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Kenya.
NATIONAL COUNTERPART REPORT
ON THE INDUSTRIAL AND TECHNOLOGICAL
INFORMATION SYSTEMS IN KENYA*

Prepared by

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

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I N T R O D U C T I O N

The Lagos Plan of Action and the Final Act of Lagos spell out the long term measures required for the restructuring of African economies on the basis of the principles of national and collective self-reliance and self-sustaining development; the promotion of the physical integration of the African economies and the creation at national, sub-regional and regional levels of a dynamic, interdependent African economy.

According to the Industrial Development Decade for Africa (IDDA), African Governments have committed themselves to the promotion of an increased measure of self-reliance and self-sustainment, which implies making economic growth and development more dependent on internal demand stimuli, increasing the substitution of factor inputs from within the system for those derived from outside, deliberately introducing patterns and processes of development and economic growth in which different components support and reinforce each other and pooling resources, manpower, markets, finance, institutions, etc... at the sub-regional, regional and other multi-national levels in order to achieve the objectives of the Lagos Plan of Action for IDDA, altering the nature and type of goods and services to meet the basic needs of the mass of our peoples; involving at all stages of the formulation and implementation of development plans all the principal agents of development, developing indigenous entrepreneurial capabilities both public and private; adopting an integrated approach to development which covers different economic and social activities, takes into account the effective interdependence of these activities and recognises the special role played by food and agriculture and industry as two production sectors.

We are fully aware that central to the successful implementation of any development strategy, so is to the Lagos Plan of Action for IDDA, is the recognition of the important role played by industrial and technological information services. It is not only vital that policies should be pursued to ensure the effective development and utilization of industrial and technological information services (banks) in all fields and sectors,

but also that effective measures should be taken to ensure the full participation of our industrial and technological information users in all dimensions of development; create equal opportunities for all and restore the self-confidence of the African Research Scientist /Technological and strengthen his abilities for endogeneous creativity.

On industrial and technological development, the Lagos Plan of Action sets out the broad framework for the long term development in Africa for translation into practical operational terms in the programme for the Industrial Development Decade for Africa (IDDA) 1980-1990. The programme and the guidelines for priority action during the preparatory phase of the Decade spell out the short-medium-and long term measures to be taken by African countries themselves, by regional and sub-regional organisations and by the international community to develop the industrial sector in Africa.

Fully cognizant of the foregoing, we must, therefore, resolve to accelerate the necessary long-term structural changes in the development and establishment of better industrial information services (banks) within national, sub-regional, regional and international centres for faster and better dissemination of industrial and technological information available.

With the successful implementation of the programme (IDDA Programme) there will be significant restructuring of the national industrial sector relating to national industrial production to indigeneous endownments for the satisfaction of the basic needs of the population and thus spurring growth in other sectors of the economy, especially agriculture. Massive international support is needed for national programmes to rehabilitate existing plants and factories and make use of available excess acapacity. With access to available industrial and technological information banks (Services) it should be easy to arrest the evident process of de-industrialization in the Country and to set in motion activities for re-orienting industry.

The establishment of INTIB Focal Points is basic to the easy distribution and marketing of basic commodities and the expansion of domestic maerkets in general.

For any marked development to be made, particular attention must be made for the utilization of resources of industrial and technological information which is of crucial importance as a basis for the formulation of national development plans and programmes within the framework of self-reliance and self-sustainment industrially.

It will be, therefore, important to re-examine the role of access to relevant information in determining the following:

- (i) Reallocation of resources on the basis of reappraised industrial policies;
- (ii) Reappraised industrial strategy and
- (iii) Required institutional machinery

PRIORITY

- (a) Prospecting for local raw materials
- (b) Processing local raw materials
- (c) Making intermediate inputs for local use and developing linkages throughout the economy, especially with agriculture
- (d) Creation of resource-based industries that use local skills and domestic raw materials
- (e) Promotion of small-scale agro-processing industries.
- (f) The promotion of entrepreneurial capabilities and the development of technical and managerial skills
- (g) Development of core industries, especially of the metallurgical, engineering, chemical, building materials, capital goods and pharmaceutical types.
- (h) Development of small-scale industries, especially those feeding and supporting medium-and large-scale industries.

Above all it is of paramount importance that African countries should do everything possible to encourage the exchange of information, whether bilaterally or through African multilateral

bodies, between interested countries on the development of industrial and technological know-how, including inter-alia bilateral and multilateral agreements, to share industrial and technological information with other countries bilaterally and multilaterally to enhance industrial and technological development.

Planned utilization of industrial and technological information is one of the most important tools in promoting national development. There is a lot of useful information in the country and globally but there is a need for establishing an effective Focal Point in order to effectively select what is required for use by the users. Kenya recognises and fully supports the important role which can be played by the provision of technological information in development. Internationally Kenya has given support to programmes aimed at improving the collection, storage and dissemination of information. In 1983 Kenya hosted the International Association of Agricultural Documentalists and Librarians Conference in Nairobi and in 1984, it (kenya) hosted, in August, the International Federation of Library Associations and Institutions : Annual General Conference, which celebrated its 50th Anniversary, in Nairobi.

The hosting of these conferences is an open manifestation of Kenya's support of the importance it attaches on the role played in the provision and dissemination of information globally for development. Nationally, in its latest development plan 1984-1988, Kenya has stressed and attached great importance and allocated financial support for the development of information institutions and services, libraries, archives, museums, documentation centres, publishing establishments and the training of personnel in these fields.

The national policy for technological information has stressed and emphasised the following objectives:

- (a) to collect, organise, preserve, translate and disseminate information generated in the country and elsewhere globally,
- (b) to ensure optimum utilization of knowledge in science and technology in order to achieve the national goals for the betterment of society
- (c) to provide adequate documentation and information services relevant to present needs, together with a capacity for developing services to meet the future needs of information users;
- (d) to ensure the availability of adequate information for decision making in management and policy formulation both in Government and Private Sector;
- (e) to provide scientists, industrialists, technologists, statisticians, and other users in the country and globally with a means of obtaining information on new findings which originate in the country and globally, and
- (f) to promote national and international co-operation in the exchange of information and expertise.

Taking cognisance of the above objectives the design of the nation's scientific industrial and technological information systems and services requires an analysis of priorities of economic, social, scientific, industrial and technological needs of the nation, their interlinkages with user needs, and the identification of gaps in national information services. The analysis should give us a system which is capable of:

- (i) providing basic services such as primary communication and publication channels; acquisition and collection of information sources such as books, journals, patents, standards and other valuable literature, and exchange of these material with other information services;
- (ii) perform the basic identification and location of information sources, such as abstracting and indexing services;

- (iii) provide basic services in the dissemination of information ; and
- (iv) provide depository services for local and external documents and data which are important for development programmes.

Whereas the country spends considerable financial and human resources in conducting scientific and industrial research, information emanating from the research is not adequately disseminated to target groups owing to lack of co-ordination thus the need for establishing a National Focal Point for co-ordination, collection, storage and dissemination of the information so acquired. More often, results of scientific and industrial research end up in files which are normally locked up in cupboards or lockers where it is not easy to have access; a few of the results end up in journals which are only accessible to a small group of researchers and the situation is even more complicated when local researchers publish their research findings in foreign journals which are inaccessible to other local research scientists. The establishment of a National Focal Point is a means of setting up a machinery for collecting and dissemination information in the country and outside. This will ensure that industrial, scientific and technological information generated in Kenya and elsewhere is collected and that the information so gathered is channelled to specific target user groups nationally internationally.

At the moment there is a tendency to duplicate functions within the present information systems in the country due to lack of legal provisions regarding the acquisition, depository and retrieval of documents and so many ambiguities exist in the present information systems and services in the country. With the establishment of INTIB National Focal Point it will be easy to co-ordinate the development of information systems and services and increase co-operation at national and international levels.

Although a case for the national planning of Documentation Library and Information Services has been set out in general terms-which most people with any degree of specialist knowledge would probably find acceptable - we are faced with a situation in which there are remarkably few examples of the inclusion and successful execution of plans for the development of library and information services in national development plans. Some reasons for this are fairly clear. Few if any national planning agencies include experienced librarian planners and few librarians have made a close study of development planning.

Areas of difficulty which are frequently experienced particularly in developing countries include lack of trained staff at various levels and lack of suitable publications in indigeneous language.

Additionally there is the over-riding need in many countries for the introduction of new methods in education and vocational training which encourage individual enquiry and acceptance of change, and as a means of achieving this, the use of sources of current information. Basic to particularly all library and information services, of course, is the spread of literacy as a tool in everyday communication.

NATIONAL INDUSTRIAL DEVELOPMENT

The industrial sector in Kenya ranks second to agriculture in importance to the national economy. It contributes about 20% to the Gross Domestic Product (GDP). The role of industry is increasing in importance in terms of resources, production, employment and export earnings. The sector is a major source of employment in the country. In 1975 approximately 130,000 persons were employed in industry, constituting about 14.5% of the total wage employment.

