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Agenda item 5

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D04213 - D04219

PROGRAMME OF WORK FOR 1972, REPORT OF ACTIVITIES IN 1970
AND UPDATING OF 1971 PROGRAMME

PART TWO

Industrial Technology Division

(Groups 1 to 6, 15b)



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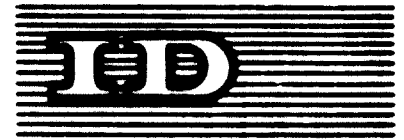
Corrigendum

Para 21, para. 2

Delete present text of para.53 (Note: the implementation of this project is being postponed).

Insert new text to read as follows:

"Following the recommendation of the 1970 Interregional Symposium on Maintenance and Repair, and after obtaining tentative agreement of the Japanese Government, a jointly sponsored Regional symposium on maintenance and repair (1.03.02) is scheduled to take place in Tokyo, Japan during the second half of 1972. This symposium will cover the developing countries in the region of Asia and the Far East. The purpose of the symposium is to call the attention of the developing countries of this region to maintenance planning as a tool in solving maintenance problems and in attaining the required level of maintenance and production efficiency."



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Industrial Technology Division

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Corrigendum

Page 16, UNIDO GENERAL TRUST FUND

Insert new heading: "Asia and the Far East" for projects 1/5 (Mongolia)
and 00/1 (Pakistan)

Page 34, SIS PROGRAMME (cont'd)

Change title of project 69/697 TUR-13 to read as follows: "Mounting of
technological equipment in the aluminium industry"

Page 93, UNIDO REGULAR PROGRAMME

Change project CON(K)06/1/1 to read as follows: "CON(K)06/1/1 (Congo, Dem.
Rep.of) Food and light industries ..."

D04212

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Editorial Note: All project components
under supporting and other activities
are Priority A unless otherwise stated.

INTRODUCTION

1. The activities of UNIDO, dealt with by the Industrial Technology Division, lend technical support to field activities in industrial branches for which the organization is responsible. Through these operational activities, UNIDO provides assistance in the optimum utilization of local natural resources, with due regard to the appropriate technology commensurate with local conditions; in product development and adaptation for local manufacture; and in the effective utilization of existing manufacturing capacities. To achieve its objectives, UNIDO uses a number of techniques among which are: surveys analysing the growth potential at sectoral level; feasibility studies on the manufacture of specific products; selection of suitable technology and processes for manufacture; trouble shooting at the plant level; and advice on general and specific technical problems. The range of problem areas covered is broad and includes product improvement and diversification, import substitution, standardization, quality control, rationalization, selection of manufacturing techniques, process planning, plant layout, optimum utilization of capacity, and repair and maintenance. In keeping with its policy of aiming at multiplier effects and at institutionalizing programmes, UNIDO attempts, through its operational activities, to lend assistance to sectoral branch infrastructure by means of pilot demonstration units, design development and adaptation centres, quality control and testing institutions, and repair and maintenance workshops.

2. The supporting activities of UNIDO carried out by the Industrial Technology Division are designed to intensify the contacts between developing and industrialized countries, with an aim of achieving a synthesis of available technical expertise and of providing nuclei for the transfer of technology through technical assistance projects. In this context, projects are encouraged which lead not only to the solution of problems in one industrial sector but also to the solution of problems of intersectoral, interdivisional and intersectoral nature. While the conventional mechanism of meetings is frequently used for the desired contacts, other techniques are also utilized including participation in sectoral survey missions and the stimulation of exchanges through publications on novel technological approaches.

3. In all its activities, especially in its supporting activities, UNIDO attempts to attain a harmonious balance among technological aspects, promotional activities in relation to technical assistance programmes, promotional initiative with respect to investment and transfer of technology. Throughout, an attempt is being made to create an awareness in the developing countries of the opportunities of establishing industries and of adapting technological processes that will facilitate the development of their manufacturing programmes. Thus, with the ultimate objective of attaining this balance, special care is taken in the selection of participants in the supporting activities. Invitations are extended to individuals, concerns, institutions and organizations with engineering and manufacturing experience as well as to persons responsible for policy decisions, such as the establishment of manufacturing units, the creation of new plants or the expansion of existing ones. In other words, supporting activities are designed to be mediae of exchange of information and ideas among highly motivated specialists from industrialized countries and decision-makers in developing countries who are actively involved in industrial development and manufacturing activities. In addition,

approach, and is carried out under industrial development plans or team incorporation of foreign managerial experience with specific technological problem-solving capacities.

5. Within the work programme of UNIDO, the Industrial Technology Division is also attempting to make a significant contribution to the "green revolution". During the past few years, the introduction of high yielding crop varieties and multiple crop systems in some developing countries has led to increased requirements for industrial inputs for agriculture such as agricultural machinery and implements; fertilizers, pesticides and allied chemicals; and plastic for water management. Thus the supporting and operational activities and policies of UNIDO are intended to contribute to the green revolution in the developing countries, primarily through advice and assistance in the local production of the required inputs for increasing agricultural yields and for mechanization to intensify agricultural production. The green revolution has also resulted in the need for an expansion of industrial processing facilities for agricultural produce. UNIDO is attempting to assist the developing countries to adopt appropriate technologies, to manufacture locally the necessary equipment and to develop the relevant industries. In all these activities, close liaison is being maintained with FAO.

HIGHLIGHTS OF INDUSTRIAL BRANCH ACTIVITIES

5. Groups 1 to 6 comprise the activities of UNIDO that are carried out in specific industrial branches. In view of the growing diversification in the manufacturing sector of the developing countries, each of these six groups covers several industrial branches. Certain branch activities such as branch reports and perspective studies have been classified under group 15b, which also falls within the Industrial Technology Division. The industrial branch reports (group 15b) not only offer guidelines for the programming of supporting activities in the form of background documents for seminars and symposia, but also frequently have a direct bearing on operational activities. The objective of the perspective studies is an assessment, on a pragmatic basis, of the prospects for the development of individual industrial branches in the 1970s in various countries and regions. Thus they represent the sectoral approach within the specific contributions of UNIDO to the Second United Nations Development Decade.

6. The major activities in group 1 (engineering industries) can be summarized as assistance in design development, adaptation of technology and manufacturing processes, and development of manufacturing units. The priority areas are agricultural machinery and implements, electrical and electronic equipment, metalworking and transportation equipment, and repair and maintenance.

7. The activities of UNIDO in the agricultural machinery and implements industries have expanded considerably. Following the UNIDO-INESOP fact-finding mission of 1970, new missions are planned to Latin America and to selected countries of North Africa in 1971. Moreover, a regional study and meeting on the design and manufacture of rice threshing and harvesting machinery in the ECAFE region are planned for 1972. A number of projects in this field are being prepared on the basis of technical consultations held with FAO. It is expected that the present activities will lead to technical assistance activities covering development and adaptation, transfer, repair and maintenance knowledge and the establishment of manufacturing units.

8. On the subject of repair and maintenance, emphasis is being placed on construction and operational techniques, the establishment of central and mobile workshops, and on trouble shooting in industry. In 1970, a symposium on maintenance and repair was held which made a number of recommendations and established guidelines for the activities of UNIDO in this field. As a new feature, national repair and maintenance weeks will be introduced in 1971 and 1972 in selected countries. In addition, a study on the supply of spare parts to industry will be conducted in 1971; the following year, it is planned to undertake a study of the operation of mobile workshops in Africa.

9. In the metalworking industries particular attention is being devoted to technical assistance projects relating to the optimum utilization of production capacity and to the development of design capabilities. The Engineering Design Development and Industrial Centre in the United Arab Republic and the Metalworking Industry Testing Centre in Chile are but two of the major operational activities in this area. As part of the supporting activities in this field, UNIDO plans to hold a workshop on the machine-tool industry in 1971 and in 1972, and an expert group meeting on metalworking industries in Latin America.

10. In the electrical and electronic engineering industries, the Electrical Testing and Experimental Centre in Spain is an important forthcoming operational activity. Among the supporting activities mention should be made of an expert group meeting on the manufacture of electrical components in 1971 and a promotional activity relating to regional manufacture of semi-conductors in 1972.

11. The programme of UNIDO in group 2 (metallurgical industries) focuses on the utilization of local metallurgical raw materials, the production of the metals and alloys needed by local industry and the creation of local metallurgical expertise. Particular attention is being devoted to the production of aluminium, the smelting of ilmenite concentrates, the development of the iron and steel industry, the establishment of pilot and demonstration foundries, the application of metals and alloys, and the creation of metallurgical technology centres.

12. A noteworthy example of the activities of this group is the process of smelting ilmenite concentrates obtained from heavy black beach sand deposits which are common to a number of developing countries. UNIDO was able to locate an appropriate and available technology and the authorities of the Union of Soviet Socialist Republics are co-operating fully with a view to its application in industrial units to be set up in interested countries. Laboratory smelting tests have already been carried out for three countries with positive results. Feasibility studies will follow, leading eventually to the establishment of industrial units for the production of pig iron and a slag rich in titanium oxide. Special Fund projects such as the National Metallurgical Research Centre in Chile, high temperature creep testing facility at the National Metallurgical Laboratory in India, and the Centre for Metallurgical Research and Development in the United Arab Republic are further examples of the activities being undertaken by this group. Other major activities in this field include attempts to systematize foundry development on the basis of integrated economic studies relating to several prototype foundries; this project is expected to establish economic norms on the optimum scale of production. In view of the continued evolution of the world's iron and steel industry, both economically and technologically, UNIDO is considering the possibility of holding a third

interregional iron and steel symposium, in 1973, for an assessment of new economic and technical conditions and of their implications to the developing countries.

13. In group 3 (construction and building materials industries) priority is being given to low-cost, locally available building materials. Attention is also being paid to cement, fibro-cement composites, and to plastics and clay building materials. This is a rapidly developing programme and assistance oriented to local manufacture of building materials such as glass, ceramics and cement has been given to a number of developing countries including Jordan, Madagascar, Mauritius and Turkey. A UNDP/SF project on asbestos processing is under operation in Bolivia. Supporting activities include an interregional seminar on cement manufacture, workshops on clay in Africa and Latin America and studies on prefabrication techniques.

14. Group 4 (chemicals, pharmaceuticals and pulp and paper industries) is actively promoting the production of marine and mineral salts through the use of solar energy, the production of essential oils from botanicals for the manufacture of pharmaceuticals, the effective use of agricultural wastes, and the manufacture of selected industrial chemicals by fermentation. Among many other projects in the field of chemical industries, technical assistance is being given to increase the production of caustic soda and chlorine in Ceylon and to improve salt production in Panama.

15. Group 5 (fertilizers, pesticides and petrochemicals industries) is directing its activities towards improvement of production capacity, establishment of new units and application of new processes. With regard to fertilizer, bulky blending units and liquid fertilizer manufacturing units are being promoted in smaller developing countries where markets are limited. A joint UNIDO-FAO UNDP/SF project is expected to become operational in 1971, and fertilizer trials, currently being carried out in Togo, should ultimately lead to the establishment of a single superphosphate and bulk blending plant in 1972. Both the Democratic Republic of the Congo and Rwanda have expressed interest in the Lake Kivu project in which methane gas will be recovered and used in the manufacture of fertilizer and plastics and in other industries. In 1971, UNIDO will hold an interregional fertilizer symposium. In the field of pesticides, emphasis is being placed on assistance in the identification and manufacture of safe pesticides. Assistance is also being provided in the establishment of formulation plants.

16. The diversified activities of group 6 (light industries) range from the textile industry, food processing, wood processing, leather and rubber products to the printing industry. Examples of operational projects in the textile industry are the assistance of UNIDO in the reorganization of the textile sector in Brazil and Indonesia and the establishment of quality control centres in several countries. With regard to the food processing industry, an expert group meeting on fish protein concentrate was held in Agadir, Morocco, in 1969 where the fish protein concentrate plant of the country is located. UNIDO assisted in the reorganization of this plant, which has now resumed operation. After the assistance it provided in the reorganization of the rice milling industry in Thailand, UNIDO plans to hold - in co-operation with ECAFE and FAO - a rice seminar, which will be devoted to the identification and analysis of further needs and to an investigation of the possibilities of a new rice milling process (wet milling). Another example of the activities of UNIDO in this field is the assistance given

in the planning of the agro-industrial development of Iran. The scheme proposed by UNIDO has been an important contribution to the planning, reorganization and development of the country's food processing industry.

17. Across-the-board techniques (group 15b) include a number of inter-industry activities in the field of industrial technology which require a multisectoral or intersectoral approach that cuts across the activities of groups 1 to 6.

18. As regards the packaging industry, four main types of activity have been developed: manufacture of packaging materials and containers; application of packaging materials, containers and packing techniques for different goods; establishment of packaging research and promotion centres; and surveys of the packaging industry, as well as recommendations for its development. Along these lines, projects are under implementation in Bulgaria, Lebanon, Thailand, Tunisia and in several other countries.

19. Another expanding activity is environmental engineering, which has developed in response to the growing concern about the impact of industrialization on the human environment. A number of factors relate to environmental engineering influence the location of the industry and the choices available for manufacturing processes. In this context, UNIDO is undertaking several projects to assist developing countries in solving problems of industrial effluents and trade waste disposal as for example in Mauritius, Singapore and Thailand. UNIDO is utilizing this experience in its contribution to the forthcoming United Nations Conference on the Human Environment to be held in Stockholm in 1972.

PROSPECTS FOR THE FUTURE

20. Through effective supporting and operational activities, a solid foundation has been laid for future activities. Within the activities falling to the Industrial Technology Division, UNIDO will put special emphasis on the transfer of technology through the diffusion of design and manufacturing capabilities, the introduction of appropriate technological processes for manufacture, the optimum utilisation of existing production capacities and the establishment of manufacturing units and pilot demonstration plants.

GROUP 1: ENGINEERING INDUSTRIES

21. The programme of UNIDO in the field of engineering industries is oriented towards promotion of, and assistance in, the establishment and expansion of design and manufacturing capabilities in developing countries and towards the maintenance of existing equipment. Within this programme, UNIDO is concentrating its activities on areas that have been given priority by the Industrial Development Board (A/8016, para.83): agricultural machinery and implements; repair and maintenance; electrical and electronic equipment; metalworking and construction machinery; and transportation equipment.
22. With regard to agricultural machinery and implements, the activities of UNIDO are designed to contribute to the "green revolution". Liaison with the regional economic commissions, UNESOE and FAO has been established to assure integration of technical assistance efforts.
23. On the subject of repair and maintenance, UNIDO is attempting to keep abreast of the needs of developing countries by, inter alia, participating in conferences. Following the recommendations of the 1970 Symposium on Maintenance and Repair, UNIDO is organizing repair and maintenance weeks to be held in developing countries. The provision of technical know-how and equipment is the objective of technical assistance in repair and maintenance.
24. In view of the increasing number of requests from developing countries for technical assistance to electrical and electronics industries, particularly with regard to the manufacture of components and semi-conductors, two expert group meetings are planned, one in 1971 and another in 1972, which are to deal with problems related to the technologies and promotion of these industries.
25. In metalworking, interest ranges from simple metal products such as household utensils to advanced machine tools. The objectives of UNIDO with regard to metalworking industries are broadly to assist the developing countries to adopt designs and tools that will meet the requirements of local manufacturing techniques and available materials and to achieve the necessary quality standards to make their products competitive.

OPERATIONAL ACTIVITIES

26. An analysis of technical assistance requirements is being prepared by the Industrial Development Board for the development of the local industry towards independence in development of production equipment and tools, lowering of production cost and towards the introduction of proper maintenance and repair services. In order to reach these objectives, design capabilities must be improved, local manufacturing industries should be planned and expanded, quality improvement programmes have to be introduced and testing facilities provided.

27. In support of these objectives, UNIDO is assisting a number of countries in the promotion of local design. An example of this type of assistance is the help being rendered by UNIDO to the Institute for the Design of Electrical Measuring Instruments in India. The purpose of the Institute is to develop designs and prototypes of measuring and control instruments and to assist in solving production problems in the domestic instruments industry. At a meeting held in 1970 on the development of engineering design capabilities (see I.O.01), problems of common interest were examined.

28. With regard to agricultural machinery and implements, the operational activities of UNIDO include assistance in the development, adaptation and testing of such machinery and implements; repair and maintenance; and development of local industries. The over-all objective of operational activities within this field is to contribute to the "green revolution" by providing a systematic approach to the development and expansion of agricultural machinery and implements industries.

29. An example of the operational activities of UNIDO in the field of quality control is the Metalworking Industry Testing Centre in Chile. The work of this Centre, which is being assisted by UNIDO, includes testing of primary materials and a product safety programme. The Centre engages in work on national standards and quality certification programmes, and it plays an important role in the promotion of manufacturing industries in Chile.

30. Metalworking problems of common interest will be examined at the forthcoming meeting on the development of metalworking industries in Latin America (see I.O4.01). Among other technical assistance activities, mention may be made of the establishment of mechanical workshops together with prototype foundries (Somalia, Sudan) in co-operation with the Metallurgical Industries Section (group 2). These projects are financed partly from the General Trust Fund of UNIDO and partly from SIS funds. Projects of this type will help to solve immediate problems in the production of spare parts needed for repair of machinery and equipment. With their demonstration and training effect, they will serve as nuclei for local metallurgical and metalworking industries.

31. UNIDO will also provide assistance in the establishment of the Electrical Testing and Experimental Centre in Spain. The Centre will strengthen and assist the electrical and electronic industries of the country in high voltage and higher power testing of electric power equipment. It will also conduct applied research in electronics, particularly in solid state devices.

33. UNIDO will continue to give attention to problems connected with repair and maintenance of production equipment as well as of equipment for infrastructure facilities such as automotive and railroad transport. As a novel feature, UNIDO is providing a number of developing countries with mobile workshops, equipped with machine tools, for repair and maintenance of road-making, earth-moving, transport, and agricultural machinery equipment. These workshops are being financed from the General Trust Fund of UNIDO.

34. Among other operational projects being carried out by UNIDO in the field of engineering industries are market and feasibility studies and promotion of industrial activities, all of which are fundamental to the establishment of a particular industry. Attention is being paid by UNIDO to yet another problem confronting the developing countries, i.e. the need to improve design capabilities and to adapt designs to local conditions. This work is being undertaken both at the plant level and at design centres sponsored by UNIDO. At the same time, UNIDO will continue to provide technical assistance to resolve production problems. Under consideration is the introduction of demonstration plants to demonstrate a specific technology based on local conditions such as the availability of specific raw materials. In a joint effort with the Industrial Training Section (group 10a), a number of operational activities involving in-plant group training programmes are being carried out. These group training programmes cover various branches of engineering industries as well as repair and maintenance activities.

35. The total number of projects under operation in this field in 1970 was 171; this is expected to rise to 195 by 1971 and 220 by 1972.

