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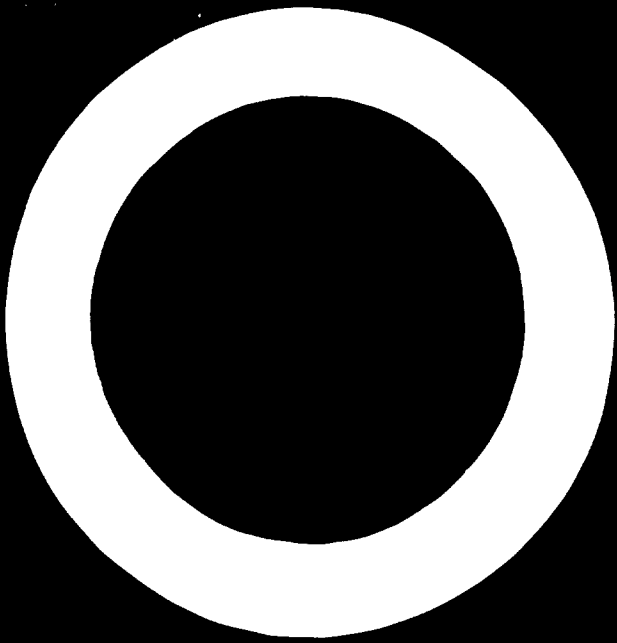
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Problems and Prospects*

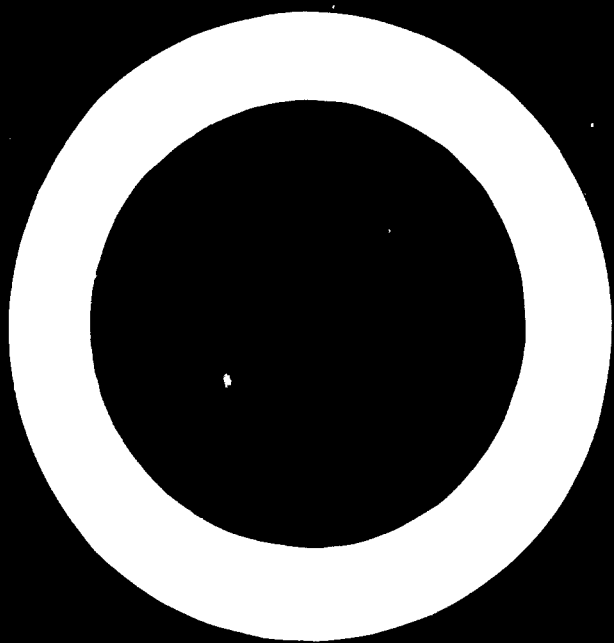
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IN INDUSTRY**

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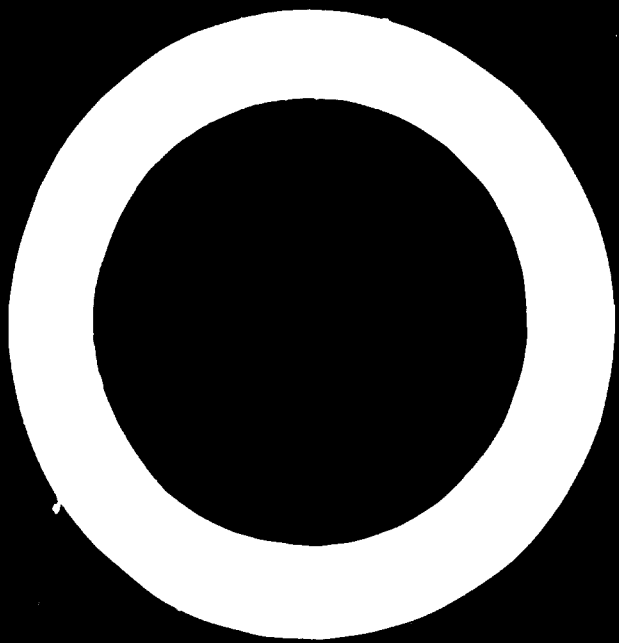


**UNITED NATIONS**





**TECHNICAL CO-OPERATION IN INDUSTRY**



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION  
VIENNA

UNIDO MONOGRAPHS ON INDUSTRIAL DEVELOPMENT

*Industrialization of Developing Countries:  
Problems and Prospects*

*Source*

MONOGRAPH NO. 21

# TECHNICAL CO-OPERATION IN INDUSTRY

Based on the Proceedings of the International  
Symposium on Industrial Development  
~~(Athens, November-December 1967)~~

*Author*



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## Foreword

The International Symposium on Industrial Development, convened by UNIDO in Athens in 1967, was the first major international meeting devoted exclusively to the problems of industrialization of the developing countries. It followed a series of regional symposia on problems of industrialization held in Cairo, Manila and Santiago in 1965—1966 under the sponsorship of UNIDO and the United Nations regional economic commissions, and a similar symposium held in Kuwait in 1966 under the sponsorship of UNIDO and the Government of Kuwait.

The Athens Symposium was attended by some 600 delegates from 78 countries and by representatives of various United Nations bodies, international organizations and other interested institutions in the public and private sectors. It provided a forum for discussion and exchange of views on the problems and prospects of the developing countries which are engaged in promoting accelerated industrial development.

The Symposium devoted special attention to possibilities for international action and for co-operative efforts among the developing countries themselves, and explored the scope, means and channels for such efforts.

Studies and papers on a wide range of problems relating to industrialization were presented to the Symposium—by the UNIDO secretariat and by participating Governments, international organizations and observers. An official report, adopted at the Symposium, has been published by UNIDO.<sup>1</sup> Based on this documentation and the discussions in the meeting, the present series of monographs is devoted to the 21 main issues which comprised the agenda of the Symposium.

Some of the monographs deal with specific industrial sectors; some with matters of general industrial policy; and others with various aspects

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<sup>1</sup> *Report of the International Symposium on Industrial Development, Athens 1967* (ID/11) (United Nations publication, Sales No.: 69.II.B.7).

**of international economic co-operation. An effort has been made to make the monographs comprehensive and self-contained, while the various economic, technological and institutional aspects of the subject matter are treated within the context of the conditions generally prevailing in the developing countries.**

Monographs 1—20 include chapters on the issues presented, the discussion of the issues, and the recommendations approved by the Symposium. The present monograph, being of a more general nature, deals throughout with the issues discussed at the Symposium, and the recommendations approved by the Symposium are annexed to the publication.

Since economic, technological and institutional aspects are described with particular reference to the needs of the developing countries, it is felt that the monographs will make a distinct contribution in their respective areas. They are intended as a source of general information and reference for persons and institutions in developing countries concerned with problems of industrialization, and particularly with problems and issues of international co-operation in the field of industrialization. With this in view it was considered that an unduly detailed technical presentation should be avoided while at the same time enough substantive material should be offered to be of value to the prospective reader. For a more elaborate treatment of the subject, the reader is referred to the selected list of documents and publications annexed to each monograph.

The annexes also contain information on the areas in which UNIDO can provide technical assistance to the developing countries on request; a selected list of major UNIDO projects in the respective fields; and a list of meetings recently organized by the United Nations.

It is hoped that the monographs will be particularly useful to Governments in connexion with the technical assistance activities of UNIDO and other United Nations bodies in the field of industrial development.

This monograph has been prepared by the secretariat of UNIDO.

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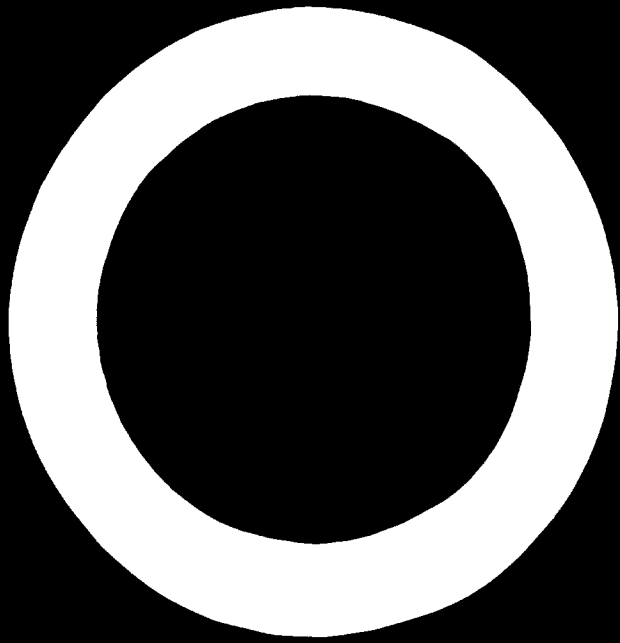
## EXPLANATORY NOTES

**Billion** refers to thousand million.

**Dollar (\$)** refers to US dollar unless otherwise specified.

The following abbreviations are used in this monograph:

<b>BIRPI</b>	United International Bureaux for the Protection of Intellectual Property
<b>CID</b>	Centre for Industrial Development
<b>ECA</b>	Economic Commission for Africa
<b>ECAFE</b>	Economic Commission for Asia and the Far East
<b>ECE</b>	Economic Commission for Europe
<b>ECLA</b>	Economic Commission for Latin America
<b>EPTA</b>	Expanded Programme for Technical Assistance
<b>FAO</b>	Food and Agriculture Organization
<b>IAPIP</b>	International Association for the Protection of Industrial Property
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>ILO</b>	International Labour Organisation
<b>ISO</b>	International Standards Organization
<b>OPAS</b>	Operational Assistance
<b>SIS</b>	Special Industrial Services of UNIDO
<b>TARS</b>	Technical Assistance Recruitment Service
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>UNDP</b>	United Nations Development Programme
<b>UNDP/SF</b>	United Nations Development Programme, Special Fund Component
<b>UNDP/TA</b>	United Nations Development Programme, Technical Assistance Component
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNESOB</b>	United Nations Economic and Social Office in Beirut
<b>UNIDO</b>	United Nations Industrial Development Organization
<b>WHO</b>	World Health Organization



## INTRODUCTION

The subject of industrial growth in the developing countries covers an extremely broad field. It includes such questions as the role that industry plays in over-all economic development; the nature and extent of the needs of the developing countries for financial and technical assistance; the attitude of the developed countries to the industrialization of the developing countries and their contribution to it; the policies and measures adopted by the developing countries themselves; and finally the measure of success they have attained so far. This monograph, however, addresses itself only to one factor in this complex undertaking of industrial development: the role of multilateral technical co-operation, with particular reference to the over-all programmes and activities of the United Nations Industrial Development Organization (UNIDO).

