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PROPOSALS FOR A CENTRE FOR INDUSTRIAL PROMOTION AND DEVELOPMENT AND FOR  
AN EQUIPMENT REVOLVING FUND

A. CENTRE FOR INDUSTRIAL PROMOTION AND DEVELOPMENT

Composition and functions

1. In general, the composition of a centre would include, for example, one industrial engineer specializing in particular in small-scale industry and able to promote and supervise the operation of an industrial estate; one industrial economist able, among other things, to give advice on planning and to co-operate with the engineer in carrying out project evaluations or analyses of surveys or in making investment proposals, etc.; one expert in accounting and management; one mechanical engineer; and in some cases, one shop foreman.
2. Fellowships for basic or further training would be provided for national counterparts, and the Government would be asked to ensure that their general level was as appropriate as possible so that they could take over all the work of the project.
3. A mission of consultants might be envisaged to assess progress on the project once or twice a year and give advice on the adjustments or improvements which might prove necessary.
4. Depending on the case, the centre would be autonomous, with a board of directors under the supervision of the ministry of industry, or would simply take the place of the directorate for industry of this department (something which would obviously be advantageous from all points of view for many countries), or else would become one of the most important units either in the ministry or in the directorate for industry. This is a choice which only the country concerned can make. In either case, a co-manager to assist the project manager would be appointed by the Government and the team would have the greatest possible independence. Its role would embrace the following functions, assuming that it would be the only focus for examining all problems relating to industrialization:

(a) It would advise the Government, where appropriate, in framing and preparing its industrial development policy and would follow the implementation of the resulting programme, undertaking periodic evaluations of that programme to determine what obstacles, if any, were hindering its implementation or what adjustments were required and to suggest appropriate measures.

(b) In order to do this, the centre would prepare a systematic inventory and study of possibilities for the industrial development of the country and for financing. It would evaluate manpower requirements and would prepare a suitable programme for training this manpower.

(c) It would carry out sectoral studies directed in particular towards the establishment of pilot small-scale industries or the processing of certain traditional products and the improvement of certain craft activities with the purpose of impelling them, in time, towards the conventional form of small-scale industry. This aspect of its activities might make possible the adaptation of technological processes to the country's requirements and would constitute one of the possible channels for the transfer of new technical know-how or technology, a problem which - justifiably - is of increasing concern to the developing countries.

(d) It would prepare for the Government all projects or studies concerning investments which the Government might be planning to make either directly or in a semi-public form, laying all the implications clearly before it as factors on which to base a final decision concerning the best course to take.

(e) In the context of its industrial development programme, on behalf of the Government, it would analyse, evaluate and comment on investment proposals submitted to the Government by foreign promoters or investors relating to industries of such scope, judged by the importance of the raw materials, that they would not fall into the category of industries provided for in paragraph (c) above.

(f) To some extent, the centre would serve as a "clinic" for existing or future industrial enterprises, to which it would give advice and suggestions in cases of difficulties in their daily operation.

(g) In order to awaken and maintain a constant interest in co-ordinated and trustful co-operation between the State and the private sector, the centre would take the initiative in maintaining sustained contacts with the national committees and all other organizations whose activities are directly or indirectly related to the industrial field.

B. EQUIPMENT REVOLVING FUND

Objective

(a) In order to avoid stopping at studies, advice or suggestions, generally with no follow-up, our action could go still further and our assistance achieve greater depth of effect if we could supplement this type of assistance by making available to the countries concerned funds varying in amount depending on the country and the needs, intended for purchasing small industrial equipment which would be used to implement the sectoral studies prepared by the centre in which positive conclusions had been reached (see paragraph 4 (c)).

Organization

(b) Depending on their source and in accordance with relevant local regulations, these funds<sup>1/</sup> would be jointly managed by a committee made up of a representative of each of the parties concerned (the Government, the source of funds, the national committee for UNIDO, the development bank, entrepreneurs or industrialists, etc.). In addition, one might consider the possibility that this "management committee", possibly expanded, might assume the functions of board of directors of the centre if the latter had autonomous status.

(c) The Government, in its policy of incentives in this field, and of encouragement and training of national entrepreneurs, would indicate the sectors in which preliminary experiments could be undertaken, and the "management committee" would allot the equipment required or the funds for purchasing it<sup>2/</sup>. This allotment would be made to individuals, co-operatives or corporations in the traditional activities concerned, and the primary condition would have to be that the persons concerned would have some experience in the relevant field (craftsmen, peasants, merchants, etc.), would have the necessary determination and would be prepared to act in accordance with the targets established by the centre for the gradual development of the activity.

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<sup>1/</sup> It should be pointed out that these funds can equally well take the form of cash or of equipment obtained either from bilateral assistance or from UNDP, the World Bank or out of UNIDO's General Trust Fund.

<sup>2/</sup> The centre's experts would in any case be responsible for selecting the equipment.

(d) After the "management committee" had taken its decision, the equipment would be supplied on interest-free credit repayable in a reasonable length of time. The revenues accumulating after deduction of amortization charges and operating costs would be used for renovating or enlarging the plant or purchasing new equipment for other activities. In other words, the provision of funds through UNIDO would take place only once. At the outset, the system would, for example, operate in the form of pilot experiments, with the centre responsible for undertaking any adjustments which might become necessary in the light of progress achieved and difficulties encountered.

(e) Installation, operation and management would take place with or under strict supervision by the personnel of the centre, whose on-the-spot training programme, supplementing its theoretical work, would be implemented in the plant at both the managerial and worker levels.



## DEMONSTRATION PLANTS

### Purpose and Definition of Demonstration Plants

At the request of the Governments of developing countries, UNIDO can undertake through the Special Fund component of the United Nations Development Programme and with the approval of the Governing Council of the UNDP to supply, construct, commission and assist in the operation of industrial scale processing plants. As the term "demonstration plant" would indicate, the purpose of this form of technical assistance is to achieve some or all of the following objectives:

- Development of the use and upgrading of locally available raw materials;
- Seeding and subsequent development of domestic markets for products made in such a plant;
- Demonstration of the feasibility and method of development of the particular sector of industrial activity;
- Development of process know-how and skills in the country receiving assistance and, in particular, training of staff and operators in factory management, operation and maintenance;
- Stimulation of the development of local ancillary and service industries.

In short, the purpose of a demonstration plant is to act as a catalyst and to stimulate in practical terms the development of a sector of the manufacturing industry in the developing countries. This concept does not normally include setting up of extensions to industrial manufacturing operations which already exist in the given country nor setting up of "pilot plants" conceived in the engineering sense, where the purpose is to bridge the gap between laboratory and large industrial scale operations and to provide design data for plant design purposes.

### Scope of Assistance

This form of technical assistance which can be provided by UNIDO can cover any sector of the manufacturing industry, providing the technical and economic feasibility of the development of this sector has been satisfactorily

demonstrated. For example, current UNIDO projects include supply, construction and operation of demonstration plants for the production of phosphatic and compound fertilizers, sulphuric acid, bromine recovery from spent bitterns, and production and formulation of pesticides. Because of UNDP policy and financial considerations, however, the amount of investment by the UNDP and therefore the size of the demonstration plants are limited.

As a guide to the total investment involved, in the case of the above mentioned examples of demonstration plants the maximum total investment, including provision of working capital and cost of plant operation for a limited period, is of the order of US\$ 2-3 million, including both the UNDP and Government contributions.

It will be seen therefore that this concept of setting up demonstration plants relates to relatively simple industrial operations and precludes setting up of large scale industrial complexes.

#### Method of Execution

This type of project is usually developed after an initial feasibility study which has proved the desirability of setting up by UNIDO of a demonstration plant. Because of its relative magnitude, the project is implemented over a period of years and is financed through the Special Fund component of the United Nations Development Programme and is subject to the administrative and financial policies governing this programme. In general, the UNDP Special Fund allocation for this type of project includes the supply of some or all of the following items, as required:

- Design, procurement, supply, erection, and commissioning of the plant and ancillary equipment. This part of the project supply is normally provided by means of a sub-contract with one or more engineering contracting companies.
- Expert services, including staff for project management, supervision of plant construction and start-up, plant operation, product quality control.
- Miscellaneous advisory and engineering services such as civil engineering design, assistance in market development and marketing of the products of the plant.
- Training of local plant management, operating and maintenance staff.

- Provision of miscellaneous supplies such as equipment spares, fuel, filling of catalysts and consummable materials for plant operation, maintenance tools and equipment, vehicles, laboratory equipment for product quality control or process development.

The Government receiving assistance is expected however to provide a counterpart contribution according to the terms governing the Special Fund component of the UNDP. Such contribution usually includes the supply of some or all of the following:

- Provision of land for the plant.
- Supply and construction of buildings or of building materials
- Provision of professional and other staff, and skilled and unskilled labour for plant construction, operation and maintenance.
- Miscellaneous locally available equipment and supplies
- Local handling and transport of imported equipment and supplies
- Insurance of plant and equipment, and plant construction and operating personnel.
- Provision of the working capital and supply of raw materials, utilities such as water, electricity and fuel, consummable materials, etc, for plant operation.
- Provision of housing for expatriate project staff.

## AGRICULTURAL MACHINERY AND IMPLEMENTS

### 1. Introduction

As most of the least developed among the developing countries are based on a basic agricultural economy, and the technological and industrial level is in the primary stages, industrialization activities, based on industrial inputs for agriculture and processing of outputs claim a high priority. Therefore, as recommended by the 51st Session of the Economic and Social Council, the first UNIDO Special International Conference on Long-Range Strategy and Orientation of UNIDO Activities, and, as directed by the Industrial Development Board at its 5th Session, UNIDO has given a significant attention to the development and local manufacture of suitable agricultural tools and implements in the least developed among the developing countries.

### 2. Outline of the Projections in the 1970's

Most of the least developed countries among the developing will emphasize on product lines which will involve small-scale production and intermediate technology. Such countries will continue import of tractors, engines, pumps and power equipment on a limited scale. They will give more emphasis to local production of hand-tools such as shovels, spades, rakes, pick axes, machetes, etc..., simple hand operated machines such as corn shellers, chaff-cutters, winnowers, peanut shellers, threshers, hand pumps, hand sprayers; and on animal-drawn implements such as plows, cultivators, harrows, bullock carts, seed drills, etc... There will be more flow of information and assistance from more developed countries among the developing to the least developed countries in the manufacture of these items as most of the industrialized countries discontinued hand-operated machines and animal-drawn equipment.

