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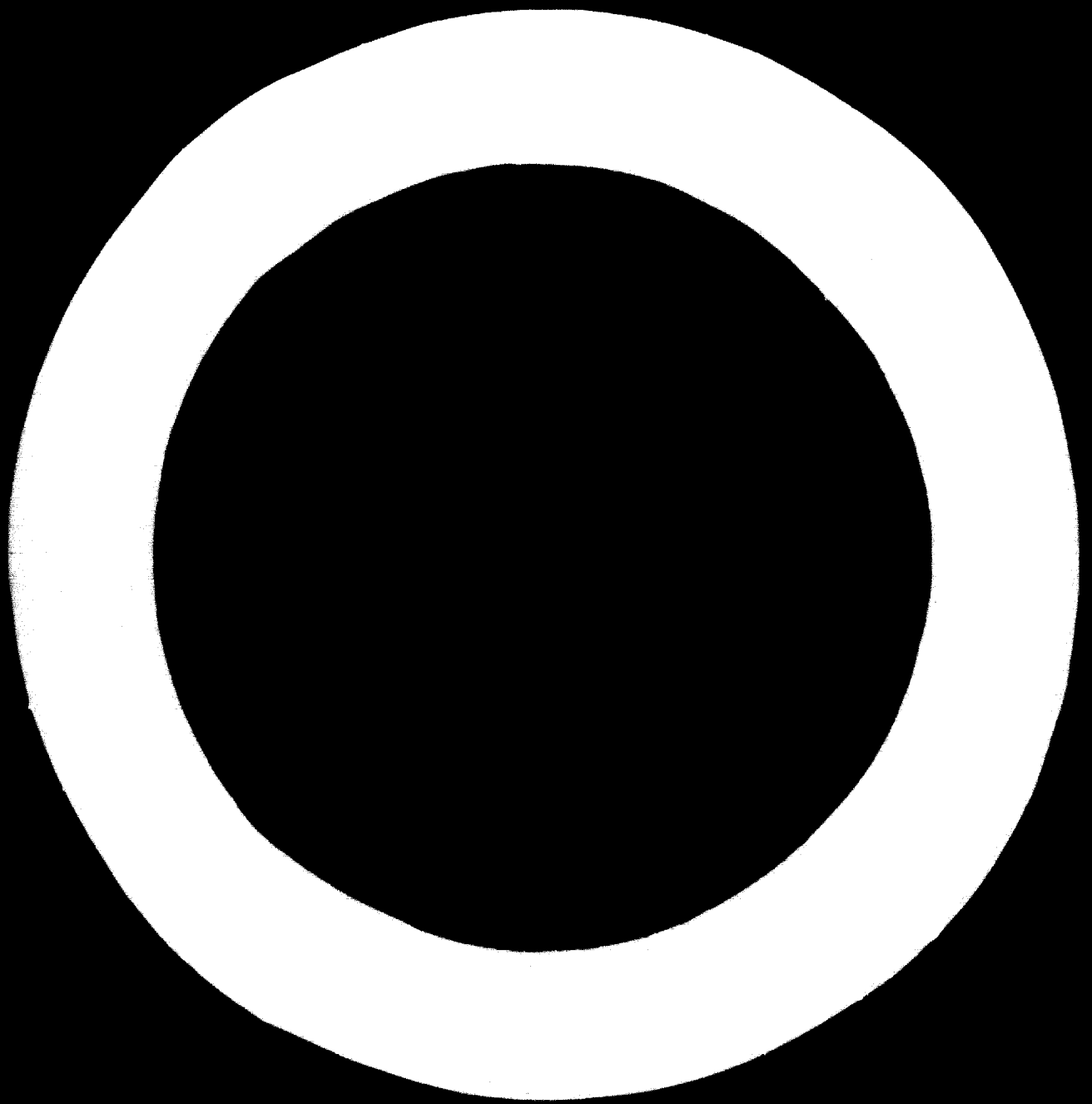
FACTS AND TRENDS RELATING TO THE
IMPROVEMENT OF INDUSTRIAL INFORMATION
WITH REFERENCE TO THE AFRICAN MARKET

by

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1/ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