The importance of industrialization to the developing countries has already been amply emphasized, if not fully demonstrated as yet. Although in its ultimate reaches industrialization is identifiable with the more complex issue of modernization, its immediate purpose, like the much broader process of economic development of which it forms an integral part, is simply to raise standards of living. Saddled in most cases with corrosive poverty and accelerated population growth, developing countries need to absorb surplus agricultural labour in fields of higher productivity. Manufacturing makes import substitution and/or increased exports possible. Manufacturing, therefore, may enable developing countries to counteract the effects of an unreliable demand for traditional primary commodities in the world market or to redress an adverse balance of trade.

The desire of the developing countries to promote their productive capacities and to shift from primary industries (production of foodstuffs and raw materials) to secondary industries (processing and manufacture) is understandable. After the Second World War, this desire was viewed sympathetically by the industrialized countries, which began to transfer capital and know-how through bilateral aid programmes. On the multi-lateral level, assistance in the form of capital loans and vocational training

and other services related to industrialization was undertaken by a number of United Nations organizations, including the IBRD group, ILO, UNESCO and FAO. It was becoming increasingly evident, however, that the complexity and scope of the industrialization process required more concerted and co-ordinated effort on the part of the multilateral agencies than heretofore. Hence the establishment in 1961 of the Centre for Industrial Development (CID) as a special unit within the United Nations Secretariat. The CID provided for the first time an administrative and operational focal point within the United Nations system for industrial development. Its work programme included the dissemination of information on industrial technology, the formulation of industrialization policies and programmes, the promotion of industrial projects and the preparation of projects acceptable to banks for investment purposes. But the CID was only a first step; consideration was given in United Nations circles to the creation of new and more adequate machinery to promote the industrialization of developing countries.

On 17 November 1966, the General Assembly voted to establish UNIDO as an autonomous organization within the United Nations, to begin operations on 1 January 1967. The experienced CID staff formed the core of the new organization.

This monograph examines the functions of UNIDO and the scope of its resources; its central co-ordinating role in the United Nations system; the various United Nations programmes of technical assistance to industry; the fields of technical assistance in which UNIDO is active; and the main problems and issues arising in the field of technical co-operation. The role of UNIDO's technical assistance activities in the development of the various industrial sectors is covered in other monographs of this series.



**UNIDO'S ROLE  
IN TECHNICAL ASSISTANCE  
TO INDUSTRY**

The purpose of UNIDO is to promote and accelerate the industrialization of the developing countries of the world, with particular emphasis on the manufacturing sector. Its principal policy-making organs are the General Assembly and the Industrial Development Board. The guidelines for UNIDO's work were established in General Assembly Resolution 2152 (XXI) of 17 November 1966 and Industrial Development Board Resolution I (1) of April 1967, under which priority is given to operational activities designed to give impetus to the industrialization of developing countries and to the co-ordination of the efforts of the United Nations system in the field of industrial development.

**OPERATIONAL ACTIVITIES**

The operational activities of UNIDO include first of all the technical assistance field projects carried out at the request of developing countries. Field activities cover the following broad categories:

Carrying out surveys of industrial development possibilities, formulation of industrial development plans and programmes, preinvestment and feasibility studies;

Advising at the various stages of implementation and follow-up of industrial projects;

Assistance in achieving the efficient utilization of new and existing industrial capacity, including the solution of technical and technological problems, and the improvement and control of quality, management and performance;

Assistance in developing and improving marketing and distribution techniques and the development of export-oriented industry;

**Assistance in the training of technical and other appropriate categories of personnel, including such forms of training as management workshops and in-plant training;**

**Assistance in the dissemination of information on technological innovations and know-how, the development of systems of patents and industrial property, and the adaptation and application of existing technology to the needs of developing countries;**

**Assistance in promoting domestic financing and in obtaining external financing for specific industrial projects;**

**Assistance in establishing or strengthening institutions to deal with various aspects of industrial development, including planning and programming, project formulation and evaluation, engineering and design, training and management, applied research, standardization and quality control, marketing, small-scale industry, investment promotion and pilot plants.**

In support of these field activities, and in the interest of promoting technical know-how and the transfer of technology, UNIDO organizes for technical personnel from developing countries various types of meetings and in-plant training programmes in which experts from the industrialized countries also participate. These include:

**Workshops designed to promote exchange of information and experience among a relatively small number of participants, primarily intended for the transfer of knowledge and techniques to participants from the developing countries;**

**Seminars for the purpose of evolving concepts or policies in a specified field of activity, identifying problems in industrialization and developing strategies and techniques to meet them;**

**Symposia for high-level discussion of general policy, management, and technological developments in a particular industry, industrial branch or groups of industries;**

**In-plant training for providing on-the-job training of technical personnel in the management, operation and production methods and systems of a specific manufacturing sector.**

Engineers are drawn from the various developing regions to participate in in-plant training programmes in industrialized countries where they are given several months of theoretical and practical training in their respective fields of specialization. A number of European countries in which these programmes have been organized in the past have offered to

make permanent arrangements with UNIDO and UNDP to provide for continuous training in a specialized field for participants from all developing countries.

The type and form of technical assistance extended to a particular country depend on the expressed needs and stage of development of that country, and the scope of the assistance depends on the capacity of the country to absorb it. Such capacity is determined by numerous political, social and economic factors, including the administrative machinery responsible for the planning and development of industrial projects, infrastructure, natural resources, capital, manpower and skills, entrepreneurship, to name just a few. The operational activities of UNIDO encompass all aspects of the manufacturing industry, its planning, programming, financing, management, training, supporting services and technology.

#### RESOURCES AVAILABLE

Multilateral aid provided by international organizations is part of the over-all developmental effort, which includes the flow of capital and know-how from bilateral sources as well as the developing countries' own contributions towards their industrialization.

The effectiveness of the technical assistance provided by an international organization is determined by the extent of the resources put at its disposal by donor countries and the efficacy and flexibility of the programmes by which the assistance is provided. Although in terms of the funds available multilateral aid amounts to only 10 per cent of the total official aid, the role of the United Nations in the development process gives it a truly international character more adapted to the special needs of a world problem.

A trend towards greater reliance on the developmental effort of the United Nations system in the past decade is indicated by the increase in funds put at the disposal of UNDP to which annual contributions increased from \$50 million in 1959 to almost \$200 million in 1968. The entire machinery of the United Nations system engaged in the development process is also under vigorous review in order to increase its efficiency and capacity to cope with its expanded functions.<sup>1</sup>

<sup>1</sup> See: *A Study of the Capacity of the United Nations Development System*, Vols. I and II, Geneva, 1969 (United Nations publication, Sales No.: DP/5); and *Partners in Development*, Commission for International Development, Praeger, New York, 1969.

Since UNIDO is a part of this system, the nature and scope of its activities will naturally be affected by future developments in the system as a whole. At present, however, its activities are undertaken and financed under the established United Nations technical co-operation programmes in which UNIDO participates. These programmes are: the Regular Programme of technical assistance devoted to industry and financed from the United Nations budget (RP); the Special Fund component of the United Nations Development Programme (UNDP/SF); the Technical Assistance component of the United Nations Development Programme (UNDP/TA); and the Special Industrial Services programme (SIS), a programme limited largely to urgent short-term missions. Some projects may also be financed from funds in trust, deposited by Governments for specific projects, or other direct voluntary contributions. In all these programmes assistance is given only at the request of the Government concerned. UNIDO's expenditures for technical assistance under these programmes amounted to approximately \$8.0 million in 1968 and \$9.0 million in 1969. In addition, voluntary contributions made by Member States to the UNIDO General Trust Fund, to be utilized in the furtherance of its operational activities, amounted in 1969 to about \$1.5 million, partly in convertible and partly in non-convertible currencies.

Table 1 gives the expenditures for industrial projects carried out by CID and UNIDO under the various technical assistance programmes from 1964 through 1969.

**TABLE 1: EXPENDITURES FOR INDUSTRIAL PROJECTS EXECUTED BY CID AND UNIDO, 1964—1968**  
(thousand dollars)

	CID			UNIDO		
	1964	1965	1966	1967	1968	1969 <sup>a</sup>
UNDP/SF .....	1,410	590	1,310	1,710	2,700	3,100
UNDP/TA .....	1,600	1,470	2,140	1,890	3,100	1,700
Regular Programme .....	540	850	890	950	1,000	1,500
SIS .....	—	—	44	490	950	2,100
Funds in trust .....	100	190	200	340	480	450

<sup>a</sup> Estimates.