Value of approved field projects and forecast of requirements, 1970 to 1972
 (in thousands of US dollars)

	1970	1971		1972	
	estimated expenditure	Approved projects	Forecast of requirements	Approved projects	Forecast of requirements
UNDP/SP	640.5	2,251.4	92.0	1,535.9	509.0
UNDP/TA	323.9	225.0	1,538.4	16.8	2,024.0
HP	108.4	171.6	114.5	-	216.0
313	340.3	439.7	584.6	-	1,195.6
GTP	111.9	525.7	5.3	-	400.0
VIT	36.0	62.0	-	-	62.0
Total	1,561.0	3,675.4	2,334.8	1,552.7	4,406.6

List of Approved Operational Projects

UNDP/SPECIAL FUND

Africa

CMR-19	Pilot programme in maintenance and repair
CON(K)-34	Central services for maintenance and repair of industrial equipment
TUN-27	Centre for the development of prototype tools
UAR-55	Engineering and industrial design development centre

The Americas

CHI-39	Metalworking industry testing centre
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Asia and the Far East

SIN-7	Metal industries development centre
IND-67	Design centre for electrical measuring instruments
PHI-30	Metal industry development centre

Europe and the Middle East

MUL-3	Research centre for instrument design
SPA-12	Electrical industry testing and experimentation centre

UNDP/TECHNICAL ASSISTANCE

Africa

ALG/69/1	Modernization of lock manufacture
ALG/69/12	Maintenance and repair of industrial equipment
TUN/70/1	Production engineering
UAR/69/10	Repair and maintenance

The Americas

ARG/68/6	Assistance to INTI
BRA/69/19	Assistance to national design centre
COL/68/23	Engineering industry
PER/69/2	Shipbuilding industry
VEN/68/6	Development of mechanical industry

Asia and the Far East

IND/70/8	Advanced design in industrial structures and machine foundation
INS/69/29	Industrial development
IRA/69/6	Ophthalmic and optical industry
IRA/70/10	Assistance to optics industry
KOR/69/16	Industrial development
PAK/69/8	Repair and maintenance
SIN/68/1	Assistance to the Economic Development Board

UNDP/TECHNICAL ASSISTANCE (cont'd)

Europe and the Middle East

BUL/70/70	Refrigeration compressor valves production
BUL/70/22	Prognosis of development and structure of machine building industry
BUL/70/40	Laboratory electric measuring instruments
BUL/70/41	Design, construction and automation of boiler.
HUN/69/7	Automation of machine sets for production of paint
HUN/69/5	Use of computers in industry
ISR/70/2	Nut and bolt manufacturing
ISR/70/5	Training of engineers in advanced industrial automation
JOR/69/8	Mechanical engineering
POL/70/2	Industrial development machinery
POL/70/15	Machine tools and metal machinery
POL/70/17	Electroplating
POL/69/28	Mechanical and electrical industries
POL/69/20	Computing techniques
ROM/69/3	Electronic spare parts production
ROM/69/5	Production of machine tools with numerical programming
ROM/70/2	Research and development of semi-conductors
ROM/70/39	Technology of car maintenance and repair
TUR/69/14	Industrial engineering
YUG/68/8	Modern technology mastering

Interregional

INT/69/11	Symposium on maintenance and repair in developing countries
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UNIDO REGULAR PROGRAMME

Africa

ALG/01/1/1	Mechanical and electrical engineering
CMR/01/1/1	Engineering industries - metal products
GHA/01/1/1	Engineering industries - agricultural machinery
MAG/01/1/1	Engineering industries - repair and maintenance
ID/FP/01-5 (Nigeria)	Engineering industry - control system (electronic equipment); refrigeration techniques
ID/FP/01-7 (United Arab Republic)	Maintenance organization

The Americas

ARG/01/1/1	Engineering industries - metal products
ID/FP/01-3 (Bolivia)	Metal working industry
COL/01/1/1	Industrial engineering
GUA/01/1/1	Engineering industries - repair and maintenance
ID/FP/01-2 (Venezuela)	Engineering industries - mechanical plant training
LAT/01/1/1	Mechanical industries - regional adviser

UNIDO REGULAR PROGRAMME (cont'd)

Asia and the Far East

CAM/01/1/1	Engineering industries
CEY/01/1/1	Engineering industries - metal products design
ID/RP/01-4 (China)	Engineering industries - shipbuilding industry
CHA/01/1/2	Electronics industries - integrated circuits
IND/01/1/4	Engineering industry - manufacture and testing of electronic parts
ID/RP/01-7 (India)	Engineering industries
ID/RP/01-4 (Iran)	Engineering industries - optical instruments; tool and die production (materials control)
INA/01/1/1	Engineering industries - new techniques
ID/RP/01-4 (Republic of Korea)	Engineering industries
PHI/01/1/3	Mechanical and electrical engineering - diesel engine manufacture
THA/01/1/2	Mechanical and electrical engineering - electrical equipment
AFI/01/1/1	Mechanical and electrical engineering - regional adviser, agricultural machinery

Europe and the Middle East

ID/RP/01-2 (Albania)	Engineering industries - machine tools production
ID/RP/01-2 (Bulgaria)	Engineering industry - new techniques
ID/RP/01-2 (Hungary)	Engineering industries - electronic industry
ISR/01/1/1	Engineering industries - electronic industry
ID/RP/01-2 (Jordan)	Engineering industries - repair and maintenance
ID/RP/01-3 (Poland)	Engineering industries - machine tools production
ID/RP/01-2 (Romania)	Engineering industries - glass fibres and tissues for textile and electronic industries; technical glasses for laboratories
SYR/01/1/1	Engineering industries - repair and maintenance
TUR/01/1/1	Engineering industries - metal mechanical products
ID/RP/01-4 (Yugoslavia)	Engineering industries - production of wheel gears; technology of joining elements (screws production)

International

INT-RE/01/1/1	Engineering industries
ID/RP/01-11	Symposium on maintenance and repair in developing countries

SIS PROGRAMME

Actions

69/328 ALG-8	Assistance to National Society on Preventive and Progressive Maintenance Services (SEMPAC)
70/732 ALG-10	Dry battery plant pre-investment study
70/795 BDI-9	Agricultural machinery manufacture feasibility study mission (joint UNIDO/FAO)
70/951 BAH-8	Exploratory mission for the establishment of a shipyard for the maintenance, repair and construction of fishing boats and other vessels
69/629 CAB-5	Preparatory study for the creation of a maintenance and repair workshop

112. PROGRAMME (cont'd)

Africa (cont'd)

70/858 NIR-16	Assistance to the telecommunication and electronics industry
63/633 NIR-12	Passenger car assembly - local parts manufacture
70/198 SWA-2	Exploratory mission on maintenance and repair facilities, services and needs
67/74 TUN-4	Société de Fonderie et de Mécanique (SOFOMECA)
68/394 UAR-20	Assistance to the Mechanical Department of the Egyptian Railways
68/373 UAR-23	Repair and maintenance of technical apparatus and equipment at agricultural research stations
69/558 UAR-29	Repair and maintenance facilities in bus transport industry
69/680 UAR 15 Phase II	High voltage transmission lines (design of insulation and local manufacture of accessories and hardware)
69/529 UPV-11	Dry battery plant pre-investment study
70/786 UPV-15	Survey of maintenance and repair facilities, services and needs
70/828 UPV-16	Market and feasibility study on enamelled holloware

The Americas

68/278 COL-4	Assistance to Forjas de Colombia
69/632 DOM-10	Complex service team in maintenance and repair of industrial equipment
69/562 JAM-6	Industrial promotion of the chemical electrical and metal industries
70/865 MEX-3	Programming of machinery production and exports (exploratory mission)
70/905 PAR-7	Assistance to the Government on the need and feasibility of establishing a centre of metals technology
70/984 LA-8	Assistance to the Junta of Andean Integration Group
69/488 LA-2	Assistance to petrochemical and assembly industries

Asia and the Far East

70/836 APG-3	Exploratory mission on industrial maintenance and repair problems
70/771 CEY-16	Specialist technician in freeze dryers for vaccine production
70/810 CEY-17	Nationalization programme of agricultural machinery manufacturing sector
70/726 CHA-13	Assistance to electronics industry
69/542 FIJ-3	Shipbuilding and repairing
69/531 FIJ-1	Metalworking
69/487 HONK-1	Assistance to the electrical industry
69/484 IND-17	Electrical industry (transformers and variable speed drivers)
70/1012 INS-20	Assistance in the production of wooden poles and ceramic insulators, exploratory mission
70/902 INS-17	Assistance in the organization of manufacturer's association
70/889 INS-15	Assistance to shipyards
70/714 IRA-27	Cutting tool production
69/565 KOR-4+5	Assistance to Korea Productivity Centre (KPC)
69/673 KOR-1	Assistance to the electronics industry

SIS PROGRAMME (cont'd)

Asia and the Far East (cont'd)

70/874 LAO-6	Agricultural machinery manufacture feasibility study
70/713 MAI-10	Investigation of repair and maintenance needs
69/597 MON-2	Complex service team in maintenance and repair of industrial equipment
69/499 PAK-5	Survey to formulate recommendations for co-ordination and efficient utilization of the steel, iron and engineering industries
70/704 PHI-14	Exploratory mission - maintenance and repair needs
67/254 PHI-2	Assistance to Board of Investments
68/402 SIN-8	Assistance to ship repair and shipbuilding industry (small shipyards)
70/703 SIN-14	Exploratory mission on repair and maintenance further technical assistance to the light industries services and the establishing of a centre for industrial design
70/724 SIN-16	Assistance in special industries project studies
70/758 SIN-19	Micro-gasoline engine manufacturing feasibility study
68/333 SIN-5	Assistance to industrial product design
70/783 THA-12	Exploratory mission on maintenance and repair facilities, services and needs
70/840 THA-19	Assistance to the electronic industry

Europe and the Middle East

70/938 ICE-5	Assistance in the improvement of small shipyard operations
69/634 IRQ-5	Assistance to the electronics industry
70/706 IRQ-7	Exploratory mission on maintenance and repair facilities needs and services
70/962 IRQ-15	Organization and operation of Iskandra tractors, implements and allied engineering industries
70/981 IRQ-17	Assistance to the electric cable industry
69/670 ISR-5	Materials handling consultancy services
69/452 ROM-3	Assistance in appraisal of the state of technology of precision measure and process control instruments
70/770 ROM-9	Design and research of diesel engines for industrial, naval and railway use
70/728 SAU-6	Assistance in maintenance and repair
68/441 SYR-12	Assistance to the electric cable industry
69/516 SYR-15	Assistance to radio and TV industry
69/452 SYR-17	Complex service team in maintenance and repair of industrial equipment
69/607 SYR-23	Assistance to engineering works
70/1008 TUR-18	Marmara Industrial and Technological Research Centre
70/816 YUG-21	Handling and transportation of semi-processed materials and finished products
70/829 YUG-22	Materials handling equipment
70/880 YUG-26	Assistance in technological and organizational problems of bearings and bushes production
70/881 YUG-27	Assistance in the heat treatment of gears
70/893 YUG-28	Assistance in automation and regulation

SID PROGRAMME (cont'd)

INDONESIA

10/73 INTERREG-13

Assistance to Industrial Development Centre for Arab States

UNIDO GENERAL TRUST FUND

Africa

- | | |
|------------------------------------|---|
| 00/1 (Algeria) | Repair shops and mobile repair units for agricultural equipment |
| 1/12 (Kenya) | Mobile repair units for maintenance and repair of industrial equipment |
| 1/5 (Mongolia) | Mobile repair units for the maintenance and repair of industrial equipment |
| 00/1 (Pakistan) | Repair shops and mobile repair units for agricultural equipment |
| 00/2 (United Arab Republic) | Machinery for repair of road transport equipment and mobile repair units |
| 00/6 (United Arab Republic) | Equipment for engineering and industrial design development centre |
| 00/7 (United Arab Republic) | Equipment for engineering and industrial design development centre |
| 1/13 (United Arab Republic) | Two-man mission for identification on technical assistance in the establishment of stationary workshops for maintenance and repair of buses |
| 1/16 (United Republic of Tanzania) | Two mobile repair and maintenance workshops for agricultural machinery and implements |

Europe and the Middle East

- | | |
|---------------|--|
| 1/10 (Jordan) | Mobile repair units for maintenance and repair of industrial equipment |
| 1/11 (Yemen) | Mobile repair units for maintenance and repair of industrial equipment |
| 1/1 (Syria) | Mobile repair shops for maintenance and repair of industrial equipment |
| 1/17 (Yemen) | Supply of two mobile repair workshops |

International

- | | |
|------------|---|
| 1/14/Rev.1 | 1970 Symposium on maintenance and repair in developing countries |
| 1/4 | Report for expert group meeting on the extension of experience in the establishment of engineering design development centres |

UNIDO-IE-TRUST

Africa

- | | |
|-----------------|--|
| 9020-70 (Congo) | Industrial evaluation - mechanical and electrical engineer |
|-----------------|--|

FUNDS-IN-TRUST (cont'd)

Africa (cont'd)

9021-70 (Congo, Democratic
Republic of)

Industrial assistance (dispensary) - mechanical engineer

9005-69 (United Arab
Republic)

Interpreter for UNDP/SF project UAR-55

Europe and the Middle East

9023-70 (Syria)

Interpreter for SIS project 69/492 SYR-17 - methods and
organisation expert

SUPPORTING AND OTHER ACTIVITIES

35. The supporting and other activities of group 1 are classified under the following projects:

Agricultural machinery and implements	1.01
Electrical and electronic industries	1.02
Repair and maintenance	1.03
Metalworking industries	1.04
Transportation equipment	1.05
Design capabilities	1.06
Processing industry machinery	1.07
Construction machinery	1.08

Agricultural machinery and implements (1.01)

36. The Industrial Development Board, at its fourth session, stressed the importance of work in the agricultural machinery and implements sector (A/8016, para.83,84). To date, the work undertaken by UNIDO in this sector has been directed towards formulating programmes for the development of industries concerned with the production of agricultural machinery and implements including storage and materials handling equipment and transport machinery. Co-operation is maintained with the regional economic commissions, UNESOB and FAO. Generally it may be said that activities are directed to support the "green revolution" in developing countries through advice on, and assistance in, a rational programme of production of required types of agricultural machinery and implements.

37. In order to facilitate the development of the agricultural machinery industry, UNIDO was advised by the 1969 Expert Group Meeting on Agricultural Machinery Industry in Developing Countries (1.01.01) to sponsor missions to the various regions to formulate the necessary technical assistance programmes and projects. The report of this meeting was published in 1970.

38. In keeping with these recommendations, a joint UNIDO-UNESOB Mission on Agricultural Machinery Industry (1.01.02) visited six countries in the Middle East in 1970 to identify areas where technical assistance was needed. Following this Mission, a number of requests have been received for technical assistance in the agricultural machinery and implements sector. A report analysing the problems of interest to the UNESOB region will be published in 1971. Further in 1970, the report on plant requirements for producing specific animal-drawn agricultural implements was finalized.

39. In 1971 it is planned, in co-operation with the Industrial Development Council for Arab States (IDCAS), to extend the survey carried out in 1970 in the Middle East UNESOB countries by sending a mission to six countries in the North African region. The IDCAS-UNIDO agricultural machinery mission (1.01.03) is expected to make an analysis of the status of the agricultural machinery and implement industries in the countries covered by IDCAS.

40. UNIDO also proposes to assist IDCAS in 1971 in conducting Industrial branch studies on lorries, tractors and prime movers (1.01.04) in selected countries covered by IDCAS. It is anticipated that the above two activities will be financed from the General Fund Fund of UNIDO.

41. In continuation of the activity directed towards the development of the agricultural machinery industry, an Agricultural machinery mission (1.01.05) to five selected countries in Latin America will be organized; the participation of ECLA will be sought. For each country covered, an individual report will be prepared which subsequently will be supplemented by a general analysis dealing with the special problems in the subregion. The reports are to be published in 1972.

42. In 1971, it is proposed, subject to availability of funds, to organize a joint UNIDO-ECA agricultural machinery and implements mission (1.01.06; Priority B) to five selected countries of West Africa.

43. Additionally, UNIDO plans to undertake in 1971 a number of studies in selected countries to assess the Agricultural machinery and implements requirements, including storage and transport in the ECAFE region (1.01.07), as an industrial input contributing to the "green revolution". Active co-operation with ECAFE will be sought in implementing this project.

44. In 1972, UNIDO proposes to carry out a regional study and to convene an expert group meeting on the Design and manufacture of wet land (rice) harvesting and threshing machinery in developing countries (1.01.08). The study, covering six selected countries of the ECAFE region, will be made by three consultants and one expert from each of the respective countries. The study will analyse specific problems of development of the local manufacture of agricultural machinery and implements, including storage and materials handling equipment and transport machinery in relation to the needs generated by the "green revolution". The study will be followed by an expert group meeting in the form of a manufacturing development clinic. The expert group will submit concrete proposals for the promotion of design, development, adaptation and manufacturing facilities on a country or regional basis, as well as of ways and means of transferring the technologies required for the production of the specialized machinery needed in the ECAFE region. ECAFE and FAO will be invited to participate in the study and the expert group meeting.

Electrical and electronic industries (1.02)

45. The Board, at its fourth session, recommended that special attention be given to the electronic industries and encouraged the production of low-cost radio receivers (A/6016, para. 95). In the field of electric power generation, a study on production of distribution transformers in developing countries was published in 1970.

46. The report of the Meeting held in 1969 on the Manufacture of Telecommunications Equipment including Low-Cost Receivers for Sound Broadcasting and Television (1.02.01) is scheduled for publication in 1971.

47. The proposed expert group meeting on Improved technologies in connexion with an international exhibition of radio and television equipment to display low-cost receivers manufacture in developing countries (1.02.02; Priority B), to have been held in 1971, is being cancelled owing to lack of adequate resources.

48. An analysis of the projects relating to the electrical and electronic industries in 1970 indicated that the main interest centred on the manufacture of components. As a result of this trend, UNIDO is redirecting its efforts in this field. Problems connected with the manufacture of electronic components fall into two parts: first the need for an examination of the technological problems of this industry; and secondly, the need for promotional activity designed to assist in the transfer of technology to existing enterprises and in the establishment of new enterprises in this field. Accordingly, UNIDO will hold in 1971 an expert group meeting on the Manufacture of electronic components in developing countries (1.02.03). This meeting, approved by the Board at its fourth session (ID/B/64/Add.1, para.27), will be arranged in collaboration with the American Institute of Electrical and Electronics Engineers to examine the major technological problems as a first step in promoting the electronic industry. The meeting is to examine the structure of electronic industry in selected developing countries and to look into technological forecasting, organization of research and development and plant requirements for components. The report of the expert group meeting is to be published in 1972.

49. A meeting, planned for 1970, on the Manufacture of refrigeration equipment (1.02.04; Priority B) had to be postponed in view of more urgent requirements.

50. UNIDO proposes in 1972 to promote the establishment of related enterprises through a study and an expert group meeting on Manufacture of semi-conductors on a subregional basis (1.02.05). This promotional activity is to start with a market survey, to be carried out by a team comprising consultants and country representatives. From the information gained through this survey, the team is to prepare a plan for the development of this branch of industry which will be circulated to potential manufacturers, licensors and investors. A meeting of the interested parties will then be convened to examine and refine the proposals of the team and, at the same time, to provide direct contact between potential investors and local enterprises. Full advantage will be taken of the contacts established by the consultants with potential manufacturers and representatives of local enterprises in the developing countries.

Repair and maintenance (1.03)

51. The repair and maintenance programme represents a joint effort of the UNIDO secretariat as a whole. However, since the Industrial Technology Division is responsible for the major part of this programme, it is included in the programme of that division. Cross references to this programme will be made by other groups of activities, particularly group 12, in as much as they are involved in projects relating to this programme. The following activities within the repair and maintenance programme of UNIDO are to be implemented by group 1.

In 1970, UNIDO held an International Symposium on Maintenance and Repair in Developing Countries (1.03.1). The symposium concentrated on general policy aspects rather than on

specific problems of repair and maintenance of equipment or industries. The report is available for publication in 1971.

53. Following the recommendations of the Industrial Development Board at its fourth session (A/8016, para.83) and the findings of the 1970 Interregional Symposium on Maintenance and Repair in Developing Countries, as well as in keeping with several technical assistance requests, a workshop on Maintenance and repair of railroad equipment (1.03.02) is to be conducted in 1971 in the Federal Republic of Germany. The workshop was to have taken place in 1971 (ID/B/61/Add.1, para.32), but had to be postponed owing to lack of resources. Maintenance and repair of locomotives, freight and passenger cars as well as of switching and related equipment will be discussed, with a view to improving the utilization of existing equipment and installations. The organization and work of the existing railway workshops and the need of new and/or modern facilities are also to be reviewed.

54. UNIDO plans to participate in the first Conference of the Federation of European National Maintenance Associations (1.03.03, Priority B) to be held in Vienna in 1971. This Federation was formed during the above-mentioned 1970 Interregional Symposium on Maintenance and Repair in Developing Countries (1.03.01). It is expected that a total of 200 people will attend the conference, including participants from developing and developed countries, and representatives of national maintenance associations. Advantage will be taken of the conference to bring to the attention of the industries of developed countries the problems of repair and maintenance in the developing countries. About one third of the agenda is to be devoted to the specific problems of the developing countries.

55. UNIDO proposes to organize National repair and maintenance weeks (1.03.04), two in 1971, subject to availability of funds, and two in 1972. The purpose of this activity is to create on the part of Governments and industry an awareness of the necessity for maintenance and repair and to obtain better utilisation of equipment and resources. Maintenance weeks will include conferences, lectures and displays on the requirements for, and effects of, planned maintenance and repair of machinery and equipment. The information media will also be invited to participate. Subject to further negotiations with and approval by, the Governments, it is planned to organize these weeks in Pakistan and Uganda in 1971. Turkey and Venezuela expressed interest in hosting such weeks in 1972.

56. UNIDO plans to have a team of two consultants carry out a study on UNIDO sponsored mobile workshops (1.03.05) in two or three African countries in 1972. The consultants are to assess the best design for such mobile workshops for different applications and to recommend the types most suitable for performing different tasks under various environmental conditions.

57. Following the recommendations made at the 1970 Interregional Symposium on Maintenance and Repair in Developing Countries (1.03.01), UNIDO plans to conduct in 1971 a comprehensive study on the Supply of spare parts to industry (1.03.06). The study will concentrate on procurement, local manufacture, storage and distribution and the role of maintenance workshops and design centres. Attention is to be given also to the manufacture of hardware. After being finalized, the study will be published.

Metalworking industries (1.04)

At its fourth session, the Industrial Development Board drew attention to the need to promote activities in the metalworking and toolmaking industries (A/8016, para.86). The work of UNIDO in this field has been concerned with the choice of technology and production processes in metalworking industries, ranging from production of simple household utensils to machine tools.