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Introduction

Within the framework of this very restricted overview an insight can be given only into few problems which have led to a deep disappointment over that which has been achieved so far both on the part of the industrialized and the less industrialized countries. The following remarks are also intended to describe the present situation in industrialized as well as in African countries and to investigate, how and through which measures the economic and particularly the industrial development of the developing countries can be promoted with the aid of the modern medium of information. If we say today that besides matter and energy, information is a tertium sui generis, then we depart from the fact that the central problem of the economy and the society of our age is not the procurement of raw materials and energy but the development of the information structure. It alone will create the prerequisites for the improvement and rational utilisation of the original production factors. In a team forecast for 1970 to 1980, in which researchers of futurology institutions from France, Great Britain, Italy, Poland, Switzerland, Czechoslovakia, USSR, USA, and the Federal Republic of Germany participated, it was stated that our future economic growth will depend on the following factors:

1. Training
2. Research
3. Establishment and maintenance of extensive and effective information structures
4. Expansion of those industrial branches, which
 - a) develop new energy and raw material sources
 - b) develop new technologies
 - c) improve technical methods and processes

I cannot discuss here the points of emphasis and priorities of a future growth policy nor deal with factors which indirectly influence growth. But management as growth factor must be mentioned in this context because it is closely linked with industrial information, the problem with which we are concerned here. Concerning the "technological gap" the study groups of OECD and IEC as well as economic experts of the highest rank are of the opinion that the availability of a management and a training system are of decisive importance to the economic growth of a country. The Europeans only gradually seem to realize this fact. An enquiry, which was undertaken in the Federal Republic of Germany, showed that in the thinking of the average German the entrepreneur --

in contrast to the United States -- is considered to be at the lower end of the social valuation scale. This clearly shows that managers seem to enjoy little prestige. The reason for this may be that most European managers learn to guide employees and manage enterprises accidentally, whereas their American colleagues are familiarized with management methods systematically at business schools and at management seminars. Here, they are acquainted for example with the solution of problems in connection with strategic objectives and control functions of an enterprise, which is called in short "management by objectives." The manager considers the growth of his enterprise, i.e., the increase in profits, to be decisive. Managers depart from the fact that their competitors force them to constantly introduce technical innovations and that these are only feasible if sufficient funds are invested in research and information.

In the marketing sector, too, the European managers have by no means adopted the principle practiced in the United States which places the market analysis in the foreground when the development of a new product is concerned. For such analyses, for which a large amount of information is required, no expenses are spared. Only if the product meets in all points the true or manipulated consumer demand or wishes, marketing, research and production start joint planning efforts. In this way the management can -- although only with the aid of different information sources -- control the entire process from the basic research via applied research to the distribution of the product in conformity with market conditions. This explains why the period of time during which a new product is developed -- i.e., from the idea to placing it on the market -- is two to three years less on the average in the United States than in Europe.

You will perhaps argue that for you it is not of interest to know how products are developed in Europe or in the United States, or how the problems of management and the technological gap are dealt with in these countries; these problems may appear to be of secondary importance in comparison with those confronting most African countries. What can countries do, whose gross national product ranges between \$1000 and \$400, whose proportion of illiterates is still above 50 per cent, whose information sources and research possibilities are restricted, and whose budget covers just the barest necessities? Even the aid provided by International Organizations or technical assistance provided by industrial countries are often just a drop in the bucket, because the strategy recommended by the United Nations for the Second Development decade, has not yet been put into practice.

We are of the opinion, however, that particularly through the industrialization process, which the African countries have entered with different prerequisites and concepts, the development of your countries is advancing. For this reason it is useful to observe the developments - in the widest sense of the word - in your neighbouring countries as well as in the industrial countries, which you often look at with suspicion. You will find out that such general terms as "highly industrialized" and "less industrialized" countries may embrace a wide range of meanings. We know today in which sectors of technical development we are in a leading position and in which new industrial branches we are likely to be able to increase growth rates in a rational manner. We also know, however, that in other fields there are gigantic gaps which could not be closed without enormous efforts. To attempt to close them because of national prestige considerations would mean economic suicide, which could only lead to a deterioration of the social conditions of a country. We know that the development of our industries will lead to the establishment of multinational enterprises which will promote international division of labour.