The over-all expenditures for industrial development (not restricted to the manufacturing sector) made by all organizations in the United Nations family considerably exceed the amounts indicated above. In their major fields of activity, several of these organizations provide

support to industrialization activities in one form or another, whether through the development of natural resources (United Nations) or of agricultural and forestry raw materials (FAO), through industrial training (ILO), scientific research (UNESCO), loans to industrial projects and to financial development institutes (IBRD), or the diversification of exports and the development of markets for manufactured products (UNCTAD). The contributions of IBRD and its affiliated institutions are primarily in the form of direct financial assistance to industry—medium and long-term loans as well as equity investments—which amounted to about \$240 million for 1967/1968. The other major source of multilateral aid, the UNDP, gives aid primarily in the form of technical assistance. If industrialization is interpreted in its broadest sense to include other aspects than just the manufacturing process, e.g. mining, power, transportation, vocational training, scientific research and other economic and social infrastructure, the over-all value of UNDP-assisted projects in industry amounted to \$34.9 million in 1968. This amount includes \$25.3 million for the Special Fund and \$9.6 million for the Technical Assistance component. (The total expenditure in 1968 was \$173.4 million for all sectors.) Industrial development has received on an average 20 per cent of the resources of the UNDP disbursed through the various Specialized Agencies of the United Nations participating in the programme.

#### CENTRAL CO-ORDINATING ROLE

The establishment of UNIDO put all the dispersed United Nations activities related to industry in a new perspective. UNIDO's functions cover all aspects of industrialization, particularly those relating to manufacturing. As stated by the General Assembly, UNIDO "shall play the central role in and be responsible for reviewing and promoting the co-ordination of all activities of the United Nations system in the field of industrial development".

In pursuance of its central co-ordinating role, UNIDO has taken a number of measures designed to harmonize and to render more effective the technical assistance activities within the United Nations system. On the administrative level, UNIDO takes stock of all activity within the United Nations system related to industry through the publication of a consolidated report, a report on the industrial development activities of the entire United Nations system of organizations. A companion publication, an analytical report, reviews and analyses the activities contained in

the consolidated report.<sup>2</sup> These reports provide a composite picture of the total United Nations efforts in the field of industry with an analysis in depth of the assistance rendered to developing countries.

#### Agreements with specialized agencies

On the operational level, UNIDO initiated shortly after its establishment bilateral negotiations with the relevant specialized agencies to identify their respective fields of competence and to explore possibilities for co-operation. These bilateral negotiations have been actively pursued at the highest levels with satisfactory results. Memoranda of Agreement have been signed by the Executive Director of UNIDO and the Directors General of ILO, UNESCO and FAO. These agreements outline the areas of respective responsibilities and establish procedures and machinery for continuous consultation, co-ordination of activities, and direct collaboration in fields of joint interest. They are intended to regularize UNIDO's relations with the agencies directly or indirectly active in industrial development and to harmonize the various efforts of the United Nations system in the field of industrialization.

The agreement with ILO, for example, delineates the respective areas of competence of the two organizations in such fields as training and small-scale industry. The agreement distinguishes between vocational training, which is the responsibility of ILO, and training above the level of technicians, in which ILO and UNIDO may be jointly interested. In the field of management, ILO plays the principal role in general management and productivity operations, while UNIDO carries on certain economic and technological activities. In the field of small-scale industry, the development of handicrafts falls within the exclusive competence of ILO, while industrial estates are the exclusive concern of UNIDO.

The fields in which UNIDO and UNESCO have common interests include education and training, research and application of technology, scientific instruments and testing laboratories, standards and specifications, and scientific and technological policies. The establishment and management of educational facilities at all levels is the responsibility of UNESCO, whereas post-graduate industrial training outside the school and university system falls within the competence of UNIDO. When

<sup>2</sup> The most recent of the consolidated reports was prepared for the Third Session of the Industrial Development Board, held in 1969 (document ID/B/56). The analytical report for the Third Session was published as document ID/B/57. See also Role of UNIDO in Co-ordination of Activities in Industrial Development (document ID/B/65).

training within the school system and training outside it are so inter-related that the areas of responsibility of UNIDO and UNESCO overlap, consultations between the two organizations determine which body will act in a specific case. General scientific research is the responsibility of UNESCO, whereas research related to a particular branch of industry or to the development of industrial processes and techniques is the concern of UNIDO. In the case of scientific instruments, distinction is made between industrial testing instruments and facilities in which UNIDO is directly interested and those for use in educational institutions related to the general fields in which UNESCO is working.

With regard to standards, UNESCO is responsible for the establishment and development of primary and secondary standards, whereas UNIDO is responsible for industrial standards and specification of products including the functioning of the necessary machinery and legislation. Both UNESCO and UNIDO recognize that their co-operation in scientific fields is essential.

The activities of UNIDO and FAO are complementary in many areas offering scope for joint action. These include the production of agricultural, fisheries and forestry equipment and machinery and the promotion of industries producing agricultural requisites, such as pesticides and fertilizers, in which UNIDO has responsibility for production and FAO in the use and application. The two organizations recognize the need for consultation on projects in these fields. Principles of co-operation have been worked out between the two organizations with respect to industries for processing and food products as well as fisheries and forest industries. The commodities involved are in two groups; group I comprising all non-edible and some edible commodities; and group II comprising bulky and perishable food commodities. It has been agreed that FAO has responsibility for production, storage, marketing and technology of processing of the agricultural raw materials for the food industries and for quality and nutritional aspects of the finished products, while UNIDO has responsibility for the equipment, engineering, chemical, managerial and economic aspects of the industry.

The agreements concluded with ILO and FAO also resulted in the setting up of joint inter-secretariat committees to meet periodically to review areas of co-operation, recommend the assignment and joint action required in specific projects and promote harmonious relations at the working level.

In addition to these bilateral agreements, UNIDO's participation in the Inter-Agency Consultative Board and the Administrative Committee

on Co-ordination of the United Nations is also helping to evolve principles on which long-term co-ordination of the activities of the various United Nations organizations can be based.

#### **Co-operation with regional economic commissions**

The regional economic commissions — ECA, ECAFE, ECLA, ECE — and UNESOB are also supporting United Nations efforts to speed industrialization. The tasks of the commissions and UNESOB are of a promotional and advisory nature, aimed at encouraging the countries in their respective regions to co-operate in economic matters. The economic commissions undertake or sponsor investigations, research, seminars and expert group meetings on economic and technological and statistical information, and assist in the formulation of co-ordinated policies to stimulate economic growth in their regions.

The need for close co-operation between UNIDO and the regional commissions has been emphasized by the General Assembly and the Industrial Development Board. UNIDO has been conducting discussions with all the commissions with a view to establishing formal principles and procedures of co-operation in industrial development activities. An agreement has been concluded with ECA that provides for a continuous exchange of information on programmes of work, co-operation in implementing operational projects in the region and consultations to review the activities of both organizations. The agreement defines the role of the regional advisers who are attached to ECA but paid by UNIDO and their working relations with UNIDO. These advisers will in effect become a regional extension of the functional units of UNIDO and will undertake, with the concurrence of ECA, certain operational duties for UNIDO as required. Similar negotiations are proceeding with ECAFE, ECLA and ECE. The relations of UNIDO with UNESOB have been greatly strengthened by the outposting to Beirut of two UNIDO staff members, who will form the nucleus of a unit for industry in UNESOB. Guidelines for future co-operation between UNIDO and UNESOB have been worked out on matters of policy and on the formulation and implementation of programmes.

Annual meetings have been initiated between representatives of UNIDO and the regional economic commissions and UNESOB for the co-ordination of their respective work programmes in industry for the ensuing year.



## **FORMS AND PROGRAMMES OF TECHNICAL ASSISTANCE TO INDUSTRY**

As previously mentioned, UNIDO's technical assistance to industry is provided through a variety of programmes constituting part of the development aid machinery of the United Nations system. A brief description of these programmes and the nature of their operations follows.

### **THE UNITED NATIONS DEVELOPMENT PROGRAMME**

UNDP came into existence on 1 January 1966 as a result of a General Assembly decision to merge the expanded programme of technical assistance, established in 1950, and the United Nations Special Fund, established in 1958. The goal of the Assembly was to co-ordinate and streamline the activities of the two programmes. Despite their merger, the two components maintain their separate characteristics. Financed from voluntary contributions of Members of the United Nations or of its related agencies, UNDP is the major source of financing for the technical assistance supplied by all agencies of the United Nations family. Even before UNIDO was established, the Economic and Social Council, aware of the need for accelerated industrialization, called for the doubling of UNDP resources devoted to manufacturing. Continuing commitments in other fields of technical assistance, however, prevented this objective from being fully met. In 1968, pledges by contributing states amounted to almost \$200 million.

Shortly after its establishment, UNIDO was designated a participating and executing agency in UNDP-financed projects as is the case with other organizations of the United Nations system.