Although the older and larger industries are generally concentrated around major urban centres, such as Nairobi, Mombasa, Nakuru, and Kisumu, there has been a growing trend in recent years, towards the dispersion of new mushrooming investments to smaller areas and intermediate sized towns such as Eldoret, Kitale, Thika, Bungoma, Kakamega, Kisii, Nyeri, Embu, Machakos and many others. The sector continues to be heavily reliant on imported intermediate industrial supplies, management and capital equipment.

The major thrust of the industrial policy includes the production of basic needs, goods and services at the lowest possible cost; expansion and diversification of production of goods required for domestic consumption and export, reduction of foreign exchange content of goods manufactured locally through increased utilization of local raw materials, promotion of efficiency and production of quality goods at competitive prices through utilization of existing spare and idle capacity of manufacturing units; better utilization of local resources including labour and the application of advanced management practices, promotion of small and medium scale industries in order to increase on employment. Dispersion of new investment opportunities throughout the country is now receiving increased attention, through the District Focus for Development System, in order to spread the benefits of industrial and technological development such as income and employment distribution throughout the country.

In order for the country to achieve all the above, there must be effective systems for generating and disseminating industrial and technological information, which will also help in the following areas:

- (i) the development, acquisition, transfer and adaptation of industrial technology;
- (ii) assessment and regulation of industrial technology transferred to Kenya;
- (iii) industrial management,
- (iv) Engineering and industrial designs for the organisation and modification of industrial products and processes
- (v) control of standards for manufactured goods and equipment;
- (vi) efficient utilization of the indigeneous natural resources;
- (vii) manufacture of replacement and spare parts, maintenance of plant, equipment and instrumentation;
- (viii) export of manufactured and intermediate goods, and
- (ix) facilitating industrial technological transformation in the country.

Industrial technology is changing at a fast rate in the World scene and Kenya is ensuring that it avails itself of the best industrial processes commensurate with the social, economic, cultural, natural resources endowments and environmental considerations. The success of future industrial development depends on innovations based on the natural resources endowment for the benefit of the Kenyan population and this will, therefore, require the strengthening of industrial research in order to identify the potential inherent in these natural resources, develop indigeneous technologies and assist in the acquisition, adaption and assimilation of foreign technologies for the betterment of the nation as a whole.

We must, however, remember that in order for the Governmental machinery to administer industrial development sufficiently and to identify, formulate and implement new projects in industry, sufficient attention has to be paid to the provision of efficient systems in industrial and technological information, to assist in decision making. Effective procedures for ensuring environment protection in respect of new industrial projects are lacking and as a result of this, information is required for use in factories that pollute the environment unabated.

Most of the industrial and technological processes and know-how presently used in Kenya have been imported, predominantly from sources in the developed market economy countries. These imported technologies have generally tended not to take account of Kenyan resources endowments, particularly as regards the availability and cost of labour relative to capital owing to lack of access to available information. There must be effective co-ordination among Government financed organisation, particularly, the Kenya Industrial Research and Development Institute (KIRDI), Industrial Promotion Department (IPD), Kenya Industrial Estates (KIE), the Industrial Research and Consultancy Unit at the University of Nairobi and the National Council for Science and Technology (NCST).

In pursuit of the transfer into Kenya of more appropriate technologies, especially those involving substitutions of labour for capital, information to Kenyan industrialists from other countries both developing and developed where successes have been realised is beneficial. In our participation in various international forums where matters concerning technologies for industrialisation are discussed, we should look for more meaningful international co-operation in the exchange of available industrial and technological information. Information is required for guidance in the establishment of production units to utilize the idle capacity existing at Government supported institutions and those of the private sector in order to provide additional facilities geared to industrial development in the interest of the development of national economy.

In view of the technological nature of mineral exploration and development, the presently available geologists/geo-scientists and mining engineers, lack sufficient technological information, to enable them make an impact in the mineral development sector. Technological information is required by mining engineers, mineral economists, experienced geologists, financial analysts to facilitate their effective participation in development, exploitation and management of our mineral resources for national development socially and economically.

INDUSTRIAL AND TECHNOLOGICAL INFORMATION

One of the most important linkages in technology between industry and research is the Information Centre. The function of such a centre is to cover the gaps in industrial and technological awareness in each field.

The demand for scientific and technological information is highly urgent in new technology and production systems. Industry must co-operate with the Information Centre to supply it with data required for all quantitative gaps between supply and demand.

Sources of information on manufacturing technology:

- (a) Research Institutions, testing programmes and handbooks
- (b) Data collected from industry
- (c) Data derived from mathematical formulas and models
- (d) Standardized data from international organization, such as, ISO, BSI etc...

INDUSTRIAL CO-OPERATION:

Industrial co-operation features prominently in the extensive system of trade, economic, scientific and technical relations between the industrially developed countries and the developing countries. In the long-term, while co-operation has been extended to other areas such as agriculture, co-operation in industry will for some time remain paramount.

The concentration of effort on establishing and strengthening industry cannot be reconciled with the shift in the centre of gravity of national plans and programmes of economic development towards the growth of agricultural production,

as has been the case in a number of developing countries since the mid 70's. Industry must be regarded as an essential condition of a balanced economic take-off and of the development of agriculture and other branches of the economy as a whole

The International Development Strategy for the Third United Nations Development Decade emphasizes the importance of industrialization, which must be directed towards a many-sided solution of the common development problems of the national economies of developing countries. The introduction of modern industry acts as a stimulus to the development of branches which are linked horizontally and vertically, thus accelerating the build-up^{of} production and the spread of employment and ensuring a more balanced national economy.

Whatever agricultural development strategy is chosen by a country, the most comprehensive mobilization of internal resources for solving the problem of food supply as a matter of priority cannot be achieved without the creation and development of branches of industry, oriented towards the needs of agriculture. The creation and expansion of enterprises engaged in the manufacture of agricultural and industrial machinery and tools is important for the development of agricultural and industrial production in the country.

The growing role of industry in establishing infrastructures and in ensuring the growth of agricultural production is due, in particular, to adoption of policies aimed at according priority to agro-industry. The importance attached to agro-industry in our (Kenya's) national development plan 1984-1988, makes it possible to find a more sophisticated solution, taking into account the socio-economic aspects of the development of villages, to the complex problem of

raising agricultural and industrial production in order to provide the population with sufficient food and national industry with raw materials and also to expand export potential. To ensure the success of industrialization and to speed up the pace of economic development it is necessary to create favourable conditions at both national and international levels through better channels of communication and to introduce a strategy which makes the best use of the internal and external factors of industrial development.

The application of Science and Technology as agents of economic growth and social development in Kenya was seen by the Government to be of vital importance and this led to the establishment of the National Council for Science and Technology (NCST) by an Act of Parliament in 1977. The Council has, since its inception, played a big role in advising the Government on matters relating to scientific and technological fields.

In one of its reports "Science and Technology for Development" NCST No.-4 the Council pointed out the need of providing adequate and relevant Scientific and Technological Information.

In its 5th Development Plan 1984-1988, the Government has attached great importance on the role to be played by research establishment in national development. One of these research establishment is the KENYA INDUSTRIAL RESEARCH AND DEVELOPMENT INSTITUTE which has been fully charged with the following responsibilities for the promotion of national industrial development:

1. To undertake research in industrial and allied technology including:
 - Civil, chemical, electrical and mechanical engineering
 - Industrial, textile, fibres, ceramics, clay, food and chemical technology

- Mining and power resources development.

2. To provide the necessary testing and consultancy services to industry;
3. To provide information and documentation services for the gathering of industrial and technological intelligence and dissemination of relevant information and findings for industrial application;
4. To co-operate with other national and international organisations and institutions in training programmes and on matters of relevant research;
5. To liase with other research bodies within and outside Kenya carrying out similar research and activities;
6. To co-operate with the Ministry of Commerce and Industry, the National Council for Science and Technology and the Industrial Sciences Advisory Research Committee on matters pertaining to Industrial Research Policies and Priorities.

For the purpose of this paper, our area of concentration is No.3

The provision of information and documentation services for the gathering of industrial and technological information and the dissemination of relevant information and research findings for industrial and technological applications for national development.

Within INTIB National Focal Point, industrial and technological information and scientific data emanating from research work from research instituties within Kenya and else where, will be documented, published and disseminated to specific target groups, hence creating more awareness of any new industrial, scientific and technological findings which can be incorporated in the work carried out in industries and elsewhere both in the informal and formal sectors of our economy. This will be a step in the right direction because it will ensure the availability and quick access to information which will assist in more research and policy formulation both in

Government and Private Sector, thus making :
industrial and technological information an
effective tool in national development economically
and socially.

NATIONAL INDUSTRIAL AND TECHNOLOGICAL
INFORMATION SERVICE (BANK)

A National Industrial and Technological Information Service (Bank) is an organisation which provides to industry scientific, technological and economic information on the properties and processing of materials and on the new techniques, developments, and results of scientific research which apply to industrial production.

The information submitted (provided) may be based on published literature, unpublished reports and the knowledge and experience of scientific and technical experts to which the service has access.