We should realize

- that there is an inter-dependence among the industrial countries and among the developing countries, but also between industrial countries on the one hand and developing countries on the other;
- that the deep discontent over the results of the First Development Decade can be overcome only by the joint efforts of the African countries themselves, towards an intensification of the industrialization process which would have to go hand in hand with increased aid contribution from the industrial countries and International Organizations;
- that besides the main elements of industrialization, namely labour and capital, training, research and information are of equal importance. Here information is of decisive significance and as a product of knowledge and experience compares with any high-quality commodity.
- it is necessary that the industrial countries make every effort towards improving their documentation and information

systems, particularly in the industrial sphere, in accordance with the resolutions of the science ministers of IIC and OECD, as well as of COMCON, SATCOM and Weinberg Report, the Symposium on Communication of Scientific and Technical Information for Industry and many other international and national reports and guidelines. This should not only be done with a view to domestic industries, but also with respect to future international division of labour. This means that an international flow of informations has to be organized; work on a World Science Information System (UNISIST) has been started on a long-term basis. "Science Information" is defined as "information essential to the advancement of science in its basic, applied and technological contexts."

- that it is of decisive importance to the African countries too, to expand their documentation and information services into national and, if possible, regional networks. These expanded documentation and information centres should collaborate with other centres, which have both the know-how and financial resources, namely International Organizations and industrial countries, and jointly place their services at the disposal of African countries, which have only a very modest apparatus and a shortage of skilled manpower. The establishment of such documentation and information services is recommended in Chapter 6 of the Jackson Report, in the Hendersen Report and in a study prepared by the FID (Federation of International Documentation) and commissioned by UNESCO in the Chapter on "Main Trends for Improvement of Documentation and Library Services in Developing Countries." These services are to serve as main sources, which within an integrated system provide the industries of the country or region concerned with the required information.
- that the modern slogan of technology transfer to African, Asian and Latin American countries must be critically analyzed. My colleague, Mr. Lindeus points out in his

paper on "Institutions for the Transfer of Technology" the concept of "adapted" technology which is to be transferred inter-alia upon the initiative of UNCTAD and which is worthwhile of being discussed. Because we do advocate the transfer of adapted technologies, you must help us in defining this term precisely and in determining which are the risks involved for your countries, if these technologies are transferred "unadapted," either with or without your consent.

Charles Cooper, joint Fellow of the Institute of Development Studies and the Science Policy Research Unit analyzes the transfer of industrial technology to the under-developed countries as follows:

"The transfer of technology covers the transfer from advanced to developing countries of the elements of technical know-how which are normally required in setting up and operating new production facilities and which are usually in very short supply (or totally absent) in the developing economies. The elements of know-how include such things as know-how for conducting feasibility and market studies, know-how for choosing technologies and for engineering design and plant construction - as well as the know-how which is embodied in the production process itself. This latter kind - which is called process know-how - is sometimes patented or at least kept secret by the companies which possess it. Process know-how probably gets most attention in the literature on transfer of technology. At the same time, however, the transfer of technology from advanced to under-developed countries involves far more than exchanges of patented process know-how. The technological dependence of the developing countries stems not only from their capacity to invent new processes and products but also from lack of other, possibly more mundane skills and capabilities, in areas like engineering design, choice of techniques, management and marketing.

On the face of it, enterprises in under-developed countries should be able to acquire the various kinds of technical know-how required in the construction and operation phases of a new project, through direct arrangements with consultants, individuals, plant construction companies, machinery producers and the like. Since these groups and individuals operate in more or less competitive markets, the recipient enterprise should benefit from the competitive prices they charge for their services.

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In practice, however, it is probably rather seldom that the recipient enterprises arrange technology transfer in this way. Most transfer of technology - at least in the capitalist part of the world economy - involve an intermediary; an enterprise in the advanced countries, which so to say, supplies a part (usually a major part) of the technical knowledge which is required in a "package." The intermediary company is sometimes simply a contracting group. More often it is a company engaged in the kind of production activities which are to be transferred. It arranges the supply of know-how either from its own resources, or by sub-contracting consultants and machine suppliers, etc., or by a mixture of both."

Cooper has two questions about the indirect mechanism which need to be explored. The first is what caused the recipient companies to use these methods of transfer and the second question concerns the incentives and motivations of the "intermediary" companies? Why do they get involved? Cooper continues: "The institutional set up in which technology transfer actually takes place, leads to a number of negative consequences. Most of these negative aspects arise because intermediary companies naturally use their technological monopolies to best advantage from their point of view. These are, of course, constraints on what they can do, but by and large these do not seem to have been very effective. In consequence, many technology agreements have aspects which have anti-developmental consequences. Amongst the most important restrictive clauses in transfer agreements are:

- clauses which limit sales of the new product to the domestic markets of the under-developed country itself.
- clauses which tie the recipient company to the technology supplier for supplies of equipment and intermediate goods."