In selected least developed countries in addition to hand-tools, hand-operated machines and improved animal-drawn implements, there will be emphasis for the local manufacture of certain simple tractor-drawn implements, irrigation pumps, power threshers, small engines and selected crop protection equipment.

Import of tractors and other power equipment will be continued. The countries will look for foreign collaboration in the manufacture of small engines and, in some cases, of pumps. The countries will put emphasis on the improvement of existing metal working industry and diversified production programmes, including agricultural machinery, and implements production. These countries will continue to import steel, and will use mostly mild steel or in some cases medium carbon steel. However, existing or new small foundries will meet the requirements for grey iron castings. These countries will also give emphasis to the development, adaptation, prototype fabrication of hand-operated machines and animal-drawn as well as simple tractor-drawn implements. Therefore, the facilities of the existing institutions in this field will be reinforced. These countries will also encourage co-operative usage and hiring stations for tractors and power machinery, give emphasis to the establishment of repair and maintenance workshops, utilization of mobile units and training of mechanics.

3. UNIDO Technical Assistance Activities

Most of the least developed countries have expressed a desire to receive UNIDO technical assistance in the field of development and manufacture of agricultural tools and implements. The type of assistance requested is specifically in the area of manufacturing feasibility study, manufacture of hand-tools and animal-drawn implements, repair and maintenance and marketing. As of January 1973, 11 least developed among the developing countries have submitted 13 official requests for technical assistance for a total duration of 52.25 m/m, involving 17 experts and two mobile workshop units. Among the 13 projects, two are joint UNIDO-FAO projects with 3 m/m of FAO expert assistance. In addition, it is anticipated that other 12 countries may initiate technical assistance activities in the field of agricultural hand-tools and implements in the near future.

4. Specific Examples of Technical Assistance and Supporting Activities - Official Request Received

A. Burundi:

Agricultural Tools Manufacturing Feasibility Study (SIS/69 BUR-8)

A two member UNIDO-FAO joint team completed the mission (UNIDO: 3 months, FAO: 1,5 months) in 1971, and has recommended a comprehensive programme for mechanization and expansion of existing facilities with respect to hoes and other hand-tools.

B. Chad:

Evaluation of Proposals Received with Respect to Manufacture of Agricultural Tools (SIS/71/1187 CHAD-8)

A UNIDO expert (3 weeks) assisted the Government in 1971 in the analysis of the manufacturing proposals received and has recommended a detailed programme for establishment of local manufacturing facility for hand-tools and animal-drawn implements. The proposal has been included in the country programme by the Government.

C. Malawi:

Market Analysis and Manufacture of Agricultural Tools and Implements (SIS/70/796 MALAWI-1)

The Government has requested UNIDO assistance. UNIDO would be making available an expert for a duration of 3 months.

D. Uganda:

Mechanical Harvesting of Papyrus Harvesting (SIS/69/451 UGANDA-7 REV-1)

The Government has requested UNIDO assistance in this field.

E. United Republic of Tanzania:

Organization and Operation of Agricultural Machinery and Implements Repair and Maintenance Facilities (V.C. Pad 70-187 and SIS/71/1247 TAN-8)

UNIDO has made available two mobile work shops under UNIDO voluntary contribution (GTF) financing, and two experts for a duration of 6 months each, under SIS financing, in the field of repair and maintenance are being made also available.

Market Survey of Agricultural Machinery and Implements (EJW-121-SHC SW/ID)

A UNIDO expert has been attached to the Industrial Studies and Development Centre at the request of the Government. The expert who is on an assignment of 6 months duration is assisting the Government, the USUNGO Farm Implements Factory and ILM Centre in the development of local industry through a comprehensive market analysis.

F. Upper Volta

(a) Manufacture of Agricultural Tractors and Implements

The Government has requested UNIDO assistance (6 months duration) in formulating a rational local manufacturing programme.

G. Sudan

(a) Agricultural Machinery and Implements Manufacturing Feasibility Study (UNIDO-EAO Joint project, SIS/70/1128 SUDAN-19)

A two member UNIDO-EAO team (UNIDO 4,5 months, EAO 1 month) assisted the Government in analysing the agricultural machinery manufacturing and mechanization programme. The team has made comprehensive recommendations on implements manufacture, tractor assembly, development and testing and repair and maintenance activities.

5. Forecast of Projects in Pipe Line

A. Botswana: Establishment of small workshops for the manufacture of poly-cultivators, hand-tools and implements; repair and maintenance shops.

B. Chad: Establishment of a manufacturing unit for hand-tools.

C. Dahomey: Agricultural implements and tools manufacturing pre-feasibility study.

D. Ethiopia: Pre-feasibility study for the manufacture of animal-drawn implements, hand-tools, hand-operated machines and repair and maintenance programme.

E. Guinea: Repair and maintenance facilities and spare parts manufacture for agricultural machinery and implements.

F. Lesotho: Development of hand-tools industry in small-scale sector.

G. Mali: Establishment of manufacturing facilities for hand-tools, carts and animal-drawn equipment.

H. Niger: Manufacture of hand-tools and implements.

I. Uganda: Manufacture of hand-tools.

J. Somalia: Repair and maintenance and manufacture of hand-tools.

6. Proposed Supporting Activities 1973

Manufacturing Development Clinic: Hand-Tools and Animal-Drawn Equipment

It is proposed to invite a number of least developed countries to a selected advanced developing country with a relatively high manufacturing industrial level with respect to hand operated and animal-drawn agricultural implements. During

this one week meeting the representatives of the least developed countries will study the product ranges and manufacturing techniques and will select product ranges and technology which may have potential for local manufacture.

7. Conclusion:

UNIDO would continue to give more emphasis to the industrial development of the least developed among the developing countries. Assistance in the manufacture of hand-tools, hand operated machines and animal-drawn implements, transfer of appropriate technology and prototype products with a view for local manufacture from the developing countries to least developed countries, and improvement of repair and maintenance activities are but a few of the examples in the field of agricultural tools and implements.

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MANUFACTURE OF ANIMAL DRAWN IMPLEMENTS AND HAND OPERATED MACHINES IN THE LEAST DEVELOPED COUNTRIES

Organized by UNIDO in co-operation with the Government of India to be held in New Delhi for ten days during the last quarter of 1973

1. Background information

1.1 The UNIDO Expert Group Meeting on Agricultural Machinery Industry in Developing Countries held in Vienna in August 1969 recognized the need to focus attention on development and local manufacture of animal drawn implements. In most of the developing countries in general, and in the least developed countries in particular, there is a large animal and human population on small arable farms. The efficiency of their operations could be significantly increased through proper use of animal and machines.

1.2 Normally, a good pair of draft animals (bullocks) can exert 0.5 horse power per pair and a human labour of 0.01 horse power per person during the course of the agricultural work. It has been proved that by utilizing better designed harness, the output of pairs of bullocks could be increased to about 1.00 to 1.25 horse power per pair. In addition, the quality and rate of work could be increased significantly by using improved animal drawn implements such as mould board ploughs, harrows, cultivators, sowing carts, planters, fertilizer distributors and hand operated machines and tools such as hand tools, sprayers, shellers, threshers, etc. Such implements are urgently needed in the least developed countries, and based on the technological level required for local manufacture as well as on the type of raw material used, there are good possibilities for local manufacture.

The industrialized countries have discontinued manufacture of many such items long ago. Therefore, there is a need to secure the assistance from appropriate developing countries which are successfully manufacturing such items for the transfer of technology to the least developed countries. Small pilot manufacturing facilities could be established in appropriate least developed countries for the manufacture of selected simple implements with the assistance of such developing countries.

2. Purpose of the Manufacturing Clinic

2.1 A number of least developed countries are interested in establishing small and medium scale manufacturing units. The project is aimed at the transfer of know-how from developing countries to the least developed countries. The project intends to bring potential entrepreneurs and Government officials (Ministry of Agriculture and Ministry of Industry) of least developed countries in contact with medium scale manufacturers in a developing country. During this 1973 contact meeting, the representatives of the least developed countries, in consultation with the manufacturers and with the assistance of UNIDO experts who will be present, will select product lines (animal drawn implements and hand operated machines) appropriate to their countries. As a follow-up on this meeting, it might be envisaged that direct assistance to least developed countries will result.



3. Description of the project - Manufacturing Development Clinic

3.1. Participants in the ten day Manufacturing Clinic will be representatives from twelve to fifteen least developed countries, manufacturers of animal drawn implements and hand tools from selected developing countries, three UNIDO experts and also officials from FAO. There will be an exhibition of various manufactured implements and tools. The Manufacturing Clinic will consist of:

- 2 days: technical consultations
- 1 day : review of exhibits
- 2 days: field study
- 2 days: factory visit and consultations
- 2 days: consultations with manufacturers
- 1 day: finalization of consultations

3.2. During this Manufacturing Clinic, the participants will identify suitable products that may be manufactured in their countries with the assistance of UNIDO experts present and in cooperation with FAO officials and other technical personnel present. The participants will select specific items that may be considered for manufacture in their country. In addition participants will formulate a preliminary manufacturing programme. They will also formulate the draft request that may be submitted to UNIDO to carry out activities at a later date.

4. Date, Place and Organization

4.1 The Manufacturing Clinic will be held in New Delhi for ten days during the last quarter of 1973 and in co-operation with:

Ministry of Agriculture, Government of India  
Indian Agricultural Fair  
Indian Society of Agricultural Engineers  
Indian Agricultural Machinery Manufacturers Association

## MAINTENANCE AND REPAIR IN DEVELOPING COUNTRIES

### Introduction

Fostering economic and industrial growth is being given increasing attention in developing countries. Acquiring capital equipment is one of the very important pre-requisites for industrial development; what is more important, however, is the safeguarding and efficient use of such equipment. Poor utilization of capital equipment, resulting in low output and shorter life, is a waste of capital, one of the scarcest resources in developing countries, and is a very great hindrance to growth.

Many reasons lead to such poor utilization of capital equipment, however, inadequate maintenance and repair are certainly amongst the most important ones. Economic development is not an easy process and developing countries have to overcome many difficulties in order to attain a reasonable rate of growth. It is imperative that developing countries should not burden themselves with greater difficulties and higher costs than what would be necessary, by neglecting their capital equipment and not paying due attention to the maintenance and repair of such equipment. The increasing financial limitations on the purchase of equipment, material and repair requirements resulting from the increasing indebtedness of most developing countries makes the safeguarding of capital and securing the optimum industrial output of crucial importance.