### **UNDP/TA**

The total expenditures of UNDP/TA for all economic sectors amounted in 1968 to \$64.6 million. UNIDO's share in this component of the programme averaged over the past few years about 4 per cent. The

amount of assistance a particular Government is entitled to receive out of the total UNDP/TA budget in the course of a year is determined by its "country target". UNDP establishes this target annually, using a complex method of calculation, which takes into consideration the size of the country's population, its level of development, its *per capita* income, its capacity to absorb technical assistance and the amount of assistance available from other sources. The UNDP resident representative keeps complete target accounts so that he can inform the Government at any time of the balance available in its target. Any unprogrammed portion of the target that remains at the end of one year may be added to the next year's target.

In programming technical assistance to industry, a Government may turn to the UNDP resident representative and the industrial development field adviser for advice on the preparation of project requests. The responsibility for determining the priorities of projects in the various fields of economic development remains with the requesting Government, since such determination is normally made on the basis of the national development plan. The Government's total requests for a year must not exceed its country target.

Arrangements previously in effect provided for biennial programming of technical assistance. Under new programming procedures instituted for 1969 and beyond, it is possible for developing countries to submit their requests for aid under UNDP/TA on a continuous basis whenever the need arises. The new arrangements permit Governments to plan projects with a duration of up to four years although the expenditures will be determined on the basis of the annual country targets, which are in turn determined by the level of the Technical Assistance component for each year.

UNDP/TA provides the services of experts at all levels of an industrial development enterprise. It also provides training for nationals of developing countries as well as equipment for demonstration purposes connected with the project. Assistance under this programme can very well lead to larger undertakings under the Special Fund component, particularly in such areas as the planning and preparation of institutional servicing and support facilities.

Training, carried out under the Programme through individual fellowships and interregional group training projects, is an important vehicle for the transfer of technology and know-how to developing countries. Group training absorbs about 17 per cent of the total UNDP/TA budget, and the interregional projects have received further generous

contributions in the form of funds, experts and facilities from the host countries in which the training takes place.

Requests for assistance should be precise and state a definite objective. They should be accompanied by full job descriptions for the posts to be filled by experts. Industrial development field advisers are available to assist the requesting Governments in the preparation of the requests and job descriptions. In evaluating proposed projects, the administrator of UNDP, in co-operation with UNIDO, determines whether the project is feasible and useful, whether it can be co-ordinated with other forms of assistance being provided to the requesting country under the Special Fund component or SIS or whether it qualifies as a UNDP/TA project.

In the formulation of their requests, Governments should work closely with the resident representatives and the industrial development field advisers and consider the whole range of resources available under all programmes of technical assistance. The co-ordination of requests under UNDP/TA with projects that have been approved or proposed under other programmes is desirable since shorter-term projects often lead to larger-scale undertakings or supplement existing ones.

In 1968, UNIDO's activities under the UNDP/TA programme in terms of services of experts amounted to 1,082 man-months. In addition, 416 fellowship posts were available. Both the services of experts and the fellowship posts covered a wide range of activities, including planning and project formulation, industrial support activities, management of enterprises, investment, and examination of technological problems in existing plants in all fields. A list of technical assistance projects in the various industrial sectors is appended to other monographs in this series dealing with the respective industrial sectors.

## UNDP/SF

The major portion of UNDP resources is spent on the financing of the Special Fund component of the programme. The technical assistance provided through this fund is concentrated on long-term pre-investment projects concerned with the basic prerequisites of economic and social development, including the survey and development of natural resources in agriculture, industry and public utilities; the development of human resources through education and training; and the transfer and application of technology through applied research.

By the end of 1969, fourteen United Nations agencies were implementing 745 Special Fund projects at a total cost (including counterpart contributions by recipient Governments) of almost \$2 billion. Projects in the field of industry, including mining, numbered 187, at a total cost of about \$423 million. Of these projects, UNIDO was implementing 35 projects, at a total cost of \$76.5 million.

Special Fund projects, which usually run from three to five years, include the following:

Feasibility studies to identify investment opportunities and to determine the extent of available resources and markets for industrial development purposes;

Development centres to promote and establish new industries through the utilization of local resources and outside help;

Research institutes to develop and adapt technology to the needs of local industries;

Design centres to turn out modern industrial designs for local industries;

Standards institutes to prepare standards of quality and methods of quality control;

Industrial estates to assist in the servicing and development of industries;

Pilot plants to set up and launch the initial operations of industrial enterprises for demonstration purposes.

Examples of projects in these categories are listed in annexes of other monographs in this series.

Special Fund projects differ in their structure and in their implementation from other forms of technical assistance. When the General Assembly established the Special Fund, its goal was to increase the effectiveness of United Nations technical assistance. Prior to that, the scope and duration of projects carried out under EPTA had been subject to strict limitations and had failed to meet the needs of developing countries in the early stages of industrialization. The new fund was to assist Governments in carrying out surveys of natural resources and feasibility studies, tasks which must precede large-scale capital investment.

A Special Fund project is a co-operative undertaking in which the assisted Government shares in the cost and administration of the project. The participation of the Government is taken as proof of its interest in the project and as a means of assuring the continued operation of the

project after the completion of United Nations support. A cardinal condition of the provision of assistance under UNDP/SF is that the project be viable and self-perpetuating. Of the \$76.5 million value of the 35 UNIDO projects mentioned above, \$31.2 million was covered by UNDP allocations and \$45.3 million by counterpart contributions from the assisted countries.

In general, the assisted Government provides whatever the project needs in the way of land and buildings, locally obtainable equipment and supplies, transportation and other services, and counterpart personnel who would, after completing their training, assume the functions of the foreign experts provided by the United Nations. Furthermore, as a partner in the project assisted, the Government shares in the administration of the project through a co-manager. The financial contributions of the Government cover so-called local costs, a cash payment in local currency calculated at 15 per cent of the estimated cost of the foreign experts engaged on the project.

Through UNIDO, UNDP provides all the experts and consultants required for the successful operation of the project, including the manager. It provides also for the training of their national counterparts and supplies the equipment and necessary technical support needed in the implementation and administration of the project.

As in the case of all technical assistance provided by the United Nations and its related agencies, requests for Special Fund assistance must come from the Governments through the UNDP resident representative. These requests are received and processed as requesting Governments submit them, and are approved on the basis of priority within an over-all annual budget. Although requests for technical assistance originate in various ways—from suggestions of Government planners, from a United Nations agency's field promotion, from direct contacts with headquarters staff, from conferences and seminars—the most frequent and fruitful requests for Special Fund projects originate as a follow-up to projects carried out under UNDP/TA or SIS, which often help to identify an area where more extensive assistance is needed.

Official requests are thoroughly appraised by both UNDP and UNIDO. UNDP scrutinizes them to see that they conform to certain procedural criteria and to policy. UNIDO evaluates the technical and substantive merit of the proposed projects. Requests are often reformulated with the help of UNDP and UNIDO specialists under preparatory allocation procedures in order to define the required assistance more precisely. Once they are precisely formulated and considered to be of

sufficient importance, the administrator of UNDP submits requests, together with his recommendations, to the Inter-Agency Consultative Board—a “co-operative stock exchange” for all UN specialized agencies—which considers the projects to be submitted to the UNDP Governing Council for final approval. The Governing Council holds two sessions a year, one in January and one in June.

After a Special Fund project has been approved, its implementation is the responsibility of the executing agency to which it has been assigned. The basic instrument for the execution of the project is the plan of operation, which is essentially an agreement between the recipient Government on the one hand and the UNDP and the executing agency on the other. The plan of operations specifies the purposes of the project, the respective obligations of the parties, the work plan, the plan of expenditure, and ancillary matters.

#### REGULAR PROGRAMME

Financed from the regular United Nations budget, the Regular Programme of technical assistance was first established in 1946 by the General Assembly. It covers those areas of activity for which the United Nations Secretariat has responsibility and which do not fall within the competence of any of the specialized agencies. These include social welfare, economic development (natural resources and industry), public administration, human rights and narcotics control.

In 1968, UNIDO was charged with that part of the United Nations Regular Programme devoted to industry. The total value of technical assistance for 1968 under this programme amounted to \$6.4 million. Of this amount, the share of UNIDO was about \$1 million. UNIDO's share was increased in 1969 to \$1.5 million by the General Assembly.

Provision of technical assistance under the Regular Programme as under other programmes is based on the requests of Governments and the priorities they establish. Unlike UNDP/TA, however, there are no country targets. Nevertheless, UNIDO seeks to ensure an equitable distribution of the resources available under the programme, taking into consideration the needs of the requesting countries and the other forms of technical assistance they receive.

Because the funds at its disposal are limited and are appropriated annually, the programme provides only short-term assistance in the nature of “seed money”, which may evolve into longer-term projects

under UNDP/TA. It provides expert advice and training for a duration of up to one year. UNIDO places great emphasis on the fellowships that this Programme offers, in the belief that the acquisition of skills and the transfer of know-how are basic to the industrial growth of developing countries.

A substantial part of the Programme is devoted to regional projects, which may originate in recommendations of the regional economic commissions of the United Nations and UNESOB. The aim of these commissions is to support the economic activities of the countries of their respective regions and to strengthen economic relations among them. UNIDO co-operates with these commissions and contributes to their work by providing technical support and carrying on joint projects, and, most importantly, by providing the commissions with posts for regional industrial advisers. Paid from UNIDO's Regular Programme funds and attached to the regional commissions and UNESOB, these advisers provide the commissions and the countries in their regions with expert advice on industrial questions.

