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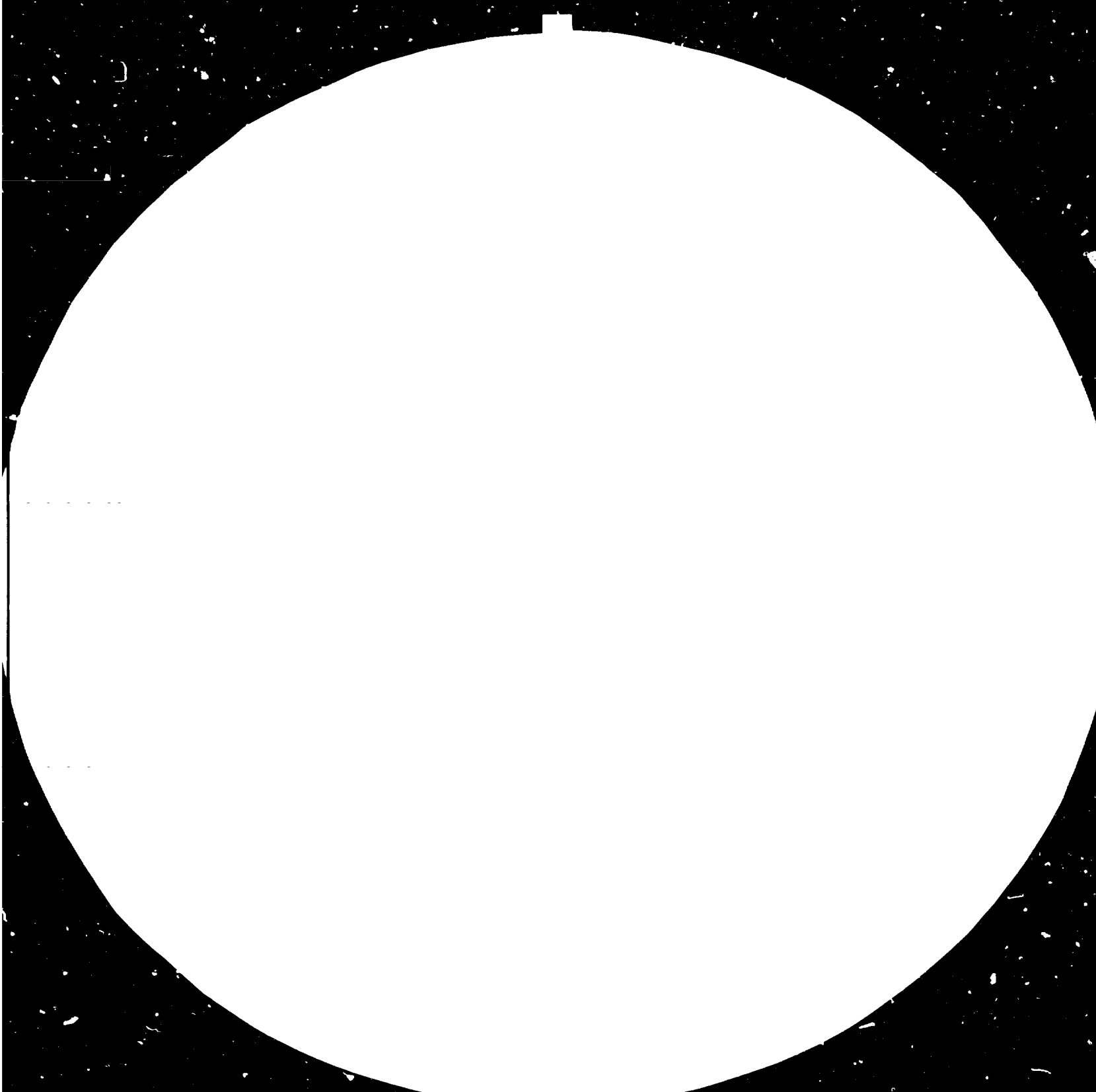
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**HIGH-LEVEL  
EXPERT GROUP MEETINGS  
PREPARATORY TO THE  
FOURTH  
GENERAL CONFERENCE  
OF UNIDO**

*Industrial Co-operation Among Developing Countries  
Bangkok, Thailand, 18-22 July 1983*

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**UNIDO'S ACTIVITIES  
FOR PROMOTING AND IMPLEMENTING ECDC/TCDC**

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## INTRODUCTION

1. The importance of economic and technical co-operation among developing countries (ECDC/TCDC) has been recognised in a series of Resolutions and Declarations of the United Nations General Assembly and other international organizations. ECDC/TCDC is essential for the establishment of the New International Economic Order and necessary for the attainment of national and collective self-reliance of the developing countries and their effective participation in international economic relations on the basis of equality and mutual benefit. Industrial co-operation among developing countries (ICDC) is particularly important for accelerating the pace of balanced industrial growth.
  
2. UNIDO has attached great importance to promoting and implementing ECDC/TCDC. In this Paper, after a brief review of ECDC/TCDC activities in its initial stage, a detailed description is given of UNIDO's comprehensive ECDC/TCDC programme consisting of five mutually supporting components.
  
3. It also presents a brief analysis of recent experience of technical co-operation among developing countries through UNIDO-implemented projects and activities. Co-operation has taken place both at the initiative of UNIDO or UNDP as well as of the developing country or countries themselves.
  
4. The analysis contained in this Paper is by no means exhaustive. It includes some significant experiences, which may lead to further co-operation and intensification of activities in ECDC/TCDC.



## I. BRIEF REVIEW OF ACTIVITIES IN THE INITIAL STAGE

5. UNIDO has been one of the pioneer UN agencies in promoting and implementing ECDC/TCDC. Even long before the UN Buenos-Aires Conference on TCDC, UNIDO had initiated activities to encourage economic and technical co-operation among developing countries in the industrial sector, working in close co-ordination with the UNDP, UNCTAD, the United Nations Regional Commissions, and other international organizations.

6. Its special interest in this field began with a proposal submitted by the Government of Senegal to the first session of the Permanent Committee of the Industrial Development Board in December 1972, calling for an exchange of experience between developing countries in the creation or development of small and medium-scale industries. In response to the support expressed for this proposal, the UNIDO secretariat, in consultation with the member states, suggested some initial activities, these were subsequently expanded into a programme of operational activities in accordance with resolution 36 (VII) adopted by the IDB at its seventh session in May 1973. In that resolution, the Board invited the Executive Director "to establish as soon as possible, and as a first stage, a concrete programme of operation activities for the purpose of promoting technical co-operation among developing countries, by the exchange of duly adapted technology, information and development assistance formulas in the field of industry, including small and medium-scale industries, industrial programming, industrial financing etc." At its eighth session in May 1974, the Board approved the programme of action proposed by the Executive Director, and, in subsequent sessions, has kept the implementation of the programme under periodic review.