National Industrial and Technological Information Service (Banks) are central organisations which work on a national basis to assist industry. They may be governmental, semi-governmental (parastatal) or private in nature provided they are recognised as a national source of information and can act as a channel through which (other) foreign countries may arrange access to the information. Usually they will serve all branches of industry.

SERVICES WHICH CAN BE OFFERED

1. supply of information on request
2. Active dissemination of information. SDI
Contents pages, weekly, monthly lists etc..
3. Maintaining a documentation service
4. Preparation of bibliographies
5. Provision of a translation service
6. Provision of technical consultancy services

7. Provision of audio-visual services
8. Maintain laboratories for testing
9. Maintain laboratories for research
10. Issue of publications: Technical reports
bulletins, newsletters, reviews, etc, ..
11. Endeavour to correlate and evaluate the data and items
of information provided.

To the mass of valuable unpublished information produced within Kenya, there is also unpublished industrial and technological documents dealing with subjects and problems that are not specific to given countries and produced mainly in developed Countries/Nations by Research Institutes, Universities, Professional Bodies, Private Firms, Specialists etc.

"Documents in pose " or "Information in growth" such as research progress, recorded observations and results of research, which often remain in manuscript stage.

This aggregate of information, often of a unique nature and sometimes irreplaceable or not newable (statistical series, for example) constitute a veritable resource whose utilization is indispensable not only for the countries which have produced it or for which it has been produced but also for other countries with similar industrial -economic-climatic conditions. Access to this unpublished information which by its topical or specific nature completes or complements information in the conventional supports such as books and periodicals is essential for many categories of users (Govt. Services, Experts on technical assistance projects, International Organisations, Educational and Research Institute, Extension workers etc.. who can thereby save considerable effort, time and money.

INTIB

The purpose of Industrial and Technological Information Bank National Focal Point will be to provide each user with the specific information she/he needs as soon as the bank receives the request.

In order for the request to be effectively performed, several tasks and operations must be performed in preparation for provision of the specific information required.

DOCUMENTS TRACING:

- (i) Secondary literature
- (ii) Publishers or original sources

Since users will often ask for the latest information in the field of their speciality, INTIB has to give high priority to non-conventional documents; local as well as foreign; better connection with other focal points so that effective service is provided to the users from the system. All national sources should be able to provide inputs into the Focal Point (generate relevant documents and information into the bank). Staff must maintain contact with all the possible sources within the country so that the bank is constantly fed (kept aware) with new materials /information being generated from time to time.

PROBLEM: Lack of (trained) manpower to organise and take care of bibliographic holdings of various national sources of information to be fed into the bank.

SELECTION OF RELEVANT DOCUMENTS:

This will require a clear knowledge of the users and their basic needs bearing in mind that users needs keep changing from time to time and this is why the basic needs must come first. This, therefore, necessitates the compilation of users profiles which should be updated from time to time so that the users needs are met.

PROCUREMENT OF DOCUMENTS:

- Purchase
- Exchange
- Donations

PROCESSING:

Documents should be properly processed once they have been acquired so that they can be easily retrieved whenever required.

EXISTING AND POTENTIAL INFORMATION
SYSTEMS, SERVICES AND NETWORKS

There are roughly three hundred (300) sources of information networks so far recorded, but many more have not been recorded yet. Of these recorded sources almost two thirds are located in and around Nairobi Area. The remaining one third are scattered in other towns of the country, that is Mombasa, Nakuru, Kisumu, Eldoret, Kakamega and so forth. Many of these networks, as I have indicated earlier, due to lack of co-ordination duplicate their services and collections.

The following information systems and networks are some of those around Nairobi Area which gather, process, store and disseminate industrial and technological information and which could be used as sources for feeding INTIB National Focal Point with the required information for dissemination locally and internationally.

1. Kenya Industrial Research and Development Institute (KIRDI) Library and Information Services, P.O. Box 30650, NAIROBI.

Subject Coverage: Chemical technological, ceramic technology; food technology; chemistry, electrical and electronics technology; engineering technology, marketing and statistics, industrial technology and development

2. Kenya Bureau of Standards Technical Library and Documentation Centre, P.O. Box 54974 NAIROBI

Subject Coverage: Quality control and standardization, chemical technology; civil engineering, food technology.

3. National Council for Science and Technology (NCST)
P.O. Box 30623, NAIROBI

Subject Coverage: Agriculture; physical sciences, natural sciences; allied and industrial science, medical science social, energy, and technology;
4. Kenya National Academy for the Advancement of Arts and Sciences Library, P.O. Box 47288, NAIROBI

Subject Coverage. Science and Technology
5. UNESCO Regional Office for Science and Technology, Library Bruce House, P.O. Box 30592, NAIROBI

Subject Coverage. Technology; Science; and Education.
6. East Africa Industries Documentation and Information Centre, P.O. Box 30062, NAIROBI

Subject Coverage: Industry, Market Statistics, Food technology; Manufacturing.
7. National Housing Corporation Library, P.O. Box 30257, NAIROBI

Subject Coverage: Building and design; planning land use; Standards.
8. Nairobi City Commission, City Planning Department, Research Section Library, P.O. Box 30075, NAIROBI

Subject Coverage: Building materials, urban planning, architecture; industry; statistical data
9. United Nations Centre for Human Settlement (UNCHS) Library and Documentation Centre; Gigiri, P.O. Box 30030, NAIROBI

Subject Coverage: Technical reports; U.N. Mission reports.
10. UNDP Reference Unit, P.O. Box 30218, NAIROBI

Subject Scope: Industrial Development; Energy development Agricultural development.
11. Kenya Institute of Management Library
P.O. Box 43706, NAIROBI

Subject Coverage: Management, Economics.

12. Centre for Research and Development, Karen, Ministry of Culture and Social Services, P.O. Box 30276, NAIROBI
Subject Scope: Applied Technology.
13. Centre d'information et de Documentation Scientifique et Technique (CIDOK) French Cultural Centre, P.O. Box 68096, Nairobi
Subject Coverage: Applied technology; Sciences.
14. Kenya Power and Lighting Training School Library, P.O. Box 30099, NAIROBI
Subject Coverage: Technical education; engineering, electricity generation and distribution.
15. Kenya Technical Teachers College Library P.O. Box 44600, NAIROBI
Subject Coverage: Industrial Education, business education, technical education.
16. Kenya Polytechnic Library, P.O. Box 52428, NAIROBI
Subject Coverage: Civil, electrical, mechanical engineering, business.
17. Kenya Posts and Telecommunication Corporation, Central Training School Library, P.O. Box 30305, NAIROBI
Subject Coverage: Engineering, telecommunications.
18. Ministry of Transport and Communications, Materials Branch Library, P.O. Box 11873, NAIROBI
Subject Coverage: Building engineering, materials technology, standards, statistical data.
19. Kabete Technical and Trade School Library, P.O. Box 29010, NAIROBI,
Subject Coverage: Technical education
20. Kenya Industrial Estates Ltd, P.O. Box 78029 NAIROBI
Subject Coverage: Industry, trade and banking, accounting, marketing, project reports; trade reports.
21. Directorate of Personnel Management Library, P.O. Box 30050, NAIROBI
Subject Coverage: Management, Economics.

22. Ministry of Commerce and Industry Documentation Centre, P.O. Box 30418, NAIROBI.
Subject Coverage: Industry production, statistical data 1969 to date
23. Research Bureau Ltd, Commercial Street, P.O. Box 72951, NAIROBI
Subject Coverage: Market research, statistics
24. Ministry of Environment and Natural Resources; Mines and Geological Department Library, P.O. Box 30009, NAIROBI
Subject Coverage: Geology, earth sciences physical sciences geophysics, mining; geochemistry.
25. Ecosystems Ltd, P.O. Box 30239, NAIROBI.
Subject Coverage: Statistical data, records data 1960 to date.
26. UNEP Library and Documentation Centre, P.O. Box 30552 NAIROBI.
Subject Coverage: Appropriate technology.
27. Ministry of Finance and Planning, Central Bureau of Statistics Library, P.O. Box 30266 , NAIROBI.
Subject Coverage: Economics, statistical data
28. Kenya Institute of Business Training, P.O. Box 42079 NAIROBI.
Subject Coverage: Business administration , management.
29. Industrial and Commercial Development Corporation (ICDC) Library , P.O. Box 45519, NAIROBI.
Subject Coverage: Business administration; records and statistical data ; industry.
30. Central Bank of Kenya Research Library Haile Selassie Avenue, P.O. Box 60000, NAIROBI.
Subject Coverage: Banking, accounting & management.