59. UNIDO had proposed (ID/B/64/Add.1, para.35) to hold two regional meetings on the Development of metalworking industries in Asia and Latin America (1.04.01). The meeting in Asia had to be postponed owing to the heavy schedule of meetings in that area during 1970. Two of the four studies for the meeting have been prepared and will be published in 1971. Thirteen countries have already indicated their interest in the Latin America meeting which will examine the selection, production and utilization of machine tools and industrial machinery. This meeting, originally scheduled for 1971, has been postponed to 1972 in order to co-ordinate it with other related work.

60. The report of the Expert Group Meeting on the Design, Manufacture and Utilization of Dies and Jigs (1.04.02) held in 1968, was published in 1970. The Meeting is being followed up through field projects.

61. An important factor in the industrial development of a country is the availability of machine tools and their proper utilization. UNIDO therefore plans to hold a meeting in 1971, in co-operation with the Bulgarian Government, on the Promotion of machine-tool industry in developing countries in Europe and the Middle East (1.04.03). Particular attention will be given to the selection, development, marketing and utilization of machine tools. A plant tour of some machine-tool manufacturing and industrial enterprises will be made to observe the production and utilization of machine tools under practical workshop conditions. Experience gained in the creation and development of the machine-tool industry in Bulgaria will be examined as a case study. It is envisaged that the meeting will take place in Varna, Bulgaria, in June 1971. The meeting will be financed from the General Trust Fund of UNIDO. The report of the meeting is scheduled for publication in 1972.

Transportation equipment (1.05)

62. This area of activity covers automotive equipment, shipbuilding and repair and includes other aspects of the manufacture of transportation equipment such as containers and pipelines, as suggested by the Board at its fourth session (A/8016, para.87).

63. The report of the Seminar on the Establishment and Development of Automotive Industry in Developing Countries (1.05.01), held in 1969, was published in 1970. The proceedings are scheduled for publication in 1971.

64. UNIDO is co-operating with ECLA and the Inter-American Development Bank in an Assessment of ancillary automotive and spare parts production industries (1.05.02). This assessment was originally planned as an examination of several field projects. It was found, however, that advantage could be taken of some studies already being undertaken by ECLA. The assessment was therefore extended to a regional level (Latin America) through a meeting organized

in 1970 by ECLA, the Inter-American Development Bank and UNIDO. The findings of the studies form part of a joint study entitled "Prospects and possible forms of regional integration in the automotive industry in Latin America", which will be published by ECLA early in 1971.

65. The scope of the study on the Utilization of idle shipbuilding and repair facilities (1.05.03) has been considerably reduced owing to the comments of the Board (A/8016, para.92) and to limited resources. The study, closely connected with technical assistance in the Pacific area, is being prepared under the title "Utilization of shipbuilding and repair facilities in the Western Pacific". It is scheduled for publication in 1971.

66. The Regional survey of container manufacture (1.05.04; Priority B), to have been carried out in 1971 (ID/B/64/Add.1, para.42,43), had to be postponed until 1972 in favour of work of higher priority in other areas.

Design capabilities (1.06)

67. The development of design capabilities was recognized by the Board at its fourth session as an important factor in the promotion of industries (A/8016, para.89). In 1970, UNIDO held an Expert Group Meeting on the Development of Engineering Design Capabilities (1.06.01). The report and the proceedings of the Meeting are scheduled for publication in 1971. Work on this subject will be continued both in the form of field projects and also as integral parts of other project components.

Processing industry machinery (1.07)

68. This area of activity concerns the promotion of manufacture of equipment for the chemical and mining industries. In 1970, a two-day meeting on Operation, Maintenance, Design and Manufacturing of Chemical Plants and Equipment in Developing Countries (1.07.01) was held in the Federal Republic of Germany. The meeting was organized jointly by UNIDO and DECHEMA - Deutsche Gesellschaft für Chemisches Apparatewesen e.V. (German Society for Design and Manufacture of Chemical Apparatuses). The meeting discussed problems of project planning, production of chemical processing equipment, methodology, technology and design, maintenance and operation of plant, particularly with regard to safety, and quality and continuity of production. The report of the meeting was published in 1970.

Construction machinery (1.08)

69. This is a new area of activity which was initially introduced to investigate the needs of the growing construction industry. As a first step in UNIDO activities in the Manufacture of construction machinery (1.08.01) two studies are proposed for 1971. These studies are to identify the types of machinery for building, road-making and earth-moving that might be suitable for manufacture in developing countries and the sources of know-how and facilities needed for their manufacture.

Expenditures and estimated costs for monitoring and other activities, 1970 - 1972
(in thousands of US dollars)

Project (Priority A)	Regular budget						Extra-budgetary resources		
	Staff a/s		Consultants		Expert Group meetings		1970	1971	1972
	1970	1971	1972	1970	1971	1972			
1.01 Agricultural machinery and implements									
1.01.02	2.0	-	-	6.6	-	-	-	-	-
1.01.03	-	2.0	-	-	-	-	-	3.7	GTP
1.01.04	-	3.0	-	-	-	-	-	7.7	GTP
1.01.05	-	4.0	-	5.0	-	-	-	-	-
1.01.07	-	3.0	-	2.0	-	-	-	-	-
1.01.08	-	-	9.0	-	17.0	-	-	-	14.0
1.02 Electrical and electronic industries									
1.02.03	-	3.0	-	-	3.6	-	9.3	-	-
1.02.05	-	-	14.0	-	-	12.6	-	-	4.0
1.03 Repair and maintenance									
1.03.01	10.0	3.0	-	5.0	-	-	-	-	(38.0 TA) (2.3 GTP) (25.0 BP)
1.03.02	-	-	5.0	-	-	5.0	-	-	25.0 TA
1.03.04	-	3.0	3.0	-	-	-	-	-	15.0 TA
1.03.05	-	-	2.0	-	-	9.0	-	-	-
1.03.06	-	2.0	-	-	8.0	-	-	-	-
1.04 Manufacture industries									
1.04.01	1.0	-	6.0	-	-	7.2	-	-	22.5 TA
1.04.03	-	3.0	-	-	8.2	-	-	14.0	GTP

PRINTED PUBLICATIONS

1970 publications programme

		<u>Languages</u>	<u>Cost (US\$)</u>
ID/18	Design, manufacture and utilization of dies and jigs in developing countries Report of the expert group meeting (1.04.02)	E F S	
ID/34	Production of distribution transformers in developing countries (1.02)	E S	
ID/36	Establishment and development of automotive industries in developing countries Part I. Report of the seminar (1.05.01)	E	
ID/47	Report of the expert group meeting on agricultural machinery industry in developing countries (1.01.01)	E	
ID/57	Operation, maintenance, design and manufacturing of chemical plants and equipment in developing countries Report on UNIDO/DECHEMA seminar (1.07.01)	E	
			<u>15,021</u>

1971 publications programme

ID/22	The selection and acceptance testing of metal-cutting machine tools in developing countries (1.04.01)	E F S R	
ID/36	Establishment and development of automotive industries in developing countries Part I. Report of the seminar (1.06.01)	F S	
	Part II. Proceedings of the seminar (1.06.01)	E F S	
ID/47	Report of the expert group meeting on agricultural machinery industry in developing countries (1.01.01)	F S	
ID/57	Operation, maintenance, design and manufacturing of chemical plants and equipment in developing countries Report on UNIDO/DECHEMA seminar (1.07.01)	F S	
ID/WG.15	Report of the development meeting on the manufacture of telecommunications equipment (1.02.01)	E F S	
ID/WG.56	Development of engineering design capabilities in developing countries Part I. Report of the expert group meeting (1.06.01)	E F S	
	Part II. Proceedings of the expert group meeting (1.06.01)	E F S	
ID/WG.02	Report of the interregional symposium on maintenance and repair in developing countries (1.03.01)	E F S	
-	Regional analysis of UNIDO-UNESCO mission on agricultural machinery in six countries of the Middle East (1.01.02)	E F	

1971 publications programme (cont'd)

	<u>Languages</u>	<u>Cost</u> (1971)
- Profitable management of machine tools in developing countries (1.04.01)	E	
- Prospects and possible forms of regional integration in the automotive industry in Latin America (1.05.02)		published by ECLA
- Utilization of shipbuilding and repair facilities in the Western Pacific (1.05.03)	E	
		<hr/> 25,600

Forecast of 1972 publications programme

ID/WG.87	Report on the promotion of machine tool industry in developing countries in Europe and the Middle East (1.04.03)	E F S H	
-	Development of the agricultural machinery industry in Latin America (1.01.05)	E S	
-	Report on the manufacturing of electronic components in developing countries (1.02.03)	E F S	
			<hr/> 7,500

Note: In the computation of the printing costs a standard formula was applied based on an average cost of internal and external printing.

GROUP 2: METALLURGICAL INDUSTRIES

70. The assistance being rendered by UNIDO to developing countries with regard to metallurgical industries has three main goals: the promotion of industrial utilization of existing resources of metallurgical raw materials; the establishment or expansion of local production of needed metallurgical products; and the establishment of indigenous sources of metallurgical expertise so that problems related to metal production and application can be solved locally.

71. These goals have emerged from the pattern of requests, received from developing countries, for technical assistance in the metallurgical industries. Although the requests cover a variety of problems relating to the production and application of metal, several priority areas have been identified and to these UNIDO has directed its main efforts and resources. The priority areas are: establishment of alumina and/or aluminium production facilities; smelting of ilmenite concentrates with production of pig iron and a slag rich in titanium oxide; planning for copper, lead and zinc production; planning for the development of the iron and steel industry; establishment or improvement of foundry facilities; and creation and transfer of know-how.

72. As a result of the experience that UNIDO is gradually accumulating in this field of activities, programmes are being related more closely to the actual and specific conditions of the developing countries, leading to increasingly significant technical assistance projects of greater practical impact. The present range of projects includes: provision of specialized expertise not easily available; laboratory and pilot scale investigations to ascertain the suitability of specific raw materials or metallurgical processes; feasibility studies on the establishment of new plants or the expansion of existing ones; long-range studies as a preliminary step towards national planning of metallurgical industries; and establishment of pilot units and of centres for metallurgical technology. At the same time, emphasis is placed on the promotional aspects of these activities with a view towards achieving direct and concrete results in the development of metallurgical industries in developing countries.

OPERATIONAL ACTIVITIES

73. The operational activities in this sector are directed towards the establishment or expansion of metallurgical industries in developing countries, with particular attention being given to local resources, conditions and needs.

74. A number of developing countries (Ceylon, Gambia, India, Madagascar, Senegal, United Arab Republic) have requested the assistance of UNIDO for the industrial processing, by smelting in electric arc furnaces, of titanium containing ores or concentrates. Laboratory tests and preliminary technical studies have been completed with encouraging results and feasibility studies are under preparation. These tests and studies are being financed through voluntary contributions to UNIDO. It is likely that, in a number of developing countries, pilot or prototype plants will be erected for the production of a TiO_2 -rich slag, which is expected to find a place on the world market, and of pig iron, a basic material for the development of local foundries and steel industries.

75. Assistance in the development of the production of alumina and aluminium was also provided. In Argentina, for example, two projects were implemented in 1970 providing basic information and analysis essential to the planning of the industry. Although lacking local sources of bauxite, Argentina has important deposits of alunite, an alternate source of alumina. UNIDO provided an expert to study the possibilities of utilizing this raw material. Moreover, power stations with large capacities and capable of generating inexpensive electricity are being erected, and the Government has requested the assistance of UNIDO in carrying out a feasibility study on the establishment of an aluminium smelter. As another example, UNIDO has been providing expertise in the establishment of an aluminium smelter in Turkey.

76. Assistance in the establishment or expansion of iron and steel industries continues to be given particular attention by UNIDO, especially in view of the requests submitted and of the interest shown by developing countries. Thus, for example, technical assistance was provided to Peru in the planning and development of its iron and steel industry. As another example, UNIDO provided assistance in planning the expansion of the iron and steel industry of Iran by undertaking a study of future demand for plain carbon and special steels as well as a feasibility study on ferro-alloy production. Further examples are the pilot plant investigations of Indian and Iranian iron ores to determine their suitability for direct reduction.

77. UNIDO is also co-operating with the Industrial Development Centre for Arab States (IDCAS) to identify problems and to provide assistance in the development of the iron and steel industry in Arab countries.

78. Another group of technical assistance projects programmed for a large number of developing countries relates to the establishment or development of foundries. Active projects include the supply of specialized expertise for improving existing foundries (e.g. in China, Ecuador, Mali, Thailand) and for establishing pilot or prototype foundry shops (e.g. in Senegal, Togo). UNIDO is assisting in the establishment of prototype foundries, in combination with

mechanical workshops, in Somalia and the Sudan (partly financed from voluntary contributions to UNIDO). Projects of this type will help to solve immediate problems in the production of spare parts that are needed for repair of machinery and equipment and, with their demonstration and training effect, will serve as nuclei for metallurgical and metalworking industries.

79. UNIDO has been requested by certain developing countries in a more advanced stage of industrialization to provide assistance in the establishment of centres of metallurgical technology. Thus, a UNDP/SF project has been approved to assist the Centre for Metallurgical Research and Development in the United Arab Republic. Pre-project activities for another UNDP/SF project have been approved to assist the National Mining Enterprise (ENAMI) of Chile to establish a centre for experimentation and investigation of industrial processes for minerals. Yet another UNDP/SF project, in preparation, is to provide assistance to a national metallurgical institution for the creation of a creep testing laboratory, justified by the increasing sophistication of the country's metallurgical industry.

80. In 1970, one UNDP/SF project and pre-project activities for another UNDP/SF project were approved in the field of metallurgical industries. It is expected that two more UNDP/SF projects will be approved in 1971, increasing the total number to four; in 1972 an additional two projects are envisaged. Of these proposed six UNDP/SF projects, three would be aimed at assisting in the development of metallurgical industries based on promising ore resources, two would involve the establishment of metallurgical centres or laboratories, and the remaining project would involve assistance to the foundry industry.

81. A total of seven projects were financed from the General Trust Fund of UNIDO during 1970. Six of the projects involved the treatment of iron titanium ores on a laboratory scale or a technical economic assessment of their subsequent treatment. It is expected that these investigations will lead to the establishment of pilot plants.

82. The total number of projects under operation in the field of metallurgical industries was 111. This figure is expected to rise to 130 in 1971 and to 160 in 1972.

Value of approved field projects and forecast of requirements, 1970 to 1972
(in thousands of US dollars)

	1970	Approved projects	1971	Approved projects	1972
	estimate: ¹ expenditure		Forecast of requirements		Forecast of requirements
UNDP/SF	-	517.4	35.0	461.3	744.0
UNDP/TA	172.3	258.2	634.6	65.9	1,002.0
RP	135.5	137.8	91.9	-	205.8
SIS	292.4	368.9	168.4	-	544.0
GTF	52.6	296.0	29.8	-	333.0
PIT	18.8	6.2	-	-	6.2
Total	671.6	1,584.5	959.7	527.2	2,835.0

List of Approved Operational Projects

UNDP/SPECIAL FUND

Africa

UAR-63 Central metallurgical research and developing institute

Asia and the Far East

IND-111 Creep testing laboratory

UNDP/TECHNICAL ASSISTANCE

Africa

SEN/69/5 Assistance to SAFAL (aluminium industry)

UAR/69/2 Science research - metal physics

The Americas

ARG/68/5 Development of aluminium industry

ARG/68/6 Assistance to INTI - mechanical and metallurgical techniques

CHI/68/15 Manufacturing of capital goods

MEX/70/20 Steel study tour to Japan

Asia and the Far East

INS/70/1 Steel wire mill

MON/68/12 Manufacturing of precious and semi-precious stones

PAK/70/5 Steel study tour to Japan

PHI/68/2 Steel industry - hot and cold roll

Europe and the Middle East

HUN/69/10 Modern high-speed procedures for the forming of aluminium

HUN/69/15 Alloy plate sheet, strip and foil

HUN/70/10 Aluminium industries

POL/70/1 Iron and steel production - area and interregional fellows

ROM/69/2 Metallurgical quality control

ROM/70/1 Technology of steel production

ROM/70/3 Technology of heat-resisting alloys and super alloys

ROM/70/38 Utilization of non-ferrous and ferrous ores

TUR/68/2 Upgrading and briquetting of lignite

TUR/68/12 Assistance to the aluminium industry - critical path method

TUR/68/11 Metallurgical industry

YUG/68/8 Modern technology mastering - iron and steel metallurgy

INT/69/12 Seminar on copper production and group study tour of copper plants in the Union of Soviet Socialist Republics

UNIDO REGULAR PROGRAMME

Africa

ALG/O2/1/2

MAU/O2/1/1

ID/RP/O2-3 (United Arab
Republic)

UAR/O2/1/1

ID/RP/O2-7 (Regional)

AFR/O2/1/1

Metallurgical industries - iron and steel; metal construction

Metallurgical industries - industrial processing of copper

Metallurgical industry - modern techniques (quality control)

Metallurgical industries - iron and steel industry

Metallurgical industries - regional adviser, iron and steel industries

Metallurgical industries - regional adviser, iron and steel industries

The Americas

BRA/O2/1/1

ID/RP/O2-2 (Colombia)

CUB/O2/1/2

ID/RP/O2-3 (Regional)

Metallurgical industries - non-ferrous metals

Industrial programming and policies (steel production)

Metallurgical industries - iron and steel

Metallurgical industries - regional adviser, iron and steel industries

Asia and the Far East

IND/O2/1/1

IRA/O2/1/2

ID/RP/O2-4 (Pakistan)

ID/RP/O2-8 (Regional)

AFE/O2/1/2

Metallurgical industry - non-ferrous industries (modern techniques and quality control)

Metallurgical industry - iron and steel production

Metallurgical industry - iron and steel production

Metallurgical industries - regional adviser, iron and steel industries

Metallurgical industries - regional adviser, iron and steel industries

Europe and the Middle East

ALB/O2/1/1

ID/RP/O2-2 (Poland)

ROM/O2/1/1

ID/RP/O2-2 (Turkey)

TUR/O2/1/2

Metallurgical industries - gas containers production

Metallurgical industries - iron and steel production

Metallurgical industries - iron and steel industries

Metallurgical industries - iron and steel; aluminium; copper

Metallurgical industries - aluminium

Interregional

ID/RP/O2-3

INT-RE/O2/1/2

Metallurgical industries

Metallurgical industries

SIS PROGRAMME

Africa

70/711 MAU-7

69/480 MOR-11

67/208 MOR-4

69/639 TOG-4

69/642 TOG-2

Iron and steel engineer

Iron ore pelletizing market study

Integrated project for the treatment of pyrrhotine kettara ashes for the recovery of copper and pelletizing of the iron oxide residue

Establishment of a small demonstration foundry shop

Assistance in establishing steel rolling mill

313 PROGRAMME (cont'd)

Africa (cont'd)

68/425 UAR-25	Assistance to Aswan steel project
68/426 UAR-26	Assistance to Aswan steel project
70/761 UAR-35	Metallurgical processing of ilmenite concentrates
70/778 UAR-32	Assistance to foundry industry - metallurgical industry
70/987 UAR-43	Preparatory mission for demonstration production and maintenance inventory control system of the Helwan integrated iron and steel works
70/1014 UAR-44	Pilot plant scale tests on Bahariya iron ore for the production of sponge iron

The Americas

68/286 ARG-6	Assistance in the establishment of an aluminium industry
69/662 BRA-24	Aluminium silicon alloy production
70/788 BRA-29	Study of the possibilities for development of metallurgical industries
69/587 CHI-6	Assistance to Instituto Nacional de Investigacion Tecnologica y Normalizacion (INDITECNOR)
70/913 ECU-12	Foundry industry
70/830 PER-15	Exploratory mission to determine terms of reference for assistance to the iron and steel industry
70/763 PER-10	Pre-investment study for the development of the iron and steel industry
70/766 PER-13	Flat product rolling mill expert
70/767 PER-14	Industrial cost accountant - iron and steel
70/984 LA-8	Assistance to the Junta of Andean Integration Group

Asia and the Far East

69/563 CRY-13	Development of the gem industry
70/751 CRY-4 Phase II	Metallurgical processing of Pulmodai ilmenite concentrates
70/750 IND-6 Phase II	Processing of heavy black sands (exploratory mission)
69/652 IND-4	Pilot plant scale tests on vanadiferous magnetites
69/486 IND-13	Assistance to the mica industry
68/322 IRE-9	Assistance to the Tjilegon steel plant (wire drawing mill)
70/716 IRA-28	Lead and zinc industry development (exploratory mission)
70/725 IRA-29	Centre for metallurgical technology
70/774 IRA-20 Phase II	Pilot plant scale tests on direct reduction of iron ores by the HYL process for the production of iron ore
70/890 IRA-31	Lead and zinc production
70/817 PAK-12	Assistance for establishing a centre for metallurgical technology
69/499 PAK-5	Survey to formulate recommendations for co-ordination and efficient utilization of the steel, iron and engineering industries
69/623 AYE-2	Ferro-alloy feasibility study

SIS PROGRAMME (cont'd)Europe and the Middle East

70/108 ICE-3	Survey mission to consider possibilities of long-range UNIDO assistance and to determine the best way of providing immediate assistance to expand the chemical and metalworking industries
70/707 IRQ-8	Iron and steel mission (exploratory)
70/842 IRQ-10	Small steel foundry project
70/871 IRQ-12	Merchant steel rolling mill project
70/872 IRQ-13	Electric steel melting project
70/873 IRQ-14	Steel market and demand projections
69/502 ISR-2	Assistance to metal-finishing industry
68/315 ROM-1	Welding of lightweight alloys
69/530 ROM-6	Metal corrosion prevention
70/743 SAU-8	Assistance to the steel industry (PETROMIN)
68/306 SYR-8	Assistance to steel rolling mill
69/513 SYR-18	Assistance to integrated iron and steel industry
68/313 TUR-11	Aluminium industry
69/697 TUR-13	Maintaining of technological equipment in the aluminium industry
70/972 TUR-16	Exploratory mission in the field of metallurgy
68/456 YUG-7A	Vacuum steel degassing project
69/459 YUG-7D	Stainless and alloy steel rolling
69/460 YUG-7E	Iron and steel expert
69/461 YUG-7F	Steel ingot re-heating and soaking project

UNIDO GENERAL TRUST FUNDAfrica

2/13 (Gambia)	Laboratory scale investigations of processing ilmenitic black sands to TiO_2 -rich slag, pig iron and other marketable by-products
2/14 (Mali)	Assistance to a small aluminium factory
2/6 Rev.2 (Somalia)	Prototype foundry plant and machine shop
2/7 Rev.2 (Sudan)	Prototype foundry plant and machine shop
2/5 (United Arab Republic)	Laboratory scale metallurgical investigations of the processing of ilmenite concentrates to TiO_2 -rich slag, pig iron and titanium-tetrachloride
2/15 (United Arab Republic)	Feasibility study of industrialization of ilmenitic ore deposits
2/12 (United Republic of Tanzania)	Techno-economic evaluation of titaniferous iron ores

Asia and the Far East

2/9 (Ceylon)	Laboratory scale metallurgical investigations of ilmenite concentrates for the production of titania-rich slag pig iron
2/10 (India)	Feasibility study and project design preparation of an industrial prototype plant for the electrometallurgical processing of ilmenite concentrates to titania-rich slag and pig iron

UNIDO GENERAL TRUST FUND (cont'd)

Interregional

2/1 Rev.2

Seminar on copper production and group study tour of copper plants

FUNDS-IN-TRUST

Asia and the Far East

9012-70 (Thailand)

Technological research institute - metallurgy

SUPPORTING AND OTHER ACTIVITIES

83. The supporting and other activities of Group 2 are classified under the following projects:

Light non-ferrous metals	2.01
Heavy non-ferrous metals	2.02
Iron and steel	2.03
Foundries	2.04
Creation and transfer of metallurgical know-how	2.05

Light non-ferrous metals (2.01)

84. Under this heading several activities are covered, ranging from ore preparation to metal fabrication and forming, including aluminium, titanium and magnesium. Many developing countries export bauxite, some export alumina and a few produce aluminium primarily for internal consumption. Moreover, certain developing countries have deposits of titanium-bearing ores that can be processed into slag, rich in titanium oxide, and pig iron.

