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NEW CHALLENGES AND OPPORTUNITIES

New dimensions in technical assistance in the sectors of
agro-based, chemical, engineering and metallurgical industries

June 1992

NEW CHALLENGES AND OPPORTUNITIES

INTRODUCTION

Technical assistance delivery is the mandate of the Department of Industrial Operations (DIO), embracing three Divisions: Industrial Services and Institutions, Industrial Operations Support and Industrial Operations Technology Division (IO/T) which covers the basic industries, namely agro-based, chemical, engineering and metallurgical industries.

About 1,000 projects with an implementation value which varies between 70 - 80 million dollars per year are under implementation by the four IO/T Branches at the same time. Projects worth some 110 million dollars are approved per annum. About two times this figure are requested, negotiated and prepared (these are considered pipeline projects). From preparation of the project concept to project approval 2 - 3 years may elapse to negotiate the technical and financial inputs and to secure the required funds.

Traditionally, projects involve all aspects in the transfer of technology related to (a) the establishment of new industries including the development of an industrial sectoral infrastructure and (b) the rehabilitation/restructuring and upgrading of already existing industries in their performance and management, keeping in mind the economic, environmental and social acceptance of industries.

For more detail please consult the brochure **PROJECT ACTIVITIES AND PRIORITY AREAS** and the individual Branch Brochures covering project activities in the various sub-sectors of the agro-based, chemical, engineering and metallurgical industries. This leaflet will only deal with new dimensions of technical assistance which apply to all industrial sectors and which are considered new, closely linked priority areas which deserve special attention.

**NEW DIMENSIONS IN
TECHNICAL ASSISTANCE**

Since its inception in 1967 UNIDO has been fulfilling its mandate to promote and accelerate the industrialization of the developing countries by responding to and inviting requests for technical co-operation in all aspects of industry. This commitment to industrialization, as a means of improving the living standards of nearly three-quarters of the world's population, continues and grows each year. At the same time UNIDO is following international developments and trends with great attention. The new political and economic environment in eastern European countries and in a number of developing countries require that special emphasis is placed on assisting industries to become competitive in market economies and to guide them in their privatization process. In this context rationalization and modernization of production is of utmost importance as is the upgrading of management skills, and the application of environmentally friendly and energy-saving technologies, to assist in rehabilitation/restructuring and upgrading of small and medium scale industries and to pave the way towards privatization.

NEW CHALLENGES AND OPPORTUNITIES

**INDUSTRIALIZATION:
NOT IN CONTRADICTION
OF A SOUND AND HEALTHY
ENVIRONMENT**

Global warming and climatic changes are issues of concern to all ecologically minded human beings. The deterioration of the environment to which industry is a major contributor represents one of the greatest challenges to UNIDO in its strive for industrialization. Thus, UNIDO has fully committed itself to environ-

mentally sustainable industrial development which was manifested in the UNIDO environment programme and approved by UNIDO's Third General Conference in 1991. This programme constitutes a good background for further promotion of environmentally sustainable industrial activities and is designed to lessen pollution, eliminate or reduce wastes, transfer clean technologies, pollution control and recycling technologies, formulate/apply environmental norms and minimize dangers to human health and the environment through projects that are viable and economically feasible.

Strongly linked to economic growth as well as to environmental concerns is the **supply and use of energy**. Proper choice of technology is an asset to reach optimum environmentally friendly operations with minimum investment. At the same time, saving in energy and thus reduced operating costs often offset the additional investment requirements within a short time-span.

A comprehensive energy programme is being formulated to assist developing countries to secure their need for energy supplies to meet their economic growth targets by using new and renewable sources of energy and applying energy conservation technologies.

Fully aware of the environmental and energy-saving requirements, IO/T can provide assistance in all aspects of transfer of technology with special emphasis on

- **Development/application of new and renewable sources of energy** (energy generation from biomass, mini hydropower plants, solar and wind); Improving the efficiency, environmental acceptability and cost effectiveness of using low grade coal, an indigenous source of energy in many developing countries;
- **Energy auditing, computer-based energy monitoring systems;**
- **Selection and application of "clean" and environmentally friendly processes and equipment (low waste/non waste technology);** This requires selecting technologies to fulfil environmental requirements (adherence to environmental standards) or by providing additional equipment design to reduce the negative impact of industry on the environment (reduced air and water pollution). IO/T assists developing countries in the proper choice of technology to reach optimum environmentally friendly operations with minimum investment.
- **Waste utilization and recycling,** as a potential to regain or re-use certain materials. Recycling of wastes from plastics, glass, oil, metallurgical and paper industries are very important examples of such activities.