- 31 Industrial Development Bank, Haile Selassie Avenue,
P.O. Box 44036, NAIROBI
- Subject Coverage: Banking, accounting, management,
Industrial development.
- 32 Kenya Agricultural Research Institute Library,
P.O. Box 362, Kikuyu.
- Subject Coverage: Agriculture, agricultural machinery,
production; laboratory technology.
33. Kenya Medical Research Institute Library,
P.O. Box 54840, NAIROBI.
- Subject Coverage: Medicine; laboratory technology,
medical equipment and apparatus, medical technology,
pharmacology and pharmaceuticals
- 34 Architecture and Design Library, University
of Nairobi, P.O. Box 30197 , NAIROBI.
- Subject Coverage: Architecture, design, building and
construction.
- 35 Medical Library, College of Health Sciences,
University of Nairobi, P.O. Box 30197, NAIROBI.
- Subject Coverage: Medical technology, Laboratory
technology, medical equipment, laboratory apparatus,
pharmaceuticals.
- 36 National Public Health Laboratory Library,
Kenyatta National Hospital, P.O. Box 20750, NAIROBI.
- Subject Coverage: Pharmacology, pharmacy, medical
technology; laboratory technology.
- 37 Housing Research and Development Unit Library,
University of Nairobi , P.O. Box 30197, NAIROBI
- Subject Coverage: Building and housing materials
and structure, research and development.
38. Medical Training Centre Library, P.O. Box 30195
NAIROBI.
- Subject Coverage: Laboratory technology; Medical technology
laboratory equipment.

39. Institute of Development Studies Library, University of Nairobi, Harry Thuku Road, P.O. Box 30197, NAIROBI.
Subject Coverage: Economics and Statistics, Development Studies, Agriculture.
40. Food Foundation Regional Office Library, Silo Park House, P.O. Box 41081, NAIROBI.
Subject Coverage: Economics and statistics, agriculture, development, population.
41. Firestone East Africa Ltd, Library, Mombasa Road P.O. Box, 30429, NAIROBI.
Subject Coverage: Rubber technology.
42. Kenya Breweries Training Department Library, Ruarak, P.O. Box 30161, NAIROBI.
Subject Coverage: Brewing technology. engineering
43. Animal Health and Training Institute Library, P.O. Box 29040, NAIROBI.
Subject Coverage: Animal products; Animal production, agricultural technology, meat technology.
44. American Cultural Centre Library, National Bank House Harambee Avenue, P.O. Box 30143, NAIROBI
Subject Coverage. Economics: environmental studies information science, administration.
45. Central Reference Library, P.O. Box 30025, NAIROBI.
Subject Coverage: Economics, reference.
46. University of Nairobi Main Library, Main Campus P.O. Box 30197, NAIROBI
Subject Coverage. Economics, engineering, commerce and business administration.

47. Jomo Kenyatta College of Agriculture and Technology
Library p.o. Box 62000 NAIROBI.
Subject Coverage: Agriculture, food science, food
technology, agricultural technology
48. Ministry of Commerce and Industry, Industrial Library
and Information Centre, P.O. Box 30418, NAIROBI
Subject Coverage: Industry, trade statistics, marketing
statistical data
- 49 Kenya Institute of Administration Library
P.O. Box 23030, KABETE
Subject Coverage: Management; public administration
economics.
- 50 Kenya Industrial Training Centre Library
P.O. Box 1732, KISUMU.
Subject Coverage: Mechanics, technical education
electrical engineering.
51. Kenya Industrial Training Institute, Documentation
and Information Section, P.O. Box 280, NAKURU
Subject Coverage: Technical education; industrial
training; industry.
- 52 Directorate of Industrial Training Library
P.O. Box 40540, Nairobi
Subject Coverage: Industry; engineering
- 53 Kenya Airways Technical Library,
P.O. Box 19002, NAIROBI.
Subject Coverage. Aeronautical engineering.
- 54 Kenya External Telecommunications Company Library
P.O. Box 30488, NAIROBI
Subject Coverage: Engineering.

55. School of Aviation, Directorate of Civil Aviation
Library, P.O. Box 30689, NAIROBI.
Subject, Coverage: Telecommunication engineering.
- 56 Ministry of Transport and Communications,
Staff Training Library,
P.O. Box 57511, NAIROBI.
Subject Coverage: Building trade, civil engineering
- 57 Ministry of Water Development,
Staff Training School Library,
P.O. Box 60015 , NAIROBI.
Subject Coverage: Water engineering Hydrology.
- 58 Ministry of Works, Housing and Physical Planning
Housing Department Library,
P.O. Box 61614, NAKURU
Subject Coverage: Housing, physical planning
- 59 Kenya Building Research Centre Library
P.O. Box 30260, NAIROBI
Subject Coverage: Planning sanitation, housing
architecture and design.
- 60 Kenyatta National Hospital , Department of Pharmacy
P.O. Box 30197, NAIROBI.
Subject Coverage: Pharmacy.
- 61 Medical Training Centre Library,
P.O. Box 10042, NAKURU.
Subject Coverage: Medicine ; laboratory technology
medical technology
62. Kenya Fresh Water Fisheries Research
Laboratory Library, P.O. Box 1881, KISUMU
Subject Coverage: Fisheries, Hydrology.

- 63 Kenya Marine and Fisheries Research Institute
Library, P.O. Box 81651, MOMBASA,
Subject Coverage: Fisheries, hydrology, oceanography
- 64 Government Chemists Department Library, P.O. Box 30014
NAIROBI.
Subject Coverage: Analytical chemistry,
- 65 Development and Documentation Section,
Rural Development Department, NCKK,
P.O. Box 45009, NAIROBI.
Subject Coverage: Rural development; water resource
management; energy development.
- 66 Documentation Office, Urban Community Improvement
Programme, NCKK, P.O. Box 45009, NAIROBI
Subject Coverage: Community development; Human
settlements; small scale enterprise.
- 67 Pyrethrum Board of Kenya Library
P.O. Box 420, NAKURU.
Subject Coverage: Pyrethrum technology
Agronomy; insecticides and pesticides.
- 68 World Food Programme Library
P.O. Box 30218, NAIROBI
Subject Coverage: Food storage; transport
- 69 Meat Training Centre Library
P.O. Box 55 Athi River
Subject coverage: Meat technology.
- 70 Directorate of Industrial Training Library
P.O. Box 74494, NAIROBI
Subject Coverage: Industrial training.

The following groups of networks and systems provide information covering a variety of field and could be used to feed the National Focal Point with information:

- (a) The University of Nairobi Libraries of the Constituent Colleges and Institutes which number up to about ten separate libraries;
- (b) The Kenya National Library Services networks which have libraries in all the eight provincial headquarters: Nairobi, Mombasa, Kisumu, Makuru, Kakamega, Garissa, Embu and Nyeri. These have already embarked on developing district libraries and some of them such as Kericho Kisii, Thika Eldoret and so forth are already completed and functioning; hopefully when the network is completed it will provide forty-one (41) district libraries in the network system.
- (c) The City of Nairobi Commission's Library networks comprising of the McMillan Library and its branches in Eastlands and Kariokor is also set to open more branches within the city estates.
- (d) The Kenya Museums Library networks also has branches all over the Country: Nairobi, Mombasa Kitale, Meru and so forth.
- (e) Libraries and information systems within Ministries, at least every Government Ministry has a Library, some Ministries have more than just one library examples of these are the Ministries of Agriculture and Livestock Development, Ministry of Education Science and Technology, Ministry of Finance and Ministry of Health.

These have several libraries all over the country.

- (f) The last group is that of non-profit making organisations which have information networks and provide services similar to those provided by those groups listed above. These are also scattered all over the country; some are owned by foreign organisations but the majority of them are owned by local organisations or citizens.

The information services provided by these existing and potential systems and networks vary depending on the needs of each user group. But the most commonly provided services are as follows:

- (a) retrospective literature search;
- (b) preparation of directories of subject specialists;
- (c) preparation of subject bibliographies for completed on-going and proposed projects;
- (d) repackaging of information;
- (e) reference and information services;
- (f) selective dissemination of information;
- (g) reprographic services:-providing photocopies of needed documents or literature to users;
- (h) preparation of directories of research in progress, completed or proposed;
- (i) user education, educating the user of the information system;
- (j) advising and consulting services;
- (k) provision of books, newspapers, journals and other relevant materials needed by users.

Most of the existing networks also provide inter-library loan services for all those items not available in their libraries which are required by users. The services provided by the networks are constantly under review to ensure continuing relevance as the needs and interests of users change from time to time.

IDENTIFICATION OF EXISTING AND POTENTIAL USERS OF
INDUSTRIAL AND STATISTICS INFORMATION

A survey of the industrial and technological information networks revealed varied groups of existing and potential users of industrial and technological information. The groups were as follows:

- a) Small and medium scale industries;
- b) Government decision makers;
- c) Research Institutes;
- d) Consulting engineering companies;
- e) Development banks;
- f) Private individuals;
- g) Other potential users are employees and staff of the following firms and companies: Sugar industry, Cement industry, Agricultural industry, Paper industry, Petro-chemical industry, Automobile industry, Water supply and Development engineering, Process industries, Material handling equipment companies, Pharmaceutical industries, and laboratory equipment firms.