85. The interest of many developing countries in the establishment of these branches of the metallurgical industry is reflected by the requests for technical assistance submitted to UNIDO.

86. On the subject of Alumina and aluminium production (2.01.01), UNIDO prepared four studies in 1970: two on purposes, methods and costs of bauxite and alumina testing laboratories; one on the processing of low grade bauxite, a problem of special interest to certain developing countries; and one on the problems and possibilities of the aluminium industry of Asia.

87. In 1972, subject to availability of funds, UNIDO proposes to hold in Vienna an expert group meeting on alumina and aluminium production in developing countries (Priority B). This meeting had originally been planned for 1970, but could not be implemented (ID/B/64/Add.2, para.15). The studies described above, together with others to be prepared in 1971, would serve as a basis for the discussions at the meeting.

88. The seminar on Complex titanium-iron ore processing (2.01.02), to be held in 1971 (ID/B/64/Add.2, para.17), will examine the industrial processing of complex titanium-iron ores. The report of the seminar is scheduled for publication in 1972.

89. In 1972, with the co-operation of experts from the Union of Soviet Socialist Republics, UNIDO plans to prepare a basic reference document on Prototype plant design and operating standards for smelting of titaniferous ores or concentrates (2.01.03). The smelting of titanium-iron ores (ilmenitic ores or "heavy black beach sands") or of their concentrates to a TiO₂-rich slag and pig iron, through a technology first developed in Canada and perfected in the Union of Soviet Socialist Republics, is of special interest to a number of developing

countries. This document would provide essential information and operating data for a typical ilmenite smelting plant of appropriate size and would be especially useful in the implementation of technical assistance leading to the establishment of such industries.

Heavy non-ferrous metals (2.02)

90. The supporting activities under this heading are related to the production and fabrication of heavy non-ferrous metals (copper, tin, lead, zinc etc.). Many developing countries are suppliers of heavy non-ferrous metal ores and concentrates and, in some instances, of primary metal. Most of these countries aspire to increase the extent of local processing of these ores, concentrates and metals in order to raise their export value or to satisfy the internal market.

91. In 1970, UNIDO published the report of the Expert Group Meeting on Lead and Zinc Industries (2.02.01), held in 1969.

92. The same year, UNIDO held a Seminar on Copper Production and Growth Study Four of Copper Plants (2.02.02), in the Union of Soviet Socialist Republics. The Seminar was attended by 51 participants including participants from twelve developing countries. The report of the Seminar will be published in 1971.

Iron and steel (2.03)

93. The activities under this heading include the preparation of iron ores, coke making, iron making, ferro-alloy production, steel making, rolling and finishing operations in the production of steel as well as wire drawing, forging, welding, tube production and other steel forming techniques. The developing countries have shown a great interest in the assistance to this branch of industry, as reflected by the number and scope of requests for technical assistance submitted.

94. UNIDO proposed the holding of a workshop on Ferro-alloys (2.03.02; Priority B) in Vienna in 1971 (ID/B/64/Add.2, para.24,25). However, due to limitations in finance and staff, the workshop had to be cancelled.

95. The expert group meeting on Direct reduction processes (2.03.03; Priority B) in the 1971 programme (ID/B/64/Add.2, para.26), will not be carried out due to limitations in finance and staff. It is planned to include discussion of these industrial processes in the programme of a third interregional iron and steel symposium, now being considered for inclusion in the 1973 work programme (see 2.03.06 below).

96. In 1970, UNIDO held a Seminar on Tin Plate Production (2.03.04) in Chile, in conjunction with ECLA (ID/B/44, para.87). Thirty-five participants from twelve developing countries took part in the seminar. The report of the Seminar is scheduled for publication in 1971.

97. A workshop on Pelletizing (2.03.05) was planned to be held in Geneva in 1970, in conjunction with ECE (ID/B/44, para.86). Due to lack of adequate resources, the workshop could not be implemented.

98. As a number of issues of decisive importance are maturing for the planning, construction and operation of iron and steel plants in developing countries, UNIDO is considering the possibility of holding a Third interregional iron and steel symposium (2.03.06). By 1973, five years after the Second Symposium (held in Moscow) and ten years after the First (held in Prague and Geneva), it may be opportune to bring together potential investors, managers and engineers interested in the establishment or operation of iron and steel plants in developing countries for the purpose of examining progress made thus far, as well as the economic, technical and financial problems still confronting developing countries and the opportunities open to them in this branch of industry. The main emphasis would be placed on the promotion of contacts between organizations and individuals capable of supplying know-how, equipment and financing with the decision-making executives and technical managers of the iron and steel industry in developing countries.

99. In addition, the position and role of developing countries as consumers or suppliers of essential metallurgical raw materials and of steel products would have to be re-examined in the light of changing world market conditions and of technological innovations. Specific issues might include: economic aspects of establishing iron and steel industries in developing countries; economic aspects of introducing new technologies; increase in value of ore exports by metallurgical beneficiation and pre-reduction; the increasing difficulties in the supply of coking coal; possibility of introducing direct reduction processes, making use of hydrocarbons or non-coking coal as reductants; factors governing economies of scale in the iron and steel industry; the role of small steel plants (non-integrated and semi-integrated); new steel products; and creation of local expertise for plant, process and equipment and for product planning, design, research and development.

100. In 1972, it is proposed to convene a preparatory expert group meeting in Vienna to examine and advise UNIDO on the need, purposes, justification and modus operandi of a proposed third interregional iron and steel symposium and to prepare its eventual agenda. Six top strategists and executives of the iron and steel industry are to be invited. Their conclusions and recommendations, especially with regard to the promotional aspect of the symposium would enable UNIDO to reach a decision on the advisability of holding the proposed symposium.

Foundries (2.04)

101. UNIDO has carried out a number of technical assistance projects in this area, which covers production of castings of iron, steel, aluminium, copper, bronze and other metals. The purpose of the supporting activities under this heading is to analyse assistance needed by developing countries in establishing or improving foundries, ranging from small sand-casting installations for simple products to large, highly automated installations for centrifugally cast iron pipes and automotive castings.

102. The report of the Expert Group Meeting, held in 1969, on the Utilization of Non-Ferrous Scrap Metal in Developing Countries (2.04.01) was published in 1970.

103. In 1971, UNIDO will prepare a background study on problems encountered in the development of the foundry industry in developing countries. Subject to the availability of funds,

UNIDO will also hold in 1971 an expert group meeting on Foundry technology for developing countries (2.04.02; Priority B - cf. ID/B/64/Add.2, para. 81).

104. In view of the general interest of the developing countries in the establishment of modern foundry shops, UNIDO prepared in 1970 a basic reference document on fraternal design and standards of operation of typical grey cast iron foundry installations (2.04.02). The document contains a description of typical grey cast iron foundry installations suitable for developing countries; typical products; estimates of investments, operating capital and production costs. It will be of direct use in the planning and operation of foundries in developing countries and will also be useful in planning and implementing the assistance of UNIDO to this branch of industry. The document is scheduled for publication in 1971.

Creation and transfer of metallurgical know-how (2.05)

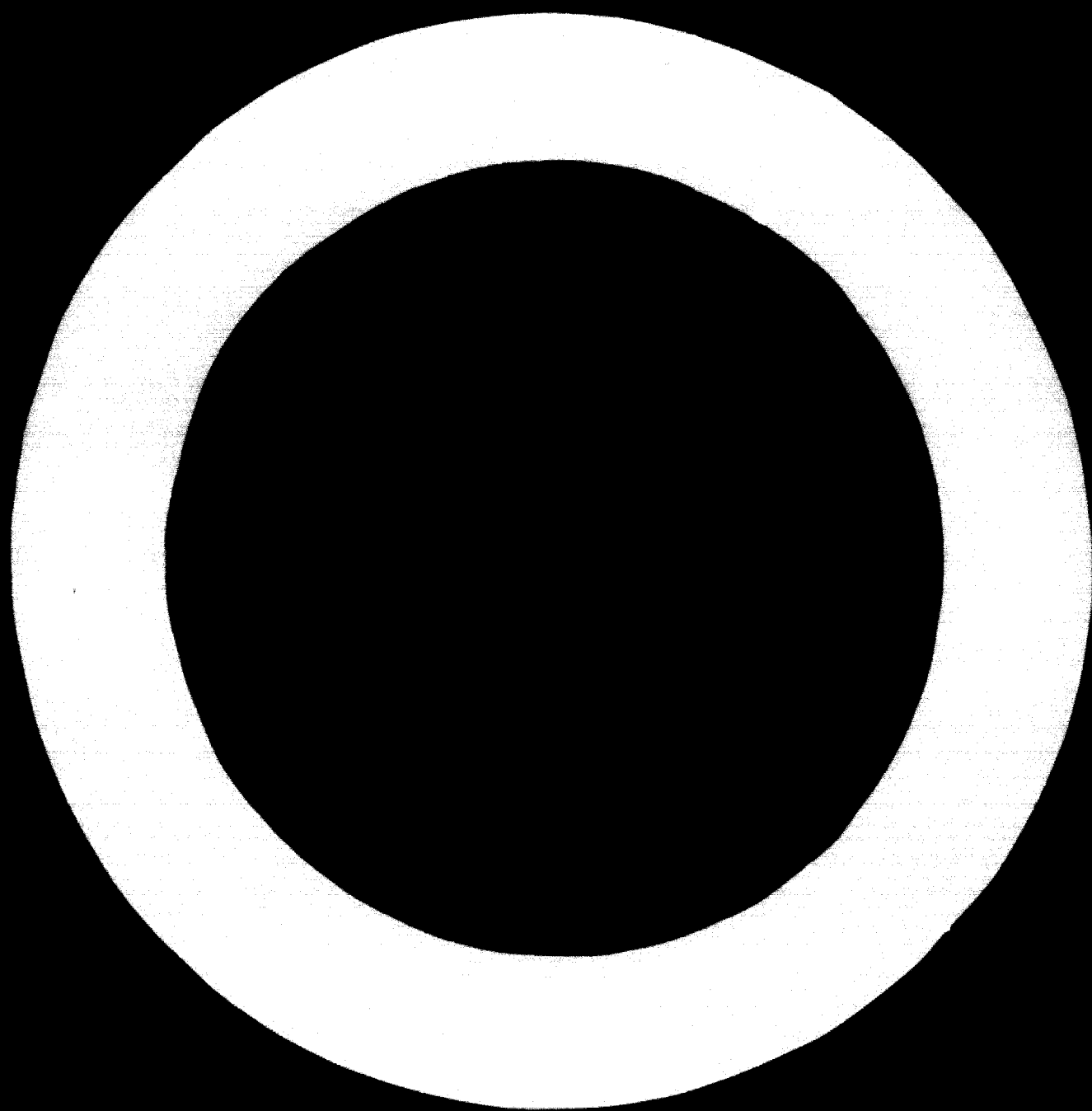
105. Many developing countries feel that they cannot afford to remain totally dependent on import of the required know-how and equipment. It is estimated that in the course of the next decade developing countries will invest in their metallurgical industry about \$20 billion (including investment in associated infrastructure requirements), a sizable portion of which will be utilized for the acquisition of direct and indirect know-how. ("Indirect know-how", as understood here, means the know-how contained in equipment purchased.) UNIDO plans to assist in the development of local know-how so that a substantial amount of the required investment can be directed to domestic sources of know-how and equipment. In other instances, the need for national sources of know-how arises from the existence of special conditions or special raw materials, requiring adaptation or development of new processes and products.

106. In accordance with the 1971 work programme (ID/B/64/Add.2, para. 33), UNIDO will hold a workshop on Creation and transfer of metallurgical know-how (2.05.01) in 1971. The report of the workshop will be published in 1972.

107. UNIDO will make a special effort to encourage the Promotion of metallurgical technology transfer to the metals transforming industries of developing countries (2.05.02). In addition to establishing extractive metallurgical industries, the developing countries must also establish and expand a diversified metals transforming industry which, starting from primary metal (in some cases imported), produces bars, sections, sheet, wire, tubes, forgings, castings, powder metal parts, composites etc. A variety of processes are in use and a diversity of metallurgical products results from the operation of the corresponding industrial units, which are frequently of small or medium size. The related technology is rapidly changing and industries in developing countries have problems establishing contacts with those of developed countries to obtain the necessary know-how through a number of different mechanisms, most of which do not involve capital participation by the donor in the recipient firm.

108. The specific goals of UNIDO in promoting this transfer of technology will be: application of selected new processes in the developing countries; conclusion of technical assistance agreements leading to new or improved operations; establishment of contacts between firms and organizations in developing countries with consulting firms in developed countries for the solution of specific problems; and establishment of institutions to institutionalize agreements.

10). To attain these goals extensive and early preparatory work will be needed. In 1971 and 1972 correspondence will be exchanged with selected organizations in developed and in developing countries and preliminary surveys will be carried out through subcontractors (appropriate international regional or national organizations), experts and staff member missions, in order to identify the supply and demand for specific know-how and to define the best going operandi to ensure practical results (agreements and contracts between donor and recipient firms or organizations). The technologies to be transferred and the contacts to be promoted between donor (in developed countries) and recipients (in developing countries) will be selected and a portfolio of promising technologies will be prepared for submission to the developing countries. Finally, a promotional meeting will be organized in 1972, probably in Latin America, to ensure and multiply direct contacts between donors and recipients.



<u>Project (Priority B)</u>									
<u>2.01 Light non-ferrous metals</u>									
2.01.01	-	-	3.0	-	6.0	-	-	6.8	-
2.04 <u>Foundries</u>									
2.04.02	-	-	3.0	-	4.0	-	6.0	6.8	-
<u>Total</u>	-	-	3.0	-	6.0	-	6.0	6.8	-

3/ Operational costs shown are included in the table on page 30.

PRINTED PUBLICATIONS

<u>1970 publications programme</u>		<u>Languages</u>	<u>Cost (US\$)</u>
ID/24	Report of the second interregional iron and steel symposium (2.03.01)	F S R	
ID/45	Technological developments in lead and zinc production and their significance to developing countries Report of the expert group meeting on lead and zinc (2.02.01)	E	
ID/51	Utilization of non-ferrous scrap metal Report of the expert group meeting on non-ferrous scrap metal (2.04.01)	E	
			<u>9,531</u>
<u>1971 publications programme</u>			
ID/WG.73	Report of the seminar on tin plate production (2.03.04)	E	
ID/WG.74	Report of the seminar on copper production (2.02.02)	E	
-	Prototype design and standards of operation of typical grey cast iron foundries in developing countries (2.04.03)	E	
			<u>2,330</u>
<u>Forecast of 1972 publications programme</u>			
ID/WG.73	Report of the seminar on tin plate production (2.03.04)	F S	
-	Report of the seminar on complex titanium-iron ore processing (2.01.02)	E	
-	Report of the expert group meeting on foundry technology in developing countries (2.04.02; Priority B)	E	
-	Report of the workshop on creation and transfer of metallurgical know-how (2.05.01)	E	
			<u>5,700</u>

Note: In the computation of the printing costs a standard formula was applied based on an average cost of internal and external printing.

GROUP 3: CONSTRUCTION AND BUILDING MATERIALS INDUSTRIES

110. The Industrial Development Board at its fourth session approved the priorities accorded by UNIDO to basic areas of the building materials industry. The Board also suggested that a major goal should be the exploitation of low-cost, locally available building materials (A/OS/16, para.124). The present work programme reflects the increased efforts of UNIDO to meet the most immediate needs of the construction and building materials industries in developing countries.

111. The efforts of UNIDO in both its operational and supporting activities are directed, therefore, towards the greatest possible utilization of local labour and material resources and are concerned with all phases of the construction and building materials industries, including both technological and promotional aspects. In summary, the activities of UNIDO that fall within this group are primarily concerned with the increasing need for building materials in developing countries.

112. The technological aspects of the activities being carried out by UNIDO include advice in the determination of needs, selection of raw materials and production methods, initiation of feasibility studies as well as assistance in the erection and operation of new facilities and improvement of the operation of existing plants.

113. The promotional aspects, which are reflected mainly in the supporting activities, include supplying assistance, with key information, to appropriate recipients. Stress is being placed on providing a platform for representatives of industrially advanced countries, for potential investors and for those who are responsible for implementing programmes of the building materials industries in developing countries.

OPERATIONAL ACTIVITIES

114. The diverse nature of the assistance rendered by UNIDO in the building materials sector is reflected by the great variety of materials dealt with, including cement, glass, fine ceramics, heavy clay building materials, natural stones, gypsum, volcanic materials, asbestos cement, expanded clays and plastic composites.

115. Assistance in the fields covered heretofore is expected to result in the establishment of several glass, ceramics and cement plants. UNIDO is widening the scope of its technical assistance in this field by extending it to general building materials, including stone, aggregates, refractories and building panels as well as fine ceramics and heavy clay building materials.

116. The diversified assistance of UNIDO to the building materials sector may be illustrated by a few typical cases taken from the present operational programme. In order to assist the Government of Mauritius in assessing the feasibility of establishing a domestic cement industry utilizing local raw materials, a UNIDO expert is advising the Government on appropriate steps to be taken. UNIDO is also assisting the Government of Turkey in connexion with the expansion of the domestic cement industry, including the planning of new facilities. The Government of Madagascar is receiving expert assistance in the ceramic industry at an established brick plant where technical difficulties have restricted production, while in Jordan, which has abundant resources of various ceramic raw materials, the Government has received assistance and advice on a long-range programme required for establishing a new industry.

117. In Bolivia, a UNDP/SF project was in operation in 1970 in asbestos processing. In addition, a number of building materials experts were provided for four operating UNDP/SF projects being backstopped by other groups of activity within UNIDO. In order to comply with the recommendations made by the Industrial Development Board at its fourth session (A/8016, para.125), UNIDO will concentrate its efforts on increasing the number of UNDP/SF projects that include demonstration plants. It is expected that in 1972 a number of such projects will be under way.