NEW CHALLENGES AND OPPORTUNITIES

□ Water and waste water management

- Water management and water planning

In many developing countries the ground water is scarce and any waste of water has to be kept to the absolute minimum. The selection of the most appropriate technology plays an important role and technologies that consume less water and entail the least loss of water (e. g. through vaporization) need to be chosen.

- Process water treatment

Owing to pollution the quality of river waters used for industrial purposes declines. At the same time the requirements for process water increase to improve the quality of industrial products. Rational use of water resources demands the introduction of more sophisticated process water treatment techniques (e.g. chemical pre-treatment, membrane technology).

- Waste water treatment

Industrial effluent and waste water treatment (e.g. to separate oil or treatment of tannery effluent) is another area of concern.

**YES TO PRIVATIZATION
WHAT GUIDANCE CAN IO/T PROVIDE**

Guiding industries towards privatization is a subject which embraces many activities. After identifying plants or units as promising candidates, privatization will often only be possible after implementation of restructuring,

upgrading and rationalization programmes. after introduction of environmentally sound technologies, improved management and operational skills and capabilities. Other pre-requisites for privatization are asset valuation and clean technologies. Finally, guidance may be provided as regards the financial and legal framework, and foreign investment and joint venture potential.

□ Rehabilitation/restructuring and upgrading of small and medium scale industries

This sector constitutes a major part of activities carried out in developing countries, since most of them have industries at the small and medium scale level. The issue gains higher priority since small scale industries are easier to privatize and are first candidates. Every effort is made to achieve plant rehabilitation with minimum economic investment. Any plant modernization programme needs to be market-oriented and the introduction of quality control and plant maintenance measures are indispensable to improve capacity and efficiency of operation. The improvement of management skills for key decision managers is often a pre-requisite for the success of the rehabilitation programme. Again, the introduction of low-waste/non-waste and energy-saving technologies as well as technological aspects in equipment maintenance and training are key issues. Plant maintenance as a means to increase plant availability and to reduce operating costs plays an ever increasing role.

NEW CHALLENGES AND OPPORTUNITIES

**LOCAL R AND D INSTITUTES
CAN EFFECTIVELY RESPOND TO
TOMORROW'S INDUSTRIAL NEEDS**

□ Upgrading/restructuring of research and development (R and D) institutes to support the Government's privatization process.

UNIDO has been active in assisting developing countries to establish or strengthen R and D centres to develop and adapt technologies according to raw materials availability and market capacity. These and other local institutions need to become self-reliant and should provide consultancy, training and extension services to the local industries to ensure their efficiency and to achieve an improvement of technology. Also, they play an important role in acting as reference laboratories/centres for design and quality control. This is of particular importance during the process of privatization, when R and D institutes are required to demonstrate their capabilities in planning technological needs, in training of personnel, and in providing advice.

□ Establishment/reorientation of pilot plants (semi-industrial units)

Alike R and D centres, available pilot plants will need to be reoriented/restructured into demonstration production units which are economically self-supporting advanced training and technology-transfer units, capable to support the privatization process.

□ Training and Retraining

So far, IO/T has been involved in all kinds of training activities (on-the-spot training, fellowships and study tours abroad, workshops, seminars, etc.). It is obvious that during any restructuring and rationalization process excessive labour force is reduced to correspond to the actual requirements. Thereby staff will be released for redeployment to other industries which requires establishment/strengthening of retraining facilities.

□ Advice on marketing and sales of products

A major emphasis is being placed on converting industries to become competitive in a market economy. This is particularly acute for eastern European countries in the transition stage from centrally-planned to market economies and also with a view to privatization. Centralized marketing and sales services that were provided in the past are often no longer available and the plants have to establish their own sales departments, undertake marketing research and provide customer service. The selection of the product mix, product design for export and packaging are other priority areas for assistance.