The small and medium scale industries constitute the biggest percentage of users of industrial information. The nature of information sought by this group of users also varied greatly owing to the nature and type of industrial venture they are involved in. The majority of these are agro-industry and food processing industries. These require information on existing and new products on the market; standards for the products; prices and marketability of the products; consumer statistics and reaction. Among these small and medium scale industries are also those involved in the basic metal industries, fabricated metal products, wood and wood processing, ceramics industries, pulp and paper industries, industrial chemical and petro-chemicals pharmaceuticals, textile and leather goods. Industrialists: This group of users is greatly interested

in statistics and industrial information to enable them produce competitive items for both local and overseas market and the nature of information needs are as varied as the group itself. Another user group is the decision makers both in Government and Private Sector. This group needs information to enable them make the right decisions, they should, therefore, be provided with the right information and at the right time. The research institutions engaged in research are interested in new innovations and therefore, require information on the latest innovation locally and internationally. There should be co-ordination between research institutions and small and medium scale industrialists.

Development banks require information for assistance in deciding where to invest with their finances, that is in viable financial projects. Economists and statisticians also are users of industrial and technological information in assessing the marketability of industrial products.

Other groups of potential users of industrial and technological information are those involved in the following projects:

- i) Energy Projects: this group of users seek information relating to alternatives to fossil fuels and investigate their applicability in developing countries, for example mini-hydroplants, solar energy, bio-gas plants; seek information in connection with production processes which can combine human and mechanical energy in such a way to result in a saving of fossil fuel inputs.
- ii) Human needs and development: this group of users need information regarding co-ordinated activities with other institutions for the development of indigenously available construction materials, nutritional supplements, drugs and health care systems, which are more appropriate to the needs and incomes of developing country population, especially those located non-metropolitan areas.

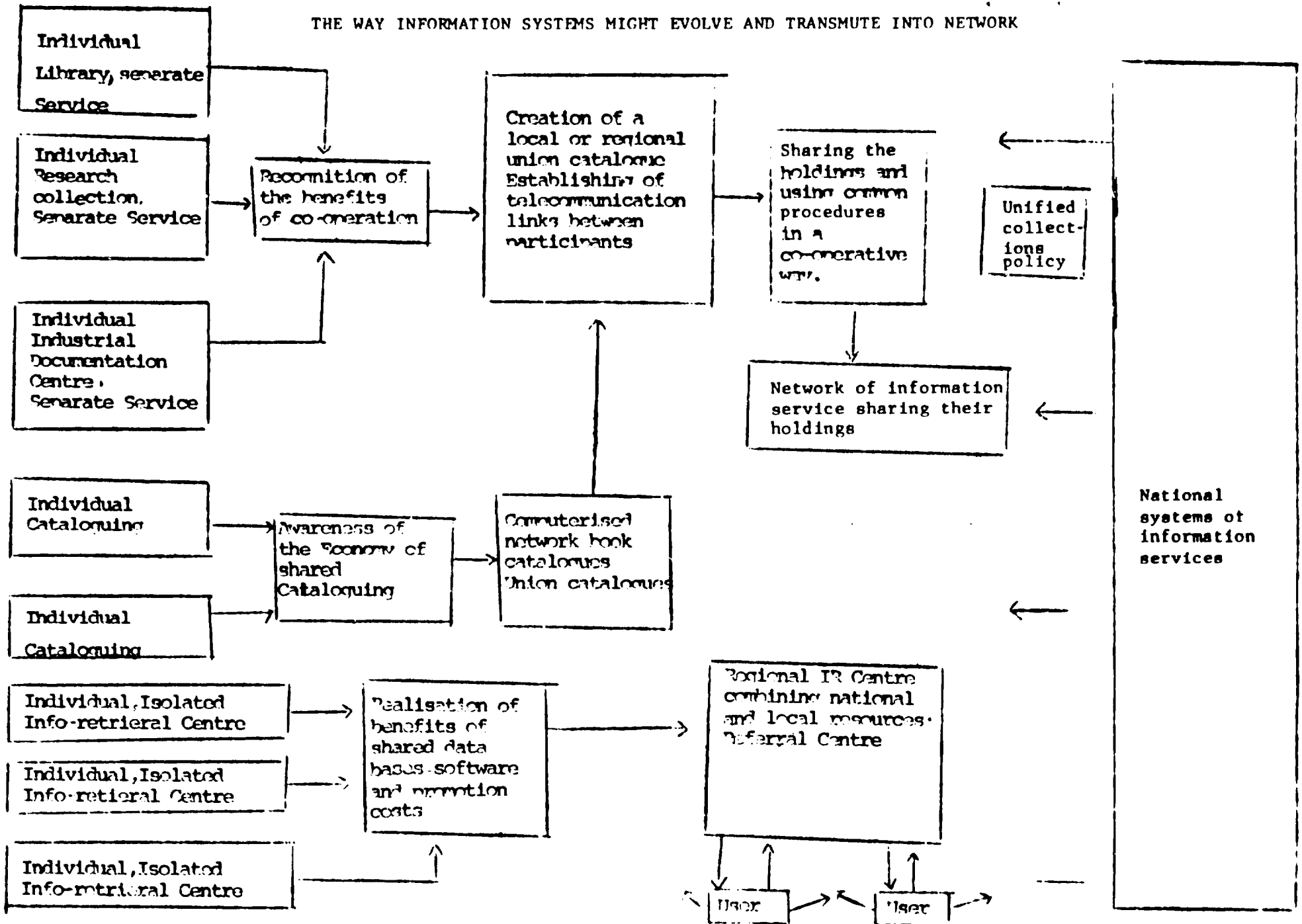
- (iii) Agriculture and related technology projects: this group of users needs information for consideration of development of energy saving methods of cultivation, irrigation, pest-control and production of fertilizers based largely on organic matter.
- (iv) Mining and mineral processing projects: this group of users seek information relevant to technologies for mining and mineral processing which are appropriate for countries with smaller endowments and the need to adopt energy-saving methods of extraction and processing of mines, minerals and metals.

The final end result of the information provided, whether to industrialists, Government decision makers, economists, statisticians, development banks, technologists, engineers, planners and managers, should be in the interest of national development.

The distribution of industrial technology between nations is such that industrial technology has come to play the role of an instrument of power in the international economic system.

Developing countries policies towards technology cannot be anodyne or neutral; they must recognise that industrial technology, if it is to realise its unfulfilled promise, will only do so when those groups wanting to use it have a clear conception of why they are using it and what ends they hope to achieve. It is only when they have the right information that they can contribute to a form of industrialisation capable of helping to alleviate poverty and simultaneously providing opportunities for greater participation of people in the decision making processes which affect their own lives.

THE WAY INFORMATION SYSTEMS MIGHT EVOLVE AND TRANSMUTE INTO NETWORK



THE NATURE OF INFORMATION NEEDS
AND SERVICES REQUIRED BY INTIB USERS

The nature of information needs and services required by INTIB users vary according to the needs of individual groups in relation to their interests and special fields of engagement. There are decision makers who need specific information to assist them in making the right decision; there are development banks which require information on development projects; there are researchers who need information on innovations; there are consulting engineering companies and the small and medium-scale industries who need information on production of materials., machinery and equipment, design of general and special purpose machine, low and high precision machines, semi-and full automatic machines as well as information on systems of manufacturing; information on marketing of the machines and other various products. Generally the basic services provided by many of the industrial and technological networks to users are as follows:

- a) Provision of primary communication, publication channels, acquisition and collection of information sources: books, periodicals, patents, standards etc..
- b) Basic identification and locating of information sources: abstracting services and indexing, catalogues (Union
- c) Provision of basic services to the dissemination of information;
- d) Provision of depository services for local and external documents and data important for the national development programmes;

- e) Current awareness services:
 - providing selected users with selected information on the literature published in their field of interest and speciality;
- f) Referral services:
 - directing users to or giving advice on where to get the information being sought;
- g) Reprographic and photographic service-providing photocopies of required documents;
- h) Information analysis for users;
- i) Provision of regular publication and newsletters;
- j) Industrial enquiry services to users.

The industrial enquiry services cover all the industrial sector including the following:

- a) Industrial chemicals, petro-chemicals and pharmaceuticals;
- b) Agro-industry and food processing;
- c) Textile and leather goods;
- d) Metal products and fabricated metal products;
- e) Pulp and paper industries;
- f) Wood and wood processing ; and
- g) Ceramic products.

A visit to some industrial information networks revealed that some of the needs and services which are required by INTIB users and ought to be provided:

- a) Lists of accessions;
- b) News bulletins giving items of current information; such as, forthcoming meetings and conferences, product exhibitions, shows etc...
- c) Surveys of literature on specific topics of relevance;
- d) Translation service-foreign publications;

- e) Microfilming;
- f) Microrecords, now being produced by manufactures:
 - Roll film
 - Microfiche
 - Opaque microcord
- g) Reference services including:
 - Provision of answers to specific enquiries;
 - dissemination of relevant information,
 - provision of essential tools to reference works such as, dictionaries, encyclopedias, and bibliographies;
 - assistance to readers (enquiries in locating whatever they may be looking for.)