7. At its seventh session, the IDB also requested the Governing Council and the Administrator of the United Nations Development Programme "to consider the measures necessary to encourage this new form of co-operation and technical assistance". In August 1973, the Executive Director of UNIDO informed the member states that a programme was being initiated by the UNDP and UNIDO to provide assistance to a few priority bilateral and multi-lateral co-operative activities mainly involving industrial advisory services, consultations or training. Resources from the programme for Special Industrial Services would be used to meet the costs of international travel and selected other services, but the co-operating countries themselves were expected to bear the costs normally involving only local currency expenditures, such as the normal salaries of technical advisers, consultants and trainees, and their in-country subsistence and travel costs while on mission.

8. Although of modest dimensions, this programme had provided a useful impetus to co-operation among developing countries. Activities financed under this programme include inter-country study tours and consultations, seminars and other forms of training, and assistance in feasibility studies.

9. Special allocations for technical co-operation between developing countries have been included in the UNIDO Regular Programme of Technical Assistance beginning with the 1974-1975 biennium. In addition, allocations for activities in this field have been made from voluntary contributions to UNIDO and from the United Nations Industrial Development Fund. Resources available, however, are not sufficient to meet the growing demand for such activities.

10. As one of the first steps in the implementation of its programme, the UNIDO secretariat carried out a survey to define specific areas in which developing countries could offer technical co-operation

for industrial development or would welcome such offers from other developing countries. In consultation with some 40 developing countries, a preliminary list of opportunities for co-operation was issued in May 1975, including some 360 specific offers of resources. Although this preliminary sample did not include information concerning a number of countries with important resources to offer, it nevertheless indicated a considerable potential for co-operation among developing countries in a fairly wide range of industrial fields and offered a useful basis for further development of the programme.

11. In March 1975, the Second General Conference of UNIDO (UNIDO II) adopted the Lima Declaration and Plan of Action on Industrial Development and Co-operation which attached great importance to ECDC/TCDC and listed 14 concrete measures to be taken to promote industrial co-operation among developing countries.

## II. COMPREHENSIVE ECDC/TCDC PROGRAMME

12. In view of the growing importance of TCDC activities after UNIDO II, in June 1977, a separate Section was established in the UNIDO Secretariat, within the Division of Policy Co-ordination, to co-ordinate specific UNIDO activities and shape them into a coherent programme to promote economic and technical co-operation among developing countries in respect of industrialization.

13. The UNIDO programme of ECDC/TCDC is primarily intended :-

- (a) to promote the spirit of solidarity and to increase the awareness of the necessity and possibility of ECDC/TCDC among developing countries;
- (b) to encourage the developing countries to adopt policies and regulations favourable to ECDC/TCDC in order to obtain maximum benefit from them;

- (c) to promote the co-operation in specific industrial sectors as well as specific projects in order to strengthen the indigenous capabilities of the developing countries.

The programme has five mutually supporting components :-

A. Organization of Solidarity Meetings and Round-Table Meetings

14. Within the framework of the Programme of Co-operation Among Developing Countries, UNIDO has organized, since 1979, eight Solidarity Meetings at ministerial level, which provide a new venue for assisting in economic and industrial development of the least developed countries. The main objective of the Solidarity Meetings is to identify means of co-operation whereby the participating developing countries can help in implementing specific industrial projects in the host least developed countries. In addition to enhancing the spirit of collective self-reliance, these Meetings serve to develop practical mechanisms to facilitate the progress of technical and industrial development of the host country. The mechanisms of co-operation agreed upon take various forms, such as loans or grants for purchase of machinery and equipment, joint ventures, exchange of technology and know-how, training, industrial research and experts' services.

15. In order to facilitate the identification of concrete co-operation possibilities, before each Meeting is held, the host country, with the assistance of UNIDO, prepares a portfolio of project proposals, indicating crucial areas and the type and volume of assistance required for accelerating its industrialization. The project portfolio is then submitted to a number of countries which are invited to the Meeting. Invited countries are given ample time to review projects and to determine the type and extent of assistance they can provide for

implementing designated projects. During the Meetings bilateral discussions are organized where the host and the co-operating countries engage in negotiating and eventually reaching concrete agreements.

16. The eight Solidarity Ministerial Meetings have been organized in the following countries: Afghanistan (14-17 May 1979), Tanzania (23-26 July 1979), Haiti (5-9 November 1979), Bangladesh (2-5 December 1980), The Sudan (23-26 March 1981), Upper Volta (1-4 December 1981), Lesotho (7-11 June 1982) and Nepal (29 November - 3 December 1982). A Meeting with similar objectives was also organized in the Islamic Republic of Mauritania (18-20 January 1982). However, since Mauritania is not classified as a least developed country, the participation was confined to countries and organizations of the Arab Region.

17. Consequent to such Solidarity Meetings considerable progress has been achieved. The following are some examples :-

18. As a result of the Solidarity Meeting held in the United Republic of Tanzania, July 1979, assistance was extended to that country by a number of other countries. For example, Yugoslavia, in co-operation with UNIDO, is assisting Tanzania in the establishment of a foundry with integrated mechanical workshop in Mwanza. The project, with a total cost of US\$1,050,000, is executed during the period 1981-1983. Egypt started a training programme for Tanzanian officials, providing a total of 50 fellowships, and Turkey offered to assist in the execution of several projects which are being finalized for implementation.

19. At the Bangladesh Solidarity Meeting, December 1980, 77 projects with a total cost of US\$88 million were agreed upon. UNIDO and the Government of Bangladesh reviewed the list of projects, in March 1981,

and selected 19 priority projects for processing and implementation. Out of these projects 4 to 5 are completed or under implementation, for instance: China has offered from its country IPF an amount of US\$100,000 to finance the procurement of equipment of the Polash Urea Fertilizer Factory and the expertise assistance to Sundarban Textile Mills, in conjunction with their bilateral co-operation projects. This project has been completed. Pakistan has offered the establishment of a complete sugar plant. According to the Memorandum of Understanding and the Contract signed by both sides, Pakistan's Heavy Mechanical Complex Limited will supply, on the basis of a soft loan, the machinery and equipment valued at approximately US\$8 million. It will also supply related services for the building supervision and initial operation of the Plant. This project is under implementation. India has offered to provide 10 million taka to finance a number of technical assistance projects, including feasibility studies, training of personnel and provision of demonstration equipment in small-scale industries. A Memorandum of Understanding on the utilization of this offer was signed by India and Bangladesh in 1982.

20. Among the co-operation projects agreed upon during the Solidarity Meeting in the Sudan, March 1981, Yugoslavia offered to supply machinery and equipment as a grant (totalling to 26 million dinars, equivalent to approximately US\$900,000), for the establishment of a pilot plant for the production of bricks. The techno-economic feasibility study has been finalized. China earmarked US\$100,000 from its country IPF to finance the procurement of equipment and living expenses of Chinese experts to assist the Khartoum ready-made clothes factory. The project is now completed.