### SIS

The programme of Special Industrial Services, financed by voluntary contributions of Governments, was established in 1966 as a supplementary means of financing industrial activity. The assistance provided under this programme comes from a trust fund, which was set up to provide a broad range of technical assistance at short notice. The SIS seeks to meet practical and urgent needs in the manufacturing industry that cannot normally be met under the formal procedures of other United Nations programmes. Quite frequently these are short-term needs that cannot be programmed in advance.

The trust fund received at its inception contributions totalling \$4,062,221, with subsequent additions of \$4,343,939. The speed with which developing countries took advantage of the service resulted in annual expenditures amounting to about \$2 million in 1969.

UNIDO's technical assistance under the SIS programme includes:

- Ad hoc* assignment of high-level experts, whose services may be requested on relatively short notice, to advise on specific questions related to the preparation and implementation of industrial projects;
- Assistance in the various stages of new manufacturing projects, particularly in respect of practical needs during the post-feasibility stage of the project, until appropriate financing is assured;

**Expert services on an intermittent basis to make specialists available for brief periods during the development of the project, whenever the need for the particular skills arises;**

**Co-operative attention of various specialists to industrial projects involving complex manufacturing techniques through *ad hoc* arrangements with specialized institutions or experienced consulting engineering organizations that are prepared to make teams of specialists available on short notice;**

**Bringing one or several national technicians to the source of specialized knowledge abroad, either to obtain the required assistance or to learn from first-hand observations the solution to technical problems as practised in industrialized areas;**

**Support in solving specific problems, such as the need for technical documentation, computations or data of a particularly complex nature, laboratory analyses of a type not available locally, design work of a specialized nature etc;**

**Confidential consultations at a high level on matters relating either to specific projects or industrial development policies, and advice on industrial project promotion problems;**

**"Trouble shooting" assignments to solve such technical problems as arise in connexion with the operation of plants and machinery, the flow of materials and quality control.**

In the absence of formal procedures or a programming cycle, requests for SIS assistance submitted by Governments are processed as they are received. Requests are processed expeditiously and approved by UNIDO and UNDP. Recruitment of experts and consultants is handled by UNIDO, on an advance recruitment basis. In addition UNIDO staff members frequently provide the required advice and consultation in the field.

The depletion lately of the SIS trust fund prompted UNIDO and UNDP to conclude arrangements for the future financing of the programme from the Revolving Fund of UNDP to the extent of \$2 million in actual expenditures, with a programming ceiling of \$4 million.

### OPAS

**As a supplement to other forms of technical assistance in the field of public administration, the General Assembly established in 1959 a modest experimental programme to meet the needs of Governments for**



operational, executive and administrative personnel (OPAS) who would serve as officials of the Governments employing them. The programme was originally financed from the Regular Programme of the United Nations. Its usefulness was soon apparent, and as a result of its rapid expansion to fields within the competence of the specialized agencies, the General Assembly authorized the use of UNDP/TA resources to finance the Programme. OPAS is a valuable adjunct to other forms of technical assistance in that it can meet needs at a particular stage of development not necessarily related to a UN-financed project of technical assistance.

The purpose of OPAS is not only to furnish Governments with experienced personnel to fill gaps in their administrative structures and public services, but also to train qualified nationals to take over from the OPAS experts upon completion of their assignments. In 1968, UNIDO provided the services of 15 OPAS experts at a cost of \$300,000.

#### FUNDS IN TRUST

For those developing countries who can afford to pay for technical assistance for projects, the United Nations has worked out arrangements under its financial rules and regulations whereby these countries may deposit funds with the UN and its related agencies to cover the cost of such assistance.

Upon payment by the country of the required funds, UNIDO implements these funds-in-trust projects in the same manner as it implements UNDP-financed projects. The services provided in 1969 under funds-in-trust arrangements cost approximately half a million dollars.

#### UNIDO GENERAL TRUST FUND

Financed from the voluntary contributions of member states, the fund is utilized by UNIDO in the furtherance of its purposes and functions in activities supplementing those developed under established programmes of technical assistance.

The first pledging conference for this fund was convened by the Secretary-General of the United Nations in December 1968 in response to an Industrial Development Board resolution adopted in accordance with General Assembly Resolution 2152 (XXI). Pledges made at the

pledging conference of 11 November 1969 amounted to about \$1.5 million, partly in convertible and partly in non-convertible currency to be used locally in the donor countries.

#### UNITY AND CONTINUITY OF TECHNICAL ASSISTANCE PROGRAMMES

Despite the diversity of the sources of funds for technical assistance and the complexity of the United Nations system for administering the assistance, the various programmes complement each other. Together they have been used to achieve greater programming flexibility and a maximum impact. Training provided under one programme backs up the expert advice rendered under another programme, or a project started by funds from one source, SIS for example, is continued with funds from another, e.g. UNDP/TA or UNDP/SF.

Thus a given agency may draw on several programmes for support to a single project and at the same time several executing agencies may co-operate on the same programme. A requesting Government may combine in one or more projects the resources of several organizations of the United Nations system and several programmes of technical assistance; in fact, they frequently do this, particularly in those areas of development where more than one agency is concerned, such as the agro-industries. A greater effort is being made in the United Nations family to unify and promote the continuity of technical assistance.

## **TYPES OF TECHNICAL ASSISTANCE PROVIDED BY UNIDO**

Technical assistance for industrialization covers a wide range of activities necessary in the establishment and operation of manufacturing enterprises and the development of an integrated industrial sector as a whole. These numerous and varied activities fall into certain broad categories:

Planning and programming on the macroeconomic level, including formulation of development plans and programmes and the support of the relevant governmental organizations;

Formulation and evaluation of industrial projects, feasibility and pre-investment surveys and studies,

Establishment and operation of plants, including the provision of technical and managerial advice at all stages of the project;

Training of personnel and the transfer of technology;

Promotion of export oriented industries;

Investment promotion and financing of industrial projects;

Establishment of service and support institutes, including research, quality control and repair and maintenance facilities.

### **TECHNOLOGY**

The organizational structure of UNIDO recognizes the specialized character of the varied activities related to industrialization but attempts to maintain the necessary correlation between them. Such areas as the selection of the appropriate technology and production process and their application, the nature of raw materials, the plant layout, the type and size of machinery and its repair and maintenance – all of which constitute the physical and technological aspects of industrialization – are the responsibility of one administrative unit, the Industrial Technology Division. As the technical process has to be attuned to its end product, this unit is subdivided according to specific branches of industry or groups of branches.

### SERVICES AND SUPPORT INSTITUTIONS

Industry is not restricted to the physical plants and the technical processes of production. Many other factors are related to the proper operation of the plants and the quality of their products. These include managerial techniques, training of personnel, standards and quality control, and continuous technological research to assist existing and prospective industries. These servicing and supporting activities also require technical assistance. They aim at securing the required skills and techniques through training of personnel and proper managerial and corporate planning at the factory level; quality control and standardization; organization of patents systems and licensing; development of applied research and consulting organizations; promotion of industrial documentation and information services to help in the gathering and dissemination of information on technological data, systems and equipment.

These supporting activities are the responsibility of UNIDO's Industrial Services and Institutions Division.

### PLANNING AND PROMOTION

The economic aspects of industrialization relate to such matters as the setting up and support of governmental organizations concerned with industrial development; policies and planning; programming and evaluation of projects; investment promotion and financing; export-oriented industries and their promotion; and industrial country surveys. These interrelated activities are the responsibility of UNIDO's Industrial Policies and Programming Division.

Technical assistance provided by UNIDO normally falls within the recipient countries' own development plans and objectives. The work of the Industrial Policies and Programming Division is concerned with the over-all support of these plans to ensure that they will be properly administered, that viable projects will be chosen, and that the required capital will be raised.

### TECHNICAL CO-OPERATION

Technical assistance, provided on the basis of formal requests from Governments for a specific and well defined activity, may take the form of short-term consultation by an individual adviser, consultation by one

or more experts attached to a government planning office or manufacturing plant for one or two years, or a long-term pre-investment project for setting up a pilot plant or design centre. The programming, administration and co-ordination of these field activities is the responsibility of UNIDO's Technical Co-operation Division. This work requires the co-operation of the foreign expert in the field, the recipient country, and UNIDO and the other United Nations organizations concerned. It falls upon the Technical Co-operation Division to provide the co-ordination and teamwork both at headquarters and in the field necessary for effective and speedy implementation of projects. The responsibilities of this division include:

Programming of operational activities of the various technical assistance programmes in consultation with requesting Governments and UNDP for projects falling within this programme;

Organization and recruitment, at the request of Governments, of teams of experts and consultants for field missions and the preparation of their job descriptions, terms of reference and plans of operation for major projects;

Implementation of field projects, ensuring their proper execution, and the periodic reporting by experts and evaluation of their work;

Co-ordination of UNIDO's activities as a participating agency in UNDP;

Maintenance of relations with Governments, the resident representatives, industrial development field advisers, and regional economic commissions for programming and co-ordination of industrial development activities.

The importance of continuous and effective relations with the field cannot be overemphasized. UNIDO needs to be well informed of the needs of developing countries in their efforts to industrialize in order to assist them to identify projects and to prepare requests as well as to co-ordinate its activities with those of other UN agencies in the same country. For this reason, industrial development field advisers have been posted to the offices of the resident representatives in the various regions of the developing countries to provide on-the-spot advice to Governments and to facilitate the formulation of their requests for technical assistance. The field advisers also provide liaison services between UNIDO headquarters and the field.