Unfortunately, however, industrial surveys in developing countries show that, generally, maintenance and repair is greatly neglected. Almost all attention and efforts are directed towards new investment and new factories and very little is directed towards getting the maximum possible from and safeguarding of investments already made. It is recognized that, in most developing countries, relatively small attention and inputs directed towards maintenance and repair of existing equipment would lead to considerable gains both in the short and long run and is certainly one of the most effective ways of stimulating industrial development.

### Requirements and implications of maintenance and repair

The objectives of maintenance and repair are:

- a) To avoid to the greatest possible extent emergency stops and accidents;
- b) To secure the maximum possible efficiency of production equipment and the required quality of industrial products at all times;

- c) To prolong the life of capital equipment;
- d) To increase to the maximum possible limit the availability of capital equipment for production;
- e) The above objectives should be attained with the lowest possible cost. An efficient maintenance and repair should lead to a lower overall production cost.

Maintenance and repair are a long-term operation which entails many inter-related aspects, activities and techniques. The economic and organizational aspects of maintenance are as important, if not more important, than the technical aspects. It is a big mistake to think of maintenance only in terms of repair operations at the floor level; maintenance is much more than this. The system is still prevailing in many enterprises of waiting until a machine breaks down and then try to repair it as efficiently and quickly as possible. This is certainly leading to a very inadequate and costly maintenance, a very high consumption of spare parts and unexpected stoppages which would upset delivery programmes. Neglecting other aspects of maintenance, mainly the economic and organizational and managerial aspects would lead, most probably, to the wrong type of maintenance being carried out, and to a very low level of performance. As a matter of fact, it is recognized, that a proper organization of maintenance would solve many of the maintenance problems in developing countries without the need for additional repair facilities and skill. A typical example is the crucial problem of spare parts and the lack of sufficient foreign currency to import the required spares. Reducing spare parts consumption by organizing maintenance would go a long way towards solving this problem without the need for extra hard currency.

There are many maintenance approaches and techniques which are adopted for solving maintenance problems. Each of these serve a particular purpose and any complete maintenance plan should entail all these techniques, but to different degrees according to local conditions.

The most important technique is maintenance prevention. The idea is why spend effort and resources on any activity if it can be avoided completely. Such approach is more important for developing countries where capital and skill are very scarce. Maintenance prevention means trying to eliminate as much maintenance and repair work as possible. This takes place in two stages. The first is when equipment is ordered and specifications are made. Any effort directed towards the securing of a design suitable for local conditions and guaranteeing of the supply of adequate maintenance and technical information is worthwhile. The second stage of maintenance prevention starts when the equipment is actually in operation. Failures should be studied carefully in order to eliminate them as much as possible. This could be attained through change of design, of material or of working conditions. The latter

may necessitate training of maintenance personnel or production personnel or both.

Not all maintenance and repair work can be avoided through maintenance prevention. However, the maintenance and repair work which has to be carried out must be carefully planned, otherwise, maintenance could never be performed efficiently and economically. In most developing countries, there is very little hope of overcoming maintenance and repair difficulties unless planning is given ample consideration.

Maintenance planning includes many activities in addition to the routine maintenance operations, such as preventive maintenance, corrective maintenance, predictive maintenance and others, all of which should be carefully considered in the process of planning and programming of maintenance activities.

To assist the developing countries in their efforts to improve local maintenance and repair facilities UNIDO has launched a campaign by offering a number of different types of technical assistance services including field projects. By organizing meetings of experts, symposia and working groups, UNIDO intends to disseminate the knowledge in the field of maintenance and repair and impress upon the responsible people in the developing countries the importance of preparing maintenance of industrial and other equipment.

A number of studies on different aspects of maintenance and repair have been prepared with the assistance of the UNIDO secretariat for distribution and use in the developing countries. New features of the UNIDO campaign include the organization of "Maintenance Weeks" and other technical and promotional events. In the field, UNIDO provides expert advice and implements projects of different types through its special industrial services programme, UNIDO satisfies the urgent requests for technical assistance while the larger projects usually financed by the UNDP/SF deals with the establishment of services and workshops when the local conditions call for them. A number of mobile workshops have been delivered to a number of developing countries to serve the needs of more remote areas and specific types of equipment.

Currently there are more than twenty-five projects under implementation and an equal number of projects is being negotiated with the respective governments.

## METALLURGICAL INDUSTRIES

### 1. Introduction

Research investigations in general and pilot plant trials in particular play a dominant role among the various factors contributing to the growth of mineral and metal industries.

Success or failure of pilot plant investigations determines whether a particular process will find eventual industrial scale utilization or shall perish by the wayside on the difficult road between research and industrial production. The decisive factor in such trials is the embracing breadth of research and development projects, ranging from the basic chemistry of reactions to financial evaluation of processes in terms of economics involved. Pilot plant investigations determine the speed by which the latest technological innovations find their way from the laboratory bench to the industrial floor. Pilot plant investigations not only permit but also condense blunders committed on a small scale that can eventually lead to rewarding successes on a much bigger scale. Pilot plant trials also provide valuable data on potentialities of by-products recoveries and their full utilization. The role of pilot plants in metallurgical research and development is indisputable.

2. The following typical cases of pilot plants and demonstration plants are given herewith as illustration of the Metallurgical Industries Section in these fields.

#### (a) Establishment of a Demonstration Plant by Andhra Pradesh Industrial Development Corporation for Production of Foundry Pig Iron utilizing raw Non-caking Coals (India)

The purpose of this project is to produce foundry pig iron without using coke and thus to conserve the reserves of caking coals to provide new outlets for raw non-caking coal and to develop new technology in the country to enable production of foundry pig iron in smaller units catering to local markets.

**(d) Pilot scale metallurgical processing of ilmenite concentrates (India)**

Aware of the need for processing minerals before use and the technological developments in the pigment manufacture, the Indian authorities are interested in the upgrading of ilmenite using a metallurgical process which would recover both the titanium and the iron values present in ilmenite concentrates to titanium-rich slag and pig iron. Based on the positive results of the study, a pilot plant will be created with UNIDO assistance.

The pilot plant will consist of a closed type furnace in which ilmenite concentrates together with reducing agents (anthracite, petroleum-coke or other carbonaceous materials) are charged. Electromelting of ilmenite together with a reducing agent will produce two products, namely titanium-rich slag and pig iron. The titanium rich slag will be crushed after cooling and the pig iron is proposed to be used for the manufacture of ferrous aluminium, which is required in decarburization of steel.

**(e) Foundry and mechanical workshop (Sudan)**

UNIDO is providing assistance for the establishment in Sudan of a demonstrative foundry and a small machine shop which will play a role not only in the maintenance and repair activities but will also be a centre of irradiation of metallurgical technology and for training.

Although foundry products (castings) comprise only a minor portion of the metals consumed in a developed economy, foundry industry is an important branch of the metallurgical industry. Castings are essential for a range of products: household fittings and appliances, machine tools frames and parts, automotive parts, agricultural machine components, hand tools, etc.

The success of prototype foundries has been proven in certain developing countries. The necessary equipment is relatively simple, at least for the most common cast products.

## BUILDING MATERIALS INDUSTRIES

The housing and institutional situation throughout the least developed countries requires special attention and initiative, through transfer of know-how, to overcome the shortage in housing and institutional facilities, as well as to face the demand for structural buildings created by the industrialization growth. The rate of population growth emphasizes the need for planning and urgent decision making. The planning consists of evaluating and assessing the following:

- a. The availability of non-metallic raw materials and wood resources established through surveys;
- b. The prospective local and regional market for the selected building material industries, including such materials as cement, lime, bricks, lumber, wood based panels, wood-wool and wood-chip slabs, roofing tiles, floor and wall tiles, sanitary ware, household ware, refractories, decorative stone, joinery (doors, windows, roof trusses) as well as secondary products such as extenders, fillers for related industries, such as rubber, paper, cosmetics, pesticides, carriers, filtering agents;
- c. The implementation and establishment of industrialization for the above building materials and refineries of non-metallic minerals and supporting refractory materials for further industrialization of related industries;
- d. Application of produced building materials for construction of low-cost housing, institutional buildings, hospitals and industrial estates, through the use of modern building methods and prefabrication etc.
- e. Rationalization of construction.

Since in most countries, the production of building materials is a neglected industry, it is however, an expanding enterprise. Much experience gained in this field by the more developed countries using modern principles for production can be adapted to the conditions in least developed countries. However, the establishment of any industry can best be implemented in the order of a), b), c), d), and e) as mentioned above. In the Building Materials Group of UNIDO, our basic principles are formulated to assist the governments with requirements for development of industries and better living conditions for their people.

The utilization of raw material resources is of utmost importance when a market for products made from those materials is available. The industrial technology can then become a reality, with a balance for raw material exploitation, building materials industries and related industries are geared and linked with the local and/or regional market.

UNIDO is able to assist in the economic aspects of building material and construction industries and related industries through feasibility studies by delegating experts or selected consulting engineering companies, pre-investment planning, evaluation of techno-economic rentability for specific industrial projects. Assistance can also be given in evaluating bids and in supervision of running in operations. Supervision through assistance to the governments for the implementation and establishment of industrial projects with the use of bi-lateral aid can also be offered counterpart fellowship training abroad and in the country can be established so that know-how can be transferred to local technicians and engineers. By doing so, the country can build its future by using labour-intensive industries for its industrial development. Governments can be advised on selection of industrial construction principles, processes to be utilized for low-cost housing, institutional buildings, hospitals, hotels, industrial estates through modern methods of civil engineering adapted for application in tropical or subtropical countries.

Assistance can also be given in rationalizing the existing construction industry.

By increasing productivity and quality of the building materials and construction industries, the least developed among the developing countries will be able to liberate some of the scarce financial resources to further its development in other sectors.



### INTEGRATED FOOD PROCESSING\*

Integrated agro-industry is a modern effort to industrialize one of the oldest and most highly significant spheres of human activities. Agro-industrial development should prove to be of interest to developing countries particularly when new regions (reclaimed areas, virgin land etc.) are about to be exploited.

To be able to compete with other branches of the economy, agriculture will have to find a way of adapting its conventional structure to the tempo of contemporary technology and the current rate of productivity in industry. One of the difficulties peculiar to the food-processing industry throughout the world is that production is dependent on the small farmer. In developed countries inefficient rural production can call upon the national income for help in the form of subsidies. In developing countries, however, where the other branches of the economy lack revenue, subsidization on such a scale is impossible.