It is worthwhile to study these remarks before discussing the problem of technology transfer. Cooper concludes with the following sentences: "An effective policy on technological transfer really implies more clearly defined policies on consumption. These, however, appear to be hard to achieve and an inexhaustible source of political difficulties."

The developing countries, which have an enormous demand for technical know-how, have a share of only eight per cent in the licence transfer in the world - of course, almost exclusively as licences. This can be explained by

the restricted absorption capacity of the developing countries, lacking infrastructure and skilled manpower as well as a lack of capital and often high costs, which are a burden on the balance of foreign exchange payments. To obtain consultancy assistance from International Organizations or to influence licence contracts by skeleton agreements can only be regarded as temporary solutions.

Concerning the transfer of technology it is a fact that every technical achievement works optimally only under those conditions for which it was originally conceived. This means that under different conditions concerning, e.g., the environment, human behaviour, or the market, changes may become necessary. It is logical that these adaptations are the more difficult and the more drastic, the wider the technological gap and discrepancy between the economic levels of donor and recipient.

Let us now turn to one of the means which is to contribute - through the provision of relevant information - towards narrowing the gaps between the industrially developing African countries on the one hand and the highly industrialised countries of Europe and America. The comprehensive literature on industrial documentation and information systems - detailed bibliographies are being compiled by the FID Committee on Information for Industry - comprises the findings of the working group on Information and Documentation of the European Industrial Research Management Association (EIRMA) which has been dealing in detail with this subject matter since 1969. From the 110 member firms in seven West European countries approximately 80 large and medium enterprises of the automobile, chemistry, electrotechnics, precision mechanics, optics and machinery construction industries were interviewed about their internal information systems. The results of this enquiry were used by the working group as basic material for 25 recommendations, which were presented in May of this year at the annual meeting of EIRMA. Some of these theses which will be part of future industrial information planning will - after having been adapted to African industrial conditions - bear a certain significance to your countries and your contacts with European countries.

- More than in the past - managers have to become aware of the significance of information as an asset in an enterprise. They have to recognize the fact that information, together with labour and capital, is one of the driving forces of the economy.

For this reason the budget for a company's documentation and information service should not be considered to be of secondary importance. The budget for documentation and information facilities should amount to two to four per cent of the research budget in large and medium enterprises. Small firms should spend between seven and eight per cent of their research budget on information facilities. For all sizes of firms it is recommended that three to four per cent of the employees working in research and developmental should permanently engage in documentation and information activities.

For the same reason the documentation and information services should be directly subordinate to the technical management of the firms and not be affiliated to secondary administrative units.

Information valuation systems should be developed in order to show the value of information services run by the research and development departments.

- The heads of research and development departments should determine all information sources at their disposal and ensure coordination of all documentation and information activities.

The users' wishes and available information sources have to be coordinated at regular intervals. The management should encourage their scientific and technical staff to constantly cooperate with the company's information service and thus contribute towards an optimal efficiency of in-firm documentation. Only those publications should be kept on stock which contain a maximum of information relevant to the enterprise.

- Through better and adequate training of the staff of the documentation and information services the effectiveness of the information flow within the firm should be increased. In-firm training of the users is an equally important problem.

The management should ensure that the staff of the companies' documentation and information services have sufficient chances of being promoted, because in this way qualified personnel can be won for these tasks. Information specialists should familiarize themselves with modern information techniques and also with the changing information demand of the firm's staff.

- Industrial enterprises should make more use of external information services than in the past, because usually these can work more efficiently in specialized fields than the company's own documentation service.

Increasingly emphasis should be placed on the integration of internal information services into networks of information services operated by companies, associations and public authorities. Industrial enterprises should learn to make use of external magnetic tape services and other information facilities and collaborate in the improvement of external services through permanent feedback.

- Industrial enterprises should influence authors of internal research and development reports to the effect that they restrict themselves to merely providing information and avoiding lengthiness. Audio-visual media should be used in those cases where they are more suitable than written documents.
- In view of the importance of scientific-technical information to any enterprise it must be ensured that at least one copy of every report received from outside is placed at the disposal of the documentation and information service. Confidential internal reports should be examined at regular intervals, as to whether they should be made accessible to the public or not. For safety reasons all important information should be stored in microform so as to have copies of the originals in cases of loss.