It is, therefore, only in alliance with the Training Officer that those managing information services can develop their educational and information services, and the first thing they have to do is to understand the nature of training programmes that the information users are going to have. In a civilization that owes so much to the achievements of industrial technology, any nation whose industrial sector fails to improve the industrial and technical education of its workers and the industrial and technological information services and needs is not only in danger of losing trade but is also denying to its people the advantages they have a right to expect.

Economies of most African countries are based on agriculture and industry. It is realised that the best way to improve African nation's economies is to develop agro-industries. Food being the main product of agriculture, food industries play the major role in Kenya's industrial sector. Kenya Government has understood that indiscriminate import of sophisticated technology, instead of improving her economy has led to worsening situation and thus measures have been taken to rectify the situation. There is a general awareness that extreme caution is to be exercised while importing technology from developed nation's and the

best way would be to develop technology, particularly for food and manufacturing industries locally /or to modify the imported technologies to suit local situation and then to transfer them to the field. This activity can best be done by providing the decision makers and small and medium scale industrialists with relevant industrial and technological information to assist them in making the right decisions and the best choices of industrial technology transfer for adaptation.

The industrialists and economists nature of information needs are for the practical application industrially for practical ends for providing materials goods and services required by the society. In a practical sense the provision of information needs to industrialists and economists assists them for the ends consistent with the social and economic development of the society. The nature of information by INTIB users can thus be summarised as follows:

- a) Knowledge:- Know-how/techniques related to process and product engineering,
- b) Data: Technical data on raw materials, finished products and all inputs and outputs;
- c) Information on tools of production: Machinery instruments and facilities and their erection and commissioning;
- d) Skills: Expert assistance and training of personnel;
- e) Costs: Details of investment, production costs and expected profits over the years
- f) Information on marketing, storage, transportation and distribution;
- g) Organisation: the system, its running, evaluation and control

These information needs are important in that they will help INTIB users by they from Government or Private Sector in the following areas:

- i) Pre-investment studies covering existing state of art, levels of production and costs etc... to decide the feasibility of the proposition;
- ii) Examination of the range of technologies available
- iii) Choice of technology with all details of know-how, engineering and modifications to suit the needs and situation
- iv) Projection of improvement needed to update the technology in the future;
- v) Listing the requirements of spares and strategic raw materials and their supply;
- vi) Study of the raw materials available and their costs;
- vii) Collection of information on the present and future demand and supply position, realisable price and competition;
- viii) Estimation of the production costs and returns;
- ix) Selection of plant and its intallation and consideration of its adverse effects if any, on the industrial supply to the consumers and on the environment.

While identifying the nature of information needs and services required by INTIB users, I have had in mind critical factors affecting industrial and technological information:

- a) competence and credibility of the industrial information generator;
- b) competence and capability of the user and
- c) the economic, social and political climate of the environment

We can in the end console ourselves with the attributes of the end results in that information, today, has become an internationally marketable commodity carrying with it credibility of its generator and the reputation of the society of its origin.

ASSESSMENT OF MANPOWER REQUIREMENTS AND TRAINING
NEEDS FOR THE NATIONAL INFORMATION SYSTEM

The development of human resources is a critical subject of concern to the developing countries today. There has been constant reiteration of the need for international organisations to assist in this area. While material resources and financial capital may be fixed inputs into the industrialisation aspect in various sectors in the overall economic development of countries, human resources and their level of skill, determine productivity and the self sustaining quality of the industrial development. Both qualitative and quantitative development of human resources is required to maximise self reliant and self sustaining development. There is therefore, a desire on the part of developing countries not to ape and repeat the successive slow steps by which the developed market economy countries evolved their own industrial development which at that time was due to a historical necessity. The developing countries, today, need to forge new mechanisms, new modalities and telescope their efforts into a much smaller time frame in order to accelerate the pace of their development and achieve in a few decades what the industrialized countries took many centuries to achieve.

Among the objectives of manpower planning of human resources in the industrial and technological information sector are:

1. to ensure the maximum utilization of human resources;
2. to provide for future manpower with respect to skills, numbers and ages;
3. to anticipate redundancies and avoid unnecessary dismissals;
4. to assess recruitment levels;
5. to provide a lease for management development programmes;
6. to determine optimum training levels;
7. to determine the cost of workforce in new projects;
8. to assess equipment and supply needs;

The objectives can, of course, be extended to clarify particular problem areas and identify trouble spots. Forecasting labour needs, for instance, is one of the more difficult tasks, and part of the planning process, managers must determine what skills will best facilitate a project's completion. Although it may be possible to recruit unskilled workers, it is not always as easy to hire the technical and managerial staff, and it may be difficult as well to retain them.

When assessing future needs "supply" and "demand" must be carefully evaluated. Manpower requirements may be predicted via certain statistical techniques involving extrapolation, regression and correlation or deterministic and econometric models. Manpower planning is essential for successful industrial and technological information services for a number of reasons:

1. it allows formulation of corporate objectives and plans;
2. it encourages careful reviews and helps maintain project organisation
3. it encourages the examination of human resources before during and after the project's completion;
4. it facilitates the review and modification of personnel policies and practices, such as recruitment, selection and training;

The essence of planning is the co-ordination of policies practices and procedures to achieve the right number of people, in the right job at the right time.

Manpower planning may be undertaken for short, intermediate or long - term periods, and for a variety of objectives. As a matter of course, a manpower analysis begins with assessment of the prevailing labour market situation. The assessment is essentially an inventory of existing manpower resources and a description of the existing balance between labour supply and demand. The formulation of a training policy to rectify projected imbalances between labour skill supplies and requirements must be regarded as an integral part of the manpower planning process, and descriptions of analytical methods relating to manpower planning should usually incorporate procedures for the determination of the numbers and type of personnel who must be trained if the skill stock is to be consistent with output targets.

In order to assess manpower requirements and training needs for the national information systems a knowledge of or a survey of the users must be carried out to enable the planners work out the projections. The group to be served by the industrial and technological information staff will comprise of those in the science and technology group covering Research and Development (R & D). 1970, an estimate was made of Scientists, Industrialists and Technologists engaged in Science and Technology activities in Kenya. Again in 1975, another survey was carried out country wide of scientists and technicians. Results of the two sets of data are produced here below to assist us in planning the required staff in industrial and technological information to provide efficient service:

SCIENTISTS AND ENGINEERS

1970 R & D	Agricultural Sciences 371	Industrial Sciences 30	Medical Sciences 55
S & T	228	1070	988
TOTAL	599	1100	1043

1975	Agricultural Sciences	Industrial Sciences	Medical Sciences
R & D	183	28	19
S & T	623	2085	1502
TOTAL	806	2113	1521

TECHNOLOGISTS

1970	Agricultural sciences	Industrial Sciences	Medical Sciences
R & D	525	62	382
S & T	4300	1000	2219
TOTAL	4825	1062	2601

1975	Agricultural Sciences	Industrial Sciences	Medical Sciences
R & D	161	6	13
S & T	925	1998	2667
TOTAL	1086	2004	2680

In August, 1982 a similar survey was launched nationwide which covered 344 firms and establishments with a scientific and technological component, the survey was completed in January, 1983 and data for this survey was expected sometime last year, 1984 but due to financial constraints, computer processing could not be undertaken.

In the latest survey "Information sources in Kenya" completed and published jointly by the Kenya Library Association and National Council for Science and Technology in 1984 there are 300 sources of information listed. The survey is nearly but by no means completely exhaustive. There are, at the moment, about one hundred, or just a little over, professionally qualified librarians in the country. The para-professionals number about 300-400 while the non-professionals are the majority numbering well over a thousand. From the data provided from the two surveys, 1970 and 1975 we note that among the three fields of Sciences: Agricultural Industrial and Medical Sciences; the Industrial Sciences had the highest number of staff of scientists and engineers but in the technological staff it had the least number among the three sciences. 1975, the number of scientists and engineers in the industrial sciences had doubled that one of 1970 and was much higher in the medical and agricultural sciences. In 1975 again the number of technological staff in the industrial sciences had moved up from last to second reversing positions with agricultural sciences while the medical sciences remained in the second position. The steady upward movement from the two surveys indicates the role the industrial sector plays in the national economy and necessitates, therefore, the proper planning for staff in the industrial and technological information systems within the country. These figures have more than doubled in 1985.

The industrial sector is the most badly hit in the supply of manpower in the area of qualified information personnel.

