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ENGLISH

COUNTRY REPORT
ON THE INDUSTRIAL AND TECHNOLOGICAL
INFORMATION SYSTEMS IN ZAMBIA¹

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* The views expressed in this paper are those of the authors and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

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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 Zambia which has 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, documentatlists and programmers, etc.

The mission is grateful to the UNDP Officers in Lusaka for their kind co-operation and assistance which facilitated the success of the mission. The mission is also thankful to Mr. G. Bekale, SIDFA, and to Mr. E. Mustala, JPO, UNIDO representatives in Lusaka and to Mr. J. Banda from Village Industry Service, 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 Zambian organizations from 28 October to 2 November 1985.

The mission was intended to assess the existing and potential information systems and services, to assess national focal point of INTIB, 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.

The identification of national focal point of INTIB in Zambia was the most important task of the mission.

The following national focal point of INTIB is proposed by mission in Zambia - Small Industries Development Organization (SIDO).

The first part of the report presents conclusions and recommendations of the mission and the second part presents recommendations dealing with INTIB 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. The recommendations 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.

2. Main problems faced by the organizations in Zambia on information field are following:

- 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.

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 (a network pattern is given in Fig. 1).

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.

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:

- 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;

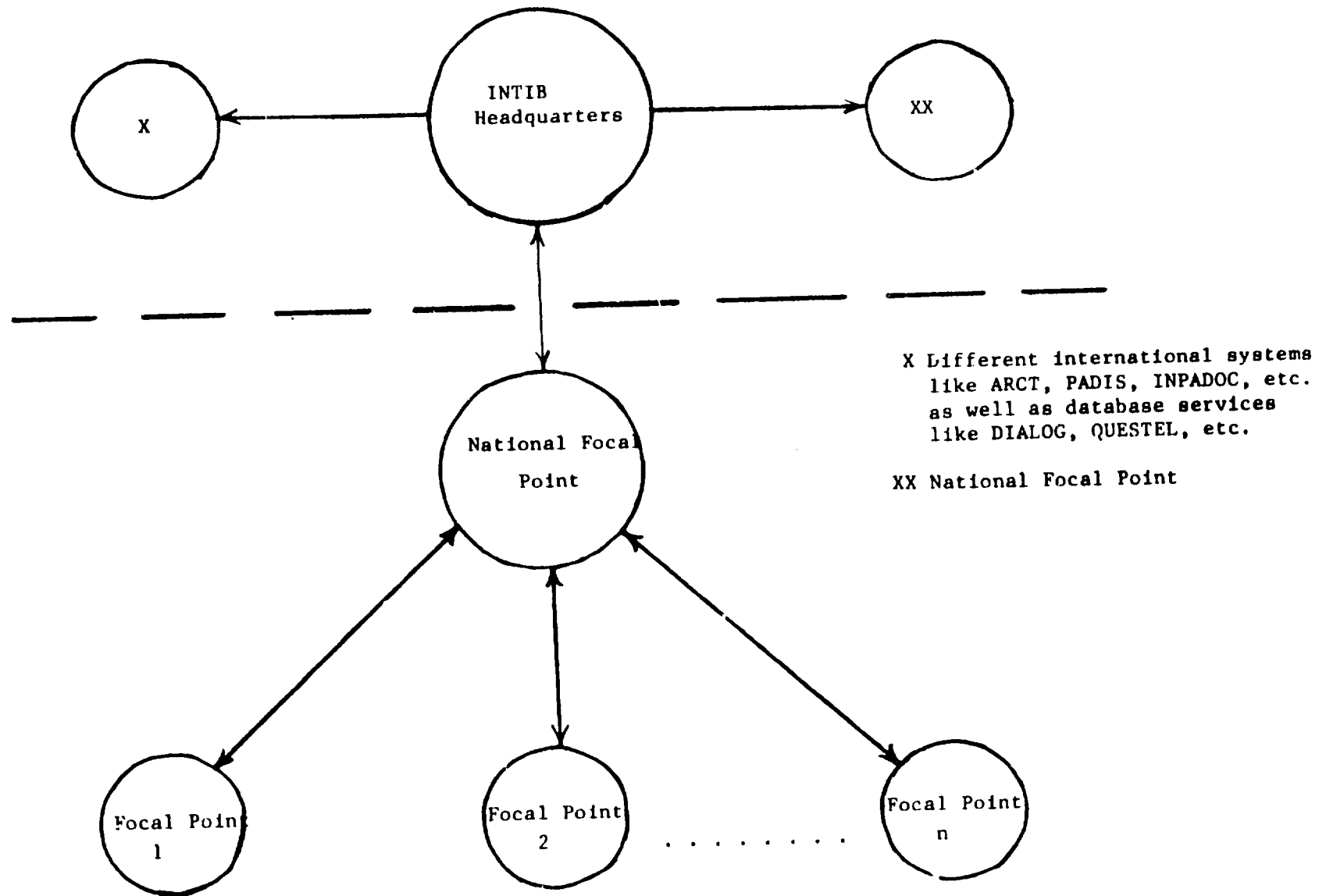


Figure I: INTIB National Network Structure

- INTIB;
- Zambia Broadcasting Services;
- Canadian Broadcast Service;
- Socially Appropriate Technology International Information Services (SATIS).

5. 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.

6. 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.

7. One of the major recommendations with regard to the national industrial information systems consists in ensuring the compatability between all the links which are part thereof. Compatability 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.

8. 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.

9. Taking into consideration the above-mentioned INTIB's mission could recommend using hardware of kind "IBM PC" and software of kind CDS/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.

10. The national industrial information system in Zambia 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.

11. 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 compatability.

12. 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.