21. After the Solidarity Meeting held in Upper Volta, December 1981, Tunisia and Upper Volta have examined in detail the project of Underground Phosphate Extraction. Samples were tested free-of-charge in a

Tunisian laboratory. A Voltaic geologist attended the tests, whereby UNIDO financed the cost of international travel and the Government of Tunisia covered the local expenses. Based on the outcome of these tests, which is expected shortly, further co-operation in the implementation of the project will be considered.

22. During the follow-up mission of the Solidarity Meeting in Haiti, where several project proposals of technical assistance were agreed upon between Brazil and Haiti: experts from the Brazilian Institute ITAL to assist in carrying out a field study in Haiti on the possibilities of fruit processing and in designing a manioc flour processing plant in Haiti, including a detailed outline for the establishment of the plant; the Brazilian Training Institute SENAI to send consultants to Haiti to assist in setting up a scheme for training skilled labour in Haiti. It is also planned that a Haitian expert will visit SENAI to explore their training facilities and discuss the possibility of having Haitians trained in Brazil. The above projects will be implemented with the support of UNIDO in 1983.

23. The experience gained so far has indicated that the mechanism of Solidarity Meetings has two advantages :-

- (1) The Meetings are usually attended by decision-makers and experts with authorization from their respective governments to take decisions during the course of the Meeting;
- (2) The Meetings discuss concrete project proposals which have been submitted to the participating countries before the holding of the Meeting for necessary preparation and, therefore, during the Meeting they can examine and agree upon joint action for concrete projects, so that tangible results may be achieved from the Solidarity Meetings.

24. UNIDO is continuing its programme to organize Solidarity Meetings. For 1983, a Meeting is planned to be held in Yemen Arab Republic; for 1984, a Meeting in Burundi is under preparation; two Meetings in Mali and Rwanda are under consideration.

25. As part of the UNIDO programme of TCDC activities, Round-Table Ministerial Meetings on industrial and technological co-operation between developing countries have been organized. The first Meeting of this kind was held in New Delhi, India, in January 1977, under the joint auspices of UNIDO and the Government of India. This Meeting produced recommendations that have provided valuable guidance to UNIDO.

26. Areas of co-operation identified by the Meeting were :-

- (a) Improvement of the identification and use of industrial technologies already available in the developing countries, including technical know-how and skills, machinery and equipment design, consulting and construction capabilities;
- (b) Establishment of a technology bank, to include joint purchase of technology and examination of contracts and agreements already concluded to provide guidance to others;
- (c) Augmentation of the skills basic to industrial development programmes through industrial training;
- (d) Establishment and strengthening of the institutional framework at the national and regional levels, to sustain industrial and technological development;
- (e) Creation of programmes of co-operation on applied research and development activities in specific sectors, drawing upon machinery and capabilities already available in the developing countries and concentrating on the engineering industries, electronics, fertilizers and agro-chemicals, pharmaceuticals, chemical industries and energy;



- (f) Development of plans for the use of engineering and consultancy capabilities available within the developing countries;
- (g) Promotion of collective action for negotiating and bargaining for more equitable economic relationships and for technology acquisition.

27. The Second Round-Table Ministerial Meeting on the Promotion of Industrial Co-operation Among Developing Countries was organized by UNIDO in co-operation with the Government of Turkey, and held in Istanbul, Turkey, 1-5 October 1979. The Meeting reviewed the progress made in implementing the recommendations of the New Delhi Ministerial Meeting and adopted unanimously the "Declaration of Istanbul" which identified several areas of co-operation and requested that appropriate follow-up action be taken.

28. During 1982, UNIDO, in co-operation with the Government of Iraq, organized another Round-Table Ministerial Meeting on Agro-Industry Development in Baghdad (Iraq), 15-19 February 1982, attended by 20 countries and seven United Nations and Arab Organizations. The Meeting adopted a series of conclusions and recommendations for promoting co-operation among developing countries in the agro-industries sector.

B. Promotion and Development of Joint Programmes for Specific Industrial Sectors

29. With regard to the promotion and development of joint programmes for specific industrial sectors, there are a number of UNIDO operational projects in the fields of energy, metallurgical industries, engineering industries, chemical industries, building materials, technology, industrial consultancy, and industrial training among others. Details are given in Chapter III, 'A Review of UNIDO's Operational Projects'.

C. Follow-up of the System of Consultation

30. The Second General Conference of UNIDO recommended that UNIDO should include among its activities a system of continuing consultations between developed and developing countries and among developing countries themselves. The consultations themselves offered excellent opportunities for an exchange of experience and ideas among developing countries which may lead to the establishment and strengthening of sectorial co-operation among developing countries.

31. Under the guidance of the Industrial Development Board, UNIDO has organized a series of Consultation Meetings in sixteen sectors and topics, including fertilizers, agricultural machinery, food processing, pharmaceuticals, capital goods, etc.

32. During the Consultation Meetings recommendations have been made to strengthen economic and technical co-operation among developing countries. For example, during the Third Consultation on the fertilizer industry a programme was suggested for strengthening ECDC/TCDC at regional and interregional levels. Emphasis was on exchange and transfer of experience, co-operation in the design and manufacture of equipment, machinery and spare parts, as well as construction of fertilizer plants and joint ventures for exploitation of reserves of fertilizer raw materials and for the establishment of fertilizer manufacturing facilities.

33. On the basis of the above recommendation UNIDO has prepared a programme to be implemented over the next two or three years. As a first step an inventory is being drawn up on specific areas of training needs and capabilities in selected developing countries. This survey has been completed and a number of training workshops will be organized. In order to expand the fertilizer industry through ECDC/TCDC a Meeting on Exchange of Experience in the Construction and Operation of

Fertilizer Plants in the Asian Region, took place in New Delhi, 4-8 April 1983. The participants found such exchange of experience very valuable and useful. A similar regional meeting will be organized in another continent.

34. ECDC/TCDC activities, as a follow-up of the Consultation Meeting, were also organized in other sectors such as agricultural machinery, food processing, etc. An Expert Meeting of the Pharmaceutical Industry will be organized, as a follow-up to the First Consultation Meeting on Pharmaceutical Industry, with the aim of establishing a basis for joint projects between the more advanced developing countries and the least developed ones in the pharmaceutical industry.

D. Development and Transfer of Technology

35. UNIDO attaches great importance to the co-operation among developing countries in development of transfer of technology. The possible areas of co-operation include: exchange of information and experience, flow of technology among developing countries, solution of specific technological problems through joint efforts, creation of networks of science and technological institutions, innovations and research in advanced technology and co-operative efforts in enhancing the negotiating power of developing countries vis-a-vis technology suppliers from developing countries.

36. Co-operation may start from an initial and simple form. A lot can be done through establishment of meaningful contacts. The exchange of experience and information through technical visits, study tours and expert meetings has proved very useful. These activities which can usually be organized with relatively little cost and effort represent the essential preliminary reconnaissance required to establish a sound foundation for further co-operation. More than 100 projects of this

kind have been implemented by UNIDO in the recent 10 years and a number of concrete co-operation programmes in the field of development and transfer of technology have resulted from these activities.