Chapter 1 endeavours to demonstrate the economic significance of low-priced raw materials in a competitive food-processing industry. It shows that small-scale farmers and their surpluses cannot offer a basis for competitive prices.

In developing countries, the bottleneck in food production is marketing rather than the lack of raw materials or processing facilities. Developing countries must give top priority to products for which no marketing difficulties are anticipated. Following initial emphasis on exports, the domestic market should be expanded, the prerequisites for such a process being suitable quality, convenient prices and prudent investment in marketing and publicity.

Increasing food production along conventional lines is a lengthy process, particularly in a developing country. Agrarian reform schemes must be initiated; the skills of the small-holders must be upgraded or co-operatives set up; land reclamation and resettlement projects must be planned with highlanders coming to the lowlands. The standard of living must be raised, mechanization programmes boosted and transport improved. The standard of small-scale production and processing will also have to be improved, and the financial means will have to be found to do this if food is to be produced on a substantial scale. The time needed to carry out all these programmes will range between 20 and 50 years; great sums of capital will be

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\* Introduction of Report I-70 II.B. 14 of Seminar on Integrated Food processing in Yugoslavia, Novi Sad, 4-28 November 1968.

necessary; skilled labour requirements will be overwhelming; and the risks involved will be far in excess of those faced when a country enters upon agro-industrial development. However, this type of development has a great advantage over conventional methods of production, since it successfully solves the conflicts of interest among producer, processor and consumer.

Agro-industrial development entails the vertical integration of the whole food-production process (or the production of other agriculture-based consumer goods) from the field to the final consumer. Vertical integration means that all stages of the process and their planning are organized and owned by one market-oriented authority that has an industrial approach and applies a policy suited to market demands. The basic theory behind integration of this kind is to produce and process acceptable food products at the lowest possible cost and to obtain profits from their sale that can then be reinvested in other products to the benefit of the country at large. The only acceptable criterion for evaluating such projects is profitability.

A developing country cannot afford not to devote some of the money at its disposal to the more conventional objectives. It should always be left to the respective Governments to decide upon the relative importance to be ascribed to agro-industrial development.

SUMMARY OF RECOMMENDATIONS CONTAINED IN THE  
REPORT  
OF THE EXPERT GROUP ON INDUSTRIALIZATION IN  
COUNTRIES AT EARLY STAGES OF DEVELOPMENT, WITH  
SPECIAL REFERENCE TO SMALL-SCALE INDUSTRY  
(Vienna, 6 - 10 December 1971)

Ref. to Parag. No.

Strategies and policies

19. Efforts towards ID in the LDC should involve:
  - i. developing industries related to natural resources, to provide immediate opportunities for employment, income creation and seasonal employment.
  - ii. improving existing artisan and craft activities, linking these to modern manufacturing undertakings.
  - iii. developing industries related to tourism.
  - iv. stimulating employment-oriented projects in agriculture, irrigation and public works.
22. International organizations should play an increasing role in preparation of pre-investment studies, feasibility studies, appropriate technology and projects for financing by foreign firms and assistance to the LDC for the negotiation of reasonable terms with foreign firms.
23. Import substitution could be part of the development strategy.
24. Manufacturing of items to be purchased by public institutions should be promoted.
25. Efforts should be made to develop export-oriented industries. Promotion campaigns should be undertaken to attract investors from abroad for export industries.
26. Planning of industries should be done on the basis of agreements with other countries linked in regional, subregional or multinational groupings.
29. Technical assistance, loans, industrial estates are incentives for development of small scale industries while tax incentives are important for the promotion of larger industrial enterprises.  
Administration of incentives should be simple enough to enable local and foreign industrialists to obtain these benefits without undue bureaucracy.

Institutional frame-work for SSI

32. A senior official in the Ministry of Industry (or in Ministry responsible for industrial development) should be designated to provide guidance, obtain government approval, co-ordinate and follow-up implementation of policies and programmes through semi-governmental or autonomous agencies.
33. In the smaller LDC it would be sufficient to have one autonomous institution in charge of ID.

Promotion of entrepreneurship

42. The UNIDO "partnership scheme" may be applied to the larger of the small-scale and to medium enterprises.

Measures for the development of SSI

46. All basic measures for development of SSI (extension services, financial assistance and industrial estates) will be needed in the LDC in different form from that prevailing in countries at higher levels of development.

Feasibility and pre-investment studies

48. Assistance should be given for training LDC personnel in searching for promising opportunities, especially those accessible to small entrepreneurs.

Assistance in technique, management and marketing

49. The most important institution for the development of SSI in the LDC is the industrial extension centre.

Financial assistance to SSI

52. UNIDO might draw attention of international and regional financial organizations on opportunities for creation of financial institutions in the LDC.
55. Collateral and security requirements of banks should be relaxed for small enterprises.
56. A simplified hire-purchase system for supply of equipment could be introduced in some LDC.
57. Temporary equity participation in SSI operated by semi-autonomous development institutions or banks, may be advantageous to the LDC.

Industrial estates

60. Notwithstanding high costs many LDC would have to resort to the creation of pilot industrial estates.
63. Industrial estates would be effective only if projects were part of a broader development programme for SSI, including industrial extension services and financing at liberal conditions.

Traditional artisan and handicraft activities

67. Traditional crafts with a potential for transformation into modern SSI should receive special assistance towards development of co-operatives.

Trade and service industries

71. Indigenous participation in the trading and commercial activities of the LDC should be considerably expanded.
72. Expatriate firms should be induced to train local traders.
75. Semi-industrial activities in the LDC (transportation, cold storage, warehouse repair and maintenance, milling and packaging of certain foods and tourist hotels) should be encouraged.

Education and training

78. Schooling should be made more relevant to work.
79. Primary and secondary schools should not produce people trained in advance to perform specific industrial tasks but should produce readily trainable people. Training in specific industrial skills can be done more economically in proximity to jobs, either by the employers or by training centres run in co-operation with industry. Certain basic ideas of organizations doing occupational training in Latin America (SENAI Brazil, SENA Columbia and INCE Venezuela) may be adapted.

International and regional co-operation

88. UNIDO should co-operate with UNCTAD and the regional economic commissions in joint action for export promotion of products for the LDC and for established

of joint facilities for experts from groups of LDC with common trade interests.

89. Ways should be devised to lower transportation costs for land locked countries and to help neighbouring maritime countries to improve road and other transport facilities. For countries that are not land locked joint facilities should be devised to hold down freight costs.

#### Technical co-operation

96. The service of associate experts or volunteers for LDC should be encouraged. These volunteers could support the experienced expert and might sometimes substitute for the non-existing counterparts.
97. Efforts should be made to recruit younger experts and new sources of recruitment might be approached.
98. Expert service should be provided with perspective of longer continuity than in more advanced countries.
99. It might be useful to attach experts to financial institutions.
100. Multi-disciplinary teams of experts might be beneficial to LDC.
102. The OPAS system should be used by UNIDO to provide managers for industrial enterprises.
103. Professional and business associations should co-operate in the promotion of new industries, the modernization of existing ones, the training of entrepreneurs and the promotion of subcontracting.

LDC - least developed countries  
SSI - small scale industry  
ID - industrial development

## INDUSTRIAL TRAINING

### I. OBJECTIVES

Training, both directly and indirectly related to industry should aim at developing and up-grading the skills, knowledge, aptitudes and experience of managerial and technical personnel to meet the specific needs of industry, therefore contributing to qualitative improvements and higher productivity.

Priority should be given to training in the overall long-term economic development plan of the country and the necessary national legislation should be secured.

### II. STRATEGY

- (a) National co-ordinating machinery  
Activities in industrial training should be co-ordinated by national machinery. This co-ordination involves national institutions and programmes of training on the one hand and corresponding bilateral and multi-lateral assistance programmes on the other hand.
- (b) Determination of training needs  
In order to have a firm basis for future planning, micro-level surveys should be conducted relating to the present and future needs of industrial establishments for trained personnel, taking into consideration the criteria of quantity, level of qualification, function, branch or sector and time.
- (c) Location of training facilities  
Training should be conducted primarily within the country itself; only in fields where no suitable training facilities are available, training abroad should supplement this deficiency. In these cases, training in more advanced developing countries - preferably within the same region should be given priority. Training abroad in industrialized countries should be considered only for key personnel from priority areas.
- (d) Training and industrialization planning  
Training of indigenous personnel should be an integral part of the industrialization planning process.
- (e) Training and foreign loans or grants  
When requests are made for foreign loans and grants to assist in industrial projects the training component of these projects may be included as part of the loan or grant. In addition there should be more emphasis on project-oriented training programmes especially in bi-lateral programmes.

### III. GOALS

Three broad groups of personnel have to be trained:

- (a) Managerial, technical and administrative personnel engaged in industrial enterprises  
This personnel should cover the top management down to the non-skilled worker. This also should include administrative personnel directly engaged in the administration of a factory.
- (b) Industrial entrepreneurs
  - 1) existing entrepreneurs
  - 2) entrepreneurs engaged in operating new industrial enterprises
  - 3) potential entrepreneurs

(c) Industrial administrators

Personnel engaged in industrial and agricultural production, industrial development schemes, planning, etc., with all industrial development banks, extension workers, technical officers, etc.

IV. MEANS

Training programmes and facilities

For training each of the above three groups of personnel, various training programmes or schemes could be initiated. They include training within industry, in-company training, in-plant training, in-service training, apprenticeship schemes, sandwich courses, seminars training workshops and training abroad either on an individual basis or in small groups.

V. TRAINING METHODS AND TECHNIQUES

In order to make training more effective, various training methods and teaching techniques should be utilized including the use of modern communication media such as broadcast and closed circuit television, business games, simulation, etc. Research should be conducted to find out the most appropriate learning technique to be utilized, adapted to prevailing conditions. If necessary, pilot schemes should be initiated to test out the new training technique.

VI. Some suggestions

- (a) To initiate exchange programmes between organizers and directors of training institutions.
- (b) To introduce exchange programmes among selected countries to offer opportunities for practical experience to newly graduated engineers.
- (c) To carry out surveys of training needs on the basis of:
  - 1) branches of industry (textiles, food, etc.)
  - 2) functional activities of industry (maintenance, quality control etc.)
  - 3) agglomeration of industry (small-scale industry, agro-industries, etc.)

# Checklist of concepts and problems in industrial planning

(Reprint from Bulletin No.17 - INDUSTRIALIZATION AND PRODUCTIVITY, United Nations - New York)

Planners and consultants in the developing countries are continually faced with the need to produce quickly tentative proposals for industrial development. This emphasis on speed, coupled with the chronic shortage of experienced personnel, puts a premium on tools that can be used to aid the planner in this task.

