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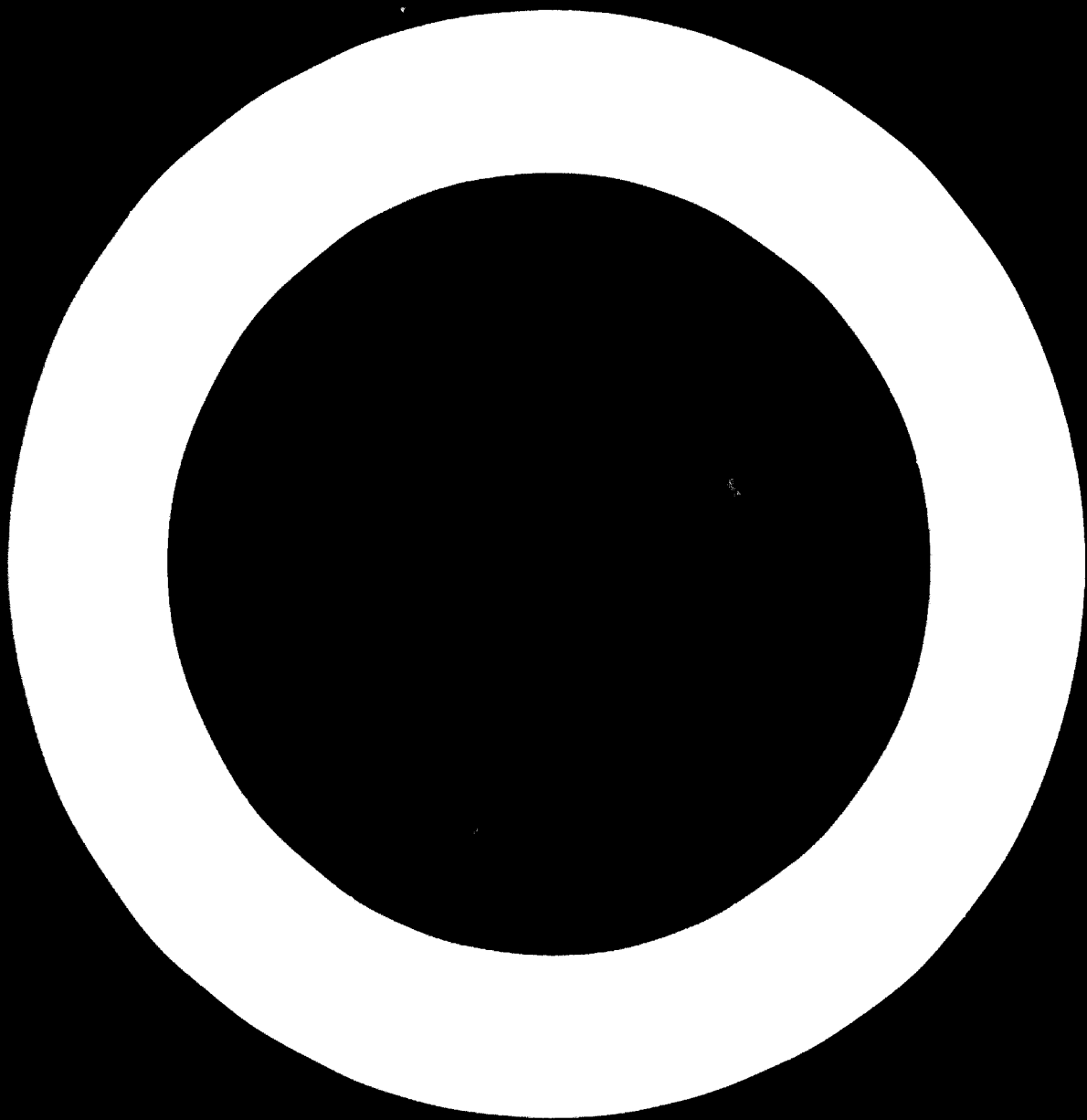
INVESTMENT PROMOTION MEETING AND TECHNOLOGICAL
CONSULTATIONS FOR CHEMICAL INDUSTRY OF
DEVELOPING COUNTRIES

Bucharest, 2 - 6 December 1974

TECHNOLOGICAL CONSULTATIONS FOR CHEMICAL INDUSTRIES
OF DEVELOPING COUNTRIES

CONCLUSIONS AND RECOMMENDATIONS

1/ Organized by the United Nations Industrial Development Organisation (UNIDO)
in co-operation with the Bucharest Office of the Joint UNIDO/Romania Centre.