To consolidate contacts with Governments of developing countries and to assist in the promotion of UNIDO activities, UNIDO national

committees are being established in these countries. These committees are composed of representatives of government departments, academic and research institutions, and public and private business organizations.

#### SPECIFIC TYPES OF TECHNICAL ASSISTANCE

The functions of UNIDO encompass the entire field of industrial development related to manufacturing. Although it is not possible to enumerate all the types of technical assistance that fall within such a broad field, some indication of the assistance provided by UNIDO to the different industrial groups may be helpful.

The three major substantive divisions of the UNIDO secretariat have responsibility for fifteen groups of activities, thus:

##### *Industrial Technology Division*

- GROUP 1 Mechanical and electrical engineering
- GROUP 2 Metallurgical industries
- GROUP 3 Construction and building materials
- GROUP 4 Chemicals, pharmaceuticals, pulp and paper
- GROUP 5 Fertilizers, pesticides and petrochemicals
- GROUP 6 Light industries (textiles, food processing, tanning and leather, wood products and others)

##### *Industrial Services and Institutions Division*

- GROUP 7 Industrial legislation, patents, licensing and standardization
- GROUP 8 Industrial research and supporting institutions
- GROUP 9 Industrial information and promotion
- GROUP 10 Industrial training, management and consulting services
- GROUP 11 Small-scale industries and industrial estates

##### *Industrial Policies and Programming Division*

- GROUP 12 Industrial planning and project programming
- GROUP 13 Industrial policies and financing
- GROUP 14 Promotion of export-oriented industries
- GROUP 15 Industrial development surveys

### Group 1 Mechanical and electrical engineering

Mechanical engineering is concerned with the production of machinery and metal products, including transport equipment—road vehicles, railways, ships and aircraft. Electrical engineering is concerned with electronics and electrical power equipment. An important area common to both branches of engineering is the repair and maintenance of equipment.

UNIDO believes that one of the major problems faced by developing countries is the need to obtain more manufacturing machinery, particularly for the manufacture of machine tools. Recent changes in agriculture have resulted in the development of an entirely new group of agricultural implements and machinery. UNIDO is assisting developing countries to produce such modern agricultural equipment, using existing facilities as far as possible.

As industrialization proceeds, the development of electrical power distribution and generating equipment can be expected. Increasing prosperity stimulates the production of household equipment, electrical appliances, and more sophisticated electrical and electronics equipment and machines for the processing industries. UNIDO has also been studying the problems caused by the rapid advance in the science of electronics, is paying attention to the readiness and capability of the developing countries to receive and absorb such advanced technologies, and is attempting to create the means of carrying out this transfer. For most developing countries, the development of telecommunications equipment, particularly in the field of receivers for broadcasting, is especially important in view of its bearing on education and public information.

Another problem in electronics engineering, with its large scientific content, is to provide a professional environment in developing countries. UNIDO is currently implementing several projects that should help in this respect. Among these are an institute for the design of electrical and electronics measuring instruments in India and the reorganization and expansion of the institute for the design of electronics devices for process control in Bulgaria.

Developing countries are receiving assistance in the establishment of design centres for the production of prototype tools and instruments and the creation of original designs; other projects in the engineering field include the establishment of specialized maintenance and repair shops servicing the equipment of various industries. The great need of

developing countries for proper methods of maintenance has prompted UNIDO to launch a broad programme to assist developing countries in establishing proper repair and maintenance facilities.

## **Group 2 Metallurgical industries**

UNIDO's activities in metallurgy cover iron and steel, heavy non-ferrous metals and light non-ferrous metals. In providing assistance in this field, UNIDO is faced by widely varying conditions for the establishment of iron and steel industries in developing countries. Some countries have already achieved considerable success in building up an iron and steel industry; others are only beginning; a third category can develop an iron and steel industry only on the basis of regional co-operation.

The Second Interregional Iron and Steel Symposium, recently organized by UNIDO in Moscow, discussed a number of topics of importance to the development of steel industries in developing countries. Among these were: the possibility of the production of iron by "direct reduction" of iron ores; continuous processes for steelmaking; continuous casting of steel; and other new methods, such as casting of semi-finished products with special configuration, and casting with subsequent rolling.

Certain developing countries plan to create and develop their iron and steel industry by backward linkage, that is, to install steel rolling facilities to process imported semi-finished steel products. Subsequent rolling, steelmaking and iron foundry capacities may be added. To introduce this method, however, it is necessary to have modern rolling mills producing a wide range of different semi-finished and finished products.

Production methods for light and heavy non-ferrous metals are fairly well established, and UNIDO's main concern in this area is to increase the amount of processing done in developing countries.

Developing countries are sometimes required to pioneer the application of new scientific and technical developments. One example of this may be in the processing of titaniferous ores of which many developing countries have large reserves. These countries have requested technical assistance from UNIDO to help in the development of such minerals. The processing of these ores is complicated, however, and needs study; UNIDO has commissioned specialist studies on this problem.



### Group 3 Construction and building materials

In the building materials field, technical assistance covers such areas as the production of clay building materials, bricks and tiles, sanitary ware and building lime; the use of plastics; and the evaluation of computer techniques for handling numerous problems in management and design of construction.

Clay building materials are already manufactured in many developing countries but often by primitive and traditional methods, and there is considerable scope for improvement both in efficiency and quality.

In the cement industry, one problem is that the size of plant that can be justified by a particular market is often too small to be economic. In certain countries there are problems of storage in adverse climatic conditions. The most suitable raw materials are frequently not available, and it is necessary to adapt the processes and modify the fuel requirements. There is, therefore, a pressing need for the design of efficient, flexible, small-scale plants capable of ready expansion as the market grows.

The successful results that have been achieved in developed countries with asbestos-cement products have led some developing countries to request technical assistance in the use of fibro-cement composites. Because of the shortage of local asbestos resources in some countries, UNIDO is investigating the use of alternative fibrous materials and ways in which new types of composites can be manufactured in developing countries.

UNIDO is paying increasing attention to the use of plastics for construction in developing countries. This is an area which tends to be highly sophisticated in developed countries. UNIDO is conducting studies designed to show how plastics can be modified and adapted to the conditions of the developing countries' construction industries and used along with traditional local building materials to provide cheap and efficient structures.

Interest in the use and manufacture of prefabricated buildings is growing, and UNIDO is assisting in the expansion of production facilities to meet the demand.

### Group 4 Chemicals, pharmaceuticals, pulp and paper

While the industrialization of a developing country depends to a considerable extent on ready and low-priced quantities of various basic chemicals, the balance of payments frequently limits their importation

by the developing countries; and it is necessary to look to manufacture within the country. The main chemicals considered are salt, sulphuric acid, soda ash and the caustic soda/chlorine complex, which represent a well-established area of the chemical industry. It may be asked what new aspects of the chemical industry deserve study in relation to the industrialization of the developing countries. UNIDO is considering two main aspects: (a) the problem of adaptation of scale; and (b) the manufacture of salt as a basic raw material for other chemical manufactures.

The adaptation of scale is an important consideration, for large plants, which are customary for basic chemicals in developed countries, are frequently unsuited to the needs of developing countries because of their complexity, the degree of supervisory skill required and the limited local markets. Special plants and/or special marketing arrangements are sometimes required.

The manufacture of common salt in developing countries is receiving attention from UNIDO. At present, many developing countries obtain salt from the sea, using solar evaporation and primitive methods of collection. The salt obtained is used largely for food seasoning and preservation. As a first step in industrialization, UNIDO is assisting in the promotion and modernization of such marine salt industries and the related development of chemicals such as sodium carbonate, sodium hydroxide, potassium salts, bromine and chlorine. When a developing country has a domestic source of these materials, it is on the way to establishing its own chemical industry.

In the field of pharmaceuticals, technical assistance is concentrated on developing products and processes adapted to a given country. Some countries may be able to use natural materials such as botanicals or animal organs to produce the active principles required for certain drug preparations. Packaging of pharmaceuticals is one area in which countries can initiate effort, and as their experience develops they can progress to the preparation of tablets and ampoules.

The production of essential oils from fruits, flowers, seeds etc. is allied to the manufacture of pharmaceuticals. Such oils are used as intermediates, e.g. perfumes in soaps. Technical assistance in this field is also concerned with evaluating economies of scale, potential domestic and foreign marketing, and the effect of product quality in such markets.

UNIDO is also concerned with the development of the pulp and paper industry. Many developing countries, lacking normal resources of suitable timber, nevertheless wish to develop their own pulp and paper

industry from local materials, such as bagasse, sisal and other vegetable fibres. Substantial experience has been gathered in this field, and one of UNIDO's tasks is to make the accumulated knowledge available to developing countries as required.

#### **Group 5 Fertilizers, pesticides and petrochemicals**

Fertilizers are one of the most important inputs into agriculture. Food production also requires the use of pesticides to control various food-destroying agents. Because ammonia, one of the main products of the petrochemical industry, is the starting point for most of the nitrogen compounds used as fertilizers, petrochemicals can be logically grouped with fertilizers and pesticides.

Technical assistance is provided for the following sectors: fertilizers (nitrogen, phosphate, potash), sulphur, pesticides (insecticides, fungicides, herbicides and rodenticides) and petrochemicals (plastics, synthetic fibres and synthetic rubber).