It is noteworthy that this list of recommendations was prepared by research managers. As a group, they are very

important as far as industrial information is concerned because they develop new technical equipment and processes.

Statistically functioning documentation centres must be transformed into dynamic information units. This requires flexibility and constant attention, especially as regards the adaptation of existing centres to the new documentation centres that have been developed in such fields as chemicals, mechanical and electrical engineering, motor car manufacture, building, and textiles. The information stored by these new centres is accessible to users in developing countries via clearing houses such as UNIDO with more than 200 correspondents.

Important Infrastructural Measures in the Field of Information

The documentation and information specialist may well have misgivings with regard to all this activity at national and international level. He would explain that effective information services need to be backed up by the following infrastructural measures:

1. Training and Further Training

OECD takes the view that there are four groups of people who make a decisive contribution to the functioning of industrial information systems:

- specialized personnel in the documentation and information field, ranging from information scientists to information officers whose task it is to bring about the practical exchange of know-how between one firm and another;
- users in firms, who are supplied with information in the form of spoken and written material, technical drawings, lists and catalogues;
- managers who in the long term promote the development of new documentation centres and encourage - rather than thrust limitations upon - existing documentation centres;
- ministers of finance, who must allocate state funds to finance the larger information services required for national development.

2. Research into the Information/Documentation Field

An information centre cannot fulfil its special functions without applied technical knowledge. The public authorities should therefore support basic research.

3. Systems Development

This implies not only the setting up of data processing equipment by industrialized countries, but also the establishment and development of efficient information and documentation centres. From the preparatory phase onwards, and in line with the current trend, the principle should be firmly established of cooperation with other information centres contributing to the solution of problems of individual enterprises and of industry as a whole. Thorough surveys are necessary for this purpose. Experience has shown that the urgent need to obtain and apply industrial information, particularly in your countries, means that nobody delays in the hope of finding the "perfect system," which there will never be, of course. As you have no time to lose, well-considered, pragmatic steps are the order of the day. The main purpose of this Seminar is to provide you with some guidelines and possible applications in this regard, and to unite with you in elaborating joint solutions valid for your countries, even though the relevant structures vary widely from one African country to another. As I remarked at the beginning, however, it should not be forgotten that it is the duty of African governments, regional organizations, and information and documentation centres in Africa - at present operating very successfully - to join with us in setting up a network of relay stations so as to improve communications, thereby improving and accelerating development.

4. Expanding Translation Facilities

Breaking down language barriers is a serious problem confronting many European as well as African countries. For example, I speak German. There are only slightly more than 150 million people who speak German as their mother tongue or as a foreign language. Some of our European neighbours such as the Scandinavian countries, Hungary, or Rumania are faced with an even greater language barrier. The last FID Congress in Budapest thoroughly examined this problem. Linguistic obstacles in the way of better human understanding should be drastically reduced to keep pace with the expansion of communications networks and the increasingly rapid means of transport which are bringing all of us closer and closer together. Catalogues, technical material relating to consignments of machinery, assembly and testing instructions, reports, research results, etc., are valueless if you cannot read them and cannot have them translated into your language because there are either very few translation services or none at all. Naturally, it would be advisable for African countries to aim at setting up a translation service on the basis of the Frankfurt Technical Library, for

example. This is an eastern languages library which acquires material printed in Russian, Chinese, and Japanese, and subsequently has it translated by a staff of qualified translators to make the information it contains accessible to the German user. This could be a task for the existing African regional organisations, perhaps, or could be carried out for a region by definite documentation centres.

Technical Cooperation in Africa

Questions of technical cooperation are discussed in the statutes of such bodies as the UN Economic Commission for Africa (ECA), the Organisation of African Unity (OAU), the East African Community (EAC), and in the EEC Agreement of Association concluded by overseas countries (the 2nd Yaoundé Convention and the related Arusha Agreement). From the last years of the First Development Decade onwards, ECA has increased its efforts to promote African industrialization. A sufficiently high return from the larger type of industrialization project can be guaranteed only by supranational associations able to supply to large markets. This applies particularly in the case of Africa because of the shortage of capital, trained manpower, populations with spending power, and large markets. ECA is therefore concentrating on carrying out similar projects requiring lower amounts of investment to create new work places. This approach assures that there are no more goods produced than can be marketed in areas within reach of the transport available. ECA is therefore doing all it can to improve transport and communications networks in Africa and to open up the continent's mineral resources and water power resources. The African Development Bank serves the financing of these inter-African development projects.