37. UNIDO has played a significant role in promoting technological co-operation through exchange of information. In 1978, UNIDO set up the Industrial and Technological Information Bank (INTIB), through which it has sought to provide the necessary information for the selection of technology on a goal-oriented basis. Some of the activities of INTIB are directly related to TCDC i.e. the publication of the Directory of Information Systems and Services in Developing Countries, Directories of Industrial and Technological Institutes by sectors of industry etc.

38. Reference is made in Chapter IV to the Technological Information Exchange System (TIES), established by UNIDO to exchange information on terms and conditions of technology acquisition contracts. A programme of co-operation was developed with the Andean Technological Information System, paving the way for a regular exchange of information between the two systems.

39. The seventh Meeting of the Heads of Technological Transfer Registries further requested UNIDO to make available within the TIES system an annual consolidated report which would cover statistical other information on technology flows and trends, in particular of licensing technology in individual industrial sectors. Technological advances and other potential for developing countries were also very important to the co-operation in the technology transfer.

40. The co-operative programme of action in micro-electronics will provide possibilities of technological co-operation among developing countries in Latin America.

41. An innovative activity, initiated in 1982, was the promotion of co-operation among industrial development financing institutions of developing countries in the field of technology selection, through a meeting of selected institutions and the initiation of a pilot scheme for a Technological Information Exchange Network. Other measures to promote co-operation in developing countries in industrial technology included studies on technology exports in selected developing countries and the preparation and dissemination of directories, inter alia, of industrial and technological research institutes in Africa (UNIDO/IS.299) and solar research institutes in developing countries (UNIDO/IS.341). In co-operation with the African Regional Centre for Technology (ARCT) and the Organization of African Unity, an inventory of African experts in the areas of industry, science and technology is under preparation.

E. Support Measures to the Caracas Programme of Action

42. The High-Level Conference on Economic Co-operation Among Developing Countries, which was held by the Group of 77 in Caracas, Venezuela, 13-19 May 1981, adopted the Caracas Programme of Action on Economic Co-operation Among Developing Countries in various sectors including: trade, technology, food and agriculture, energy, raw materials, finance and industrialization. The Caracas Programme of Action places emphasis on the economic and technical co-operation for industrialization. It specifies, among other issues, concrete co-operation activities in the following areas: collecting and disseminating industrial information, enhancement of industrial capacities through joint efforts and development of human resources for industrialization.

43. After the Caracas Conference a number of follow-up actions have been carried out in different sectors. Thirteen Sectorial Meetings have been held so far. Although all UNIDO's ECDC/TCDC activities were

closely related to the relevant recommendations of the Caracas Programme of Action, special efforts have been made in line with, and in support of, the Caracas Programme of Action within the framework of UNIDO's ECDC/TCDC activities. UNIDO has actively participated in the various Sectorial and Follow-up Meetings, held in accordance with the Caracas Programme of Action, namely :-

- (1) the Meeting on ECDC Finance, Kingston, 26-31 March 1982;
- (2) the Meeting of Heads of Science and Technology Agencies of Developing Countries, New Delhi, 3-6 May 1982;
- (3) the First Meeting on the Capital Goods Industry, Algiers, 10-13 May 1982;
- (4) the High-Level Meeting of Officials Responsible for Industrial Manpower Training in Developing Countries, Bucharest, 31 May to 4 June 1982;
- (5) the High-Level Meeting on New and Renewable Resources of Energy, Rio de Janeiro, 31 May to 4 June 1982;
- (6) the Meeting of Heads of National Technical Co-operation Agencies, Tunis, 25-29 October 1982.

In addition to these Sectorial Meetings, UNIDO also actively participated in the First Meeting of the Inter-governmental Follow-up and Co-ordination Committee on Economic Co-operation Among Developing Countries, Manila, 23-28 August 1982.

44. UNIDO provided support to the Group of 77 in organizing the first two Sectorial Meetings listed below, as requested by the Caracas Programme of Action, and would extend assistance to the third Meeting to be held in July 1983.

- (1) Meeting of Experts on Technical Co-operation Among Developing Countries in Energy, Vienna, 24-27 May 1983;

- (2) Meeting of Experts on Economic Co-operation Among Developing Countries in Industrialization, Vienna, 30 May to 3 June 1983;
- (3) Meeting on Energy, Supplies and Rationalization of Energy Consumption, Thailand, July 1983.

45. In addition to the preparation and participation in the various sectorial technical meetings, UNIDO has also helped the Group of 77 in implementing the Caracas Programme of Action in the various aspects of industrialization, such as in technology, energy etc., details of which have been given earlier in this Paper.

46. In the Meeting of Heads of National Technical Co-operation Agencies, which was held 25-29 October 1982, in Tunis, the inter-enterprise co-operation was discussed. As a follow-up action, UNIDO is preparing three projects in this aspect, including technical assistance projects utilizing the entrepreneurial expertise in developing countries, enterprise-to-enterprise co-operation among member countries of the Organization of Islamic Conference and Expert Group Meeting on Enterprise-to-Enterprise Co-operation Among Developing Countries. The objective of these activities is to promote inter-enterprise co-operation, assistance in establishing mechanisms, methods and guidelines for inter-enterprise co-operation.

47. The current High-Level Expert Group Meeting on Industrial Co-operation Among Developing Countries, for which this Paper has been prepared as a background document, will examine the role and potential of industrial co-operation among developing countries within the context of the overall international co-operation within the context of the overall international co-operation, as well as policy options, mechanisms and possible areas for promoting the co-operation in line with and in support of the Caracas Programme of Action.

### III. A REVIEW OF UNIDO'S OPERATION PROJECTS

#### A. ENERGY AND ENERGY-RELATED TECHNOLOGY

##### Regional Network for Small Hydro Power (RN/SHP)

48. UNIDO and ESCAP have closely co-operated during the last three years with the UNDP and with Governments and Agencies in Asian countries in promoting the development of small/mini hydro power generation in the region. Three Workshops and one Expert Group Meeting were held on the subject, the first in Nepal in September 1979, the second in China and the Philippines in 1980, and the third in Malaysia in 1983; the Expert Group Meeting took place in 1982 in China. These efforts have culminated in the establishment of a Regional Centre for Research, Development and Training in Small/Mini Hydro Power in Hangzhou, China. The Regional Research, Development and Training Centre will be used as a focal point in a network of national mini hydro power generation organizations or institutions designated by individual member countries of the region. The Centre will act as a catalyst with the following development objectives :-

- (a) to undertake scientific research and technical development in the field of mini/small hydro power;
- (b) to exchange technical information on mini/small hydro power generation;
- (c) to carry out technical training of personnel from developing countries in mini/small hydro power; and
- (d) to provide technical advisory services and assistance to developing countries in mini/small hydro power.

49. More than 10 Asian developing countries are expected to participate in the networking arrangements through designated focal points.