As a partial, modest response to this need, this article presents a checklist of concepts and problems that a planner may wish to consider in formulating recommendations for industrial development strategy, plans and programmes, and implementation schemes for a particular country. This checklist is intended to stimulate ideas. Not all of them will be important to a particular country. Furthermore, their relative importance will vary from country to country. It is up to the individual planner to determine which of these or any other concepts or problems he may need to consider seriously.

For convenience, the concepts and problems have been grouped into the following six general categories:

- (a) Industrial strategy;
- (b) The role of government and institutions;
- (c) Foreign markets, imported technology, and foreign aid;
- (d) Planning;
- (e) Planning for implementation;
- (f) Foreign investment and imports.

## *Industrial strategy*

Industrial strategy usually deals with major long-term measures envisioned to provide a general framework for the relatively flexible planning of short- and medium-term development. The importance of this framework is attested to by the following list of concepts and problems that may be considered in dealing with it:

The essentially long-term nature of a strategy, owing to the long-term courses of action to which it usually commits the country's Government, its people, and its resources, should be recognized.

Plans and policies should not be confused with strategy; attempts to make them serve as substitutes

for a well-thought-out basic strategy should be avoided.

The proper role and proportion of industrial development will vary from one developing country to another and can best be determined separately for each country.

Industrial development exerts a heavy influence (compared with its proportion of GDP) on the whole development strategy of a country.

Sometimes the attempt is made to achieve occasional leaps forward in industrial development, instead of pursuing a continuing development at a slowerrate.

It should be recognized that industrial development must share in the allocation of funds and other resources with the development of infrastructure and agriculture and the development of mineral exports, including petroleum.

It is important to capture the popular imagination with the industrial development programme, in order to gain active support for it.

Determination of strategy for development cannot be based solely upon the mathematical weighting and aggregation of the proposed development of individual sectors, owing to the arbitrariness of weight assignment. Less formalized and more direct methods of arbitrating the final sectoral mix on which the development strategy is to be based, are usually preferable.

Since development plans must serve multiple purposes, no single purpose in them can be optimized, although suboptimizations are often feasible and useful.

Some objectives are essentially contradictory, such as maximizing productivity and minimizing un-

\* UNIDO has repeatedly received requests from planners in developing countries for a list of concepts and problems that would stimulate their creative thinking on industrial strategy, planning, and implementation issues. In partial response to these requests, several lists of concepts and problems are presented in this article. The lists were compiled by the UNIDO secretariat, but each list draws heavily upon the thinking of consultants and planners from both the developing and the developed countries.



employment at the same time, what is called not a something of a compromise.

There is usually constant opposition between short-term and long-term objectives. High investment for greater long-term growth comes at the expense of short-term production for immediate consumption or consumption of imports.

A strategy that forces an "either/or" choice (a dichotomous choice) between developing one or more part of the economy, such as infrastructure, and another, such as industry, should be avoided. What is needed is an intelligent blending of the development of various areas. Some of the other areas in which it is important to avoid a dichotomous choice are:

- (a) Export promotion versus import substitution.
- (b) Heavy industry versus light industry.
- (c) Cash crops versus subsistence agriculture.
- (d) Balanced versus unbalanced economic growth.

Alternative industrial strategies should be developed so that the "best" of several may be selected, or so that the selected strategy can be more easily changed if it becomes desirable to do so. These alternative strategies can be developed by:

- (a) Varying the goal mix;
- (b) Varying the policies adopted;
- (c) Comparing different sequences of arriving at the same results after a given period.

Industries that are likely to yield the highest returns in terms of satisfying some of the goals should be identified. This will be a trial and re-trial iteration process.

Strategy should be based on an extensive analysis of all relevant information and the examination of various alternatives—rather than solely on the character of an industry or on an average development pattern in a number of countries, established by regression analysis.

Prospective industries should be roughly classified into supply-determined industries (natural resource and power-oriented) and demand-determined industries, in order to focus attention on the limits to their rate of expansion.

Possession of rich mineral resources does not necessarily make a country potentially rich—extraction costs, transport costs, and the high capital investment required to process them often prevent their economic exploitation.

A choice may have to be made between capital-intensive and labour-intensive techniques of production.

The size of the domestic market for industrial products cannot usually be measured by *per capita* income or GDP; instead, the distribution of the country's income needs to be taken into account.

Human resources usually suffer from a shortage of

the needed skills to handle a pace of urbanization without corresponding supporting industrialization, and a rigid social stratification. These impose rather severe restraints on the development strategy.

An adequate supply of spare parts and skilled repairmen to maintain continuous output in the industries by preventing costly shut-downs must be assured.

#### *The role of government and institutions*

The role of government and institutions focuses upon the continuing need to design policies and establish new institutions specifically to support selected industrial development strategies and plans. In doing this, consideration may be given to the following concepts and problems:

Society's general long-range objectives should be clarified. Industrialization is not an aim in itself but is rather a means to achieve desired economic progress and social welfare.

The need for an industrial development strategy and for close co-operation between the planners and the framers of the strategy should be recognized.

Because of growing demographic pressures (high rate of increase of population), there is a need to industrialize at a greater rate.

In most developing countries the development strategy for industry should be closely tied to those for agriculture, institutions and infrastructure.

The country's policies that bear on development need to be continually revised.

What responsibility the public, the co-operative, and the private sectors will have in furthering industrial development must be determined.

Controls may be needed on the allocation of scarce resources.

Fiscal, income, and pricing policies may need to be revised to allow or encourage the desired industrial development.

Some restriction may need to be placed on the expansion of industries producing luxury goods and some limit placed on the import of such goods in order to release resources for expansion of industries producing the "essentials".

The future drain of capital out of the country to service foreign debts may be overlooked when foreign loans are contracted or foreign investment to develop the country's industry is welcomed.

Industries that will replenish the foreign exchange they initially require by contributing to the country's exports or reducing its imports should be promoted.

Sufficient import capacity or foreign aid or foreign loans to overcome the country's deficit in the supply of raw materials, intermediate goods, equipment, consumer goods, management know-how, or skilled manpower services should be available. If the capacity is inadequate, ways will have to be sought to increase

it, or the industrial development programme will be restricted.

New special financing institutions may have to be established to loan, or otherwise provide the initial capital and continuing working capital needed by industry.

Certain projects should be chosen for location in particular areas of the country, with the aim of reducing regional inequalities.

A government-supported programme of research and development on specific industrial problems of the country should be considered.

#### *Foreign markets, imported technology and foreign aid*

Some of the problems and concepts related to foreign markets, imported technology, and foreign aid for industrial development are:

The question of access to foreign markets for exportable raw materials brings up the problem of how much value to add to the raw materials before exporting them.

Access to foreign markets is not simply a matter of producing competitively or of subsidizing exports, but also involves imaginative trade policies to penetrate areas already dominated by large vested interests.

Foreign aid may sometimes be allowed to dominate a country's industrial development strategy, when the country's strategy should actually determine the foreign aid projects.

Technological and technical problems often arise from the dependent position of developing countries with respect to what is offered or sold to them by the developed countries; what is offered is not always the best and in some cases is very unsuitable for economic use in the developing country. Problems also arise from the direct transfer of advanced technology from the developed countries without sufficient adaptation or modification. Special conditions existing in the developing countries, which should be used to advantage, are ignored.

#### *Planning*

Only a few of the concepts and problems related to the planning of industrial development can be included in the following list:

Too great a pressure may be brought to bear on the planning group, with the result that politically popular investment projects, inadequately supported by economic analysis or comparison with other possible projects, are selected.

Personnel capable of adequately evaluating preliminary feasibility studies is lacking.

The lack of feasibility studies in connexion with plans and planning leaves the planner with only

tentative choices of general options and too few specific projects.

Different criteria are used to select different investment projects, rather than common criteria and common accounting values, which permit a more valid comparison to be made of the contribution of the various projects.

A propensity to build large plants in order to impress people with something spectacular is sometimes encountered.

New plants are constructed when the same results could be achieved by expanding or modernizing existing plants.

Unnecessary investment is made in industrial construction, when it would be possible to leave the installation without protective cover or with only a light shelter.

#### *Planning for implementation*

Planning for implementation is increasingly being recognized as an important part of industrial development planning. Some problems and concepts related to this area include:

Thinking of planning and plan implementation as two distinct processes rather than as a continuous process leads to poor planning and uneconomical allocation of resources.

Planning that gives little or no attention to the implementation phase often leads to a significant gap between planned results and economies and those actually realized.

In order to achieve the "best" use of available investment resources and at the same time to reduce inflationary pressures, the plan should include sufficient inducements and controls to encourage investment in the desired industries and discourage investment in the less essential industries, or investment abroad.

Failure to take into account during the planning stage the demands that the planned industrial projects will place on infrastructure, the country's supply of skilled personnel, and its capacity to import leads to delays in project implementation and interference with the operation of existing industry.

Planning the implementation of too many projects at the same time results in too much competition for material, equipment, skills, imports and money.

Projects planned using only one set of key variables are not flexible enough to survive changing or unforeseen conditions. Each project should be planned with at least two variations of one or more key variables (those most likely to change at the time of implementation), such as capital intensity or the minimum economic size of the production unit or the import content.

Lack of foreign exchange to finance the import content of the planned investment programme may arise from unforeseen changes in the balance-of-payments position owing to such things as adverse shifts in terms of trade, emergency imports of food, and failure to attract foreign capital at the planned rate.

Inefficient allowance may be made at the planning stage for increases in project capital costs caused by unforeseen delays. These automatically increase the capital-to-output ratio of the project.

Inadequate allowance may be made at the planning stage for probable delays in project implementation caused by organizational difficulties, transport bottlenecks, and inadequate time-scheduling of material and equipment deliveries or for possible delays in project implementation caused by bad weather.

#### *Foreign investment and imports*

Both foreign investment and imports should receive adequate attention in planning industrial growth. Some important concepts and problems in these areas are:

Lack of control over the flow of foreign investment into industrial projects results in a pattern of investment in conflict with the planned or desired pattern, in an unproductive competition with already established local plants, and in a wasteful (from the

developing country's point of view) use of foreign capital.

Too much emphasis on direct foreign investment in industrial projects and too little on foreign loans results in too great a long term outflow of funds and adds to the balance-of-payments problem.