The significance of the chemical industry for the economic development of the developing countries was stressed in background paper presented by the UNIDO consultants Cesare, P. Stefanescu and V. Anghelencu. An account was then given of certain selected issues relating to the development of chemical and petrochemical industries in the developing countries. These issues were discussed in detail during three plenary sessions and the following conclusions and recommendations were approved:

1. Exploitation and Utilization of Indigenous Raw Materials

Developing countries endowed with vast natural gas resources can create production facilities for fertilizer and petrochemicals capable of supplying a substantial portion of the developing world demands. The cost of production in these plants would be competitive with that in developed countries owing to the relatively low cost of feedstocks.

However, countries that lack hydrocarbon resources should explore the feasibility of developing industries based on alternative raw materials such as those based on the production of acetylene from calcium carbide or on the products derived from the fermentation of molasses, in addition to raw materials based on coal and lignite.

In view of the increase in the price of hydrocarbon feedstocks at the end of 1973, it is recommended that UNIDO should examine and make available the developing countries techno-economic studies on the production of chemicals and polymers from these alternative raw materials as compared with their production from petroleum and natural gas.

2. Fertilizers, Pesticides and Planting as Inputs in Agriculture

Stress was laid during the discussions on the importance of the fertilizer and pesticides industry in view of the serious food situation in many developing countries. Attention was also drawn to technological and economic competitiveness of plastic pipes in irrigation and land drainage. The discussion brought the following recommendations:

a) UNIDO jointly with FAO, should convene a high level working group to draw up a world strategy for the production of fertilizers, pesticides and other agrochemical products.

- b) It is desirable that developing countries carry out pilot tests for the application of liquid fertilizers, particularly ammonia and for the use of plastics in agriculture. UNIDO should assist and promote these activities.
- c) UNDP and UNIDO should assist developing countries in installing demonstration plants for the formulation of pesticides and pilot multi-purpose plants for the synthesis of various active ingredients.

3. Problems Relating to the Transfer of Technology

High technology transfer in the field of chemical, petrochemical and pharmaceutical industries must necessarily take place from advanced to developing countries. However, problems arise in this transfer among which are the very high costs of license agreements, restrictive provisions of various types and the inappropriateness in many cases of the transferred technology to conditions prevailing in the developing countries.

These problems were discussed in great detail and the following recommendations adopted:

- a) UNIDO, on the basis of a questionnaire to licensees, should compile a directory of the main technologies available for licensing, their characteristics and conditions of granting licenses. This information should be periodically updated and made available to developing countries.
- b) It is desirable that UNIDO take action to convene an inter-regional symposium on the transfer of technology in the chemical, petrochemical and pharmaceutical industries.
- c) Developing countries may wish to set up regulatory bodies and enact laws for the transfer of technology similar to those established in India, Argentina and Mexico.
- d) UNIDO should provide developing countries with guidelines for evaluating the cost of licenses and know-how and should assist those countries, at their request, in evaluating specific license agreements and in acquiring foreign technology on equitable terms.
- e) UNIDO should consider the establishment of a "Technology Fund" financed by voluntary contributions from developed and developing countries. This Fund would enable UNIDO to sponsor a research and development effort in chemical and petrochemical technology aimed at modifying existing technologies and/or technology creating new ones more appropriate to the needs of developing countries.

4. Indigenous Research and Development

Governments in many developing countries have realized the importance of establishing a domestic industrial research and development capability and have set up industrial research institutions, both specialized and multipurpose.

The importance of Research and Development activities in the production, applications and use of various chemical and petrochemical products was emphasized. It was also felt that close appropriate organizational and financial links between these institutions and enterprises engaged in production, are desirable.

In this connection it is recommended that developing countries establish and/or strengthen national or regional research and development facilities for fertilizers, plastics and pesticides technology.

5. Design Development Activities and Local Manufacture of Equipment

Case histories of Kenya, India and Latin American countries were presented in order to show how a country can gradually develop its own plant design capability and manufacture certain or most items of chemical plant equipment. It was recommended that :

a) Local cadres from developing countries should participate at all stages of the development of a chemical or petrochemical project, from the initial project formulation, feasibility study through the design and detailed engineering stage, to the construction and start-up of the plant.

b) In negotiating the terms of a license or know-how agreement or a contract for the supply of equipment, developing countries should always insist on utilizing as much as possible the capacity of local engineering firms.

c) UNIDO and UNDP should promote and assist in the setting up and operation of national or regional design and construction centres in developing countries.

6. Economies of Scale

It was recognized during the discussion that modern chemical and petrochemical industries are capital-intensive and subject to economies of scale. It was emphasized, however, that careful study was needed in each case to determine the optimum size of plant to install in a given developing country since there may be social justifications and other considerations which are different from those prevailing in developed countries.

feasible form of joint venture agreement where by countries of a region may have complementary needs of chemical products for sale through the above mentioned mechanism as one solution to overcome the limited sizes of local markets. Joint ventures between two or more countries in the above mentioned categories.