50. The national focal points established in the various countries are expected to provide a large number of services. The focal points will co-ordinate the activities in this field within the country and furnish the necessary inputs required to other focal points. These focal points are expected to provide the following services in the assigned aspects :-

- Organize an information service (technical and general);
- accept or recommend candidates for training from other focal points;
- make available short-term advisory services;
- undertake research and development projects depending on the facilities available to the focal points;
- organize meetings for the benefit of the network;
- establish links with institutions outside the network.

#### Bio-fuels and Syn-fuels

51. UNIDO's technical co-operation projects on bio-fuels and syn-fuels in Brazil, China, India and the Philippines are addressing major research and development problems of interest to other developing countries. These four countries have agreed to share the results of UNIDO's projects with other developing countries and to collaborate with them under TCDC arrangements.

52. The project in the Philippines deals with production of ethanol from cellulosic materials. Assistance has been provided to the National Chemical Laboratory in India to strengthen research and development efforts in the use of cellulosic materials. The work involved studies and processes for the production of microbial biomass animal feed from cellulose, the enzymatic hydrolysis of cellulose to glucose and the conversion of glucose to ethanol. In Brazil,

assistance was provided to strengthen the research and development work of a number of research organizations on the problem of enzymatic hydrolysis of cellulosic materials for the production of ethanol. In China assistance has been provided to the industrial biomass technology demonstration plant and experimental station.

53. An earlier project in the Philippines has already resulted in the development of a pyrolytic converter to use rural waste.

54. Projects for coal conversion technology (gasification, liquefaction) in China and India would enable exchange of experience and mutual application of results.

55. In co-operation with the Government of China, technical consultations among developing countries on biogas technology were held in Beijing, in July 1980. In the recommendations adopted emphasis was placed on the establishment of administration units, the upgrading of technology (through periodic exchange of visits among biogas experts), the exchange and dissemination of technical information and the provision of training facilities with the assistance of UNIDO

#### Industrial Energy Management

56. Following a 4-week programme on industrial energy management for Asian countries hosted by the Philippines, the Government of the Philippines is providing training facilities (including instructors, instructional materials and equipment) for an interregional programme for the least developed countries. The programme includes energy planning and development, demand-supply projection techniques, process of energy analysis, energy audit, energy conservation, energy information and energy management methods.

Regional Energy Development Programme

57. A UNDP/ESCAP project - Regional Energy Development Programme - would offer considerable opportunities for co-operation among developing countries in regard to energy planning and management, transfer of technologies, particularly relating to new and renewable sources of energy, carrying out of studies and exchange of study visits. It is expected that the forthcoming phase of the project will enable networking arrangements with national focal points for the development, dissemination and application of energy-related technologies.

B. METALLURGICAL INDUSTRIES

Co-operation in the Field of Sponge Iron Production  
through Direct Reduction

58. The Demonstration Plant of Sponge Iron India Ltd. (SIIL) set up with UNDP/UNIDO assistance has made rapid progress in adapting the sponge iron production technology based on 100% non-coking coal to the conditions in India. The plant is working at 95% of rated capacity of 30,000 tpy of sponge iron. It is proposed to have the plant's testing facilities made available also to other developing countries. UNIDO has recently assigned to SIIL test work on coals from Pakistan to be tested with Indian iron ores. Tests are also being undertaken on iron ores and coals from Hungary to assess their suitability for sponge iron manufacture (SI/HUN/82/802).

59. The subject for development and promotion of sponge iron production was amply discussed at the UNDP sponsored and UNIDO/RCTT organized study tour and workshop to promote technology development and transfer in the area of sponge iron manufacture and use in developing countries of the ESCAP region, held from 29 March to 8 April 1983 at Hyderabad, India, and incorporating visits to the Krakatau

Steel Plant, Cilegon, Indonesia (DR plant using gaseous reductant) and the SIIL Plant, Kothagudem, India (using solid reductant). The participating countries urged the need for UNDP assistance in the development of sponge iron industry in the Asian region and formulated a project document "Regional Development of Sponge Iron Industry through Direct Reduction Technology for Mini Steel Plants", a US\$500,000 project which is now being pursued with UNDP, New York. The project is already included in the Country Programme for the Asian Region, under project DP/RAS/81/063, for implementation during 1983-1986. The project is expected to be sponsored by 14 ESCAP developing countries.

60. The project will facilitate co-operation among the participating countries in the promotion/establishment of national and/or regional plants for the production of sponge iron, through the most suitable route, depending on individual conditions. In particular, the immediate objectives will cover the following :-

- (a) to study the application of well-proven direct reduction technological processes in developing countries, based on available resources, such as :
  - i) iron ores (high grade lumps/oxide pellets) and ilmenitic ores for sponge production;
  - ii) natural gas including naphta resources for direct reduction;
  - iii) solid reductants (non-coking coals, charcoal).
- (b) to select the optimum direct reduction technology best suited for sponge production in different countries of the ESCAP region, through the establishment of :
  - i) sponge plants on a national basis;
  - ii) sponge plants on a regional basis.

- (c) to recommend the appropriate steps to be taken in establishing such plants on a bilateral and multilateral basis, including the mechanism of exchange of raw materials and sponge products among developing countries in the Asian region to meet the national and regional steel market needs.
- (d) to assess the capital investment needs to set up facilities envisaged under (a) and (b) above and make techno-economic appraisals thereof including evaluation of production costs based on alternative technological routes.
- (e) to prepare a master plan for the growth of the iron and steel industry based on sponge iron production on a national basis for various developing countries in the region, with particular reference to (a) and (c) above, and in doing so, to undertake wherever necessary:
  - i) laboratory/pilot/demonstration scale investigations on sponge production based on high grade iron ores/pellets, ilmenitic ores and solid (non-coking coals) reductants at a Demonstration Plant including the UNDP/UNIDO established Pilot and Demonstration Plant for the Production to Sponge Iron at Kothagudem, Andhra Pradesh, India (DP/IND/71/611);
  - ii) formulate the production flow-sheets for respective sponge plants in different countries; and
  - iii) assess the overall techno-economic analyses of sponge production and its use for the steel industry in the developing countries of the ESCAP region.

#### Co-operation in the Aluminium Industry

61. Two examples of co-operation between a developing country of the ESCAP region and a developing country in another region are given below, to illustrate possibilities for similar action within the ESCAP region.

62. Assistance is being provided by UNIDO to Mozambique in studying the feasibility of establishing a large aluminium smelter based on hydro-electric power from the Cabora Bassa Dam (DP/MOZ/80/022). Within the project activities contacts have been established between Mozambique and India, initiated through a UNIDO consultant, and a Protocol of Discussions between the two parties was signed. The aim of the contact is to combine the utilization of complimentary natural resources of the two countries, namely India which has significant bauxite deposits for production of alumina for export and Mozambique which has electricity for maintaining an aluminium smelter for further processing of the Indian alumina. India would also keep importing a significant part of her aluminium metal requirements. This proposed co-operation may eventually lead to an investment project of the order of US\$500 million.