To date there has been little success in Africa as regards cooperation based on the division of labour. This is understandable because ECA has not been in existence for as long as the other UN Economic Commissions and the majority of Member states did not accede to independence until after ECA was founded. Existing ties with the former colonial powers are as large an obstacle in the way of African intergration as are linguistic, religious, cultural, racial, and economic differences within and between the African countries themselves.

It is important to note that the objectives of ECA, as declared in Article 1 of the Charter, include:

- a) undertaking or sponsoring such investigations and studies of economic and technological problems and developments within the African region as is deemed necessary by the commission; and disseminating the findings of these investigations and studies,
- b) collecting, evaluating, and disseminating such economic technological, and statistical information as is deemed necessary by the Commission.

The Organization for African Unity, which is based on voluntary inter-governmental cooperation, has no supernational features whatsoever. It is understandable that countries that have struggled hard for their national independence are not prepared to yield this up without further ado to a supernational authority. Nevertheless, a 7-article agreement between ECA and OAU expresses the desire of both organizations to accelerate African economic and social development by means of close cooperation. Arrangements have been made and are being acted upon for mutual consultations, joint statistical offices, and exchanges of information, documentation, and reports. The three OAU Commissions undertake activities in the economic, social, education, science, technology, and communications sectors. Important resolutions have been passed on inter-African cooperation. These relate to the setting up of an Economic Committee to be entrusted with the study of inter-African economic questions, and to the extension of the Commission for Technical Cooperation in Africa South of the Sahara (CCTA) into an OAU subsidiary organization for the purpose of promoting technological, scientific, and cultural co-operation. The latest OAU initiative is noteworthy. It comprises the organization of Pan-African trade fairs, the first of which was held in Nairobi in March 1972 and was attended by exhibitors from 34 of the 41 Member States.

The East African Community is a common market grouping of three African countries (Kenya, Tanzania, Uganda). It has an economic structure that is typical of most developing countries in that agriculture, forestry and fisheries account for a very large part of the gross national product. The processing industries (mainly food processing) are underdeveloped in comparison. Kenya is the most industrialized of the three Member States and produces 69 per cent

of East African industrial output. The East African Common Market will bring advantages only when development proceeds at an equal pace throughout the entire Community. To this end, therefore, the Member States have contracted to adopt the following approaches:

- a) promoting economic and industrial development in the less favoured areas by means of financial incentives, e.g., subsidies and tax rebates;
- b) protecting that partner country which is the least developed economically and industrially by imposing duties on exports to the country concerned;
- c) giving preferential treatment to least favoured areas in the allocation of funds through the East African Development Bank for financing measures for the " promotion of industry and the necessary infrastructures.

ECA disposes of a number of joint services. These are (a) financially independent associations active in the fields of posts and telecommunications, railways and ports, and include East African Airways; and (b) financially dependent organizations and institutions, including the following which are worthy of special attention in this context: the East African Industrial Council, the East African Literature Office, and the East African Industrial Research Organization with institutes in Kenya, Uganda and Tanzania.

Articles 17 to 30 of the Agreement of Association (known as the 2nd Yaoundé Convention) between the LEC and African states and Madagascar is rooted in the principle of financial and technological cooperation. With this Agreement the contracting parties plan to strengthen the economic structure and economic independence of 18 African states, to promote the industrialization of these states, to favour regional cooperation in Africa, and to contribute to the further development of world trade.

The Development Fund has made US\$1000 million available for investment in the diversification of the economic structure, especially the promotion of industrialization and agricultural development, for measures aimed at fostering technical cooperation, and for the export marketing and sales promotion of the goods produced by these African countries. The beneficiaries may be the countries themselves but can also be, for example, recognized

producers' associations and similar organizations, and (in exceptional cases) the individual producer. Within the framework of technical cooperation, technical institutes and other organizations which train specialized personnel, as well as individual scholarship holders, trainees, or participants in training courses, may also be beneficiaries.