There are only, at the moment, a handful of professionally qualified librarians or information officers of the graduate level manning or incharge of well established industrial and technological information systems. The majority of the remaining industrial and technological networks are manned by para-professional personnel and in some cases by non-professionals. There is, therefore, a great need, and this requires to be given priority, to improve this situation, for the immediate time by:

- a) mounting crash training programmes of reasonable duration for personnel currently engaged in industrial information work;
- b) mount from time to time short-term seminars, refresher courses and exchange visits for personnel currently providing industrial and technological information services or working in institutions which will contribute to or benefit from such services;
- c) use all means at their disposal to train and educate or to encourage the training and education of information users both in government and private sector;
- d) mount from time to time short-term seminars and course dealing with the use of computers for the storage and dissemination of information;

The above are for the immediate short-term programmes in providing the present personnel with the required basic knowledge for efficiency in the provision of information. For the supply of sufficient qualified personnel in the industrial information sector, the government should:

- a) regard information as a fundamental resource which should be made available as a service to society as a whole;

- b) institutionalise the national organisation of the interphase between information supply and demand;
- c) include a co-ordinated information system in the development plans;
- d) ensure that the operational efficiency of the information systems and networks are guaranteed by competent machinery;
- e) legislate for the establishment and maintenance of information systems and networks and recognition of the information profession as a contributing factor to national economy;
- f) ensure that the established INTIB National Focal Point becomes the national central clearing house with the key functions of co-ordinating in industrial and technological subject areas and geographical regions, collecting data in information on on-going and completed industrial and development projects, and providing in information on the same as and when required nationally regionally and internationally.

The government has taken keen interest in improving the provision of para-professional personnel in the field of information through certificate courses at the Kenya Polytechnic which last for one academic year. It is hoped that the new in-take into Moi University in Eldoret, proposed for the 1986 1987 academic year for degree courses in Library and Information Studies will go a long way in alleviating the shortage of qualified staff at the graduate level in the profession. But for the first couple of years or so after the degree programme at Moi University has taken off, there still will be need for training outside the country and much more so because of the initiation of the District Focus for Development Programmes which emphasizes development at the District levels and with the encouragement of the government to entrepreneurs to establish small scale

and medium scale industries in rural areas and reduce mass flow of employment seekers into urban areas by creating employment opportunities in rural areas. The manufacturers and entrepreneurs starting business and small and medium scale industries in rural areas require information to enable them function efficiently. This, therefore, calls for efficient personnel to supply industrial and technological information efficiently to decision makers both in government and private sectors, to consulting engineering companies to research institutions, bankers and to those in small and medium scale industries both in urban and rural areas.

The need for professionally qualified personnel in the field of industrial and technological information is becoming much more felt than it has been in the past owing to the increasing number of small and medium-scale industries being established in the country and the part played by the industrial sector in Kenya's economy. We have more and more young people getting employed in the industrial sector both at the graduate and middle level grade and these are the people who should be provided with the relevant information in the area of their operation, a part from the managerial staff who make decision, to enable them perform their daily functions efficiently. Last year's (1984) Agricultural Society of Kenya Show theme: "Focus on Rural and Industrial Development" was itself a clear example of the emphasis Kenya's government places on the development of the industrial sector in Kenya. This year's (1985) Agricultural Society of Kenya Show theme is: "Intensify production for Export". This refers to agricultural and industrial production. Kenya's industrial sector must, therefore, have efficient information systems to provide industrial and technological information on various items that have to be produced within the country to ensure that they meet the required standards to compete on the international market, otherwise, the goods will not be exported. Information is required by the decision makers to enable them make the right decisions; by bankers and market research officers to enable them decide on whether the

manufactured goods are marketable or not,, by consulting engineering companies, agro-industries, food processing industries and research institutions for producing goods that meet the required standards both for local market and international market. The staff to man and run the industrial and technological information networks should be well trained to be capable of collecting, processing, storing and disseminating the information so collecting processed, and stored, to the right users. This will, therefore, necessitate, as I have mentioned elsewhere in this paper, crash training programmes for the existing staff while recruitment and training of new personnel is being planned. There is a need for priority to be given on courses or training covering handling of information on computers as this is becoming more common with the introduction of modern technology. Hopefully in the future all nations will devote a fraction of the energy and resources now concentrated on weapons of destruction to improving the communication, transfer and dissemination of information.

The INTIB National Focal Point will require a number of years to become fully operational. In the meantime, with additional personnel to the present staff, the project can take off but it will be necessary to have some expert to assist in working out details required for the completion of the project for a period of six to twelve (6-12) months. This will involve the following expenditure which will be greatly appreciated if UNIDO assisted in funding

-	Expert for 12 months	-	US \$ 72,000.00
-	Equipment	-	100,000.00
-	Materials (documentation, books etc..)		50,000.00
-	Fellowship-12 months	-	20,000.00
-	Miscellaneous-expenses	-	40,000.00
-	Consultancy Services	-	18,000.00
	TOTAL		<hr/> US \$ 300,000.00

The Kenya Government will be willing to contribute through The Kenya Industrial Research and Development Institute by providing the following:

- Office space- adequate for the project
- Personnel (One Officer at graduate level and four assistants - para-professional level)
- Equipment and furniture for Officers

It is envisaged that in the long-term planning more personnel will be required for the national network systems for feeding information into INTIB National Focal Point. The actual number of personnel required for the whole system will be arrived at after a detailed project is finalised.

AUTOMATED SERVICES FOR INTIB NATIONAL FOCAL POINT

The human mind has an infinite capacity for invention and an insatiable desire for discovery and exploration. As inheritors of several millenia of civilization, and more particularly of four or so centuries of very intense and rapid growth and expansion of knowledge, and live in a world where discovery and application of technology has become essential, not just to enable us stand still but to progress to even higher and better civilization along an exponential scientific, industrial and technical growth curve. Because of his ability to plan ahead, coupled with his real power to influence the course of events in the universe, inventive man has learned to control his environment and to harness natural resources for his own benefit, convenient and enjoyment. A new discovery in chemistry may have pharmacological implications; a new drug is successfully tested and a former "killer" disease can now be cured.

New telephone, telex and data-transmission business is generated, with social, business, industrial and scientific implications. The building of the first stored programme electronic computer in the 1940's and the successful marketing of such machines from the 1950's onwards, has led in the 1960's, 1970's and 1980's to such an innumerable lot of applications in almost every facet of life that it is no exaggeration to say that we are now witnessing a revolution in data and information processing, storing and transmitting, commensurate in its likely effects with the industrial Revolution that was sparked off in the eighteenth and nineteenth centuries by the then newly harnessed power of steam. Many information centres have now adapted the use of computers to perform various functions. It is, however, important that this like all new innovations, discoveries and applications, the computer has implications in many other directions. Some of these are already apparent; others may not be obvious for some years to come.

One thing has already become clear with the introduction of the use of computers in information networks, that is, the quality of service that can be provided is increasing steadily as computer methods become more and more widely adopted in information networks. While problems remain, associated for example with the high cost of mechanised systems, and some human problems of running the systems, very few information networks can afford, at the present moment of industrial and technological development, not to be seriously involved in introducing use of computers in their networks. We must also remember that no library or information network exists and operates on its own in isolation from other information networks. It is one and at the same time a part of local, regional, national and international networks of organisations providing bibliographical, library and information services to all sections of the community.