63. Co-operation between the People's Republic of China and Kuwait in the manufacture of aluminium windows and doors has taken place through two projects of similar character in Kuwait (TF/KUW/81/001) and China (DP/CPR/80/045). The Chinese Government implementing Agency is the State Administration of Building Construction and the Guangzhou Window Frame Factory subordinated to it. The Kuwaiti national counterparts are the two sister companies Kuwait Aluminium Co. and Arabian Light Metals Co. Responding to UNIDO's approach in 1982 to accept Chinese fellows within the framework of the Chinese project, the Kuwaiti partners accepted such training for a team of three Chinese experts for 4 weeks and even covered all costs, including international travel for two of them. During a recent UNIDO visit, the Kuwaitis expressed their readiness to continue and widen the scope of co-operation with China as a ECDC activity under the auspices of UNIDO. The proposed activities would cover training of Chinese experts in Kuwait, consultancy visits of Kuwaiti experts to the Guangzhou plant in China and possibly in-plant training conducted by Kuwaiti experts in China. As a consequence UNIDO has prepared a conceptual outline of a ECDC programme of industrial co-operation at the plant level for 1983/1984 which is now for consideration with the two parties.

Co-operation in the Field of Standardization, Quality Control and Quality Certification of Iron and Steel

64. A comprehensive project on standardization, quality control and quality certification in the iron and steel sector in Brazil has paid rich dividends in the short period of 4 years. The development and implementation of just five standards in one steel plant has led to annual savings of about US\$2 million; in the same steel plant, the stock was reduced from 106,000 to 60,000 items within 2 years.

65. Apart from generating awareness of the importance of standards and quality, the project resulted in a reorganization of national standardization activities and improvement of related procedures. Existing standards were updated and priority standards for iron and steel and related areas such as refractories, welding, codes of practice for design of steel structures and steel plant equipment were formulated.

66. The UNIDO project manager has initiated courses in steel standardization for other Latin American countries that are also now benefitting from the project. The Brazilian Government has recently granted TCDC funds for holding an International Seminar on Steel Standardization for Developing Countries. UNIDO is also contributing to the project from its Regular Programme. It is planned to invite 20 participants. The Seminar is tentatively scheduled to be held in November 1983 in Rio de Janeiro.

Maintenance Management in the Iron and Steel Industry

67. The Egyptian Iron and Steel Company has been receiving UNDP/UNIDO assistance over the past few years in developing and establishing an integrated modern maintenance management system. The introduction of this system brought about a 10-12% increase in productivity and

considerably helped the company in meeting its production targets. The EISCO is presently assisting other metallurgical and basic industries in Egypt by expanding and spreading the system to them. They are also willing to share their accumulated experience with other countries. As a first step, a demonstration workshop on managed maintenance in metallurgical and foundry industries for 11 African developing countries was organized by UNIDO in co-operation with EISCO and held in Cairo, from 26 March to 15 April 1983. The Workshop proved very successful and its repetition, possible as early as fall 1983 is envisaged. Discussions took place on turning EISCO-managed maintenance facilities into a "centre-of-excellence" for regular undertaking of training programmes for national and international staff.

68. Such a project may be possible also in the ESCAP region.

#### C. ENGINEERING INDUSTRIES

##### Regional Network on Agricultural Machinery

69. ESCAP in co-operation with FAO and UNIDO has been successfully executing a project promoting co-operation among ESCAP countries in the development of agricultural machinery. The project is essentially oriented to information dissemination and mechanization of agriculture, including the use of appropriate agricultural tools, equipment and machinery.

##### International Centre for the Promotion of Agricultural Machinery Industry in Developing Countries

70. Following the first Global Consultation Meeting on Agricultural Machinery Industry, organized by UNIDO in 1979, the People's Republic of China hosted a Meeting in 1980 on Exchange of Experiences and Co-



operation Among Developing Countries in the Development of Agricultural Machinery Industry. The Meeting discussed product/production, design and adaptation of equipment, training, service network, installations, information service and research and development. After detailed discussions it unanimously recommended that a Centre for the Promotion of Agricultural Machinery Industry in Developing Countries should be set up in Beijing, China. A draft project document was prepared and examined by a group of high-level experts who met in Vienna in December 1981.

71. The proposed project is of a global nature aimed at promotion of technical co-operation among developing countries and at establishing interlink/twinning of specific activities between institutions and manufacturers of developing countries and interested industrialized countries. The project is a "programme network" which will interlink specialized institutions and manufacturers at all levels. The project programmes related to preparation of industrial/engineering/technological profiles and information dissemination; exchange of experience and promotion of techno-economic discussions; promotion of co-operative applied engineering; manufacturing promotion; technical training. China is prepared to make a contribution towards the implementation of the project.

Co-operative Programme in the Field of Small-Scale Shipbuilding and Ship Repairing

72. UNIDO's work in this field in the Latin American and Caribbean countries has led to the formulation of a co-operative programme among the Latin American countries themselves. It includes the following aspects :-

- to identify specific mechanisms of collaboration among the countries of the region;

- to obtain and distribute scientific and technical information on the development of the world's shipbuilding and shiprepair industry;
- to formulate and develop joint co-operation programmes on small-scale shipbuilding and shiprepair;
- to prepare and introduce training programmes covering training of high and medium level technical staff and to guarantee the future availability of qualified personnel for the shipbuilding and shiprepair industry, including the introduction of new shipbuilding and shiprepair technologies and the development of auxiliary industries;
- use of modern computer methods for design of ships and management of shipyards in the countries of the region.

73. There are obviously possibilities for developing such a programme among ESCAP countries. It will be necessary to identify an existing national institution to form the regional centre and national institutions in other countries to act as national focal points.

#### Maintenance and Repair of Sugar Industry Equipment

74. In October 1981, a Workshop on Maintenance and Repair of Sugar Industry Equipment was held in Havana, jointly organized by UNIDO, the Group of Latin American and Caribbean Sugar Exporting Countries (GEPLACEA) and the Government of Cuba. The major conclusions of the Workshop was to embark on a joint regional programme in the maintenance of sugar industry equipment

#### Machine Tools

75. Possibilities exist to promote co-operation in the development of the machine tool industry. In 1982 senior design and technology staff

from the People's Republic of China visited enterprises, institutions and centres in India and exchanged experiences in design, manufacture and management of the machine tool industry. Co-operation between India and several African countries has taken place in recent years for the establishment of machine tool manufacture in the latter. There is undoubtedly further scope for expanding co-operation in this field among ESCAP countries.

#### Engineering Industry Associations

76. In August 1980, UNIDO, in co-operation with the Engineering Industry Associations from the member countries of ELCA and the Association of India Engineering Industries, organized a technical meeting in Santiago, Chile, at which discussions of areas and forms of co-operation in the metal-working industries and the exchange of relevant experience, resulted in concrete ECDC/TCDC recommendations. Special efforts were made to establish co-operation programmes at the national level in order to enhance development through the transfer and sharing of technology, the exchange of operational and managerial experience and the utilization of available industrial engineering and construction capabilities.