It would seem advisable for the East African Community to conclude an agreement of association with the EEC, when one considers:

- a) the preferential treatment secured by the Yaoundé Agreement for the 18 African associate member countries, offering them better sales opportunities in the whole EEC market;
- b) the introduction of the EEC common external tariff, which is higher than the former national external tariffs of individual EEC countries;
- c) the EEC trade preferences provided for in the Nigeria Agreement and possible future agreements, e.g., with the Maghreb States, Sierra Leone, Ghana, etc.

The Arusha Agreement provides for duty-free entry, subject to certain conditions, of all East African products into the EEC countries. For certain well-founded reasons, e.g., the protection of new industries or marketing organizations, the EAC states may temporarily raise their import duties or introduce quantitative restrictions.

Conclusion

By taking important political and economic groupings as an example, this paper has sought to reveal the "golden thread" running through industrial development and technological co-operation in Africa. There is insufficient space here to allow us to examine the numerous other international and national, public and private activities carried out on a bilateral or multilateral basis for the promotion of African industrial development.

I shall therefore limit myself to listing the consequences that accompany this "golden thread."

1. It is the aim of ICA, OAU and IAC, as well as of the Yaoundé Convention, to arrange for the allocation of funds and implementation of measures designed to promote the industrial and technological development of the African countries.

2. Since industries and technological developments require planning and execution, and as the resultant output then has to be marketed, there is a need for a wide variety of easily accessible data, statistics, standards, regulations, technical literature, research results, new publications, etc. This need is felt by the aforementioned regional organizations, national governments, industrial associations, scientific institutes, and business enterprises.

3. This material must be organized and made accessible as quickly and easily as possible to decision-makers at all levels active in all sectors of the economy, as well as to scientists, research workers, engineers, project leaders, etc. This task can be accomplished only through appropriate information centres.

4. It seems essential, therefore, that a certain percentage of the resources - in terms of capital and personnel - devoted to development planning and realization should be set aside for the purpose of setting up and running such information centres. A rate of approximately one per cent could be taken as a guide.

5. An "information centre" is understood as either a documentation centre, public or specialized library, reference service or information supply centre operating as a clearing house; or as a group of information officers working individually in advertising; or as project, business, market, technical, or consumer consultants.

6. This last-mentioned group will play a very important part in African development. Consultants carry a heavy burden of responsibility because they are in charge of and must pass on information essential for the industrialisation process, and must ensure that information systems are set up and operated with the utmost efficiency.

7. Special care should be taken, therefore, in selecting information officers, in ensuring that they are accorded a high social status and are assigned to those sectors of the information field for which they are best suited. In addition to the appropriate professional qualifications, such personnel must have an analytical approach to problems; an awareness of correspondences; a friendly, outgoing personality; drive; and flair.

8. The points made under "Scientific and Technical Information for Developing Countries" in one of the FID/DC Studies commissioned by UNESCO - on which I worked with Mrs. Lévai and colleagues from OECD/DC, the German Democratic Republic, and Czechoslovakia - were intended to help all those confronted with these problems and to encourage criticism.

9. This study on "National Structures for Documentation and Library Services in Countries with Different Levels of Development, with Special Reference to the Needs of Developing Countries" is based on reports and literature from 28 industrialized and less industrialized countries, including seven African countries (Ethiopia, Ghana, Kenya, Nigeria, Senegal, Tunisia, and Zambia). In addition to reporting on the situations and main characteristics of various documentation and library services, the authors of the Study considered it appropriate to offer information users some guidance on the solving of the problems arising in this field. They therefore included in the Study a comprehensive chapter on "Main Trends for the Improvement of Documentation and Library Services in Developing Countries."

10. Two quotations from the section on "Scientific and Technical Information for Developing Countries" will convey an idea of the range and general trend of this study. The authors are contemplating problems which they would like to bring nearer to solution by working in unison with the African nations. The first and last paragraphs are as follows:

"Whereas, aside from certain difficulties besetting information processing, the problem of the explosion of scientific and technical knowledge and know-how has been satisfactorily solved in industrial countries, it frequently places developing countries in a dilemma. The many problems facing these countries which are eluding solution have their causes in the great shortage of scientific and technical achievement. Of cardinal importance is, therefore, the transfer of scientific and technical information and its utilisation in local production with the intention of achieving improvement in science and technology."