13. 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

14. 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.

15. 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. UNIDO has in the past given technical assistance to national information systems or services in several countries, such as Algeria, Angola, Ivory Coast, Sudan, Kenya, Libya, Mauritania, Mozambique, Nigeria, Senegal, Togo, Tunisia, Rwanda, Burkina Faso and Zaire.

16. Since the projects in these countries have been completed there is a base that exist but nevertheless needs continuing support not so much by the provision of expert services on a medium or long-term basis but through advisory services and the establishment of adequate links with those selected primarily from the foregoing list to implement activities envisaged under this project.

III. OBJECTIVES OF THE MISSION

17. 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

18. The end-users of the industrial and technological information in Zambia 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.

19. 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.

20. Many of the users are vitably interested in receiving primary technological documentation, the creation of selective information dissemination and current awareness service and also in the establishment of various ad-hoc advisory services for different technical problems.

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

Information Staff:

Professional: 20

Supporting personnel: 13

Hardware:

MEPAS, COMMODOR, IBM PC

Software:

COBOL, BASIC

Yearly Budget: (in US dollars)

Approximately US\$ 300,000 in all organizations visited.

22. The following INTIB contributions are expected:

- to donate relevant monographs, handbooks, encyclopedias, dictionaries, etc. on small industry;
- financial support of information projects;
- preparation of training courses;
- experts from INTIB in data classification;
- assistance in training of staff;
- computer equipment;
- technical information in 20 sectors of INTIB;
- acquisition of information in the field of standard.

V. ACTIVITIES OF THE MISSION

23. An inventory of industrial and technological information systems in Zambia includes the information systems in the following organizations:

- 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.

24. The major problems in the information field in Zambia are that the local market can't satisfy demand the right technical and general literature on small industries and the industrial information is often scattered in different formats.

25. Absence of national industrial and technological information policy is considered by officials who are responsible for this activity as main constraint which makes the information system development impossible.

26. 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.

27. 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.

28. 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 IBM PC and software of kind CDC/ISIS.

VI. ACTION PROGRAMME (FOLLOW-UP)

29. 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.

30. 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.

31. 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?

32. 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.

33. 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.

34. 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.

35. 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.

36. 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

1. A Programme for the Industrial Development Decade for Africa, prepared jointly by the Economic Commission for Africa, the Organization of African Unity and the United Nations Industrial Development Organization, New York, 1982.
2. Lagos Plan of Action for the Economic Development of Africa 1980-2000, International Institute for Labour Studies, Geneva, 1981.
3. Role of INTIB, (ID/WG.450/13), 20 September 1985, UNIDO Secretariat. Round Table Discussion of an Advisory Group of INTIB Users, Vienna, Austria, 23 - 27 September 1985.
4. Sung Jin Choi, Guidelines for the Formulation of National Industrial and Technological Information Policy, INTIB Secretariat.
5. Ching-Chih Chen, Microcomputer Use in Libraries in the U.S.: Current and Future Trends, UNSECO - Upils Asian Regional Seminar/Workshop on the Application of Microcomputers to Library and in Information Management, Dillman, Quezon City, 29 October - 2 November 1984.
6. Bankowski J., Wysocki A., Guidelines for the Establishment or Redesign of Industrial and Technological Information Service System, Including Selection of Software and Hardware, Warsaw, September 1985, INTIB Secretariat.
7. Industrial and Technological Information Bank - Questionnaire, IDDA Project RP/RAF/85/621.

II. Zambia

1. National Council for Scientific Research (NCSR), October 1983, Lusaka.
2. The University of Zambia, Technology Development and Advisory Unit Handbook.
3. International Food Policy Research Institute Report, Printed by Mutlimedia Zambia for the Publishers National Food and Nutrition Commission, 1985.
4. The Zambia Industrial and Commercial Association, Newsletter.

ANNEX II

Industrial and Technological Information Bank

IDDA Project (RP/RAF/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:

Professional:

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

Ms. B. Chilesa	Technology Development and Advisory Unit The University of Zambia
Mr. Vamoer	Executive Director National Food and Nutrition Commission
Mrs. J. Mapoma	Chairman Village Industry Service
Mr. Likulunga	Head Promotion Division Development Bank of Zambia
Mr. G. Tembo	Head Agriculture Engineering Section Ministry of Agriculture
Mr. S.A. Mwambazi	Director Zambia Bureau of Standards
Dr. C.O. M. Ngandwe	Director Small Industries Development Organization (SIDO)
Mr. Mushipi	Head Documentation Centre National Council for Scientific Research
Mr. Humphrey J. Samuchapi	Chief Executive The Zambia Industrial and Commercial Association
Dr. S. Moyo	Director Institute for African Studies University of Zambia

ANNEX IV

Abbreviations and Addresses

SIDO	Small Industries Development Organization Lusaka
UNZA	University of Zambia P.O. Box 32379 Lusaka
ZINCOM	The Zambia Industrial and Commercial Association Lusaka
DBZ	Development Bank of Zambia Lusaka

ANNEX V

Schedule of UNIDO INTIB Field Mission to Zambia
28 October to 3 November 1985

28 October 1985

9.00 a.m.	UNDP/UNIDO Lusaka
9.30 a.m.	Mr. Mushipi National Council for Scientific Research
11.00 a.m.	Ms. B. Chileshe The University of Zambia
14.00 a.m.	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. Ngandwe Small Industries Development Organization (SIDO)
15.00 p.m.	Mr. Likulunga Development Bank of Zambia

30 October 1985

9.00 a.m.	Mr. J. Samuchiapi 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
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1 November 1985

9.30 a.m.	Mr. Bekele, UNDP
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