NEW CHALLENGES AND OPPORTUNITIES

**IO/T - ALSO ACTIVE
IN HIGH-TECH**

□ *Introduction and development of new and emerging technologies and high technology based industries;*

Apart from the environment and privatization issues, UNIDO is also actively engaged in promoting and encouraging the development and transfer of high technology on the basis of the least possible cost but highest possible revenue for developing countries. The raw materials necessary for new materials production are available in many developing countries and are often materials in high demand by the electronics, energy source, pollution control and consumer products industries. Here again IO/T promotes the selection and application of energy saving and environmentally friendly "clean" technologies (e.g. LW/NW) as well as high tech based on recent scientific achievements, such as genetic engineering, biotechnology, production of synthetic fibres, composites, new materials, advanced ceramics and special glasses.

OTHER PRIORITY AREAS

For staff members of IO/T it is a challenge to keep abreast of new and changing developments and technologies and this is reflected in the preparation of project documents. The priority list is constantly

increasing and new priorities need to be added, such as:

□ *Safety aspects*

In all aspects of industrialization, safety issues must not be neglected. This subject is of particular concern in pesticides production where UNIDO is actively promoting the introduction of integrated international safety guidelines for pesticide formulation, as well as development of pesticides based on natural products. Other issues of attention are dual technologies in chemical industries, replacement of banned toxic chemicals, safety audits, etc.

□ *Conversion of military to civilian production*

This subject would require a review of the different military technologies used in a given country (e.g. in the former USSR) in the past to identify the scope which these technologies leave for production of other goods for the local market, as well as for export.

□ *Emergency assistance*

Ad-hoc advice from IO/T is being sought when emergency measures need to be launched. This may refer to the elaboration of new specifications and techniques for establishment of housing and shelters in earthquake prone areas

NEW CHALLENGES AND OPPORTUNITIES

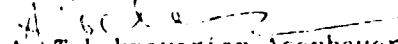
of urgent trouble shooting assistance through short term projects in various industrial sub-sectors. Special emphasis is accorded to assist least developed and seriously affected countries.

CONCLUSIONS

IO/T has unique capabilities and potentials in the industrial sectors described, as well as in all aspects of technology linked to industry especially in the light of the rising cost of energy and its economic impact on industrial development. Recycling of wastes and utilization of by-products is an increasingly important activity connecting environmental and economic aspects of industries and creating new possibilities for small, medium and large scale industries, especially in the private sector. This dynamic process creates a **unique advisory base** which may not easily be matched elsewhere. A group of knowledgeable and highly experienced technical staff in various technological operations gives the Division a flexibility and potential to respond to diverse problems arising from industrialization. As regards the specialization of professional staff in IO/T, such information can be found in **"Who's Who in the Industrial Operations Technology Division"**, a brochure which is continuously updated and issued twice a year by IO/T. In addition to its own staff, the Division relies on other in-house experience, as available from e.g. economists of other Branches. At any time staff members, particularly the Senior Interregional Advisers, are ready to provide information to Member States, governments and industry. UNIDO, through its IO/T Division, is in the forefront when considering aspects of industrial technical assistance project management, especially in areas of industrial planning, productivity, transfer of technology, manpower evaluation, global trends in marketing and financing, as well as R and D.

Furthermore in giving the required impetus to various industries, IO/T staff help to counterbalance the occasional lack of technical dialogue between the suppliers in the North and the receivers in the South, as well as the lack of access to the latest technological applications. Individual staff members can provide unbiased advisory services and may perform, in big projects, as contract executors working with several contract managers, assisting in the preparation of tender documents, specifications and evaluation of tenders for establishment of industrial plants/units and procurement of equipment. They may also advise the governments on the selection of suitable contracts and companies for their consideration.

Finally the key role played by the Division is the identification of problems, the basis of which is the formulation of enterprise level projects and Trust Fund Agreements. These are for the increase of efficiency and the raising of capacity of industries. This is an essential and expanding area which challenges in-house knowledge and especially the Division's competence and expertise in solving problems of operating on an industrial scale. It is IO/T that implements most enterprise-level operations on behalf of owners, with a number of trust fund projects operational over the last ten years.


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Industrial Operations Technology Division

NEW CHALLENGES AND OPPORTUNITIES

THE FOLLOWING PUBLICATIONS ARE ALSO AVAILABLE:

WHO'S WHO
AGRO-BASED INDUSTRIES
CHEMICAL INDUSTRIES
ENGINEERING INDUSTRIES
METALLURGICAL INDUSTRIES
ENERGY AND ENVIRONMENT RELATED PROJECTS
PROJECT ACTIVITIES AND PRIORITY AREAS
LIST OF DOCUMENTS ISSUED BY IO/T
LIST OF MEETINGS ORGANIZED BY IO/T

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