"The onerous provision of considerable funds by industrial countries in close cooperation with the Specialized Agencies of the United Nations and the developing countries is essential for the achievement of all these objectives."

Let us leave the last word to Robert Gardiner, Executive Secretary of ECA. "Given the variety of raw materials and their quality and the potential resources of energy and power with which the continent is endowed, there is no reason why the present level of development in Western Europe should not be attained by Africa by the beginning of the next century. What is needed is well-organized effort."

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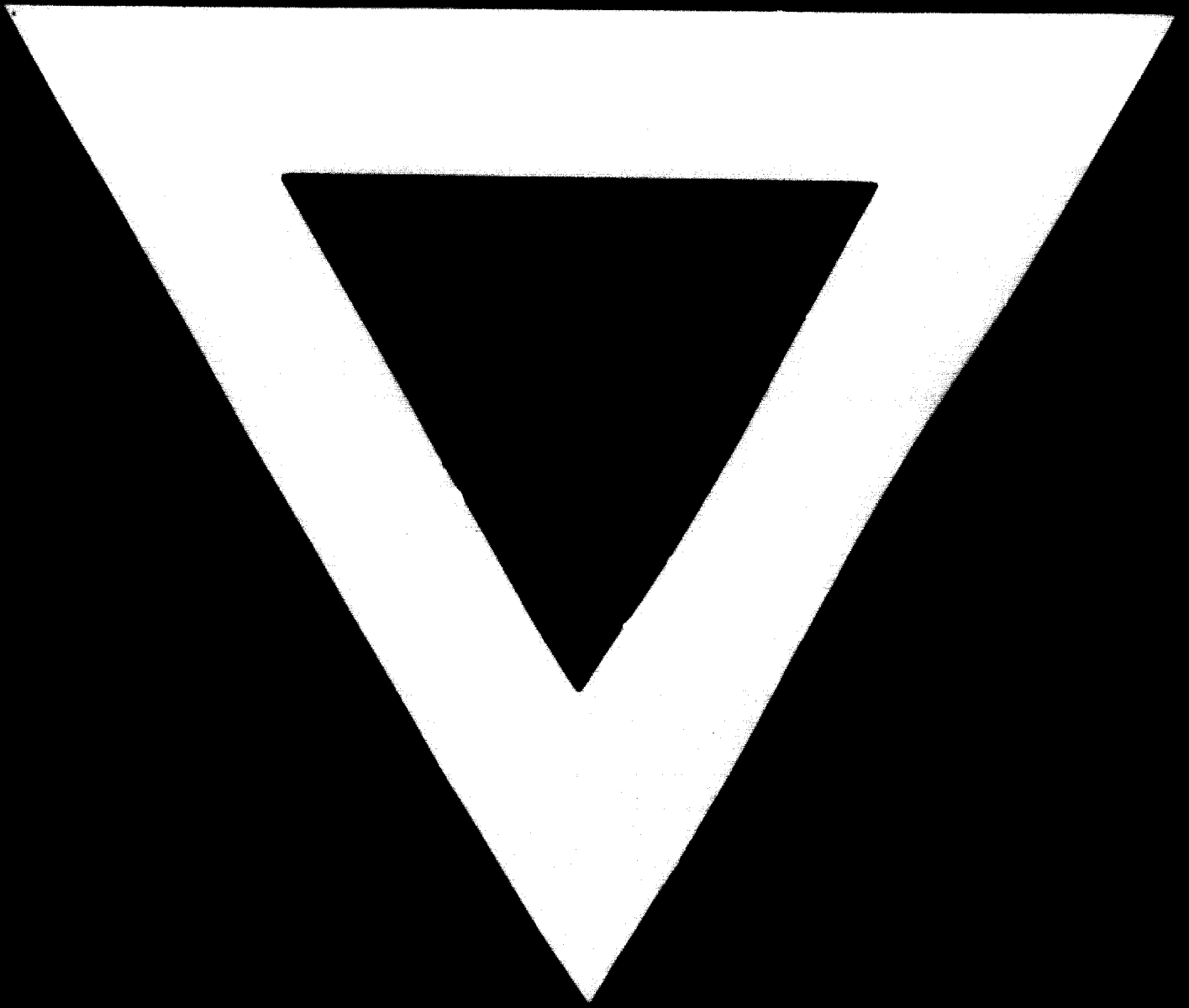
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