Importing capital goods for new plants is unwise when the foreign exchange could better be used to import essential replacement parts for existing plants.

Purchase of foreign know-how and specialists' services as part of an industrial plant package contract is inadvisable when they could be purchased at less cost if purchased separately from capital equipment.

Opportunities to minimize the import content of the project and to give preference to imports payable in soft currency may be missed. If planners are imaginative, they can find ways to use local materials and skills in constructing a plant instead of relying heavily on imported materials and skills. This would add to local employment during the construction period and should reduce import requirements as well as costs, provided that sufficient attention is paid to the use of more labour-intensive (less capital-intensive) methods of constructing the plant.

The lists of concepts and problems presented in this article are by no means complete, nor are they intended to be. Rather, they are presented to stimulate the planner's thinking and to give him at least a start on planning in these areas.

## ADVISORY MISSIONS ON INDUSTRIAL PROJECT EVALUATION

### Background information

One of the major constraints to industrial development is the shortage of well-studied industrial projects. Projects have to be identified, then prepared, and finally evaluated as to their contribution to the industrial development of the national economy. In the past several years Governments have sponsored participation of their officials in training courses abroad in industrial project preparation, evaluation and financing. This has not been enough, however, to achieve self-sufficiency in personnel thoroughly equipped to adequately prepare industrial projects and evaluate their profitability.

Governments can train a larger number of officials in the techniques of project preparation, evaluation and financing through UNIDO advisory missions to that effect. The missions may be designed to cover either (a) preparation, evaluation and financing, or (b) preparation and evaluation, or (c) evaluation only. In what follows, we will deal only with advisory missions on project evaluation.

### Objective

The objective of the advisory missions on industrial project evaluation is to train Government officials in advanced methods and techniques of evaluation of industrial projects. Essentially the evaluation consists in a cost-benefit analysis assessing the contribution of industrial projects to the national economy.

### Description of the mission

The missions are executed by a small team of experts on cost-benefit analysis and are usually directed by a UNIDO staff member competent in the matter.

In order to reach responsible officials it is recommended to keep the missions as short as possible. It is expected that the participants will be government officials actually engaged in

Industrial project evaluation and that they will have the opportunity to apply the skills acquired during the mission. The participants should subsequently be the focal point for propagating the use of the methods in Government services.

Though the missions include a training workshop of varying importance, they stress the practical operation. As a rule no more than one half of the time should be taken by the presentation of the methodology, the other half being devoted to application and actual exercises.

#### Programme of the missions

The detailed contents of the programme should be worked out with the interested parties according to their specific requirements. In the standard programmes the training workshop starts with a review of project preparation which provides the basic data necessary for the subsequent evaluation, and a review of financial evaluation which provides the opportunity to explain basic concepts such as discounted cash flow, present value and internal rate of return. The core of the workshop are the sessions on cost-benefit analysis which include the measurements of benefits and costs (direct and indirect), shadow prices and national parameters (significance, derivation and use by the project evaluator) and the practical approach recommended. The problems raised by uncertainty and the ranking of projects are then briefly examined. The application of the methodology is illustrated by several case studies presented to the participants.

The direct advisory mission includes the supervision and direction of the participants in the evaluation of national projects of current interest, and a review and discussion of existing practices in project evaluation.

Attached hereafter is a standard programme outline for a two-week advisory mission.

Missions accomplished:

At the present time, we have accomplished several missions of the

kind:

<u>Place</u>	<u>Date</u>	<u>Language</u>
Mexico	June 1966	English and Spanish
Colombia	December 1966	English
San Damián	Dec. 1966 - Jan. 1967	English
Yehowah	February 1968	English
Tunis	November 1971	French
Dome	September 1972	French

Another mission is scheduled to take place in Tangier, in English, in January 1973.

Advisory Missions on Preparation of Project Proposals on

Standard Two-year Outline

Twenty working sessions of 3 hours each distributed approximately as follows:

Number of  
working sessions

A. Training workshop (14 sessions)

1. Basic data for evaluation

Stages of project preparation	1
Market study	1
Techno-economic study	1

2. Methods of evaluation

Financial evaluation	
Simple criteria	1
Discounted cash flow	1
Social cost-benefit analysis	
Shadow prices and national parameters	1
Measurement of benefits and costs	1
Practical approach recommended	1
Sensitivity, uncertainty and risk	1
Ranking of projects	1

3. Case studies

Presentation of two examples	2
Presentation of a national project submitted for evaluation	2

one week = 10 sessions

Methodology

one week = 10 sessions

Application

B. Direct advisory mission (6 sessions)

1. Case studies

Evaluation of one or two national projects by the participants under supervision	4
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2. Establishment of procedures and machinery

Review of existing practices	1
Discussion of improvements	1

PRINCIPAL CONCLUSIONS OF THE EXPERT GROUP MEETING ON REGIONAL INDUSTRIAL CO-OPERATION (RIC), IN CO-OPERATION WITH UNCTAD. Vienna, 6-10/XII/71

1. RIC aims at utilizing the resources available in regional groupings of countries in such a way as to increase the cohesiveness of the economies concerned, and, by this means, both to accelerate their economic development and to increase their ability to control the rate and structure of their development. Many developing countries are involved in existing schemes; others are concerned currently in the formation of new groups. The meeting noted that despite the fact that the benefits of RIC were widely recognized, results had so far been disappointing.
2. The meeting reviewed the reasons for these disappointing results. RIC could only advance where it is clearly seen to be in the interests of each member of the group. The major problem is that whereas the chief benefit to the region of a well-articulated programme of RIC is of a long-term developmental character, its impact effects are often seen as resulting in an immediate loss of opportunity to develop desired industries.
3. In most regional groups, RIC has commenced with trade liberalization, on the assumption that this would contribute to economic development in part through promoting more rapid and broader industrial development. However, experience demonstrates that trade liberalization is not a sufficient condition for effective RIC. Nevertheless, it was generally felt that commonly some degree of trade liberalization was a pre-condition for RIC on specific industrial projects.
4. The meeting recognized that the difficulties were partly related to the differences in, and the character of, underlying national development strategies, implicit or explicit, on which RIC is superimposed and which necessarily conditions its present character. Other difficulties would in any case have arisen whenever the need to adapt national policies other than trade policies was not properly taken into account. In some instances, this may have occurred because of a desire to advance co-operation on the basis of what could for the moment be achieved, leaving recognized problems to be resolved later once the basis and habit of co-operation had been established. The meeting, however, suggested that the incentive to resolve these policy problems was lessened once full trade liberalization had been achieved. It was not felt surprising that in relation to the formation of new groupings and in relation to negotiations for the widening of existing groupings, a satisfactory solution of these policy problems has been made a condition of progress on RIC and further trade liberalization.



5. The meeting felt that in relation to decisions in the area of RIC, political and social considerations were in practice frequently given more weight than purely economic factors. The meeting only dealt with technical, economic and administrative constraints and concentrated its attention on the following aspects:

- (a) the difficulties involved in examining potential future industrial development in a group of countries in sufficient detail for an appropriate and agreed programme of action to be developed far enough in advance;
- (b) the difficulties of establishing a mechanism for allocating selected industrial plants which is both efficient and acceptable to the different member states;
- (c) the widespread adaptation of national policies required to implement programmes of regional industrial development;
- (d) the efforts required to fulfil these tasks in a short space of time and the limited resources available at the level of both the regional secretariats and member governments.

#### References

ID/WG.111/2      Expert Group Meeting on Regional Industrial Co-operation  
Draft Report - Summary of Principal Conclusions and Suggestions

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INDUSTRIAL OPPORTUNITIES IN SOME OF THE LEAST DEVELOPED COUNTRIES

1. The aim of giving the following basic information on industrial projects in some of the least developed countries<sup>1/</sup> is to raise interest of potential investors and help these countries in their efforts to industrialize. More details on these projects are available in UNIDO and could be obtained from reports of industrial survey missions and lists of projects submitted to meetings to promote industrial projects. These reports and lists (once derestricted by the respective Governments) could be put at the disposal of international financial bodies, investors and all interested persons upon their request.

2. Information on national organizations financing industrial projects in the least developed among the developing countries is also given here whenever such an information is available in UNIDO. The main sources of information on these organizations are the industrial survey carried out by the Survey Section.

3. The Industrial Survey of Botswana<sup>1/</sup>, one of the least developed African countries, was drafted recently (August-September 1971) and lists ten industrial projects (see Table 1) with proposed investments ranging from R 60,000 to R 1 million (one Rand equals about US\$ 1.4). The Industrial Survey of Botswana gives more information on the output of each of these projects, their export possibilities and the magnitude of expected national demand.

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<sup>1/</sup> See UNIDO Industrial Survey of Botswana. Final Report of the Industrial Survey Mission, August-September 1971

Table I Botswana - List of Industrial Projects

1. Dairy Plant (processing 2000 gallons a day)
2. Maize Mill (proposed investment P 500,000)
3. Brewery (producing clear lager type beer, 20,000 hl per annum)
4. Engine Reconditioning Project (proposed total investment P 70,000)
5. Galvanised Sheet Mill (proposed investment P 160,000)
6. Pharmaceuticals, Cosmetics and Toiletries Plant (proposed investment P 1 million)
7. Small or Medium Handloom Plant (for processing domestic wool; proposed investment P 60,000)
8. Large Scale Tannery (processing 37,000 hides per annum)
9. Coarse Clay Products Plant (proposed investment P 500,000 and proposed annual capacity 6 million bricks or equivalent)
10. Plastic-ware Factory (producing extruded plastic pipes, household goods, plastic shoes; proposed investment P 100,000)

4. As far as national organizations financing industrial projects are concerned, Botswana established a development corporation in April 1970. The Botswana Development Corporation (BDC), which is a limited liability company entirely owned by the government with an authorized capital of R 1 million. The corporation is permitted to conduct any and all lawful trade business enterprise, transactions or undertakings of any kind, including but not limited to those commonly known as industrial, commercial or agricultural. The BDC enters into partnership generally by way of minority share holding and loan finance in development projects. The work so far done by BDC was mainly concentrated on the preparation of development projects, most of them in the industrial field. The main findings are laid down in prefeasibility studies of which some have been forwarded to UNIDO's third regular African Meeting to Promote Industrial Projects, held very recently in Abidjan. BDC is granting loans on terms which correspond nearly to free capital market conditions. At the moment the normal interest rate for such loans is 9 per cent. The total amount of outstanding loans granted by BDC does not exceed P 200,000.