7. Maintenance of Chemical and Petrochemical Plants

The maintenance of modern chemical and petrochemical plants, particularly the simple train ones, with few spares and spares was recognized as a major problem for developing countries because of shortage of skilled technicians and long delivery period for spare parts, especially when thousands of miles away. The training of technicians in the operation and maintenance of chemical plants was recommended. In this connection it was recommended that :

a) In planning modern petrochemical plants in a country or a group of countries, attention should be made to standardize machinery and equipment so as to reduce the cost of spare parts stocks and ensure their availability.

b) UNIDO should give priority to the organization in developing countries of simple training courses in maintenance.

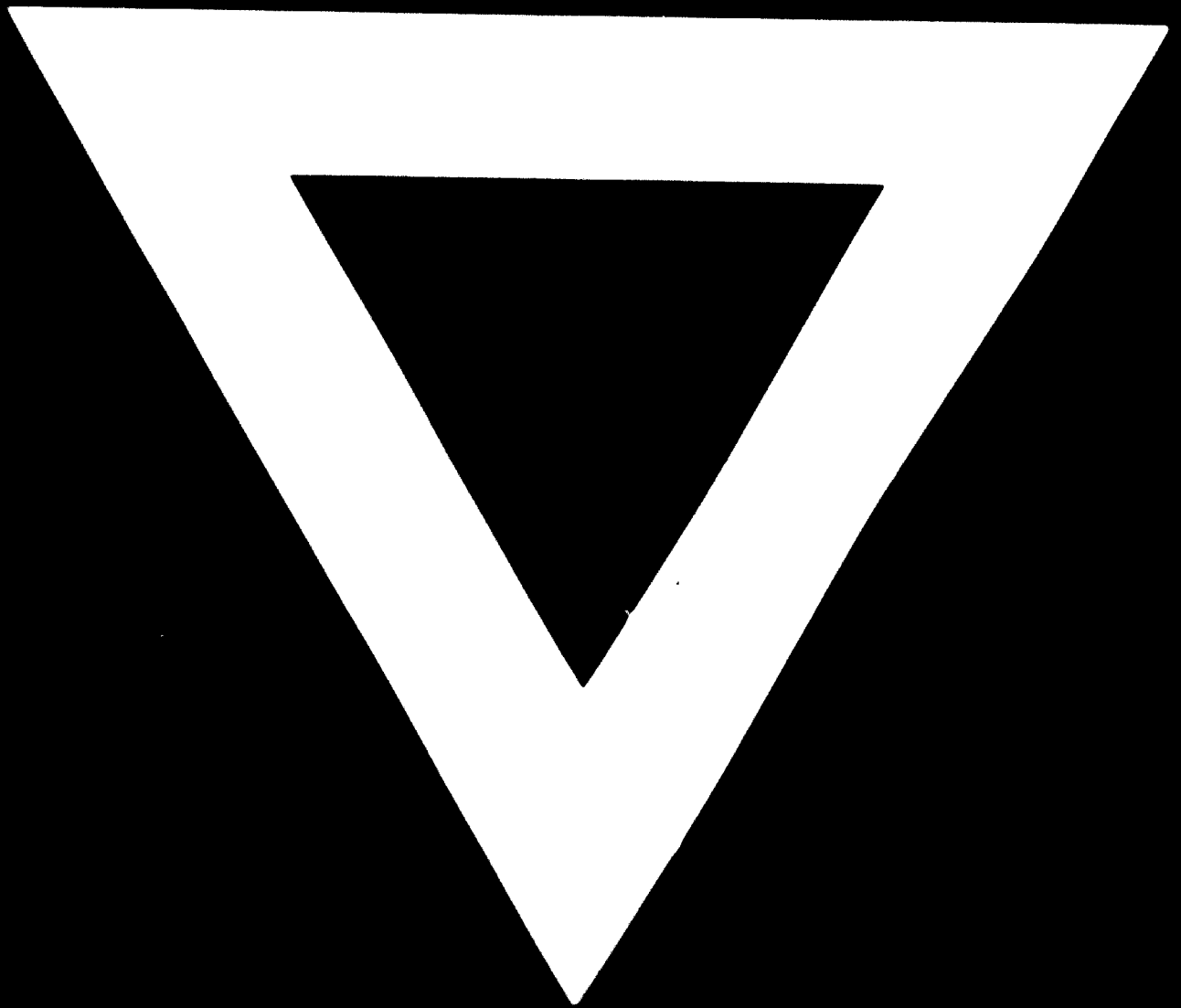
c) In view of the time loss on the day of stoppages in chemical and petrochemical plants when breakdowns in plants are tried, UNIDO should initiate programmes of training in "Detection and Testing".

8. Co-operation between Developing Countries

UNIDO programme of co-operation between developing countries was outlined.

It was recommended that UNIDO intensify the programme particularly in the areas of training, exchange of experiences in operation and trouble shooting and exchange of the results of research and development activities.





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