The number of technical assistance projects in the fertilizer field (nitrogen, phosphate, potash) has increased significantly in recent years in order to meet growing demand, with emphasis on feasibility and market studies, improved production and maintenance of existing facilities. Emphasis will be placed on assisting countries only now starting to produce fertilizers. Dry mixing and bulk blending of fertilizers and the production of single superphosphate are attracting particular attention. Countries having production facilities will be assisted in the manufacture and use of liquid fertilizers, diversification of products marketing, establishment of local plants and the solution of problems of underutilization of existing plant capacity. Assistance will be provided on liquefaction of natural gas and on the use of gas for large production units of synthetic ammonia. Technical assistance can be expected for industries producing potash and sulphuric acid based on gypsum.

In the field of pesticides, technical assistance is available for studies on excess chlorine in various countries and for carrying out projects aimed at its economic utilization.

UNIDO is also providing considerable assistance in the field of petrochemicals. Increasing attention will be given to the linkages of the petrochemical industry with other industries and to the establishment of petrochemical complexes on a regional basis in order to overcome the problems of economy of scale and high tariffs. In particular, production

of plastic products, including the use of plastics in construction and pipelines, has been the subject of increased technical assistance. Assistance in the production of protein and fodder yeast from gas and oil may be anticipated.

## Group 6 Light industries

### TEXTILE INDUSTRY

In textiles, activities supported by technical assistance fall into four main categories: systematic studies of the textile industry on a national level, its planning and reorganization; research and development; feasibility studies; and mill-level assignments focused on quality control, better use of raw materials, processing problems, dyeing and finishing and selection of equipment. Almost half the projects fall into the first category. The clear emphasis on sectoral surveys reflects the need to compile and analyse reliable data required for a rational development programme. Large-scale country projects under consideration include provision of consulting services, reorganization and re-equipment of the industry, and establishment of quality control and standards centres.

### FOOD INDUSTRY

Activities in the field of food processing include the establishment and reorganization of vegetable-oil processing plants, fruit and vegetable processing plants, meat and sugar plants, integrated fish-processing plants; research; development of cassava mills; and development and reorganization of rice-milling plants.

Although food and nutrition are mainly the responsibility of FAO, UNIDO also concerns itself with some of the more industrial aspects of food production. For example UNIDO supports two pilot projects for the manufacture of protein from oil and is interested as well in making protein concentrate and protein-enriched materials from soya and fish. UNIDO provides assistance in the over-all planning of the food industry, with emphasis on the establishment of agro-industrial concerns.

UNIDO is also interested in programmes that will make the most advanced rice-milling techniques available to countries in which rice is the main staple food so that these countries may achieve better results in extracting whole kernels as well as rice protein and rice fat. Improved

methods are being investigated for the treatment of sorghum, mill and cassava to make a satisfactory flour.

Most subtropical and tropical countries could grow oil-bearing materials advantageously, but methods of pre-processing, storing and transporting these valuable crops are often very primitive. However, they could be greatly improved by the application of science.

UNIDO is also investigating the application of the latest achievements in sterilization techniques in order to conserve liquids prone to deteriorate and thereby save on storage, transport and refrigeration costs.

#### LEATHER AND FOOTWEAR INDUSTRIES

Technical assistance covers such specific fields as improvement of hides, including flaying, curing and grading; development of industrial methods of producing leather; selection of machinery; feasibility studies; footwear manufacturing; research in leather technology; and marketing of leather and leather products. In some countries, integrated projects are being carried out covering all stages from the handling of the raw materials to the marketing of the finished product. Large-scale projects under consideration include the establishment of centres for applied research and for demonstration and training.

#### WOOD INDUSTRY

Activities in this sector have concentrated specifically on production of particle board; promotion of industrial development of wood-based panels; design of industrial products, e.g. wooden furniture; improved methods in the woodworking industry; use of agricultural wastes in the production of boards; wood drying; and wood impregnation.

#### Group 7 Industrial legislation, patents, licensing and standardization

The aim of technical co-operation activities in this area is to promote the development of modern industrial legislation systems for the protection of both consumers and inventors. Specific activities include the organization and administration of patent offices and systems, licensing of technological innovations and the training of licensees. When technical assistance in these fields is provided, the programmes of long established

international organizations with similar goals, such as the United International Bureaux for the Protection of Intellectual Property (BIRPI), and the International Association for the Protection of Industrial Property (IAPIP) are taken into consideration.

#### **Group 8 Industrial research and supporting institutions**

This group includes three main areas: industrial research, standardization and quality control, and administrative machinery for industrial development. Technical assistance in these areas deals with such matters as the establishment and improvement of institutes and centres for industrial research and technical services, the strengthening of organizational and administrative machinery for industrial growth, and the development of effective standardization programmes and quality control facilities.

In the field of standardization, UNIDO works closely with the International Standards Organization (ISO).

#### **Group 9 Industrial information and promotion**

Activities in this field are designed to further the flow of technical information to developing countries. UNIDO maintains a roster of industrial consultants from which it provides names and addresses when requested to recommend experts in specific fields. It maintains an advisory service for the supply of industrial equipment. It publishes information on investment opportunities in developing countries, and it assists these countries to set up or improve their own industrial information services and documentation and data centres.

#### **Group 10 Industrial training, management and consulting services**

In this field, UNIDO assists developing countries to increase the number and improve the quality of managerial, technical and economic personnel. Training is provided on the basis of both individual fellowships and in-plant group training programmes. Other activities include the organization of management clinics and the establishment of local consulting services.

**Group 11 Small-scale industries and industrial estates**

In this field, of considerable importance to many developing countries, technical assistance has helped to establish and promote institutes and centres for small-scale industry, industrial estates, industrial extension services and common service facilities. UNIDO also provides assistance in related fields such as subcontracting and credit schemes.

**Group 12 Industrial planning and project programming**

Assistance in this area is focused on helping Governments to prepare industrial development plans and programmes; to identify, evaluate and implement industrial projects; to collect and analyse planning data; and to develop an effective organizational framework for carrying on this work.

**Group 13 Industrial policies and financing**

In this field, UNIDO provides advice and assistance in the formulation of: general policies for stimulating industrial development; policies offering fiscal incentives to industry; policies concerned with prices, wages and profits; and policies affecting the public manufacturing sector. It assists in the mobilization of both domestic and foreign financial resources for financing industrial development and in the establishment and strengthening of industrial banks and other financing institutions. To further the flow of capital, UNIDO compiles information on bankable projects, locates appropriate sources of investment, and helps to match the two through investment promotion meetings at the regional or country level.

**Group 14 Promotion of export-oriented industries**

UNIDO's goal in this field is to assist developing countries to identify viable export industries that would broaden their export trade and improve their balance of payments. UNIDO provides advice and assistance in carrying out market studies and in improving standards of quality, design and packaging so that products will be competitive abroad. UNIDO also advises Governments regarding policies and initiatives they might undertake to create and develop export industries.

**Group 15 Industrial development surveys**

Industrial development surveys carried out at the request of Governments and at the initiative of UNIDO in connexion with the Second Development Decade include both country surveys and surveys of specific industrial branches. UNIDO offers technical guidance in the preparation of such surveys. It assists Governments to compile and utilize statistical data on industrial trends.



## PROBLEMS AND ISSUES OF TECHNICAL CO-OPERATION

The scope of this monograph precludes a consideration of all the forces and factors governing industrial growth in developing countries—the economic, social and institutional obstacles to industrialization or the domestic and international measures conducive to it. If “industrialization” is used in its restricted sense to designate the growth of the manufacturing sector, some of the more common obstacles to industrialization in the developing countries can be identified. These include the lack of technical know-how, capital, entrepreneurship and appropriate institutions. Through its technical co-operation programmes, UNIDO seeks to assist developing countries to overcome these obstacles.

The pace and pattern of industrial development depend on a country's natural resources, technical skills, stage of advancement and its socio-political character. These factors extend beyond the scope and capacity of UNIDO's technical co-operation programmes, which are concerned only with specific questions—the flow of technology, the training of manpower, the promotion of investment, and the development of appropriate institutional machinery at the decision-making and servicing levels. The problems and issues of technical co-operation are confined to such matters as the amount and effectiveness of the assistance rendered in relation to the discernible needs and priorities of developing countries.

Since the industrial growth of the developing countries depends to a great extent on the ability and readiness of the industrialized countries to make available the required technology, expertise and capital, industrial development is an international question. The United Nations provides a meeting ground for both groups of countries. The scope of its role in industrialization and in all developmental aid depends on the physical and human resources put at its disposal by the donor countries and the capacity of the recipient countries to assimilate these resources. Its role is a difficult one. When priorities for technical assistance are being established, the United Nations has to respect the wishes and policies

of the requesting countries and to obtain the co-operation of the industrialized countries, whose own economic pursuits and bilateral aid may be at variance with multilateral programmes of assistance.

### THE FLOW OF TECHNICAL ASSISTANCE TO INDUSTRY

The success of technical assistance programmes depends first of all on the amount and proper use of available resources. It depends also on more subtle factors, most of which are beyond the control of the agency responsible for executing the assistance. The foreign expert is the primary means for transferring technical know-how. It is by no means easy to obtain the right expert for the right job. The success of his missions depends not only on his professional skills and his ability to transplant his own country's techniques into foreign environments, but also, and perhaps to a much greater extent, on the recipient country's ability to build upon the highly specialized knowledge he leaves behind. This presupposes the existence of local institutions and counterparts well equipped to carry on the work after the expert has left. The tendency for many countries to request piecemeal assistance reduces drastically the effectiveness of technical assistance programmes.