5. A second organization is dealing in Botswana with financing of industrial projects: The Botswana National Development Bank which is also a statutory body entirely owned by the government. It provides loans for both agricultural and industrial projects. The Bank mainly fosters small enterprises and the small farmers by granting small loans some of which have the character of hire-purchase contracts. In the industrial field the Bank so far has

financed fixed assets as well as working capital by credits granted in the form of loans. In 1969 loans for commercial and industrial development amounted to P 110,905, most of them relating to commercial enterprises

The Industrial Survey of Lesotho, another least developed African country, contains two sets of industrial projects. The first set includes 21 projects with a presently satisfactory local market or with export possibilities which adequately augment the local market (see Table II). The second set enumerates 6 other projects based on the indigenous raw materials for which the local market potential and, in some cases, the eventual prospects for exports warrant thorough investigations (see Table III). No indications are given in the Industrial Survey as to the magnitude of output or investment needed for each industrial project. Furthermore the Industrial Survey was carried out two years ago (in September 1969) and these lists of industrial projects need to be brought up to date.

Table II Lesotho - Industrial Projects with satisfactory local and export markets.

1. Wool and Mohair Processing Factory or Factories
2. Textile Factory (blankets, curtains, bedspread, upholstery fabrics)
3. Garments Factories (in several areas)
4. Knitting Factory (ladies', men's jerseys, etc.)
5. Brick and Tiles Factories
6. Cement Products Factories
7. Quarries
8. Diamond Processing Plant (cutting, polishing)
9. Iron and Steel Furniture Factory (tables, chairs, beds, etc.)
10. Kitchen and tableware Factory (enamelled household ware)
11. Meat Processing Factory (including abattoir, meat packing, canning sausages, etc.)
12. Tannery
13. Leather Products Factory (handbags, purses, cases, boxes, etc.)
14. Shoe Factory (leather and rubber shoes)
15. Maize Mill (including feed mixing and milling wheat)
16. Fruit and vegetable processing Factory (preservation and canning of jams, jellies, pickles, etc.)
17. Biscuit Factory
18. Confectionery Plant
19. Soft Drinks Factory
20. Distillery (rum, gin, etc.)
21. Wood Carving Factories

Source: Some Aspects of Lesotho's Industrial Development, Final Report, prepared by UNIDO consultant, September, 1969.

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**Table III**      Lesotho - Potential Industrial Projects for which thorough Investigations Should be Done

1. Milk Factory (pasteurisation, sterilisation, powder, condensed milk, cheese, butter)
2. Sugar Factory (including sugar beet plantations)
3. Paper Conversion Factory (cartons, boxes, bags, envelopes, etc.)
4. Paint Factory
5. Semi-precious Stones Factory
6. Agricultural Implements Factory (ploughs, harrows, spades, mammoets, shovels, axes, etc.)
7. Hardware Factory (nails, pins, wood-screws, nuts, hinges, bolts, chains, buckets, etc.)
8. Prefabricated Housing Factory

Source: Some Aspects of Lesotho's Industrial Development, Final Report, Prepared by UNIDO Consultant, September, 1969.

7. Information on industrial projects in eight other least developed African countries (Chad, Dahomey, Mali, Niger, Rwanda, Sudan, Tanzania, and Uganda) also has been collected by UNIDO and submitted to the Third African Meeting to Promote Industrial Projects, which took place in Abidjan from 24 November through 1 December 1971. Information sheets and background information sheets related to these industrial projects were prepared by UNIDO and could be communicated upon request. Table IV below gives the titles and a short description of each of these industrial projects. It gives also the kind of foreign contribution desired by these countries, classified in four categories: equity participation, supplier's credit, know-how and management.

**Table IV**      Industrial Projects in eight least developed African countries

<u>Title of the Project</u>	<u>Foreign contribution desired</u>
<u>CHAD</u>	
Two Soap Factories Capacity: 3,000 tons p.a. and 1,500 tons p.a. Total investment: US\$ 750,000 and \$ 550,000	Equity Long-term loan Supplier's credit
Manufacture of Particle Board Capacity: 1,000 to 1,500 tons p.a. Total investment: US\$ 550,000	Majority Equity Long-term loan Know-how Management
Malt Factory Capacity: 2,200 tons p.a. Total investment: US\$ 1,200,000	Majority equity Long-term credit Supplier's credit Management

Table IV continued

Title of Project

Foreign Contribution Desired

GHA (cont.)

Enamelled Household Goods  
Capacity: 250 tons p.a.  
Investment: US\$ 290,000

Majority equity  
Long-term loan  
Supplier's credit  
Know-how

Two Edible Oil Factories  
Capacity: 2,000 tons ground-nut oil p.a.  
1,500 tons cotton seed oil p.a.  
Investment: not yet estimated

Equity participation  
Equipment  
Financing

GHANA

Manufacture of Enamelware  
Capacity: 700 tons p.a.  
Investment: US\$ 190,000

Equity participation  
Supplier's credit  
Know-how  
Management

GUI

Manufacture of Bags from Dah (Kenaf)  
Capacity: 2,630 tons p.a.  
Investment: US\$ 2.5 million

Equity participation  
Supplier's credit  
Know-how/Management

Quick Lime  
Capacity: 13,500 tons p.a.  
Investment: US\$ 686,000

Equity participation  
Supplier's credit  
Know-how/Management

Vegetable Fibre Board  
Capacity: 7 tons/8 hours  
Investment: US\$ 850,000

Equity participation  
Supplier's credit  
Know-how/Management

GUINEA

Dehydration of Onions  
Capacity: 600-750 tons of finished product p.a.  
Investment: not indicated

Equity participation  
Supplier's credit  
Know-how/Management

Meat and Tomato Canning  
Capacity: 300 tons canned meat p.a.  
400 tons canned tomato concentrate p.a.  
Investment: US\$ 684,000

Equity participation  
Management  
Know-how  
Supplier's credit

Tannery  
Capacity: 2,000 hides per day  
Investment: US\$ 180,000

Equity participation  
Supplier's credit  
Know-how/Management  
Marketing

RWANDA

Bottle Factory  
Capacity: 2,500 tons p.a.  
Total investment: US\$ 1,200,000

Majority equity  
Management  
Know-how

Table IV continued

Title of Project

Foreign Contribution Basis of

BWILDA (cont.)

Cement Capacity: 60,000 tons p.a. Total investment: US\$ 5 million	Majority equity Management Know-how
Nitrogenous Fertilizer Capacity: 45,000 tons p.a. Total investment: US\$ 7.5 million	Equity Know-how Management
Methane Gas Capacity: 30 million m <sup>3</sup> p.a. Total investment: US\$ 900,000	Equity Know-how Management Marketing
Lyophilized Instant Coffee Capacity: 900 tons p.a. Total investment: US\$ 2,400,000	Majority Equity Management Know-how
Plastic Articles and Retreading of Tyres Capacity: 1,000 tons plastic articles 12,500 pieces retreaded tyres Total investment: US\$ 440,000	Majority Equity Supply of equipment Management Know-how
Dehydrated Vegetables Capacity: 500 tons p.a. Total investment: US\$ 700,000	Majority Equity Management Know-how
Thermal Power Station Capacity: 5 Megawatts Total investment: US\$ 700,000 to US\$ 1 million	Negotiable

DEMOCRATIC REPUBLIC OF SUDAN

Alcohol and Yeast from Sugar Molasses Capacity: processing 30,000 tons of cane sugar molasses p.a. Investment: US\$ 3 million	Equity Know-how Marketing Loan Supplier's credit
Production of Cotton Seed Oil Capacity: processing 7,000 tons of cotton seed p.a. Investment: US\$ 600,000	Equity Supplier's credit
Animal Fodder from Oil Cakes Capacity: 36,000 tons p.a. Investment: US\$ 700,000	Equity Loan Supplier's credit Know-how
Tubes and Tyres for Motor Vehicles Capacity: tyres: 247,000 units p.a. tubes: 375,000 units p.a. Total investment: US\$ 6 million	Equity Loan Supplier's credit Management/Know-how

UNITED REPUBLIC OF TANZANIA

Wood Wool Cement Slabs Manufacturing Capacity: about 200,000 sq. metres p.a. Total investment: about US\$ 250,000	Equity Management Know-how
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Table IV continued

<u>Title of Project</u>	<u>Foreign Contribution Desired</u>
<u>UNITED REPUBLIC OF TANZANIA (cont.)</u>	
Baker's Yeast Capacity: 1,000 tons p.a. Total investment: US\$ 509,600	Minority Equity Supplier's credit Management/Know-how
Fishing and Fish Processing Multipurpose: Canning	
Three Hardwood Sawmills For each: Capacity: 20,000 cubic metres sawn p.a. in 2 shifts Investment: US\$ 550,000	Loan Supplier's credit
Three Softwood Sawmills For each: Capacity: 10,000 cubic metres p.a. in 2 shifts Investment: US\$ 255,000	Loan Supplier's credit
Veneer Plant Capacity: 2 million sq. ft. p.a. Total investment: US\$ 420,000	Loan Management Know-how Marketing
Production of Sugar Capacity: 30 - 40 tons p.a. Total investment: US\$ 14 million	Loan Supplier's credit
Processing of Seed for Farmers Capacity: 1 ton seeds per day Total investment: US\$ 420,000	Loan
Parquet Flooring Plant Capacity: 1.5 million sq. ft. p.a. in two shifts Total investment: US\$ 300,000	Loan Marketing Know-how Supplier's credit
Processing of Fish Fillets	Loan
Furniture Factory Capacity: 100,000 chairs, 10,000 tables p.a. Investment: US\$ 840,000	Loan/Supplier's credit Know-how Management
<u>UGANDA (Private Sector)</u>	
Plant for the Manufacture of Cutlery Capacity: 2 million pieces p.a. Total investment: US\$ 170,000	Equity Loan/Supplier's credit Know-how/License
Plant for the manufacture of Builder's Hardware Total investment: US\$ 300,000	Equity participation
Plant for the Manufacture of Wire Products Capacity: 4,700 tons p.a. Investment: US\$ 350,000	Equity participation Loan Know-how/License
Extraction of Cobalt Capacity: 1,000 tons of cobalt p.a. Total investment: US\$ 6.5 million	Loan/Supplier's credit
Source: <u>UNIDO Final List of projects as of 30 September, 1971, Third African Meeting to Promote Industrial Projects</u>	



NATIONAL COMMITTEES FOR UNIDO

In the course of the regional and international symposia on industrialization held in recent years, close contacts were established between the representatives of public and private institutions whose activities give them an interest in the programme of work of UNIDO.