118. In 1970 there was a total of 47 operational projects. This figure is expected to rise to 65 in 1971 and to 90 in 1972.

Value of approved field projects and forecast of requirements, 1970 to 1972
(in thousands of US dollars)

	1970	1971		1972	
	<u>estimated expenditure</u>	<u>Approved projects</u>	<u>Forecast of requirements</u>	<u>Approved projects</u>	<u>Forecast of requirements</u>
UNDP/SF	59.2	286.3	-	260.5	-
UNDP/TA	75.5	73.8	443.2	3.8	591.0
BP	19.0	32.0	21.5	-	54.0
SIS	122.0	226.9	280.4	-	543.0
GTF	-	1.7	31.9	-	40.0
MIT	23.0	5.7	-	-	-
Total	<u>298.7</u>	<u>626.4</u>	<u>776.8</u>	<u>264.3</u>	<u>1,233.7</u>

List of Approved Operational Projects

UNDP/SPECIAL FUND

The Americas

BOL-20

Experimental production plant for asbestos processing

UNDP/TECHNICAL ASSISTANCE

The Americas

ARG/68/6

Assistance to INTI - construction technology

BOL/70/4

Ceramics industry

Asia and the Far East

CHY/68/3

Ceramics industry

HOR/69/16

Industrial development

MOH/68/10

Technological development of glass plant

PAK/68/9

Cement production

Europe and the Middle East

ROM/70/7

Technology of glass production

TUR/68/3

Chemical engineering

TUR/69/4

Development of cement industry

UNIDO REGULAR PROGRAMME

Africa

ALG/03/1/3

Construction and buildings materials

ID/RF/03-2 (Cameroon)

Building materials industries

NER/03/1/1

Building materials industries

The Americas

NIC/03/1/1

Building materials industries

PAR/03/1/1

Construction and building materials

Asia and the Far East

IND/03/1/1

Building materials industries

ID/RF/03-3 (Iran)

Building materials industries

THA/03/1/3

Construction and building materials

Europe and the Middle East

JOR/03/1/1

Construction and building materials

ID/RF/03-3 (Romania)

Building materials industries

ID/RF/03-5 (Yugoslavia)

Building materials industries

SIS PROGRAMME

Africa

67/89 ALG-4	Reactivation of industrial plants - glass industry
67/115 DAH-1	Marble cutting and polishing factory
70/754 ETH-14	Assistance to Ethiopian Cement Corporation S.C.
69/641 GHA-8	Assistance to the glass factory
68/293 MWI-5	Assistance in establishment of a pottery industry
70/701 MAU-8	Industrial utilization of gypsum deposits
69/465 MAR-7	Establishment of a cement industry
69/600 MAR-10	Feasibility survey of the clay products industry
70/194 NIR-15	Techno-economic survey - assistance to the Cement Company of Northern Nigeria Ltd.
69/649 SOM-9	Industrial utilization of gypsum deposits
70/878 UAR-42	Expert on establishment of research centre for refractories and building materials

The Americas

69/296 BOL-5	Development of the ceramics industry
70/929 BOL-12	Assistance to asbestos cement factory
69/506/Rev.1 BOL-2*	Establishment of refractory products industry
69/553 BRH-1	Establishment of a lime industry
70/742 NIC-4	Assistance in development of glass industry

Asia and the Far East

70/887 FIJ-7	Heavy clay products industry feasibility survey
69/60 IRA-26	Assistance in mining of decorative building stones

Europe and the Middle East

70/940 ICE-7	Feasibility study of industrial uses of perlite and pumice
70/995 RON-14	Assistance to ceramics and glass industries
68/448 SYR-14	Assistance to asbestos cement processing factory
70/797 WE-3	Exploratory mission to study the feasibility of polysand products manufacture (pipes and building materials)

Interregional

70/737 INTREG-13	Assistance to Industrial Development Centre for Arab States
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UNIDO GENERAL TRUST FUND

Europe and the Middle East

3/1 (Jordan)	Laboratory test of "tuff" building material
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FUNDS-IN-TRUST

Africa

9015-70 (Dahomey)	Interpreter to SIS project
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Asia and the Far East

9010-70 (Thailand)	Technological Research Institute - construction materials
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SUPPORTING AND OTHER ACTIVITIES

119. The supporting and other activities of group 3 are classified under the following projects:

Cement	3.01
Fibre-cement composites	3.02
Plastics in building	3.03
Clay building and allied materials	3.04
Prefabrication in the building industries	3.05
Building materials industry studies	3.06
Building materials industry research	3.07

120. The main objective of the supporting activities within this group is the promotion of the building materials industry in developing countries, including transfer of know-how that will lead to the widest possible utilisation of locally available raw materials. To achieve this objective, UNIDO is assisting the developing countries in implementing their building materials industry programmes by providing machinery to enable executive technologists and representatives of the investment sector to solve problems inherent in the establishment and strengthening of such local industries. In this connexion, co-operation with the United Nations Centre for Housing, Building and Planning (UNCHBP), the regional economic commissions, UNESOB and other United Nations agencies will continue.

Cement (3.01)

121. Cement production is one of the basic industrial activities in developing areas and has a decisive impact on industrialisation and industrial development in general. In view of the importance attached by developing countries to assistance in the creation and strengthening of their cement industries, UNIDO was asked by the Industrial Development Board at its fourth session to pay particular attention to the transfer of know-how in the manufacture of cement (A/8016, para.127).

122. In compliance with this request, UNIDO plans to hold in 1972 an interregional seminar on the Manufacture of cement (3.01.01) with the objective of providing decision-makers from developing countries with an opportunity to meet technologists and potential investors from developed and developing countries in order to elaborate ways and means of promoting cement manufacture in countries where this is feasible. The seminar will be held in co-operation with UNCHBP and invitations will be extended to the regional economic commissions, UNESOB and ILO. In addition, UNIDO commissioned a study on "The manufacture of cement and sulphuric acid from calcium sulphate" (ID/B/26, para.66) which was completed in 1969. This study, which is to be published and distributed in 1971, will provide developing countries with information on simultaneous manufacture of cement and sulphuric acid.

123. To encourage cement manufacture in those developing countries where conditions are not yet suitable for the establishment of complete cement plants, retroactive integration (i.e. import of cement clinker and the installation of clinker grinding plants) provides a useful approach. It is planned, therefore, to carry out in 1972 a survey on Cement machinery (3.01.02) Priority B which will provide the developing countries with pertinent information on this approach.

Fibro-cement composites (3.02)

124. Asbestos fibres and Portland cement required for the manufacture of traditional asbestos cement are often not readily available in developing countries, and this lack can hamper the development of an integrated building materials industry. This condition has led to a number of suggestions for partial or complete substitutions for these components, a development that is expected to generate a range of new products and technologies.

125. The Expert Working Group on Fibro-Cement Composites (3.02.01), held in Vienna in 1969, adopted a number of recommendations with regard to the assistance rendered by UNIDO in asbestos substitution. These recommendations form the basis of the 1971 and 1972 programmes in this field. The report and proceedings are scheduled for publication and distribution in 1971.

126. Interest in these technologies involving the substitution of asbestos was expressed by several developing countries. Following the recommendations of the above mentioned Expert Working Group, UNIDO, in collaboration with Hungarian technical associations, plans to carry out in 1971 a study on the Substitution of asbestos by mineral wool (3.02.02). It will deal with a prototype process for the introduction of mineral wool produced from basalt rocks into an asbestos-cement composition. This technology, which would allow the partial substitution of asbestos in the manufacture of asbestos-cement sheets, is expected to encourage the promotion of building materials industries in countries lacking asbestos. Publication of the monograph is planned for 1972.

127. Low-grade asbestos is available in a number of developing countries. Its utilization in asbestos-cement manufacture could lead to increased production. UNIDO was urged to review testing methods for the evaluation of such types of asbestos, particularly of the amphibole group, and to recommend grading specifications with regard to applicability of this asbestos in asbestos-cement products. UNIDO therefore plans to undertake in 1972 a survey on Low-grade asbestos (3.02.03) Priority B, which is expected to provide recommendations concerning the adaptation of the national grading systems to international standards.

Plastics in building (3.03)

128. The increasing need for more diversified building materials, together with the growing capability of the petrochemical industry in certain developing countries to supply the necessary raw materials, has led UNIDO to consider the promotion of the utilization of plastics in building as a potential outlet for locally produced petrochemicals.

129. In order to further the co-operation of the building materials industry and the petrochemical industry sector, UNIDO intends to continue the preparatory work started in 1971 in organizing in 1971 an expert group meeting on the Use of plastics in the building industry (3.03.01), in co-operation with UNCHBP. It is expected that this meeting will lead to new approaches in the building materials industry without making developing countries dependent on imports. The report of the meeting is scheduled for publication in 1971 and the proceedings in 1972.

130. On the basis of the results and recommendations of the above mentioned expert group meeting, UNIDO proposes to hold in 1972 a seminar on the Production of multi-material houses incorporating plastics (3.03.02a Priority B). The use of plastics could provide an impulse to the building industry in the housing sector, and houses of this nature would better meet many of the physical requirements. UNIDO proposes to hold the seminar in a developing country in which the production of petrochemicals has reached a relatively advanced stage and where the building of multi-material houses incorporating plastics is most likely to be a success. The co-operation of UNCHBP, the regional economic commissions, UNESOP and FAO will be sought.

Clay building and allied materials (3.04)

131. The Industrial Development Board at its fourth session supported the programme of UNIDO in clay building materials (A/8016, para.128). Since many developing countries produce clay and allied building materials by outdated methods, UNIDO proposes to focus its efforts on promoting both improved technologies and a more general utilization of these products.

132. Following the recommendations of the Interregional Seminar on the Development of Clay Building Materials Industries, held in Denmark in 1968, a series of regional Workshops on clay building materials industries (3.04.01) was started. The first, a Workshop on Clay Building Materials Industries in Africa, held in Tunisia in 1970, concentrated on particular circumstances prevailing in Africa for the development of the clay building materials industry. The findings of the Workshop are expected to strengthen operational activities in this field. The meeting was held in collaboration with the Government of Tunisia, UNCHBP and ECA. Publication of the report and proceedings is planned for 1971. The workshop on clay building materials industries in Latin America, recommended by the 1968 Seminar and initially planned for 1971 (ID/B/6A/Add.3, para.21)^{1/}, is now proposed for 1972. Co-operation with UNCHBP and ECLA will be sought.

Prefabrication in the building industry (3.05)

133. The importance of prefabrication in the building materials industry has been stressed by the Industrial Development Board at its third and fourth sessions, with particular attention to the manufacture of small prefabricated elements (A/7617, para.103 and A/8016, para.129). UNCHBP, in collaboration with ECAFE and ECLA, has already held two regional meetings on this subject, one in 1967 and the other in 1968, both in Denmark.

^{1/} Formerly project component 3.04.02..

134. A third meeting was to have been organized in 1969 by UNIDO but had to be postponed to 1970 (ID/B/64/Add.3, para.73). It has again been re-scheduled to include the countries of the UNESOB region and is now planned to take place in Africa in 1971 as an expert group meeting on Prefabrication in Africa and the Middle East (3.05.01). Co-operation with UNCHBP, ECA and UNESOB will be sought. The meeting will provide an opportunity for technologists and executives from industry and finance (public and private sectors) to transfer know-how and to establish contacts which hopefully will lead to investment promotion. The report and proceedings are scheduled for publication in 1972.

Building materials industry studies (3.06)

135. The Interregional Workshop on Organization and Technical Measures for the Development of Building Materials, held in the Union of Soviet Socialist Republics in 1968, recommended that a number of studies be carried out in the field of building materials industry. The validity of this recommendation has been borne out by the number of technical assistance requests to UNIDO indicating a need for more diversified building materials.

136. As was stated in document ID/B/64/Add.3, para.25, UNIDO therefore proposes to carry out in 1971 Studies in building materials industry (3.06.01) relevant to the needs of developing countries. The studies will be undertaken in collaboration with UNCHBP and will be financed* from the General Trust Fund of UNIDO. The topics proposed, which are related to technical assistance work envisaged or being undertaken by UNIDO in the field, comprise the following:

- Survey on techno-economic project data on basic materials;
- Process and equipment for stone cutting and dressing;
- Manufacture of reed panels with particular reference to seismic zones;
- Manufacture and use of special glasses, glass products and refractories;
- Manufacture of large wall panels, both cement-based and of other composition.

Publication of these studies is scheduled for 1972.

137. The Industrial Development Board, at its fourth session (A/8016, para.128), encouraged UNIDO to consider the manufacture of silicate bricks in countries where clay deposits were not available. Accordingly, UNIDO proposes to undertake in 1972 a study on Building components produced from silicious raw materials (3.06.02) that will cover relevant production technologies and processes which may be introduced in developing countries. The resulting monograph will later be published and distributed.

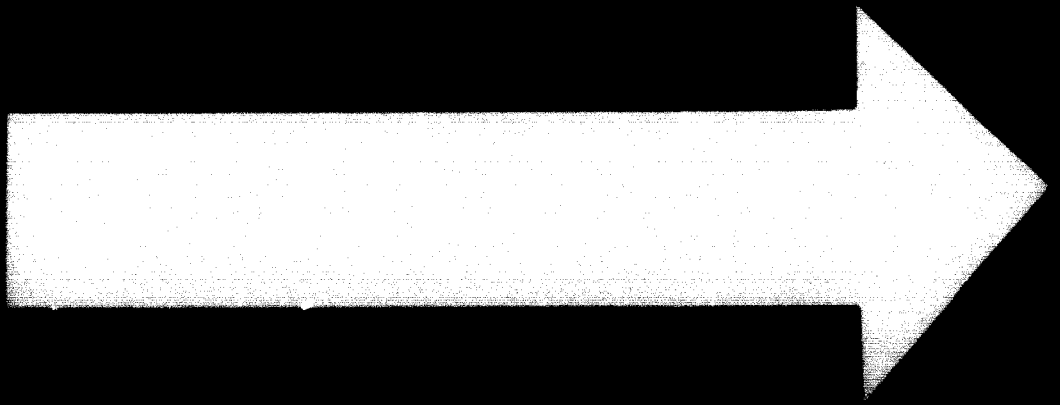
Building materials industry research (3.07)

138. The role and importance of research in the building materials industry can hardly be overemphasized when one considers the construction programmes in the developing countries and their significant share in the national economy.

Not only conventional building materials and related production processes but new products and modern techniques are being continuously evaluated and developed in most countries. Limited human and financial resources are often wasted in the duplication of efforts in this field of research. The need to avoid overlapping in building research was stressed at the Seminar on the Development of Building Materials for the ECAFE Region, held in Bangkok in 1968, which clearly indicated the necessity of permanent and continuous exchange of research results.

139. As was stated in document ID/B/64/Add.3, para.21, a Meeting of the heads of building materials research and development organizations (3.07.01) was planned originally for 1970 but had to be postponed. It was later scheduled to be held in Melbourne, Australia, in 1971, in co-operation with UNCHBP and ECAFE. It is expected that the meeting will not only help to promote the exchange of information and to co-ordinate the building research programmes of the ECAFE region but that it will recommend measures which would lead to the promotion of production programmes for both the building materials and the building industries. The report of the meeting is scheduled for publication in 1971 and the proceedings will follow in 1972.

140. A survey on Construction and building materials industries in the UNESOB region (3.07.02), was planned as a joint UNIDO-UNESOB venture to be undertaken in 1970. It was based on preliminary country surveys on the construction and building materials industries, followed by a review and evaluation by consultants. The basic objectives of the survey were to assist countries in the UNESOB region in more effectively planning the development of the industry and in identifying investment opportunities. The scope also includes an identification of potential areas for technical assistance.



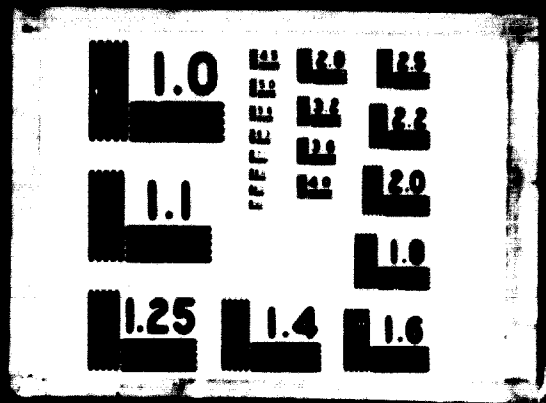
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Expenditures and estimated costs for supporting and other activities, 1970 - 1972
(in thousands of US dollars)

Project (Priority A)	Regular budget						Extra-budgetary resources		
	Staff w/m		Consultants		Expert group meetings		1970	1971	1972
	1970	1971	1972	1970	1971	1972			
3.01 <u>Cement</u>	2.0	5.0	3.0	-	3.0	-	-	-	25.0 TA
3.02 <u>Fibrocement composites</u>	-	1.0	-	-	-	-	-	-	-
3.02.01	-	1.0	-	-	-	-	-	-	-
3.02.02	-	2.0	-	-	2.0	-	-	-	-
3.03 <u>Plastics in building</u>	2.0	4.0	-	3.2	6.0	-	-	-	-
3.03.01	2.0	4.0	-	3.2	6.0	-	-	-	-
3.04 <u>Clay building and allied materials</u>	3.0	4.0	7.0	3.5	2.0	3.0	12.6	-	20.0 TA
3.04.01	3.0	4.0	7.0	3.5	2.0	3.0	12.6	-	20.0 TA
3.05 <u>Prefabrication in building industries</u>	-	8.0	2.0	-	8.0	-	11.7	-	-
3.05.01	-	8.0	2.0	-	8.0	-	11.7	-	-
3.06 <u>Building material and industry trials</u>	-	3.0	-	-	-	-	-	10.0 GTP	-
3.06.01	-	3.0	-	-	-	-	-	10.0 GTP	-
3.06.02	-	-	1.0	-	-	1.0	-	-	-
3.07 <u>Building materials industry research</u>	-	3.0	-	-	-	-	-	20.0 TA	-
3.07.01	-	3.0	-	-	-	-	-	20.0 TA	-
3.07.02	-	-	-	5.0	21.0	7.0	12.6	20.0 TA	45.0 TA
Total	10.0	30.0	17.0	11.7	21.0	7.0	19.7	10.0 GTP	10.0 GTP

Backstopping and servicing of operational activities

16.0
24.0
40.0

6.0
30.0
36.0

22.0
32.0

Project (Priority B)

3.01 Cement

3.01.02

- - 3.0

4.0

-

-

3.02 Fibro-cement composites

3.02.03

- - 2.0

3.0

-

-

3.03 Plastics in building

3.03.02

7.0
12.0

7.0

7.0

29.0 TA
39.0 TA

Total

2/ Operational costs shown above are included in the table on page 46.

PRINTED PUBLICATIONS

<u>1970 publications programme</u>		<u>Languages</u>	<u>Cost (US\$)</u>
ID/15	The establishment of a brick and tile industry in developing countries (3.04.02)	F S	2,686
<u>1971 publications programme</u>			
ID/39	The manufacture of cement and sulphuric acid from calcium sulphate (3.01.01)	E	
ID/56	Fibro-cement composites Vol.I. Report of the expert group meeting (3.02.01)	E F S	
	Vol.II. Proceedings of the expert group meeting (3.02.01)	E F S	
ID/WG.81	Development of clay building materials industries in Africa Report and proceedings of the regional workshop (3.04.01)	E F	
-	Use of plastics in the building industry Report of the expert group meeting (3.03.01)	E	
-	Report of the meeting of the heads of building materials research and development organisations in the ECAFE region (3.07.01)	E	6,000
<u>Forecast of 1972 publications programme</u>			
-	Substitution of asbestos by mineral wool (3.02.02)	E F	
-	Use of plastics in the building industry Part I. Report of the expert group meeting (3.03.01)	F S	
	Part II. Proceedings of the expert group meeting (3.03.01)	E	
-	Prefabrication in Africa and the Middle East Report and proceedings of the seminar (3.05.01)	E F	
-	Studies in building materials industry (3.06.01)	E	
-	Proceedings of the meeting of the heads of building materials research and development organisations in the ECAFE region (3.07.01)	E	7,900

Note: In the computation of the printing costs a standard formula was applied based on an average cost of internal and external printing.

GROUP 4: CHEMICALS, PHARMACEUTICALS AND PULP AND PAPER INDUSTRIES

141. The programme of assistance of UNIDO within this group of activities is designed to promote the utilization and processing of locally available resources and to stimulate the development of key industrial branches as well as to support the agricultural sector. The cost associated with the transport of basic chemicals from present sources of supply in developed countries has restricted the introduction and growth in developing countries of user industries such as pulp and paper, forest products, metallurgical and mining, petroleum refining and petrochemicals, as well as modern agriculture and food processing.

142. In support of this programme, emphasis is being placed by UNIDO on two priority areas: the production of marine and mineral salts through the use of solar energy; and the production of essential oils from botanicals with a view to their utilization in the manufacture of pharmaceuticals and toiletries as well as for auxiliary chemicals.