Since technical assistance to industry requires long-term, international efforts, it is logical to channel it through an international organization, which has accumulated experience in the administration of funds and is capable of pooling the diverse technical knowledge and human resources needed. Such an organization has the added advantage of being on neutral ground both with regard to the provision of the required expertise and the ideological and commercial implications of the advice and consultation requested of it. It is in a unique position in that it can draw on the experience of all the industrialized countries.

Although in recent years developing countries have provided between two thirds and four fifths of the savings required for the total investment undertaken in their countries, the total net flow to them of financial resources from all developed countries and from multilateral agencies was estimated at about \$11 billion in 1967. UNIDO's contribution to this total was meagre, as was that of the UN system as a whole. In 1968, UNDP assistance was less than 2 per cent of the total flow of external financial resources to the developing countries.

One encouraging aspect to this statistical record is, however, that, while the over-all amount of fiscal aid from the industrialized countries

has somewhat dwindled in recent years, the technical assistance resources of the United Nations system have been steadily increasing. Thus, a trend towards multilateral technical assistance can be discerned, coupled with a growing recognition that a greater share of the resources available should be allocated to industrial development. In the last UNDP pledging conference, several of the donor countries announced an increase in their contributions to the programme, but indicated they wished to see more funds allocated to industrial projects. The first UNIDO pledging conference, in December 1968, resulted in contributions of about \$1.5 million to the UNIDO General Trust Fund. Meagre though this amount was, the Conference nevertheless demonstrated the concern felt by many States for increasing the pace of industrialization in the developing countries.

#### PRIORITIES IN TECHNICAL ASSISTANCE

Although United Nations assistance is provided only in response to requests from Governments and the Governments are expected to determine their own needs and priorities, Governments in fact ask UNIDO to assist them to identify their needs and to formulate their requests for assistance. UNIDO also helps to establish priorities through its procedures for approving technical co-operation projects. Because funds are limited, priorities must be given to projects that are most likely to stimulate the economy.

The question of priorities is much more important in industry than it is in other fields of development because industry's demands for capital and skills are higher. Before an industrial project can be chosen, a number of matters related directly or indirectly to the project must be considered, such as location, size, technology, raw materials, markets, balance of payments, training of personnel and supporting institutions.

The intricacies of industrialization policies and the complex criteria for selecting projects cannot be dealt with here. Suffice it to say that the increased cost of industrialization, a result of advances in science and technology, makes the choice of priorities even more critical to industrial planners and the assistance that an international development agency can give in establishing these priorities more welcome. The possible results of hasty and ill-considered decisions may be both costly and harmful.

Four key criteria for a sound industrialization policy have been suggested: "The degree to which the development of various sectors of

the economy is balanced; the rate of industrial growth; the order in which the various industries are established; and the extent of industrialization aimed at.<sup>3</sup> Conditions in the developing countries suggest certain priorities. For most developing countries, labour-intensive industries appear to be more competitive than capital-intensive industries. The availability of raw materials and an adequate market for the product may help to determine priorities. Countries with perennial balance-of-payments difficulties may give priority to the stimulation of exports and/or to import substitution. Finally, certain social and commercial considerations, such as stability of employment and a quick yield of goods, may determine the priority of a project.

How to evaluate all these criteria is the responsibility of the planners, who have to make their decisions on the basis of the present economic situation in their country and of its future development. The role of technical co-operation is to assist the planners at the decision-taking level as well as at the implementation stage so that whatever resources are available will be invested in projects with the greatest yield.

#### IMPROVING THE EFFECTIVENESS OF TECHNICAL ASSISTANCE

The effectiveness of technical assistance depends to a great extent on the expeditions recruitment of experts, the evaluation and follow-up of projects, and the flexibility of programming procedures. These matters have been under constant review by UNIDO and the other UN agencies concerned with technical co-operation; and over the years a number of measures have been adopted to improve the means of delivering technical assistance.

##### Recruitment of experts

All technical assistance programmes face common difficulties in recruiting experts. Recruitment problems are particularly acute in the field of industry, where it is difficult to compete for the few highly qualified, highly paid experts. Once UNIDO was established, urgent measures were adopted to remedy the normally slow process of recruiting technical personnel. Among these measures were the establishment of a recruiting unit at UNIDO headquarters to supplement and eventually

<sup>3</sup> See: *Processes and Problems of Industrialization in Under-developed Countries*, p. 69 (United Nations publication, Sales No.: 55.II.B.1).

assume the functions of TARS (the Technical Assistance Recruitment Service) in New York. At the same time a UNIDO planning unit was set up whose functions are to examine well in advance the expected needs for experts so that advance measures can be taken to secure them. This unit also schedules their work so that highly qualified experts can be used continuously in a succession of missions. It is extremely difficult to recruit experts for short or medium-term missions.

UNIDO has established a contracting unit for procuring the services of consultants and consulting firms and for the purchase of equipment. The use of consulting firms has often much to recommend it when individual experts either may be difficult to locate or will prove inadequate for a complex mission.

Recruitment is a long and complex process involving the Government requesting the assistance, the countries nominating candidates for the posts and UNIDO. Recruitment requires programming and budgeting. Job descriptions must be issued, candidates interviewed and a roster of promising candidates compiled. The requesting Government must then select the expert to be appointed. Although a time lag in filling vacant posts is inevitable, the administrative measures taken by UNIDO in co-operation with the countries involved should reduce it to a minimum.

### **Evaluation and follow-up of projects**

Of the four main phases in developmental assistance—identification of needs, appraisal of projects, operational control and implementation, and evaluation of results and follow-up—the last has been the subject of particular concern to those in the United Nations engaged in technical co-operation. Since its inception UNIDO has been aware of the importance of evaluation and follow-up. A special unit has been set up at headquarters to establish procedures for continuously and systematically evaluating field projects and operational methods. The success of efforts to evaluate the impact of technical assistance projects and their results depends very much on the ready co-operation of the assisted country.

### **Flexibility of programming procedures**

All organizations concerned with technical assistance to industry face the vexing problem of adapting fixed programming procedures to meet industry's special and urgent needs. SIS, especially tailored for the

manufacturing industry, was to a great extent UNIDO's solution to this problem. As previously mentioned, the procedures governing UNDP/TA assistance were changed to increase programming flexibility. Similarly, in UNDP/SF, new elements are continuously introduced to lessen the rigidity of the programme. The "mini" project, for example, is designed to satisfy the need for shorter-term assistance, provided by a small team of experts, as distinct from the traditional, large, "institutional" projects. Advance appropriations are also possible when it is reasonably certain that projects will be approved. These projects can be launched before they receive formal approval. A revolving fund would permit feasibility studies of potentially urgent Special Fund projects to be undertaken without referring the request to the UNDP Governing Council.

## Annex

### **RECOMMENDATIONS APPROVED BY THE INTERNATIONAL SYMPOSIUM ON INDUSTRIAL DEVELOPMENT, ATHENS, 1967<sup>1</sup>**

Having regard to the limitations of funds available for technical co-operation and in view of the need for securing the greatest effective use of such funds, it is recommended that priority be given to technical co-operation projects which can demonstrate that optimum results can be gained from the expenditures.

Owing to the special qualifications required of experts in the field of industrialization and the urgency of the recruitment problem, consideration should be given, as a matter of urgency, to the establishment of special facilities for the speedy recruitment by UNIDO of competent technical assistance personnel.

In view of the need for expeditious recruitment of experts with diverse and high-skilled capabilities, it is recommended that greater use be made of consulting firms.

Developing countries should intensify their efforts to provide capable counterpart personnel for United Nations programmes and projects in the field of industry.

The Centres for Industrial Development established or in the process of being established in a number of countries with the assistance of UNDP/UNIDO should play an expanding role in assisting in the identification and implementation of industrial pre-investment projects.

Taking into account the Industrial Promotion Service and the value of the services it provided during the Athens Symposium, it is recommended that consideration be given to ways and means for providing further services of a similar nature.

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<sup>1</sup> From Report of the International Symposium on Industrial Development, Athens 1967 (ID/11) (United Nations publication, Sales No.: 69.II.B.7).

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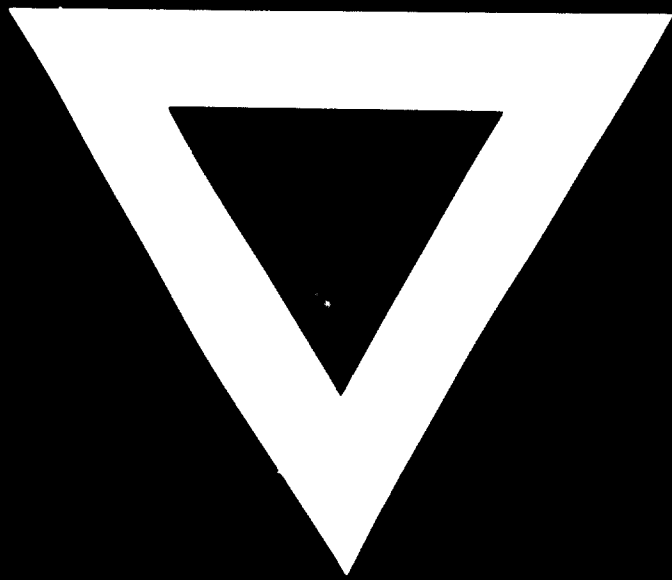
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