These contacts were further strengthened by the establishment of the Industrial Promotion Service during the International Symposium on Industrial Development which was held in Athens, Greece, from 29 November to 19 December 1967. Delegates to the Symposium recognised the advisability of setting up, at the national level, a permanent machinery which would enable the various public and private bodies concerned with industrial development and desiring to co-operate with UNIDO, to meet, to co-ordinate their activities and to advise governments on questions concerning UNIDO.

The International Symposium on Industrial Development adopted unanimously the following recommendation concerning the establishment of National Committees for UNIDO;

"It is recommended that Member States consider the establishment of National Committees for UNIDO, composed of representatives of government departments and agencies as well as representatives of academic and research institutions and public and private industrial and business establishments concerned with industrialization. The National Committees would serve in an advisory capacity to the governments and to the member institutions in regard to all questions related to the activities of UNIDO. Member States might assign the functions of National Committees to already existing organizations in their countries with any additional mandate as may be appropriate to enable them to perform their functions in an adequate manner.

As of April 1972 forty one countries, following the recommendation of the Symposium, had established National Committees for UNIDO. These are Bulgaria, Burundi, Central African Republic, Chile, Cuba, Czechoslovakia, Dominican Republic, Ecuador, Egypt (Arab Republic of), Finland, Ghana, Honduras, Hungary, India, Iran, Korea (Republic of), Kuwait, Laos, Lesotho, Madagascar, Malaysia, Morocco, Netherlands, Nicaragua, Norway, Pakistan, Philippines, Poland, Rwanda, Singapore, Somalia, Sudan, Tanzania (United Republic of), Thailand, Togo, Tunisia, Upper Volta, Uruguay, USSR, Vietnam (Republic of) and Yugoslavia.

In most cases, the existing National Committees for UNIDO are chaired by the Minister of Industry or of the governmental department in charge of industrialization or by the Minister of Foreign Affairs of the countries concerned; in some cases they are chaired by a top official of one of the governmental departments referred to above.

The areas in which National Committees for UNIDO could support the efforts of Governments in questions relating to industrial development and UNIDO are the following:

1. Advising their respective governments on all questions relating to industrial development and, in particular, participating in the promotion, study and submission of technical assistance projects;
2. Co-operating with the professional institutions in their respective countries, depending on the case, such as chambers of commerce and industry, economic groupings, trade unions, etc., in order to interest them in the activities of UNIDO and induce them to support the promotional activities and projects of UNIDO in their respective spheres of interest;

3. Contributing towards making UNIDO more widely known in academic institutions and research institutes and centres, as well as in institutions and organizations concerned with industrial development;
4. Keeping abreast of the activities and projects undertaken by UNIDO, particularly in the following areas: industrial information and promotion, economic studies, manpower training programmes, and the future programme of UNIDO to assist developing countries in setting up specialized repair shops and maintenance centres for industrial and agricultural equipment;
5. Co-operating with the United Nations Information Centres in their respective countries in order to ensure a wide distribution of information on the activities of UNIDO and of the National Committees;
6. Contributing towards the drafting of proposals which Governments could submit regarding the preparation of the international development strategy for the Second Development Decade;
7. Drawing the attention of Governments to the importance of their participation in the Pledging Conference for voluntary contributions to UNIDO which takes place each year during the regular session of the United Nations General Assembly and constitutes a valuable instrument for providing additional financing for the operational activities of UNIDO;
8. Making suggestions on the part that UNIDO could take in the programmes of research institutes;
9. Making suggestions on assistance that UNIDO could render in order to reactivate certain industries which are stagnating at the present time.

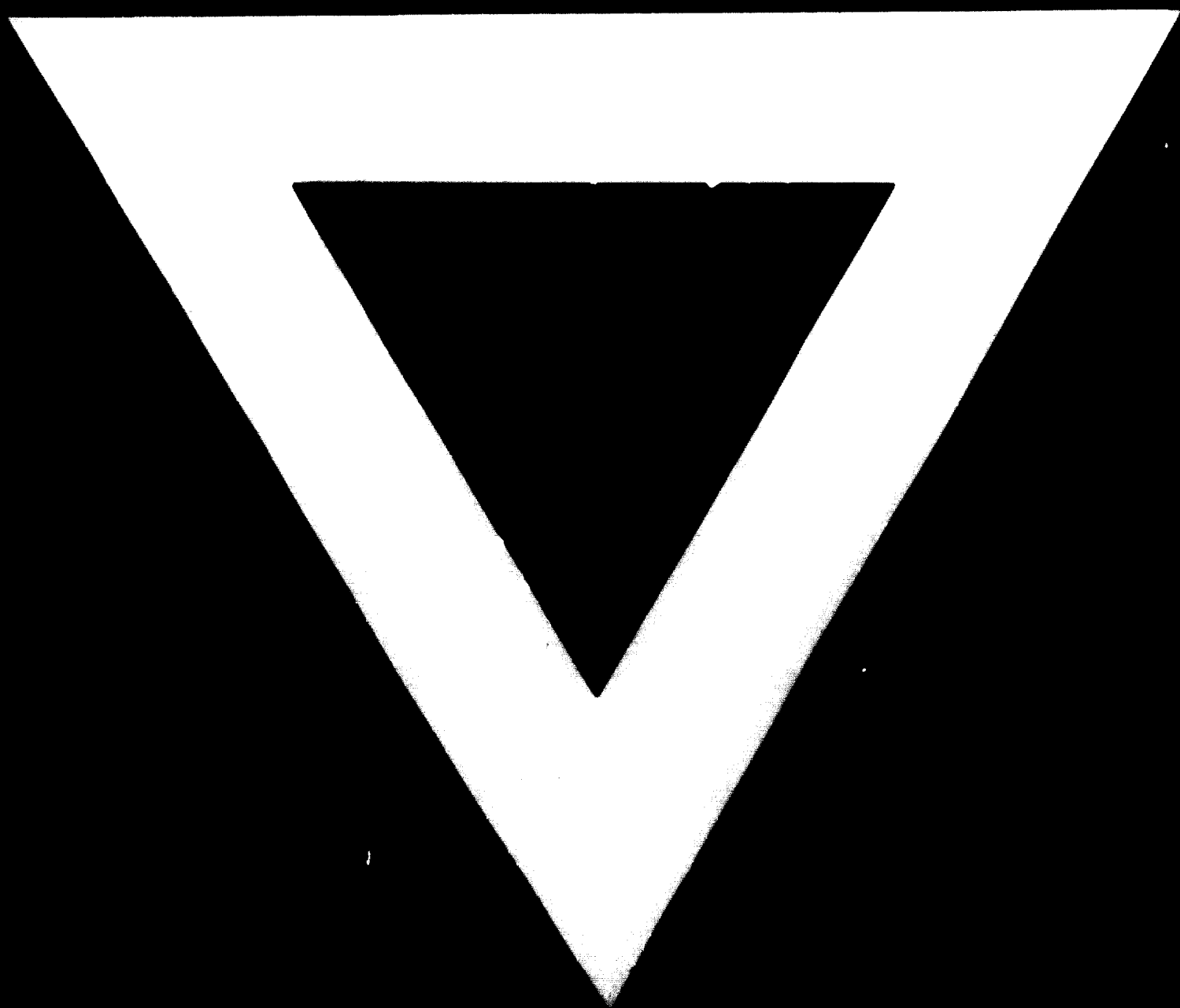
Within the framework of its relations with the National Committees for UNIDO, the Secretariat of UNIDO keeps them informed of the current activities of the UNIDO, and in particular, of training programmes in the field of industry and of all the technical meetings organized by UNIDO such as symposia, workshops,

expert group meetings, seminars etc. Arrangements are also made to inform the National Committees of technical assistance missions sent by UNIDO to their respective countries. The Committees also receive information about UNIDO technical assistance projects in their respective countries.

The creation by Member States of National Committees for UNIDO has added another dimension to the work of UNIDO at the level of the countries. By bringing together the officials of the governments, representatives of different institutions and organisations concerned with industrial development in a particular country, the National Committees have provided a focal point for co-ordination of the work of UNIDO at the level of the countries. The Committees facilitate the flow of information about UNIDO, to the relevant institutions and organisations in the respective countries. They are also instrumental upon request, in providing to the interested organisations in the particular countries data obtained from UNIDO on technological processes and experiences of other countries in the establishment of their manufacturing enterprises. The National Committees are also potential sources of information on the specific needs of the countries in industrial development.

MAJOR FIELDS OF ACTIVITIES OF NATIONAL ADMINISTRATIVE MACHINERY DIRECTLY CONCERNED WITH INDUSTRIAL DEVELOPMENT

<u>Fields of activity</u>	<u>Examples of institutions</u>
(1) MACRO-ECONOMICS surveys strategies policies planning programming	DEPARTMENT OF INDUSTRY MINISTRY OF ECONOMIC AFFAIRS MINISTRY OF INDUSTRY AND MINES NATIONAL PLANNING ORGANIZATION INDUSTRIAL DEVELOPMENT AUTHORITY
(2) MICRO-ECONOMICS project identification formulation feasibility studies evaluation	INDUSTRIAL DEVELOPMENT STUDY CENTRE
(3) FINANCING	NATIONAL DEVELOPMENT BANK INDUSTRIAL FINANCING CORPORATION INVESTMENT PROMOTION INSTITUTE
(4) MARKETING	EXPORT PROMOTION BOARD
(5) TECHNOLOGY quality control standardization metrology innovation design research	MAINTENANCE AND REPAIR WORKSHOPS INDUSTRIAL RESEARCH INSTITUTE
(6) HUMAN RESOURCES manpower planning training	PRODUCTIVITY AND MANAGEMENT DEVELOPMENT CENTRE VOCATIONAL TRAINING BOARD
(7) SMALL SCALE INDUSTRY entrepreneurs extension services industrial estates	SMALL SCALE INDUSTRY DEVELOPMENT CENTRE INDUSTRIAL ESTATES CORPORATION
(8) INFORMATION	INFORMATION AND DOCUMENTATION CENTRE
(9) MANAGEMENT OF STATE OWNED INDUSTRIAL ENTERPRISES	INDUSTRIAL PRODUCTION CORPORATION
(10) SUPPORTING SERVICES licensing intellectual property legislation	CHAMBER OF COMMERCE AND INDUSTRY FEDERATION OF INDUSTRIALISTS INDUSTRIAL LABOUR UNIONS



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