143. In view of the simplicity of equipment design, the low capital requirements and also the frequent availability of raw materials, in the form of agricultural waste products, the manufacture of selected industrial chemicals by fermentation is another promising area of assistance being stressed by UNIDO.

144. Attempts are also being made by UNIDO to encourage the utilization of industrial wastes at an early stage of industrial development, so as to avoid costly adaptations of equipment and plant lay-out for waste disposal at a later stage.

145. In the pharmaceuticals sector UNIDO is encouraging the formulation of active materials that are being imported in bulk. The promotion of retroactive integration in this industry, beginning with the import substitution of intermediates, however, will receive increased attention.

146. As regards the pulp and paper industry, UNIDO is placing emphasis on the use of locally available non-timber resources, though assistance is being offered in the maintenance and operational aspects of processing equipment.

OPERATIONAL ACTIVITIES

147. The operational programme of UNIDO within group 4 is designed to provide technical assistance with a view to promoting the utilization of locally available materials, where possible, and to stimulating the development of key industrial sectors. The assistance given takes a number of forms, from diagnostic assessment missions to comprehensive technical and economic pre-investment surveys, all directed towards the implementation of industrialization programmes in selected developing countries or areas.

148. Illustrative of the operational activities being carried out by UNIDO within this group are the following projects. A UNIDO adviser on basic chemical production in Ceylon has helped to increase the production of caustic soda and chlorine as well as to improve the quality of the products. Through such assistance, the foundation has been laid for a basic chemical industry in that country. An assessment mission in the East African Community developed a co-operative pharmaceutical industry sector programme whereby the three countries involved will pool pharmaceutical purchasing, testing and, to some extent, manufacture. Through this programme, high quality medicinals can be produced locally at reasonable cost permitting the countries involved to become self-supporting in some areas of the pharmaceutical sector. A UNIDO expert in pulp and paper was able to assist in the improvement of the operation of a bagasse pulping plant in the United Arab Republic. The plant subsequently increased its output and improved the quality of its products. A UNIDO sponsored assessment mission to Panama developed procedures to improve solar salt production and laid the foundation for the development of a UNDP/SF project for the production of high quality salt that will meet domestic needs and export requirements.

149. The total number of operational projects falling to group 4 in 1970 was 84. For 1971, 105 projects are planned and in 1972 approximately 120 projects are expected.

Value of approved field projects and forecast of requirements, 1970 to 1972
(in thousands of US dollars)

	1970 estimated expenditure	1971		1972	
		Approved projects	Forecast of requirements	Approved projects	Forecast of requirements
UNDP/SF	-	-	130.0	-	570.0
UNDP/TA	159.6	106.2	401.8	22.5	693.0
RP	136.3	100.4	66.9	-	198.0
SIS	207.2	510.4	803.0	-	1,338.1
GTF	5.7	35.0	65.0	-	366.7
FIT	-	13.8	-	-	13.8
Total	508.8	765.8	1,466.7	22.5	3,179.6

List of Approved Operational Projects

UNDP/TECHNICAL ASSISTANCE

The Americas

ARG/68/6	Assistance to INTI - chemistry
BRA/68/25	Technical assistance to SUDENE - chemical industries planning
CUB/69/3	Industrialization of sugar cane derivatives
HAI/68/8	Essential oils and fats production

Asia and the Far East

BUR/69/6	Pulp and paper technology
CEY/69/12	Development of chemical industry - caustic soda
CHA/68/12	Sea salt manufacturing techniques
MON/68/11	Technological development of soap factory
PAK/69/15	Penicillin production (mycology)
PAP/69/3	Pulp and paper industry - tropical hardboard
PHI/69/27	Assistance to the Board of Investments

Europe and the Middle East

BUL/70/34	Emulsion for chemical industry
BUL/70/14	Pulp and paper industry
BUL/70/21	Production and use of quartz elements
BUL/70/39	Design and production of quartz filters
BUL/70/35	Use of vegetable extracts in cosmetics
POL/69/1	Industrial technology - carbon chemistry
POL/69/30	Water sewage in fireboard industry
POL/70/3	Chemical industry
TUR/68/1	Industrial planning - chemical engineer (industrial economist)

Interregional

INT/69/13	Seminar on basic chemicals
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UNIDO REGULAR PROGRAMME

Africa

RMA/04/1/1	Chemicals, pharmaceuticals
ID/RP/04/4 (Togo)	Chemical and pharmaceutical industries
ID/RP/04-8 (Regional)	Chemical industries - regional adviser
AFR/04/1/2	Chemical industries - regional adviser

The Americas

ID/RP-04-4 (Argentina)	Chemical and pharmaceutical - pulp and paper adviser
ID/RP/04/4 (Bolivia)	Industrial programming - techno-economic assistance; industrial engineer

UNIDO REGULAR PROGRAMME (cont'd)

The Americas (cont'd)

ID/RP/04-3 (Chile)	Chemical industries - technological research, pulp and paper industries consultant
ID/RP/04-2 (Cuba)	Chemical industries - industrial fermentation
ID/RP/04-6 (Regional)	Chemical industries - regional advisers, chemical/pulp and paper industry
ID/RP-04-9 (Regional)	Symposium on the pulp and paper industry
LAT/04/1/2	Chemical industries - regional advisers, chemical/pulp and paper industry

Asia and the Far East

ID/RP-04-3 (China)	Chemical industry
CHA/04/1/1	Chemical industry - brine processing
PAK/04/1/1	Chemical and pharmaceutical industries

Europe and the Middle East

ID/RP/04-2 (Malta)	Chemical industries - industrial standards laboratory
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SIS PROGRAMME

Africa

68/380/Rev.1 CAP-4	Medicinal plants and essential oils
68/417/Rev.1 CON(B)-5	Assistance to the pulp and paper industry
70/839 CON(B)-6	Exploratory mission to prepare terms of reference for projects in the field of salt, pharmaceuticals, basic chemicals and essential oils
70/826 DAN-4	Exploratory mission to assess the solar salt industry
68/418 GUI-5	Assistance to pulp and paper
68/420 KAO-7/Rev.1	Pulp and paper industry
70/918 MAR-14	Assistance in the production of selected pharmaceuticals
70/825 MOR-14	Exploratory mission to assess solar salt and rock salt industries
69/514 RMA-21	Assistance in the assessment of selected sectors of pharmaceutical and essential oil industries
69/572 RMA-23	Investigation of the development of pulp and paper industry
68/383 RMA-4	Industrial utilisation of peat
70/100 SON-13	Exploratory mission - solar salt study
69/451 UGA-7/Rev.1	Feasibility study for paper manufacturing from papyrus
69/349 UAR-23	Butanol-acetone by fermentation
69/658 UAR-31	Assistance to Misrayon Co. (cellophane film)
70/784 AFR-10 Phase II	Establishment of pharmaceutical industry sector in the East African Community

The Americas

69/685 PAA-16	Evaluation of the expansion plan of Compania Nacional de Alcalis (production of salt and soda ash)
69/117/1/1	Assistance to pulp and paper industry

SIS PROGRAMME (cont'd)

The Americas (cont'd)

70/838 ECU-10	Improvement of salt operations of COOPESA (Co-operative de Refinadores de Sal)
70/820 ECU-11	Industrialization of selected derivatives from botanicals
69/562 JAM-6	Industrial promotion of the chemical, electrical and metal industries
69/651 PAN-2	Assistance to solar salt industry
67/161 PER-2	Feasibility study for Bagasse pulp and paper project
68/145 TRI-6	Purfural industry

Asia and the Far East

69/537 CHE-12	Development of basic chemical industries
69/490 CHA-12	Assistance to the Union Industrial Research Institute
70/1030 FIJ-9	Exploratory mission - solar salt production
69/589 IHS-11	Assistance to the Goa paper mill
69/630 KOR-8	Exploratory mission to assess the Korea Salt Corporation
69/599 PHI-10	Assistance in the evaluation of pulp and kraft paper production from abaca stalks
70/823 PHI-17	Industrial fermentation
67/254 PHI-3	Assistance to Board of Investments
60/718 THA-13	Development of chemical industries
70/800 THA-15	Industrial effluents and trade waste disposal

Europe and the Middle East

70/708 ICE-3	Survey mission to consider possibilities of long-range UNIDO assistance and to determine the best way of providing immediate assistance to expand the chemical and metalworking industries
70/996 ROM-15	Production of transfer paper for decalcomania industries
70/997 ROM-16	Assistance to Chemigas Corporation
68/450 SYR-3	Assistance to rehabilitate the salt industry
68/445 SYR-4	Advice on industrial utilisation of sodium chloride
70/936 SYR-27	Evaluation and feasibility study of salt production from lakes or from the sea
70/937 SYR-28	Feasibility study of the manufacture of sulphuric acid and cement from gypsum
70/945 TUR-15	Production of sulphuric acid
70/809 YUG-20	Improvement of paper mill operation (reduction of losses of fibres and films and their re-use in the process)
70/852 YUG-25	Assistance to cellulose and viscose factory

UNIDO GENERAL TRUST FUND

Asia and the Far East

4/16 (Ceylon)	Equipment for the quality control and ceramics research department of the Ceramics Corporation
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UNIDO GENERAL TRUST FUND (cont'd)

Interregional

4/1/Rev.1

Seminar on the basic chemical industry

FUNDS-IN-TRUST

The Americas

9002-69 (Dominican Republic) Industrial development - chemical engineer (associate expert) *

Asia and the Far East

9009-69 (Ceylon)

Local manufacture of water treatment chemicals

SUPPORTING AND OTHER ACTIVITIES

150. The supporting and other activities of group 4 are classified under the following projects:

Basic chemicals	4.01
Marine salt	4.02
Pharmaceuticals	4.03
Essential oils	4.04
Pulp and paper	4.05
Industrial fermentation	4.06
Utilisation and disposal of industrial wastes	4.07
Chemicals from coal	4.08

Basic chemicals (4.01)

151. At the fourth session of the Industrial Development Board it was noted that chemical industries necessitated complicated capital-intensive processes. Appreciation was also expressed by the Board that the activities of UNIDO related to basic chemicals were, at this stage, confined to a limited number of areas. In this connexion, the importance of exploiting local raw materials and of developing chemical industries was stressed (A/8016, para.134).

152. In order to develop guidelines for satisfying the basic chemical requirements in developing countries UNIDO had proposed (ID/B/64/Add.4, para.12) to hold an Interregional seminar on basic chemicals (4.01.01). Originally scheduled for 1970 in the Union of Soviet Socialist Republics, the seminar has been postponed to 1971. A number of regional economic commissions, UNCTAD and ILO have agreed to participate and are contributing background papers. Furthermore, a number of papers have been prepared during 1970 by experts who are to attend the seminar. The papers are scheduled for publication in 1972.

153. As a follow-up of the seminar, UNIDO proposes to undertake a Regional survey of basic chemicals (4.01.02) to investigate conditions for the manufacture of basic chemicals in a selected region. Advice would be sought as to whether manufacture on the basis of a regional or subregional market would be feasible, taking into account the effects of economy of scale. This survey, originally planned for 1971 (ID/B/64/Add.4, para.13), has been postponed to 1972 in order to benefit from the recommendations and proposals of the seminar.

Marine salt (4.02)

154. Salt, particularly marine salt, obtainable by solar evaporation is a potential resource of many developing countries and constitutes the raw material for a number of basic chemicals. The first effort of UNIDO in this field, the Expert Group Meeting on Modernization and Mechanization of Salt Industries Based on Seawater, held in Rome in 1968, has led to a number of requests which are presently being implemented under the operational programme.

155. In 1970, a study on the Marine salt industry (4.02.01) was completed, covering the technical and economic factors influencing the manufacture of chemicals from seawater, inland brines and rock salt. The study is scheduled for publication and distribution in 1971.

156. The recovery of marine salt as a raw material for basic chemicals could, in certain instances, be linked advantageously to desalination processes. UNIDO therefore proposes to hold in 1971 an expert group meeting on Water-salt chemical complexes (4.02.02; Priority B) which would examine the feasibility of such complexes in selected developing countries and areas. Industrial planners from developing countries and potential donors of know-how will be invited to participate. This subject is also of interest to the Resources and Transport Division of the United Nations and the IAEA, and UNIDO will seek their co-operation. The report and proceedings of the meeting would be published in 1972.

157. The proceedings of the Expert Group Meeting on Modernization and Mechanisation of Salt Industries Based on Seawater (4.02.03), held in 1968, were published in 1970.

Pharmaceuticals (4.03)

158. The need for establishing pharmaceutical industries in developing countries has been emphasized by expert working groups and has been reflected by requests for technical assistance from a number of developing countries and areas. In this field, UNIDO is working in co-operation with WHO with regard to medicinals and with FAO in the area of animal medicinals. The assistance planned by UNIDO for 1970 is intended to encourage production of pharmaceuticals with a view to meeting, at least partially, the therapeutic needs of the countries or regions concerned. Co-operation will be sought from international pharmaceutical concerns and associations to secure their assistance in pharmaceutical production, marketing, testing, personnel training etc.

159. The report and proceedings of the Expert Group Meeting on the Establishment of Pharmaceutical Industries in Developing Countries (4.03.01) were published in 1970.

160. As a follow-up to the above mentioned Expert Group Meeting, UNIDO proposes to collaborate with the regional offices of WHO in setting up Team missions on pharmaceuticals (4.03.02) during 1971 to outline objectives and to prepare plans for initiating and up-grading the production of pharmaceuticals (including veterinary products). An attempt will be made to enlist the co-operation of firms from the private and public sectors in developed countries. FAO will be consulted in so far as veterinary products are concerned.

161. The Guidebook for pharmaceutical industries (4.03.03), proposed for publication in 1971, has been discontinued owing to lack of resources.

Essential oils (4.04)

162. The extraction of essential oils from plants is a flourishing enterprise in many developed countries. Developing countries located in tropical and subtropical regions also have the potential of developing this industry, and UNIDO completed two country projects in this field in 1970.

163. In view of the comments expressed at the fourth session of the Industrial Development Board (A/8016, para.137), UNIDO has cancelled the expert group meeting on Extraction of essential oils from indigenous plants (4.04.01), which was originally planned for 1971 (ID/R/64/Add.4, para. 1).

164. It is now proposed to adopt a more direct approach by preparing the ground work for an action team which would promote the Extraction of essential oils from indigenous plants (4.04.02). The team, equipped with a portable apparatus for the said procedure involved, would visit a number of selected countries and carry out demonstration tests in co-operation with the local authorities. It is anticipated that this procedure, together with subsequent technical assistance, would lead to the establishment of commercial essential oil extraction plants in those developing countries where such a process is feasible and where marketing considerations would justify the establishment of such an industry.

Pulp and paper (4.05)

165. Due to the increasing consumption of pulp and paper throughout the world, traditional raw materials for pulp and paper production are being progressively depleted. Alternate raw material input into the pulp and paper industry such as bagasse, bamboo, several species of straw and other fibres are therefore receiving increased attention. The Industrial Development Board, at its fourth session, welcomed the proposals advanced by UNIDO for assisting developing countries to establish pulp and paper industries, including plans to promote the utilization of bagasse, sisal etc. in tropical countries (A/8016, para.138). Co-operation with the regional economic commissions, UNESOB and FAO is being sought in this programme.

166. An Expert group meeting on pulp and paper (4.05.01) will be held in Vienna in 1971 to develop guidelines for further technical assistance in this field which should lead to creating and strengthening respectively the pulp and paper industry in developing countries (ID/R/64/Add.4, para.29). Publication of the report and proceedings of the meeting is planned for 1972.

167. Following the expert group meeting, UNIDO proposes to convene in 1972 a workshop on Pulp and paper production (4.05.02; Priority B) in a developing country. The objective of this workshop would be to provide planners and plant managers from developing countries a possibility of exchanging views related to their plans and problems with pulp and paper experts from advanced countries as well as with suppliers of specialized equipment. It is anticipated that representatives from the private and public investment sectors of developing countries will also participate.

Industrial fermentation (4.06)

168. The efforts made by UNIDO to assist the developing countries in the production of chemicals by industrial fermentation have resulted in a number of requests for technical assistance which are being implemented under the operational programme.

169. The report and proceedings of the Expert Group Meeting on the Manufacture of Chemicals by Fermentation (4.06.01), held in 1969, are scheduled for publication in 1971.

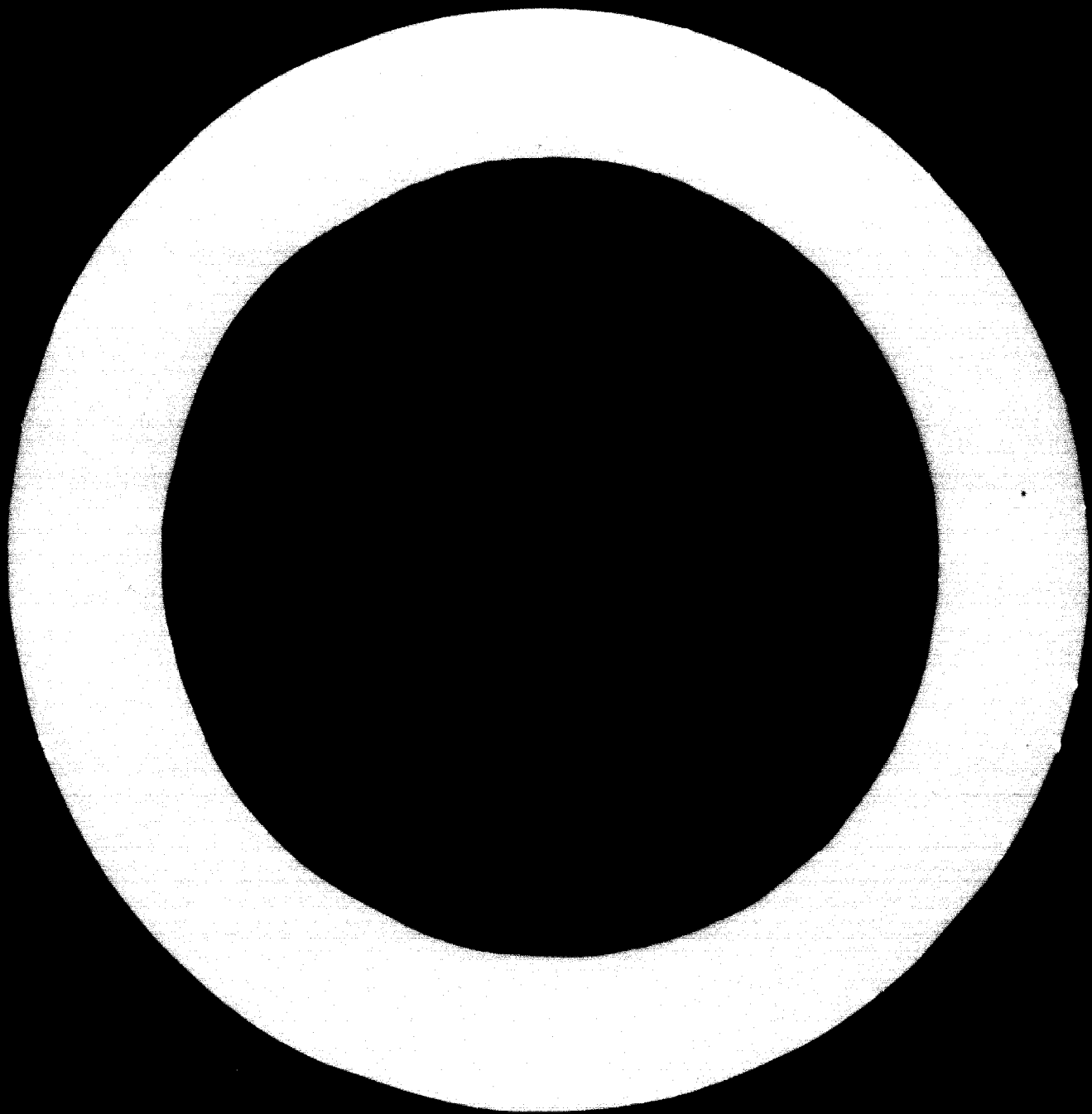
Utilization and disposal of industrial wastes (4.07)

170. The problem of the utilization and disposal of industrial wastes, which is already acute in developed countries, is gaining momentum in the developing countries as they progress towards industrialization. At the fourth session of the Industrial Development Board (A/3016, para.140), the plans of UNIDO for assisting developing countries in the utilization and disposal of industrial wastes evoked considerable interest, particularly in view of the general problem of human environment.

171. The Regional meeting on industrial wastes (4.07.01a Priority B), originally planned for 1971 (ID/B/64/Add.4, para.34), had to be cancelled owing to lack of resources. All the pertinent activities of UNIDO related to human environment are now being dealt with under group 15b.

Chemicals from coal (4.08)

172. Within the series of Studies of chemicals from coal (4.08.01), a report was prepared in 1970 on the carbonization of coal, the recovery of by-products and the hydrogenation of coal; the report is scheduled for publication in 1972. A bibliography was compiled in 1970 on the hydrogenation of coal and coal tars. No further studies in this series are planned for the immediate future.