#### D. CHEMICAL INDUSTRIES

##### Pharmaceuticals

##### Co-operation between India and Cuba in the Establishment of A Multi-Purpose Pilot Plant

77. UNIDO is assisting in establishing a multi purpose pharmaceutical plant at a cost of US\$2 million at Havana. Besides producing pharmaceuticals for the Cuban market and for export to neighbouring

countries, the plant will facilitate the training of key personnel for the Caribbean region and, it is confidently expected, will later make useful contributions to the development of drugs production technology. Technical know-how is provided entirely from India's Sarabhai Research Centre who have offered technology for 12 out of 15 drugs to be manufactured in the plant. This UNIDO-inspired example of technical co-operation between India and Cuba may be of relevant to other countries.

#### Sub-regional Centre for Research and Development of Antibiotics

78. With the assistance of the United Nations Interim Fund for Science and Technology, UNIDO undertook an evaluation of research and development activities on antibiotics in Mexico, Costa Rica, Cuba, Guatemala, Guyana, Honduras, Nicaragua and Panama and prepared a project for setting up a sub-regional centre for Central America and the Caribbean. The objectives, areas of activity and the organization of the centre as well as equipment, services and buildings required, economic and legal aspects were examined in the report. The establishment of such a centre will enable close co-operation among the Caribbean and Central American countries by providing technologies for production of antibiotics, training of personnel and technical assistance. The centre will be linked with national focal points, thus making possible the development of specialization in research and development, as well as sharing the markets and expertise. Similar co-operation is possible among countries of the ESCAP region.

#### Pesticides

79. UNIDO/ESCAP/UNIDO have established a regional network for the production, marketing and control of pesticides in Asia and the Far East. Five countries of the region participated in this project. The

project provides for opportunities for increased co-operation among the countries of the region not only in controlling and monitoring the use of pesticides, but also in exchanging experiences on pesticide formulation, research and development. Mutual co-operation may particularly assist in the development of flexible multi purpose production units.

### Fertilizers

80. The fertilizer industry in the region needs a comprehensive assistance programme including in some areas direct support to industrial plants and factories and the establishment of industry-oriented training and information centres on both production and application of fertilizers. There is considerable scope for benefiting from the experiences of the more advanced of the developing countries of the region. In this connection a survey on training needs and capabilities in selected developing countries has been completed and a training workshop is proposed to be held in Indonesia. Meetings will also be held on exchange of experiences in the construction and operation of fertilizer plants in the developing countries, on a regional basis. Construction operation and maintenance problems will be handled not only through exchange of experiences but also intensification of in-plant training and training of managers.

### Petrochemicals

81. Considerable scope exists for co-operation among developing countries through the establishment of a joint or co-operative engineering construction research and development, marketing and manpower training facility or facilities. An international seminar on this subject, held in Vienna in March 1983, recommended a study

of existing co-operation agreements between developing countries and sub-regional groupings such as the Association of South-East Asian Nations (ASEAN), the Andean Group (Bolivia, Colombia, Ecuador, Peru and Venezuela), the Gulf Organization for Industrial Co-operation (GOIC), and the Association of Petrochemical Producers of Latin America (APLA). Based on the study, guidelines for similar co-operation arrangements could be formulated. Other recommendations included the preparation of directories on technical capabilities in developing countries and on petrochemical products produced in developing countries and earmarked for export and a world-wide investment opportunity study on the petrochemical industry in the developing countries "under different scenarios".

E. FOOD PROCESSING

82. A joint UNIDO/Yugoslav programme for international co-operation in the development of food processing industries in the developing countries, was organized on the occasion of the 48th International Fair which was held in Novi Sad, May 1981. Twelve least developed countries from Asia and Africa participated in this programme with exhibits of selected products and portfolio of specific projects. A number of projects were selected and agreed upon for the bilateral and multilateral co-operation, including possible UNIDO assistance within the ECDC/TCDC scheme. The similar programmes were also organized in 1982 and 1983.

F. BUILDING MATERIALS

83. A regional project with the participation of 18 ESCAP countries has been developed for co-operation in low-cost building materials, technologies and construction systems. The project provides for

networking arrangements with the Philippines as the Headquarters and the use of regional expertise consultants, to facilitate the construction of low-cost housing units for urban and rural areas, through adoption of appropriate technologies in the manufacture of building materials and in housing construction using locally available resources. National focal points have already been identified in 13 countries. Over a period of 5 years the project will carry out the following activities :-

1. Gathering and disseminating information on the technologies, techniques, processes, research results on building materials and appropriate construction technologies, systems and design for lower cost structures in particular through state of the art reports, newsletters, semi-annual reports, technology manuals, directories and bibliographies;
2. Identifying, initiating and co-ordinating inter-country research and development programmes of common interest in low-cost building materials as well as in the preparation of feasibility studies in pre-casting or pre-fabricating plants for mass production of standard building materials and components;
3. Arranging for the provision of consultancy/advisory services in appropriate research activities on manufacturing processes and/or construction techniques for low-cost building materials;
4. Organizing training programmes, individual fellowships, seminars/symposia, workshops and study tours, utilizing countries' TCDC contributions to the extent possible, to cover the various aspects of building materials research, testing and application techniques and equipment, and planning, programming and implementation of low-cost building constructions;

5. Providing support to regional and country exhibition centres for display of building materials and components (as well as improved housing designs) produced in the participating countries.

84. In co-operation with the Government of Turkey and Turkish Cement Manufacturer's Association, UNIDO organized a High-Level Meeting on Co-operation Among Developing Countries in the Field of Cement, Lime and Related Industries, in Ankara, December 1981. The objectives of the Meeting were to review these industries in developing countries and assess their urgent needs for support which could be mobilised within the ECDC/TCDC framework and to start the planning of short and long term co-operation programmes necessary for attending the uninterrupted development of this sector.

#### Non-metallic Minerals

85. In co-operation with the UNDP Special Unit for TCDC and the Government of Yugoslavia, UNIDO organized a Workshop on Non-Metallic Minerals and Processing in Yugoslavia, with special focus on building material for the construction industry, which was attended by representatives of developing countries from Asia, Africa and Latin America.

### G. INDUSTRIAL CONSULTANCY

#### Asian Regional Network

86. Following two Expert Group Meetings held in the ESCAP region, an Asian Regional Network for industrial consultancy is in the process of being formed. This network will provide for regional co-operation



through national focal points by pooling resources and consultancy capabilities, to enable larger and more complex industrial projects to be designed and implemented in the developing countries of the region.