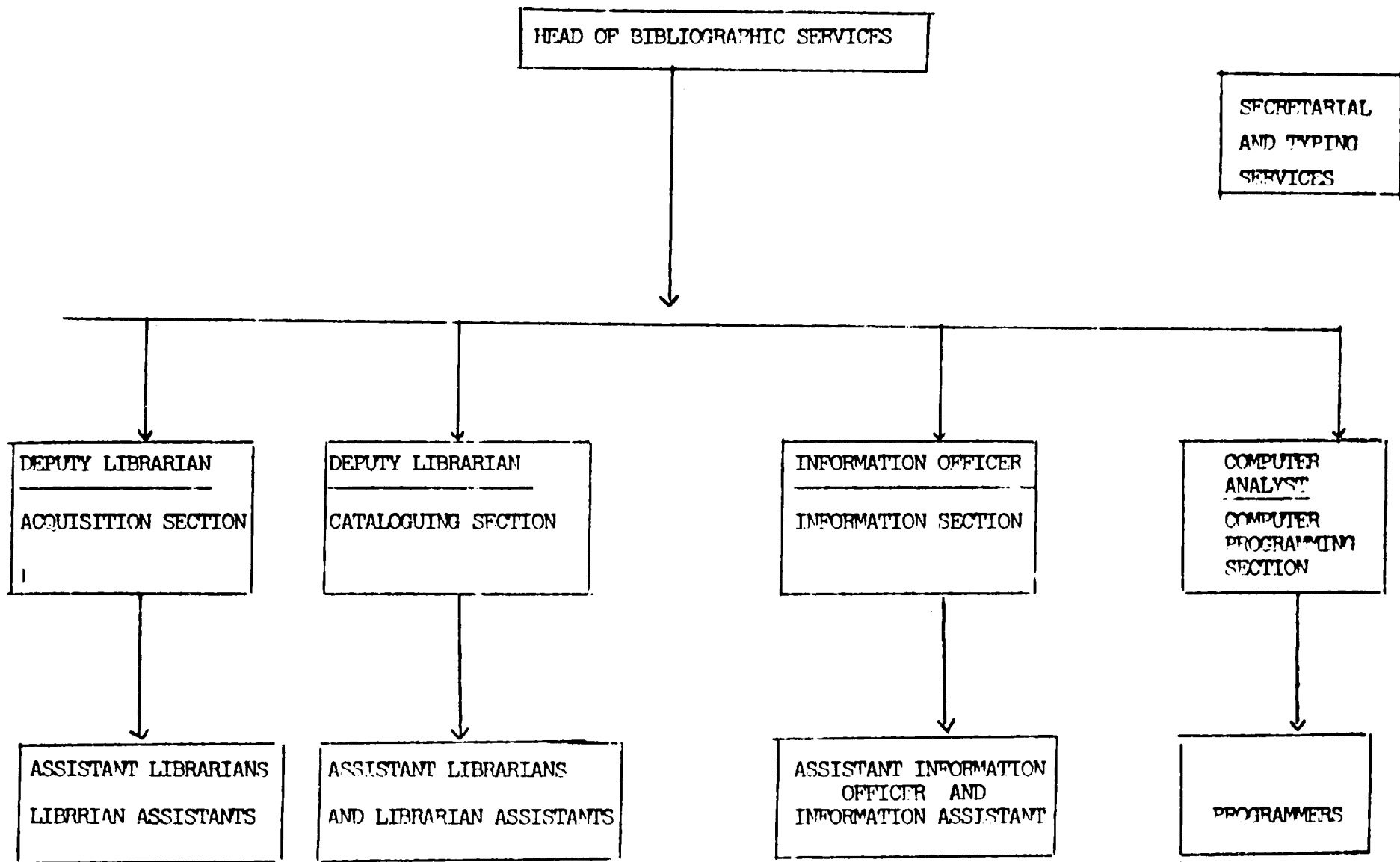
A mechanised and computerised Industrial and Technological Information Bank (INTIB) National Focal Point will have an active interaction with all segments of industrial development: Government Ministries, the universities, the vocational training programmes, and most importantly, constant, continuous and frequent liaison with industrialists, locally and internationally. The stage has been set when the technology and perhaps also the economic incentive exist for a radical long-term appraisal of the nature of library and information services that should be an integral part of a highly organised scientifically and industrially advanced society. In computer-based library and information systems we have both the reason for making such an appraisal and the means for achieving the goals that may emerge from it. The objectives of a mechanised information system are: speed, standardisation and economy. If a constant and interrelated sequence of changes, applications and inventions has resulted in material improvement to the whole way of man's life and if to continue this process will yield still further betterments, the enjoyment of those benefits can be hastened by a speeding up of the rate of invention. This can, therefore, relate to either economic, scientific, industrial, medical or to any other kind of development.

This possibility of speeding up the application of new discoveries, with the assistance of available relevant information is part of the whole ethos of scientific and industrial research and development.

We live in a world of change, from which, by and large, we all benefit. And so we all have an obligation to contribute to future benefits by making appropriate improvements in our own areas of professional competence and responsibility. Mechanisation in information networks is therefore, aimed at improving existing services, and developing new ones.

Information networks deal essentially in recorded knowledge, which in our world is expressed in terms of alphabetic and numeric characters written on some suitable medium. The technology pertinent to information function and development has, therefore, been that dealing with characters and their manipulation, their storage and transmission. In other words, alphabets and writing, ink, stone, clay, papyrus, vellum, paper, film, type and other storage media, printing, photography, postal, telephone and telex services, data-processing machinery, computers and data transmission. We all know the advantages of automatic photocopying speed, cleanliness less cumbersome and so on.

The computer, which in general terms is a machine not just for performing mathematical computations for manipulating characters and storing them, is an invention of direct relevance to information network's prime concern - the acquisition, storage and exploitation of knowledge as recorded in documents of all kinds in other words, character manipulation. It is therefore, important that INTIB National Focal Point should encourage the use of computers in its information networks.



STAFF STRUCTURE OF AN AUTOMATED BIBLIOGRAPHICAL SERVICES

S U M M A R Y

The 1978 United Nations Conference on Science and Technology for Development, recognising the importance of communication recommended the establishment of an international scientific, industrial and technological information system.

The exponential growth of the scientific, industrial and technological literature and the rising cost of bibliographic materials render a traditional policy based on self-contained, comprehensive library collections economically impracticable, particularly in developing countries where resources are limited. Even in highly developed and sophisticated countries, no single library can be completely self-sufficient in terms of supplying information to its users. An alternative policy which encourage selective collections containing materials most useful to a given user population and resource sharing among user populations is feasible through the setting up of National Focal Points for the purpose of sharing. Information is like love, it must be shared.

Thus, each library in INTIB National Focal Point network would acquire, maintain and finance its own core collection as initially identified using agreed on described selection procedures. In this way each library maintains autonomy over its own operation but shares its resources with member libraries on a one-to-one each basis.

Resource sharing does, however, present some problems for developing countries. Many have no functional inter-library loan services and lack both the resource and personnel to prepare the necessary union lists and catalogues. But if information is essential to industrial and economic development, efforts must be made to overcome these obstacles.

An industrial information system based on selective collection building and resource sharing is analogous to a health care system based on primary, secondary and tertiary level of care. At each level of INTIB National Focal Point, resources available should be those most often needed by the user population served. Where resources are not available on one INTIB Focal Point, an efficient referral system will connect the user with the next appropriate INTIB Focal Point for the required information needs. For an information network INTIB will consist of various levels and nodes of information services, each of which makes the best possible use of bibliometric data analysis in designing its services and the most appropriate technology for referral and communication. We should, therefore, envision every industrial institution having an adequate collection immediately available, and access to successively more comprehensive national, regional and international collections. When required information becomes available nationally, regionally and internationally then only can mankind expect the free flow and sharing of industrial technology.

Industrial research and development is a function of human need. Any society which does not conduct industrial research and development cannot expect to satisfy its needs efficiently at manageable costs. It is not possible for any country to achieve an optimal balance of dependence without an accompanying industrial research and development effort to further the development of indigenous technology. Industrial technology has become an important element in the global division of labour and socio-economic development. Countries which have not developed industrially and technologically consistently register stagnation and sometimes decrease in productivity. In support of national problem-solving efforts, international bodies, such as UNCTAD, ILO, the World Bank and UNIDO have initiated programmes to identify problems and suggest solutions which would enhance industrial and technological capabilities of developing countries. A good example of this gesture is UNIDO's support in the establishment of INTIB National Focal Points in developing countries.

A N N E X

SCHEDULE OF UNIDO EXPERTS FIELD MISSION IN THE COUNTRY

The specific purpose of the UNIDO Expert Field Mission will be:

- a) to review and assess the effectiveness of UNIDO/UNDP assistance to industrial and technological information services in Kenya and developing countries in general;
- b) to review and assess the impact of industrial and technological information services in the development of the country;
- c) to determine to what extent this and similar INTIB Focal Points have played or can play as a constructive role in the transfer of and adaptation on the one hand, and as a development on the other, of suitable technologies in the industrialization.

The ultimate purpose of the Field Mission should be to provide UNIDO and the developing countries an opportunity to review the direction and relevance of their current and projected activities in the area of industrial and technological information services, networks and systems, with particular reference to the potential role of industrial and technological information in technology transfer and adaptation on the basis of the analysis made of selected existing and potential networks and systems.

The evaluation results of the Field Mission should be used in the formulation of policy and programming guidelines.

VISIT SCHEDULE

1ST DAY: Desk review of preliminary analysis including discussions with selected officials and ministries:-

- i) Director, KIRDI
- ii) National Council for Science and Technology, Industrial Science section
- iii) Ministry of Commerce and Industry
- iv) Kenya Industrial Estates
- vi) Kenya Bureau of Standards

2ND DAY: Visits to selected information networks:

1. KIPDI Library and Information Services
 2. Kenya Bureau of Standards Technical Library and Documentation Centre
 3. East Africa Industries Information and Documentation Centre
 4. Ministry of Commerce and Industry Documentation and Information Centre.
 5. University of Nairobi Libraries
 6. Kenya Technical Teacher College Library
 7. UNEP Library
 8. Ministry of Transport and Communication Materials Branch Library
 9. Kenya National Library Services Headquarters
 10. Ministry of Agriculture and Livestock Development Information and Documentation Centre
 11. Kenya Building Research Centre Library Nairobi
 12. Kenya Industrial Training Institute Documentation and Information Centre, Nakuru.
 13. Kenya Marine and Fisheries Research Institute Library, Mombasa.
 14. Kenya Industrial Training Centre Library, Kisumu
 15. Kenya National Library Service, Eldoret
 16. Egerton College Library, Njoro
 17. Moi University Library, Eldoret
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3RD DAY· A synthesis of the findings by the Field Mission and review of the report prepared by the National Expert.

A visit to some of the information centres outside Nairobi will be necessary in which case, two extra days will be required to visit places outside Nairobi.

In consideration of the very important requirements the exercise (Field Mission) should be a comprehensive attempt to assess industrial and technological services, networks and systems based on their actual performance and suggestions of the Field Mission, should reflect real and critical problems which face most developing countries industrial and technological information services, networks and systems.
