical Information Network &lt;br&gt;101, Kaser El Ainy Street, Cairo, Egypt</td>
</tr>
<tr>
<td>ENSTINET</td>
<td>Egyptian Documentation and Information Centre of Agriculture &lt;br&gt;Ministry of Agriculture &lt;br&gt;El Dokky, Cairo, Egypt</td>
</tr>
</tbody>
</table>
OEP

Organization for Energy Planning
1, Eashah El Taymoriah Street
Garden City, Cairo, Egypt

EIDDC

Engineering and Industrial Design and Development Centre
213, The Pyramids Road, Giza, Egypt

NIDOC

National Information and Documentation Centre
El Tahrir Street, El Dokky, Cairo, Egypt
ANNEX V

Schedule for UNIDO INTIB Field Mission

Nigeria: from 19 - 26 October 1985

Monday, 20 October 1985
9.00 a.m. Meet with Dr. Shonubi at UNIDO office
11.00 a.m. Mr. R.O. Sodipe
Mr. R.O. Sodipe
Chief Research officer
Federal Institute of Industrial Research, Oshodi (FIIRO)

Tuesday, 21 October 1985
10.00 a.m. Mr. Okeke
Mr. Okeke
Manufacturers Association of Nigeria
11.30 a.m. Mrs. Ajayi
Mrs. Ajayi
Nigerian Industries Development Bank

Wednesday, 22 October 1985
10.00 a.m. Eng. I.O. Faluyi
Eng. I.O. Faluyi
Nigerian Society of Engineers
12.00 a.m. Resident Representative
Resident Representative
UNDP Office, Nigeria

Thursday, 23 October 1985
10.00 a.m. Dr. Obiaja
Dr. Obiaja
Federal Ministry of Science and Technology, Nigeria

Friday, 24 October 1985
10.00 a.m. Mr. Aje, National Library
Mr. Aje, National Library
12.00 a.m. Mr. Akajiobi
Mr. Akajiobi
Federal Ministry of Industries

Zambia: from 28 October - 3 November 1985

28 October 1985
9.00 a.m. UNDP/UNIDO Lusaka
9.30 a.m. Mr. Mushipi
Mr. Mushipi
National Council for Scientific Research
11.00 a.m.          Ms. B. Chileshe
                  The University of Zambia

14.00                  Dr. S. Moyo
                  Institute for African Studies

29 October 1985

9.00 a.m.          Mr. G. Tembo
                  Ministry of Agriculture

14.00 p.m.         Dr. C. Mgandwe
                  Small Industries Development Organization (SIDO)

15.00 p.m.          Mr. Likulunga
                  Development Bank of Zambia

30 October 1985

9.00 a.m.          Mr. J. Samuchapi
                  The Zambia Industrial and Commercial Association

11.30 a.m.          Mr. S.A. Mwambazi
                  Bureau of Standards

14.00 p.m.          Mrs. J. Mapoma
                  Village Industry

31 October 1985

9.00 a.m.          Mr. Vamoer
                  National Nutrition Commission

1 November 1985

9.30 a.m.          Mr. Bekele, UNDP

Tanzania: from 4 - 10 November 1985

4 November 1985

Arrival by KA480

5 November 1985

8.30 a.m.           Mr. Ouattara
                  Resident Representative, UNDP

9.30 a.m.           Mr. E.L. Kamuzora
                  Director-General, TISCO
11.30 a.m.  Mr. J. Harbison, Chief Technical Adviser, TIRDO
14.00 p.m.  Mr. W.E. Kasenga, Executive Director, Dar-es-Salaam Chamber of Commerce

6 November 1985
9.00 a.m.  Mr. A.J. Chillumangu, Director, Planning and Research, Ministry of Industries and Trade
14.30 p.m.  Mr. E. Th. Protzen, Technical Manager, IPI

7 November 1985
9.00 a.m.  Mr. K.Y.A. Dachi, Acting Managing Director, National Institute for Productivity
11.30 a.m.  Mr. A.U. Kibona, Studies and Research Manager, Tanzania Investment Bank
14.30 p.m.  Mr. Ake Schilstrom, Chief Consultant, MEIDA

8 November 1985
8.30 a.m.  Mr. D.G. Mbaya, Director, Projects Appraisal, TDPL
11.00 a.m.  Mr. L. Magai, Ag. Director, Training and Ext. Services, SIDO

9 November 1985
10.30 a.m.  Mr. Mieleka, Deputy Head, Science and Technology Department, Ministry of Planning and Economic Affairs