Expenditures and estimated costs for supporting and other activities, 1970 - 1972
(in thousands of US dollars)

Project (Priority A)	Regular budget						Extra-budgetary resources		
	Staff m/m		Consultants		Expert group meetings		1970	1971	1972
	1970	1971	1972	1970	1971	1972			
4.01 <u>Basic chemicals</u>	1.0	2.0	-	-	-	-	1.0 TA	35.0 GTF	-
4.01.01	-	-	-	-	-	-	4.0 GTF	24.0 TA	-
4.01.02	-	-	3.0	-	-	-	-	-	7.0 TA
4.02 <u>Marine salt</u>	2.0	-	-	3.0	-	-	-	-	-
4.02.01	-	-	-	-	-	-	-	-	-
4.03 <u>Pharmaceuticals</u>	1.0	1.0	-	-	-	-	-	-	-
4.03.01	-	3.0	-	1.0	2.0	-	-	-	-
4.03.02	-	-	-	-	-	-	-	-	-
4.03.03	-	-	-	-	-	-	1.7 GTF	-	-
4.04 <u>Essential Oils</u>	-	-	2.0	-	-	-	-	-	-
4.04.02	-	-	-	-	6.0	-	-	-	-
4.05 <u>Pulp and paper</u>	2.0	3.0	1.0	0.3	3.0	-	-	6.0	-
4.05.01	-	-	-	-	-	-	-	-	-
4.06 <u>Industrial fermentation</u>	-	1.0	-	-	-	-	-	-	-
4.06.01	-	-	-	-	-	-	-	-	-
4.08 <u>Chemicals from coal</u>	1.8	10.0	6.0	1.5	6.0	-	-	6.0	-
4.08.01	-	-	-	-	-	-	-	-	-
Total	11.8	30.0	54.0	11.8	60.0	6.0	5.7 GTF	35.0 GTF	7.0 TA
backstopping and servicing of operational activities	11.8	30.0	54.0	11.8	60.0	6.0	1.0 TA	24.0 TA	-

PRINTED PUBLICATIONS

1970 publications programme

		<u>Languages</u>	<u>Cost</u> <u>(US\$)</u>
ID/32	Modernization and mechanization of salt industries based on seawater in developing countries Proceedings of expert group meeting (4.02.03)	E	
ID/35	Establishment of pharmaceutical industries in developing countries Report and proceedings of expert working group meeting (4.03.01)	E	
			<u>2,375</u>

1971 publications programme

ID/32	Modernization and mechanization of salt industries based on seawater in developing countries Proceedings of expert group meeting (4.02.03)	F S	
ID/35	Establishment of pharmaceutical industries in developing countries Report and proceedings of expert working group meeting (4.03.01)	F	
ID/WG.37	Complete individual papers presented at the expert working group meeting on the establishment of pharmaceutical industries in developing countries (4.03.01)	E	
ID/59	Manufacture of chemicals by fermentation Report and proceedings of expert group meeting (4.06.01)	E P S	
-	Chemicals from seawater, inland brines and rock salt (4.02.01)	E	
			<u>7,400</u>

Forecast of 1972 publications programme

-	Papers prepared for the interregional seminar on basic chemicals (4.01.01)	E	
-	Water-salt chemical complexes Report and proceedings of the expert working group (4.02.02; Priority B)	E	
-	Report and proceedings of the expert group meeting on pulp and paper (4.05.01)	E	
-	Studies on chemicals from coal (4.08.01)	E	
			<u>5,700</u>

Notes: In the computation of the printing costs a standard formula was applied based on an average cost of internal and external printing.

GROUP 5: FERTILIZERS, PESTICIDES AND PETROCHEMICALS INDUSTRIES

173. The "green revolution" now taking place in many of the developing countries is the result of a number of factors, one of which is the introduction of high yielding varieties of cereals. Of equal importance are the numerous other inputs including products of the fertilizer and pesticide industries. The immediate need for such products has made a great impact on the industrial sector of the developing countries. A significant part of the present and proposed activities of UNIDO within group 5 is therefore devoted to assistance to the developing countries in establishing and strengthening efficient industries to support their agricultural sector. The requirements of the "green revolution" have effected not only those activities related to fertilizers and pesticides, but even those connected with petrochemicals, as for example the production of plastic sheets and pipes for agriculture.

174. With regard to the operational activities undertaken within this group, a number of current and proposed projects are designed to provide Governments with advice as to investment opportunities, selection of projects, sources of financing and preparation of tenders as well as in the evaluation of offers and promotion of joint ventures. Supporting activities, such as regional or interregional meetings, are being organized to bring together experts and potential investors from developed countries with the people responsible for industrial development in the developing countries.

175. As a novel approach, UNIDO is developing plans for the direct transfer of practical industrial technology and "know-how" by means of a visiting team consisting of experts and consultants. The team will visit a number of developing countries to assist in improving production and management techniques, in identifying technical assistance needs, and in obtaining financial support for the industrial development of the petrochemical and plastics industries.

OPERATIONAL ACTIVITIES

176. UNIDO's programme of operational activities within group 5 is designed to encourage and stimulate the establishment and development of the fertilizer, pesticide and petrochemical industries. Assistance is given in identification of investment opportunities; preparation of market studies, technical feasibility studies and specific techno-economic feasibility studies; drawing up of invitations to tenders; evaluation of tender offers; preparation of dossiers for loan applications; and in supervision of construction and initial operations.

177. Other operational activities, relating to efforts to improve the efficiency of existing units, include assistance in the modernisation of established manufacturing facilities; advice in operational procedures, including preventive maintenance and quality control; marketing assistance; co-operation in the training of personnel; and trouble-shooting.

178. A good example of the activities of UNIDO in this field are the fertilizer demonstrations and the trials being carried out by UNIDO, in co-operation with FAO, as the first phase of a UNDP/SP project in Togo. After the types of fertilizers needed for different soils and different crops have been determined and the cost benefit ratios worked out by FAO, a single superphosphate plant and a bulk blending plant will be built. Several blends of nitrogen-phosphate potash will be produced, utilizing indigenous phosphate rock together with other fertilizer ingredients. Local personnel will be trained in the production and maintenance of the plants and in the marketing and distribution of the products. This project is expected to contribute to the development of both industry and agriculture.

179. In Tunisia, where UNIDO is providing technical assistance to the National Industrial Development Centre, an expert is assisting in the evaluation of the feasibility of producing intermediates for export in place of the traditional exports of phosphate rock, a step that would add significantly to the value of exports of this important fertilizer material. In Syria, an expert supplied by UNIDO has assisted in resolving problems of the Homs Nitrogen Plant. UNIDO is also providing experts to India and Romania to help develop local skills in the use of computers for production control and design of chemical fertilizer and petrochemical complexes.

180. In Burma, UNIDO has supplied a process simulator and a pilot laboratory unit for the training of local engineers and technicians in production techniques. In Pakistan, five typical modern plastic fabrication machines are being supplied by UNIDO to develop a plastic development centre. Mould making and mould repair facilities as well as a documentation centre are expected to be introduced later. At the same time, a participant from Pakistan underwent an eleven-week UNIDO training course in plastics in Austria. These are but a few examples of the operational activities being carried out by UNIDO in the field of fertilizers, pesticides and petrochemicals.

181. The total number of projects under operation in this field in 1970 was 80. This figure is expected to rise to 116 for 1971 and 148 in 1972.

Value of approved field projects and forecast of requirements
(in thousands of US dollars)

	1970	1971		Approved projects	Forecast of requirements
	estimated expenditure	Approved projects	Forecast of requirements		
UNDP/SF	1,088.3	2,303.4	-	989.3	941.0
UNDP/TA	93.5	109.3	797.3	3.8	1,007.0
RF	74.6	103.4	68.9	-	267.2
SIS	388.7	180.7	373.0	-	866.3
OTF	48.9	11.5	194.2	-	432.2
FTT	-	-	-	-	-
Total	1,694.0	2,768.3	1,433.4	999.1	2,913.7

List of Approved Operational Projects

UNDP/SPECIAL FUND

Africa

RWA-3	Pilot plant for industrialization and pyrethrum production
TOG-12	Fertilizer use promotion, demonstration and production scheme
UAR-69	Demonstration pesticide production plant based on chlorine and bromine resources

Asia and the Far East

PAK-26	Pre-investment studies for the promotion of the fertilizer and petrochemical industries
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UNDP/TECHNICAL ASSISTANCE

The Americas

ARG/70/2	Assistance to plastic industry - lectures to First National Congress on Use of Plastics
ARG/68/6	Assistance to INTI - rubber technology
LAT/69/14	Meeting for the development of the fertilizer and pesticides industry

Asia and the Far East

BUR/70/11	Universal laboratory pilot plant
BUR/70/12	Technician instructor for the universal process trainer
IND/69/1	Chemical and petrochemical industries - polymer chemist
KOR/69/16	Industrial development - petrochemical industry; plastic processing industry

Europe and the Middle East

BUL/70/36	Kinetics of polymerisation processes
HUN/69/1	Production of artificial leather
HUN/69/11	Selection of products in petrochemical plants
POL/69/1	Industrial technology - carbonyl chemistry
ROM/70/6	Treatment of utilization of stereoregular polymers
ROM/69/4	Study of heterogeneous catalysis

Interregional

INT/69/16	Seminar in plastics technology for developing countries
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UNIDO REGULAR PROGRAMME

Africa

ALG/05/1/4	Fertilizers, pesticides and petrochemicals
MAR/05/1/2	Fertilizer industry

UNIDO REGULAR PROGRAMME (Cont'd)

Africa (Cont'd)

ID/RP/05/4 (Rwanda) Petrochemical industries - industrial economist
SOM/05/1/1 Fertilizer industry

The Americas

CHI/05/1/1 Petrochemical industries - plastic products
ID/RP/05-5 (Chile) Plastics seminar (study tour)
CUB/05/1/1 Fertilizer, pesticides and petrochemicals - pesticides
CUB/05/1/3 Petrochemical industries - petrochemical products and lubrication
PER/05/1/1 Chemical industry - chemical and petrochemical industries development
TRI/05/1/1 Fertilizer, pesticides and petrochemical products industries

Asia and the Far East

ID/RP-05-6 (China) Petrochemical industries - styrene monomer acrylonitrile
ID/RP/05-6 (India) Fertilizer and petrochemical industries - polymer chemistry
IND/05/1-5 Fertilizers, pesticides and petrochemicals - petrochemical industries
ID/RP/05-8 (India) Petrochemical industries
ID/RP/05-3 (Pakistan) Fertilizer industry - in-plant group training
PAK/05/1/2 Fertilizers, pesticides and petrochemicals
VIE/05/1/1 Fertilizers, pesticides and petrochemicals
APE/05/1/3 Petrochemical industries - regional adviser

Europe and the Middle East

ID/RP/05-3 (Iraq) Fertilizer industries - in-plant group training
KUM/05/1/1 Fertilizers, pesticides and petrochemicals - petrochemical industries
ID/RP/05-4 (Poland) Chemical industries - plastics production
SAA/05/1/1 Fertilizers, pesticides and petrochemicals
ID/RP/05/3 (Syria) Fertilizer industries

Interregional

ID/RP/05-4 Petrochemical industries
INT-RE/05/1/3 Petrochemical industries
ID/RP/05-8 Course in fertilizers

SIS PROGRAMME

Africa

70/968 GAB-7 Exploratory mission for the promotion of petrochemical industry
69/507 GUI-6 Composting of town's garbage
69/692 MOR-13 Expansion of the phosphatic fertilizer industry

SIS PROGRAMME (Cont'd)

Africa (Cont'd)

69/409 RWA-16	Elaboration of technical and economic data necessary for possible construction of prototype unit for gas recovery and washing
69/472 UAR-6 Phase II	Ammonia/urea fertilizer project
69/471 UAR-5 Phase II	Phosphorous and phosphatic fertilizer complex

The Americas

69/588 CHI-7	Development of the plastics industry
70/755 HON-5	Exploratory mission to the pesticides industry
6-624 NIC-3	Fertilizer project (ammonia/urea complex fertilizers)
70/849 NIC-5	Exploratory mission on assistance to the plastics industry
67/109/Rev.2 NIC-1	Petrochemical complex - low density polyethylene and polyvinyl chloride
69/698 PAN-3	Assistance to fertilizer industry
70/762 PER-9	Pre-investment survey for the petrochemical industries
70/956 PER-16	Exploratory mission to decide with Government and contractor action for phase II on current petrochemicals study
69/660 TRI-16 Phase II	Assistance to petrochemicals marketing
69/488 LA-2	Assistance to petrochemical and assembly industries - industrial engineer in petrochemicals

Asia and the Far East

69/646 CEY-14	Consultancy services to State Fertilizer Manufacturing Corporation
69/495 CEY-9	Production of synthetic resin adhesives for plywood, chipboard and related products
69/500 CHA-11	Assistance to the Union Industrial Research Institute in the field of high polymers
70/744 CHA-16	Assistance to the Union Industrial Research Institute in the field of unsaturated polyesters
70/892 INS-16	Assistance in drafting the terms of reference for a survey on the petrochemical industry

Europe and the Middle East

70/720 ROM-8	Exploratory mission in petrochemistry and catalytic process field
70/835 ROM-10	Optimization of an olefines plant (computerisation of process control)
70/756 SYE-7	Compositing of town's waste - marketing expert (organic fertilizer); production expert (compost fertilizer)
68/309 SYR-5	Assistance to Homs nitrogen fertilizer project
68/325/Rev.1 SYR-3	Study of fertilizer requirements and urea production - chemical engineer
69/509 SYR-19	Adviser on natural gas development (petrochemicals and fertilizers)
69/535 SYR-16	Assistance to insecticides industry
68/345/Rev.1 YUG-9	Assistance to petrochemical industry
68/437 YUG-9B	Assistance to petrochemical industry

SIS PROGRAMME (Cont'd)

Europe and the Middle East (Cont'd)

68/438 YUG-9C	Assistance to petrochemical industry *
69/566 YUG-17	Production development trends and by-product finalization; processing of coal into fuels and complex fertilizers (exploratory mission)
70/755 YUG-31	Evaluation of long-range development of petrochemicals (exploratory mission)

Interregional

70/737 INTERREG-13	Assistance to Industrial Development Centre for Arab States - fertilizer expert
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UNIDO GENERAL TRUST FUND

Interregional

5/11	Ad-hoc group - preparatory meeting for the 1971 symposium on fertilizers
5/12	Seminar on plastics technology for developing countries

SUPPORTING AND OTHER ACTIVITIES

182. The supporting and other activities of group 5 are classified under the following projects:

Fertilizers	5.01
Raw materials for the production of fertilizers and pesticides	5.02
Pesticides	5.03
Petrochemicals	5.04

Fertilizers (5.01)

183. The supporting activities in this field have been formulated with the aim of providing information for the growth and strengthening of existing facilities and for the formulation of national and regional projects. Throughout, UNIDO is maintaining close contact with FAO to ensure the co-ordination of activities in this area.

184. To assist in the identification of prospects for fertilizer development, UNIDO is continuing its surveys on Prospects of fertilizer development possibilities (5.01.01). The surveys are carried out in co-operation with the regional economic commissions concerned and the drafts of the surveys are submitted to them and to FAO for comments before publication. The results of these surveys form a basis for discussions at the fertilizer and pesticide development meetings planned for each region (see 5.01.02).

185. The surveys are being published as a "Directory of fertilizer production facilities". The first three parts of this Directory are scheduled for publication in 1971 and comprise the information obtained from the 1968 survey of the African region, the 1969 survey in Asia and the 1970 survey in Latin America. The survey which UNIDO will conduct in the UNESOB region in 1971 (ID/B/64/Add.5, para.14) is scheduled for publication in 1972. UNIDO proposes to undertake a similar survey in 1972, possibly in co-operation with ECE, in the East European region.

186. In 1970, UNIDO, in co-operation with ECLA, held a Meeting on the Development of the Fertilizer and Pesticide Industries (5.01.02) in Rio de Janeiro. Participants from fourteen Latin American countries and businessmen from the fertilizer and pesticide industries attended the meeting. In 1971, a similar meeting will be sponsored by UNIDO for the UNESOB region (ID/B/65/Add.5, para.18), and in late 1972, UNIDO proposes to hold another such meeting for the East European region. The co-operation of ECE will be requested.

187. Every effort is being made by UNIDO to bring together at these meetings government officials and industrialists from developing countries as well as experts and possible investors from developed countries for discussions on technical problems, possibilities of joint ventures and prospective investments in the fertilizer and pesticide industries. The regional economic commissions, UNESOB and other appropriate organizations are invited to participate in these meetings.

188. Work on the Fertilizer balance sheets (5.01.03) will be carried out in 1971 under 5.01.01 and 5.01.02.
189. Owing to the shortage of raw materials and spare parts or to technical and managerial problems, many developing countries fail to utilize fully their existing production facilities. In recognition of this problem UNIDO has included in its programme a series of studies on Underutilization of capacities in the fertilizer and pesticide industry (5.01.04). The study which UNIDO had planned to undertake in the ECAFE region in 1970 (ID/B/64/Add.5, para.31), had to be postponed to early 1971. Later in 1971, UNIDO proposes to conduct a similar study in an African country. Subject to availability of resources, such a study will be carried out in a Latin American country in 1972 (Priority B). If these studies prove successful, they will be extended to cover more countries in each region.
190. In 1970, UNIDO convened an ad hoc expert group meeting to make preparations for the 1971 Second interregional fertilizer symposium (5.01.05). It is planned to hold the symposium in the Union of Soviet Socialist Republics with a following study trip to New Delhi, India, to visit local fertilizer plants and facilities. About 100 participants from developing and developed countries will acquaint themselves with, and discuss, the condition and state of the fertilizer industry in a developed and a developing country. Participants will be expected to identify areas of technical assistance possibilities and opportunities for investments. A number of organizations, including the regional economic commissions, UNESOB, UNCTAD, FAO and the World Bank, will be invited to the symposium. The report and proceedings of the symposium are scheduled for publication in 1972.
191. The two Studies (5.01.06) commissioned in 1969 (ID/B/64/Add.5, para.25) have been prepared. UNIDO proposes to determine the interest of FAO in the study "Direct use of phosphate rock as fertilizer and cattle food" to see if the study can be published jointly. With regard to the study on "Experience of the Union of Soviet Socialist Republics with processes for reducing the use of sulphur in fertilizer manufacture", further work and clarification are needed.
192. Aside from the other documents related to, and described under, specific project components, the following Publications (5.01.07) are scheduled for 1971:
- Fertilizer demand and supply projections to 1980 for South and Central America;
Techno-economics of nitrophosphate fertilizers.
193. In order to assist the developing countries to integrate the development of their fertilizer industry with their agricultural development, UNIDO proposes to prepare, in 1972, an information paper on Models for establishing national fertilizer development centres (5.01.08). The paper would describe the organization and functioning of such well-developed centres as the TVA National Fertilizer Development Centre in the United States of America, the Union of Soviet Socialist Republics' Nitrogen Institute and the Fertilizer Association of India. If the developing countries show an interest in this subject, technical assistance could be provided on the establishment of similar centres.
194. The technology of catalyst production and use is vital to the development of the petrochemical and fertilizer industries. In several developing countries, catalysts could be produced

with relatively low investment, utilizing domestic raw materials. UNIDO therefore proposes to organize in 1972 an expert group meeting on the Transfer of know-how in production and use of catalysts (5.01.09), to identify opportunities for investment in production facilities and to consider ways and means of transferring catalyst technology to countries in which the chemical industry is sufficiently well developed to justify domestic production. On the basis of the deliberations of the expert group, technical assistance would be provided in the technology of the production and use of catalysts. The report of the meeting is scheduled for publication in 1972.

Raw materials for the production of fertilizers and pesticides (5.02)

195. Some five years ago, there was a world shortage of sulphur, an important raw material used principally in the production of fertilizers. In an effort to assess the possible need for developing fertilizer industries using processes that required little or no sulphur, UNIDO commissioned the British Sulphur Institute to study future supply and demand for sulphur. The results of this study indicated that future supplies would be adequate. UNIDO is therefore devoting its attention to ways and means of reducing sulphur costs to the developing countries. One way of achieving such reductions would be to import sulphur in molten form. Consequently, UNIDO plans to commission in 1971, subject to availability of resources, a study on the Treatment of molten sulphur (5.02.01; Priority B).

Pesticides (5.03)

196. In accordance with the directives of the Industrial Development Board (A/8016, para.145), several discussions were held with the liaison officers of FAO and WHO at the IAEA in order to identify alternate pesticides to those which leave harmful residues. Many developing countries are requesting advice and information on substitutes for chlorinated hydrocarbons such as D.D.T. and B.H.C. which have been banned in some countries. FAO and WHO are formulating their recommendations and UNIDO will be guided by them.