87. With the need to accelerate the development of national consulting capabilities on the one hand at minimum cost and time, and availability of a diverse pattern of already established consultancy firms in developing countries, the situation is ideal for co-operation. Such co-operation would involve sharing of experiences, exchange of personnel, joint working on projects, joint ventures between consultancy firms, and exchange of information of relevance to the consultancy profession on a regular basis. Such a scheme of co-operation would help the consulting firms by accelerated development of their own capabilities and thus increased acceptability of their expertise. It will also provide them improved marketing strength and thus business opportunities. While the stress is laid on co-operation among developing countries, this does not preclude the possibilities of triangular arrangements of co-operation between consultancy firms of two developing countries and a consultancy firm from an industrialized country. For example, the consultancy firm from an industrialized country can provide the basic engineering package and some of the more sophisticated solutions to engineering problems, the two consulting firms from developing countries could jointly provide the necessary expertise for detailed designing and engineering, project management, etc. Triangular arrangements would be most effective, when the absorptive capacities of the consultancy firms in developing countries have developed to a certain level, which can be achieved through co-operation among consultancy firms of developing countries.

88. For the users of consultancy services, such a scheme of co-operation would mean lower cost because of greater use of local services, and a reduced risk because of the pooling of experience.

89. For the governments, who are deeply interested in development of consultancy services, it would mean reduction in cost of professional development and in training expenditure, and telescoping of time for development of expertise through exchange of experience and joint working on projects.

90. The work of the network will be centred on :-

- Training of consultants;
- development of consultancy methodology,
- organization of consultancy;
- research on specific topics, and
- promotion and mobilization of co-operation in the field of consultancy among countries, institutions and organizations.

#### H. TECHNOLOGY

##### Technological Information Exchange System (TIES)

100. UNIDO operates a technological information exchange system among technology transfer registries of 32 developing countries. The total number of contracts registered is over 7,000. Detailed information on contracts for specific technologies is provided to member institutions. A coding manual for exchange of information on service agreements is in operation. A methodology for evaluation of technology payments as well as guidelines for software licensing agreements are being developed.

101. A common denominator of technology transfer registries is that they have regulatory, co-ordinating, promotional and monitoring functions. The nature of the national technology transfer policy determines which function dominates. Through the system of TIES (Technological Information Exchange System), significant co-operation has been established among the registries to facilitate exchange of economic and technological information contained in approved and registered contracts. The

information is exchanged on a confidential, reciprocal, equal and mutually beneficial basis. In practice, this means that only these registries which supply data to TIES will receive data through TIES. It also means that when a registry is legally restricted to supplying certain data only, it receives through TIES only data at that level. It is believed that in this way reciprocity would be maintained and co-operative spirit safeguarded.

102. A further strengthening of TIES would undoubtedly increase the national technological capabilities in negotiating for acquisition of technology and strengthen the collective bargaining position of the developing countries in the technology market, thus bringing about greater co-operation.

103. During the relatively short span of its existence, TIES has proved to be an extremely useful co-operative mechanism for developing countries to learn from each others' experiences in acquisition and application of technology, and the technological, financial and legal framework of technology transfer contracts. This has led to improved bargaining and negotiating capability on the part of developing countries in the technology market, where they are still largely dependent on the multi-national and other enterprises of industrialized countries.

#### Technological Services Delivery System (TCDS)

104. UNIDO has developed an approach to mobilize the research work of industrial research and service institutions (IRSI) for application to industrial enterprises. This approach was called the "Technological Services Delivery System" in the Philippines. The system provided for linkages between industrial enterprises and research institutes.

105. Such a system, on a regional basis, has been developed in the Caribbean - the Caribbean Technological Consultancy Service (CTCS). It is conceived as a network mechanism by which the knowledge and skills already accumulated at different institutions on the national level are mobilized to the needs of Caribbean industry and, where appropriate, adopted and transferred to productive enterprises, to make them better adjusted to local circumstances and more self-reliant.

106. There is scope for linking up national institutions where deliver technological services to industry in each country through networking arrangements, providing for exchange of technical information, mutual referral of problems and their solution through exchange visits, optimum use of specialized facilities, etc.

#### Project Development Facility for Developing Countries

107. A project development facility for developing countries would assist in the proper formulation and preparation of projects, including pre-feasibility studies, feasibility studies and bankable projects. The Asian network of consultancy organizations could promote the use of existing project formulation consultancy capabilities in the Asian developing countries. The UNIDO Manual for the Preparation of Feasibility Studies and the recently introduced Computer Model for Feasibility Analysis and Reporting (COMFAR) may be suitable tools when such a facility is established.

#### Co-operation Among Testing Laboratories

108. A proposal has been made for co-operation among Asian countries to design and implement an inter-laboratory correlation programme. The purpose would be to assist participating member institutions by :-

- providing a practical means for local testing laboratories to earn and maintain international accreditation for their quality assurance measures, and (thereby)

- strengthening the international competitiveness of local manufacturing industry.

109. The intent is to begin with a small number of very important industrial sub-sectors and gradually increase the number according to the absorptive capacity of the system and the prospective marginal gain of adding further sub-sectors.

110. Membership would consist of national standards testing and quality control institutions.

111. This programme would enable the development of an application system of inter-laboratory comparisons and correlation. Laboratories will routinely check the results of their tests on control samples against an audited and accepted mean, or another desired reference point. Deviations would call attention to a need for procedural or equipment changes or lead to the adoption of a correction factor. The successful implementation of such a programme would make a significant contribution to participants' competitive effectiveness in international markets.

## I. INDUSTRIAL TRAINING

### Centres of Excellence Programme

112. Under this programme the UNIDO Secretariat seeks to identify existing training institutions/centres, assess their capabilities and potential and develop technical co-operation projects, to strengthen such centres to serve both national needs and, as appropriate, those of other developing countries. This programme offers one of the most promising ways of strengthening co-operation among developing countries.

After identification and assessment, the selected institutions are assisted to strengthen training capacities and capabilities; to develop a network for improved co-operation among industrial training institutions; and to exchange information on programmes developed to meet the short, medium and long term needs of developing countries. A survey in the ESCAP region has covered 11 countries. 65 institutions have been assessed so far.

Training Programme in Diesel Engines, People's Republic of China

113. Since 1979, an in-plant group training programme has been organized in China every year in the field of operation, maintenance and repair of diesel engines. The objective is to develop middle-level supervisory and technical personnel for the repair and maintenance of diesel engines in developing countries. About 15 persons are trained every year. The training programme is organized by the Shanghai Diesel Engines Works, Shanghai. The project promotes co-operation among developing countries through the exchange of relevant experience and technical information.

Training Programme in Agricultural Machinery

114. China is providing facilities at the Zhengjiang Institute of Agricultural Machinery for training of engineers and higher level technicians in the manufacture of small and medium-sized agricultural machinery. About 15 persons will be trained every year in the design, manufacture, construction and performance of small and medium-sized agricultural machinery including working tractors and agricultural implements.

Training Programmes in India

115. As a result of a survey and assessment made in India, four institutions have been selected where assistance would be provided to

strengthen facilities for programmes of training for developing countries. These programmes will relate to tool and die design and making; small industry promotion; standardization and quality control and prototype machine and tool development in the metals, wood, plastics and leather industries.