Kenya: from 11 - 18 November 1985

Monday, 11 November 1985
8.00 - 8.30 a.m.  Resident Representative, UNDP, Kenya
Att: Mrs. L. Josich
8.40 - 9.30 a.m.  Dr. R.O. Arunga, Director, Kenya Industrial Research Development Institute, Nairobi
Wednesday, 13 November 1985

10.00 - 11.00 a.m. The Executive Director, Industrial Development Bank, P.O. Box 44036 Att: Mr. F. Ondiek

11.15 - 12.00 a.m. The Managing Director, Industrial and Commercial Development Corporation, P.O. Box 45519, Nairobi Att: Mr. Simba

2.15 - 3.30 p.m. The Director, Kenya Bureau of Standards, P.O. Box 54974, Nairobi Att: Mr. J. Osundwa

Thursday, 14 November 1985

10.30 - 11.15 a.m. Director, Appropriate Technology Centre, Kenyatta University, P.O. Box 43844, Nairobi Att: Dr. E. Othieno

Friday, 15 November 1985

10.00 - 11.00 a.m. The Principle, Kenya Industrial Training Institute, P.O. Box 280, Nakuru Att: Mr. Ochieng

12.00 - 1.00 p.m. The Principle, Egelon College, P.O. Kjoro

10.00 - 11.20 a.m. The Secretary, National Council for Science and Technology, P.O. Box 30623, Nairobi

11.30 - 12.30 p.m. The Chief Executive, Kenya National Chamber of Commerce and Industry, P.O. Box 47024, Nairobi

2.15 - 3.30 p.m. Department of Industry, Ministry of Commerce and Industry, P.O. Box 30418, Nairobi Att: Mr. Omendi

4.00 - 5.00 p.m. The Permanent Secretary, Ministry of Planning and National Development

Tuesday, 12 November 1985

8.30 - 9.30 a.m. Chief Materials Engineer, Ministry of Transport and Communications, P.O. Box 11873, Nairobi Att: Mr. H.H.O. Awuor
10.00 - 11.00 a.m.  
Technical Director, East Africa Industries, P.O. Box 30062, Nairobi  
Att: J.H.G. Wambura

11.30 - 12.30 p.m.  
Director, Directorate of Industrial Training, P.O. Box 74494, Nairobi  
Att: G.K.N. Mbugua

2.30 - 3.30 p.m.  
Kenya Industrial Estates,  
P.O. Box 78024, Nairobi  
Att: Operations Manager

Egypt: 18 - 23 November 1985

Monday, 18 November 1985  
Arrival at 11.00 a.m.

Tuesday, 19 November 1985  
8.30 - 9.30 a.m.  
Ms. Omnia Gomaa  
UNDP Office, Cairo

10.00 - 10.30 a.m.  
Prof. Dr. Mohamed Kamel  
President, Academy of Scientific Research and Technology, Cairo

10.30 - 11.00 a.m.  
Prof. Dr. Ali Ali Hebiesh  
Head, Office President of the Academy

11.15 - 13.30 p.m.  
Mr. Ahmed Abdel El Bassit  
Director, Egyptian National Scientific and Technical Information Network

Wednesday, 20 November 1985  
8.30 - 10.30 a.m.  
Eng. Dr. Yousef Khalil Mazhar  
Director, Engineering and Industrial Design Development Centre (EIDDC), Cairo

10.30 - 12.30 p.m.  
Eng. Maissah El Mahdy  
Director, Industry Node in EIDDC, Cairo

13.00 - 14.00 p.m.  
Eng. Ibrahim Zaki Ibrahim  
Director, Egyptian Documentation and Information Centre for Agriculture, Ministry of Agriculture, Cairo

Thursday, 21 November 1985  
8.30 - 9.00 a.m.  
Prof. Dr. Mohamed B. Fayez  
Director, National Research Centre, Cairo
<table>
<thead>
<tr>
<th>Time</th>
<th>Person and Title</th>
</tr>
</thead>
</table>
| 9.15 - 9.30 a.m. | Prof. Dr. Ahmed Naiem  
Director, National Information and Documentation Centre (NIDOC) |
| 9.30 - 11.00 a.m. | Ms. Hodda El Sharawy  
Chief, Information Section in NIDOC |
| 11.30 - 13.30 p.m. | Prof. Dr. Hussien Abedalah  
President, Organization for Energy Planning, Cairo |

Friday, 22 November 1985

Holiday