197. In 1970, UNIDO undertook preparatory work prior to the sending in late 1970 or early 1971 of a mission to investigate the Availability of excess chlorine and its potential use for pesticide production (5.03.01) in the Latin American region. The countries to be studied were selected in consultation with ECLA and the results of this study will serve as a basis for the identification of investment possibilities.

198. In 1971, UNIDO proposes to send a similar mission to the ECAP region. Subject to availability of resources a mission of this nature will be sent to Africa in 1972 (Priority B).

199. No new work was undertaken in 1970 on the Pesticides manual (5.03.02; Priority B). However, the proceedings of the Syracuse University Training Course in Pesticides (cf. 5.03.04) are planned for publication in two volumes and this material will cover a number of the subjects contemplated for the pesticides manual.

200. Owing to lack of resources, no preparatory work could be undertaken in 1970 for the Workshop on pesticides (5.03.03; Priority B) which UNIDO had proposed for 1971 (ID/B/64/Add.5, para.32).

201. In 1970 UNIDO, in collaboration with the Syracuse University, New York, United States of America, held a Second Interregional Training Course for Industrial Production of Pesticides in Developing Countries (5.03.01). Some 40 participants attended the course. A third course is being planned for 15 participants in 1971. The first volume of the proceedings, entitled "General principles and formulation of pesticides", is scheduled for publication in 1971.

Petrochemicals (5.04)

202. In the activities related to petrochemicals, UNIDO has given priority to assisting national and regional institutions in organizing and strengthening plastic development centres. For example, a centre being developed in Pakistan will provide equipment for training and demonstration in the newest techniques of plastic moulding; it is expected to generate interest in investments in fabrication industries and, in turn, in the development of the basic petrochemical industry which supplies the materials used in fabrication. In the in-plant training programme in plastics fabrication and utilization, held in Vienna in 1970, in co-operation with the Austrian Government, plastics fabrication technology, application, standardization and quality control were of particular interest to participants from many developing countries. At the seminar, several instances of specific needs for further technical assistance were identified.

203. Petrochemical surveys were carried out on behalf of UNIDO by consulting firms such as by the Japan Gasoline Co. in Peru and Trinidad and Tobago, and the French Petroleum Institute for the Industrial Development Centre for Arab States (IBCAS). Pre-investment feasibility studies are envisaged in Indonesia and other countries in petrochemicals production.

204. The report of the Baku Interregional Petrochemical Symposium on the Development of Petrochemical Industries in Developing Countries (5.04.01), held in 1969, was published in 1970. The proceedings of the Symposium are on the 1971 publications programme of UNIDO.

205. Due to lack of resources no work was done in 1970 on the Study on the establishment of plastic fabrication and application facilities (thermo-plastics materials) (5.04.02; Priority B). As a result, this project component has been deleted from the 1971 work programme of UNIDO. The subject matter is dealt with, however, in the in-plant training programme of UNIDO in plastic fabrication and utilization (cf. 5.04.04).

206. In accordance with the recommendation of the Industrial Development Board at its fourth session (A/8016, para.146), UNIDO limited its work on the expert group meeting on Future trends in, and competition between, natural and synthetic rubber (5.04.03) to the collection of data in order not to duplicate efforts. UNIDO commissioned a background study in 1970 which will incorporate all available data from UNCTAD and other international organisations. The expert group meeting, to be held in Vienna in 1971 (ID/B/64/Add.5, para.38), will identify the problems of the rubber industry and provide guidelines for the future work programme of UNIDO in this field.

207. In 1970 UNIDO, in co-operation with the Government of Austria, conducted the first In-plant training programme in plastic fabrication and utilization (5.04.04). The programme was held in Vienna, from 14 September to 29 November, with 6.500 participants taking part.

The programme is reported within the operational activities of UNIDO being carried out under Group 10(a), Industrial Training. UNIDO proposes to carry out similar courses in 1971 and 1972.

208. Several Latin American countries received technical assistance in 1970 in the use of plastics, and other countries in the region have expressed interest in the plastic fabrication industry. UNIDO therefore proposes to widen the scope of the expert group meeting planned for 1971 (ID/B/64/Add.5, para.41) on the use of plastics in agriculture and to change the meeting to a symposium on the Development of the plastic fabrication industry (5.04.05) in Latin America. If approved by UNDP, the symposium would be held in 1972.

209. The study, commissioned by UNIDO, on Proteins from hydrocarbons (5.04.06) will be completed in 1971. It is expected that detailed studies will be commissioned in 1971 if sufficient interest in any aspect of the problem becomes evident. No further activities are foreseen in 1972.

210. No further Studies in petrochemicals (5.04.07) are envisaged by UNIDO for 1971 or 1972 except those to be prepared for meetings by consultants. Steps are being taken to ensure full exchange of information with the Organization of the Petroleum Exporting countries in connexion with preparations for future meetings and studies.

211. UNIDO is currently assisting in the establishment of plastics technology centres in Chile, China and Nicaragua and in strengthening the plastics technology centres in Algeria, Israel and Pakistan. UNIDO proposes therefore to prepare in 1972 an information paper on the Establishment of a plastics technology centre (5.04.08), as a model for the establishment of such centres. The paper, which will draw on the experience of similar centres in both developed and developing countries, will be prepared by a staff member.

212. UNIDO proposes to commission a report on the Universal process training unit (5.04.09) to stimulate interest in other countries. This training unit, which UNIDO is supplying through its operational programme, is used to train operators in the petroleum and fertilizer industries. An advantage of the training unit is that, while based on the principle of a dynamic simulation of a process, it is not connected with the working plant. This makes it possible to give practical training without the risk of loss of production and damage to the plant. In addition, training can be started well in advance of the completion of an industrial project. A very important feature of the training unit is that it is mobile and can be set up in areas convenient to trainees.

213. UNIDO proposes to try a new approach to the transfer of technology by setting up a visiting and consulting Team for petrochemicals and plastics industries (5.04.10). Prior to the organization of such a team UNIDO proposes to commission in 1972 a consultant to identify an appropriate area or country to recommend the composition of the team and to suggest procedures, mechanisms and other details of the mission. On the basis of his recommendations, a team would be fielded and closely backstopped by other personnel; a staff member might even be included in the personnel of the team.

214. The visiting team, which would consist of carefully selected experts and consultants, would be expected to offer advice to developing countries on the general development of the petrochemicals and plastics industries. Such advice would include assistance in planning, transfer of new technology, management consultant, identification of technical assistance needs and suggestions on business and financial aspects. UNIDO plans to organize, on a trial basis, one visiting team for a specific country to determine the effectiveness and practicability of the scheme. If successful this activity would become a regular component of the operational programme of UNIDO.

PRINTED PUBLICATIONS

<u>1970 publications programme</u>		<u>Languages</u>	<u>Cost (US\$)</u>
ID/2	Fertilizer technology, production and use	F S	
ID/13	Factors inhibiting the indigenous growth of the fertilizer industry in developing countries Report of the <u>ad hoc</u> group of experts from fertilizer-deficit countries, 1968	F S	
ID/46	Petrochemical industries in developing countries Vol.II Report of the interregional petrochemical symposium, 1969 (5.04.01)	E	
ID/55	Development of plastics industries in developing countries (5.04.02)	E	
<u>Fertilizer industry series</u>			
ID/SER.P/3	The reduction of sulphur needs in fertilizer manufacture	E	
ID/SER.P/4	The ammonium chloride and soda ash deal manufacturing progress in Japan	F S	
ID/SER.P/5	New process for the production of phosphatic fertilizers using hydrochloric acid	F S	
<u>Petrochemical series</u>			
ID/SER.J/3	Studies in plastics fabrication and application	F S	
ID/SER.J/4	Studies in the development of plastic industries	F S	
ID/SER.J/5	Establishing standardization of plastics in developing countries	E S	

18,315

1971 publications programme

ID/44	Directory of fertilizer production facilities Vol.II Africa (5.01.01)	E	
ID/46	Petrochemical industries in developing countries Vol.II Report of the interregional petrochemical symposium, 1969 (5.04.01)	F S E	
	Petrochemical industries in developing countries Vol.III Proceedings of the interregional petrochemical symposium, 1969 (5.04.01)	E R	

Fertilizer industry series

ID/SER.F/6 Fertilizer demand and supply projections
to 1980 for South and Central America
(5.01.07) E S

Petrochemical series

ID/SER.J/5 Establishing standardization of
plastics in developing countries F

ID/WG.80 Development of the fertilizer and
pesticide industries in Latin America
Report of the meeting (5.01.02) E S

- Directory of fertilizer production
facilities

- Vol.III: Asia (5.01.01) E
Vol.III: Latin America (5.01.01) E

- Techno-economics of nitrophosphate
fertilizers (5.01.07) E P S

- World supply and demand and price
trends of sulphur (5.02.01) E P S

- Industrial production and formulation
of pesticides in developing countries
Vol.I: General principles and formu-
lation of pesticides (5.03.04) E

- Manual on cost acrylic sheet business E

33,600

Forecast of 1972 publications programs

- Directory of fertilizer production
facilities
Vol.IV: UNESOB region (5.01.01) E

- Production of fertilizers
Proceedings of the second interregional
symposium (5.01.05) E R

- Production of fertilizers
Report on the second interregional
symposium (5.01.05) E R

- Transfer of know-how in production
and use of catalysts
Report of the expert group (5.01.09) E

46,350

Notes: In the computation of the printing costs a standard formula was applied
based on an average cost of internal and external printing.

10927

GROUP 6: LIGHT INDUSTRIES

215. In the broad and diverse field of light industries, UNIDO is providing assistance towards the promotion and acceleration of the industrial development of the textile, food processing, wood processing, leather, rubber products and printing industries. In keeping with the recommendations made by the Industrial Development Board at its fourth session (A/8016, para.153, 158), UNIDO has devoted particular attention in its programme to the leather, furniture, and vegetable oil industries, as well as to the industrial production of protein-rich food for human and animal consumption.

216. An important innovation introduced in 1970 was a new type of co-operative programme. Through this programme, the Government of Czechoslovakia is to provide assistance from its wood and leather industries sectors to the corresponding sectors in Pakistan and the Sudan; UNIDO will assist and advise both parties and will co-ordinate operations. The programme will be financed from voluntary contributions to UNIDO, Funds-in-Trust from the recipient countries and from UNDP resources, if and when the need arises. Assistance would be rendered in the following areas: training, product design, quality control, investment promotion, trade and export promotion, and selection and supply of machinery and equipment. If successful, this programme could be extended to include other fields in different countries.

217. Another innovation, which is likely to become operational in 1971, is a long-range co-operative research and product development programme with the International Institute for Cotton (IIC) and its member States. The objective of the programme would be to introduce the quality improvements required to enable cotton products to compete with synthetic fibres. Experiments have shown that a number of properties, such as tensile strength, resistance to abrasion, durability, lustre, softness etc., can be added to cotton by chemical and physical treatment. The programme proposed by UNIDO envisages the establishment of an international research and product development centre which would provide training and technical assistance to developing countries. The centre would enter into co-operative research agreements with textile research institutes, universities with textile research facilities, leading chemical companies, textile finishing companies and manufacturers who are engaged in significant research on cotton textiles. The centre would establish a network of pilot plants to demonstrate and teach manufacturers in developing countries how to apply new mechanical and chemical processes.

OPERATIONAL ACTIVITIES

218. Within the operational activities of UNIDO related to the textile industry, two types of projects stand out: techno-economic surveys of the industry and assistance provided to centres and institutes dealing with quality control and product development work. The surveys, such as those carried out by UNIDO in the textile industries of Brazil, Senegal, Peru and the East African Community, provide recipient Governments with information, analyses and recommendations on which to base their policy decisions. Direct assistance to individual textile mills is also rendered in a number of projects; generally, however, the programme of UNIDO in this field is designed to cover a specific sector of textile production (e.g., dyeing/finishing) in which problems have been identified.

219. The assistance provided by UNIDO to textile centres and institutes generally takes the form of UNDP/SF projects, such as those currently in operation in Indonesia and the United Arab Republic. In 1972, UNIDO plans to increase its assistance to such centres and institutes. Currently, it is formulating a programme of co-operation with the International Wool Secretariat with a view to establishing quality control schemes for the wool industry in selected countries. Increased co-operation with the International Institute for Cotton is also foreseen, particularly with regard to training courses and applied research work on cotton.

220. The majority of the projects of UNIDO related to the food processing industry deal with the reorganization, expansion and modernization of the fruits and vegetables processing subsectors and the vegetable oil processing, sugar production, meat processing and cereals (milling and flour processing) subsectors. UNIDO has also frequently rendered assistance, upon request, in the planning of entire food processing sectors (agro-industrial complexes). In Kenya for example, two experts prepared a feasibility study for the development of a corn processing plant, which is now being established by the Government in co-operation with private investors. In Dahomey, experts prepared a feasibility study on the establishment of a cashew nut processing plant. In Ceylon, experts assisted in the preparation and implementation of a plan for reorganizing the vegetable oil processing industry. In Ethiopia, a feasibility study, prepared by UNIDO experts on the establishment of a soluble coffee plant, is presently being implemented. In Iceland, UNIDO undertook a project for the reorganization of the fish processing industry. In Ecuador, a programme was prepared for the reorganization of the fruit and vegetable processing industry, and in Iran, a plan formulated by UNIDO for agro-industrial development in the country is now under implementation.

221. In Morocco, UNIDO assisted in the reorganization of a fish protein concentrate (FPC) plant, and Chile and Peru, among other countries, have indicated their interest in promoting FPC production with the assistance of UNIDO. In Thailand, a large-scale project is being undertaken to define measures for the reorganization of the rice processing industry.

222. In 1972, an increase is expected in the activities related to fish protein concentrate production. Further, assistance in the reorganization of the rice industry will increase substantially. Assistance in the sectors of fruits and vegetables and vegetable oil processing will

continue to play an important role in the technical assistance programme, especially with respect to the establishment of export-oriented industries.

223. In the wood processing industry most of the technical assistance consisted of trouble-shooting, though feasibility studies for the establishment of new plants were also carried out. In this field, requests for assistance increased from eight in 1968 to twenty-seven in 1970. Among the activities were expert advice to the furniture industry, research in wood technology, and joinery plant development. The aim of such assistance is to improve quality and productivity and to enable the industry to develop a viable export trade. Another specialized field of assistance is the production of panels from agricultural wastes, and the development of processes for the utilization of hitherto unutilized annual crops such as esparto grass and date palm fronds. In 1970, a staff member was seconded to the International Bank for Reconstruction and Development to participate in its industrial survey mission to Turkey and to prepare a report on the wood processing industries sector.

224. Assistance to the leather and leather products industry has increased substantially since 1967. In 1970, twelve projects were completed, while sixteen additional projects were under active implementation. Surveys were carried out in the leather and footwear industries in Argentina, Ethiopia, Jamaica, Pakistan, Singapore, Thailand and Tunisia. The prospects for exporting leather products made in Argentina, Ethiopia and the Philippines were studied. Technical assistance was given to tanneries and factories manufacturing leather products in Ghana, Malaysia, Mongolia and the Sudan, and a feasibility study for a new tannery in Uganda was prepared. An integrated leather-footwear, leather-goods factory was established in Malaysia, with the advice and assistance of UNIDO experts. An applied research and experimental centre is being established as a UNDP/SF project for the leather and leather goods industry in Mongolia with UNIDO as the executing agency for the project.

225. A supplementary UNDP/SF project for an experimental plant for the utilisation of scrap leather in Mongolia has been submitted to UNDP for approval. In Turkey, a UNDP/SF project for a central research and training institute for hides, skins and leather is being executed by FAO with UNIDO as the associated agency. In addition, six prospective UNDP/SF projects, related to the leather and leather products industry, are in the preliminary or preparatory stages. It appears that, in the immediate future, requests for assistance to tanneries will continue to be predominant, though there is a noticeable increase in the number of requests received for assistance in the design and manufacture of leather footwear and leather goods. Short-term expert assistance will also be continued in this field.

226. In 1969 and 1970, UNIDO sent experts to Jordan and Singapore to survey the printing industries and to assist in solving their technical problems. UNIDO will continue to assist in the development of this industry, both through feasibility studies and trouble-shooting missions.

227. Assistance to the rubber products industry is a relatively new field of activity for UNIDO. One expert has already completed a mission to assist the Government of Thailand in the development of the rubber products industry. Two further projects relating to this industry are under negotiation.

228. In 1970, UNIDO had six UNDP/SF projects under operation in the field of light industries; the number is expected to rise to about 12 in 1970 and to nearly 18 in 1972. The total number of projects that UNIDO had under operation in this field in 1970 was 215; this figure is expected to rise to 270 in 1971 and to 300 in 1972.

Value of approved field projects and forecast of requirements, 1970 to 1972
(in thousands of US dollars)

	1970	1971		1972	
	<u>estimated expenditure</u>	<u>Approved projects</u>	<u>Forecast of requirements</u>	<u>Approved projects</u>	<u>Forecast of requirements</u>
UNDP/SF	93.8	1,200.6	216.0	1,050.9	1,067.0
UNDP/TA	114.0	267.3	3,253.1	46.3	3,666.0
RP	263.4	216.6	145.4	-	486.0
SIS	899.6	960.7	567.2	-	1,659.7
OTF	4.6	6.4	126.3	-	253.0
FTT	60.3	37.4	-	-	37.4
Total	<u>1,435.7</u>	<u>2,689.0</u>	<u>4,308.0</u>	<u>1,097.2</u>	<u>7,169.1</u>

List of Approved Operational Projects

UNDP/SPECIAL FUND

Africa

MOR-33

Feasibility study for a fish protein concentrate plant

UAR-62

Textile quality control centre

The Americas

URU-12

Productivity centre (in participation with ILO) - garment manufacture; leather footwear manufacturing

Asia and the Far East

INS-31

Textile industry rehabilitation and development programme

NON-6

Applied research and experimental centre for leather and leather goods industry

Europe and the Middle East

YUG-10

Development of forestry and forest industries (in participation with FAO)

UNDP/TECHNICAL ASSISTANCE

Africa

ALG/69/11

Treatment and industrial application of cork

SUD/63/5

Food and light industry

UAR/69/1

Catgut manufacturing

UAR/69/12

Tin lithographing and varnishing

UAR/70/18

Biscuit production

UAR/70/23

Hydrogenation and margarine production

APR/69/25

Seminar on the development of leather industries in Africa

The Americas

ARG/68/6

Assistance to INTI - food technology; textile technology

Asia and the Far East

CEY/70/10

Textile industry - handloom technology

INS/69/29

Industrial development - textile industry

IRA/68/28

Food industry development

MAL/68/6

Assistance to MARA (commerce/industry division) - leather processing

MON/68/8

Technological development of leather goods industry

MON/69/2

Assistance to meat and milk industry

PAK/69/9

Wood panel industry - particle board; fibre board; wood based panel production and marketing

PHA/69/26

Sugar production control - laboratory techniques

UNDP TECHNICAL ASSISTANCE (cont'd)

Europe and the Middle East

BUL/69/20	Furniture industry
BUL/70/23	Fur processing industry
BUL/70/24	Cotton spinning industry
BUL/70/25	Furnishing of supermarkets
BUL/70/33	Design and production of tandem tires
HUN/69/2	Technical development of the knitting industry
HUN/69/3	Technical development of household textiles
LEB/70/9	Sunflower products and by-products
POL/70/5	Light industries
POL/70/20	Textile industry
ROM/70/5	Micro-structure of textile fibres
ROM/70/18	Technology of flour paste ware production

UNIDO REGULAR PROGRAMME

Africa

BDI/06/1/1	Food and light industries - milling techniques
CMR/06/1/2	Food and light industries - agro-industrial training
ID/RP/06-2 (Central African Republic)	Food and light industries - cassava processing; production of feedstuffs
CHD/06/1/1	Food and light industries - wooden carts and wheels production; particle board production
COG(K)06/1/1 (Libyan Arab Republic)	Food and light industries - furniture production
GAB/06/1/1	Food and light industries - wood processing
IVC/06/1/2	Food and light industries - agro-industrial development
KEN/06/1/1	Food and light industries - corn industry; leather production
LIB/06/1/1	Food and light industries - leather industry
ID/RP-06-3	Food and light industries - tannery technology
ID/RP/06-3 (Madagascar)	Food and light industries - agro-industrial training
ID/RP/06-2 (Mali)	Food and light industries - agro-industrial training
MLI/06/1/1	Food and light industries - leather production; textile industries
MAR/06/1/1	Food and light industries - tuna fish processing
ID/RP-06-4 (Nigeria)	Food industry - microbiological techniques; fermentation technology
NIR/06/1/1	Food and light industries - textile production
SEN/06/1/2	Food and light industries - milling techniques
ID/RP/06-3 (Somalia)	Food and light industries - agro-industrial training
SOM/06/1/2	Food and light industries - joinery and boat building
ID/RP-06-3 (Sudan)	Food and light industries - oil seed industries; food chemistry
SUD/06/1/1	Food and light industries - agro-industrial development
TAN/06/1/1	Food and light industries - wood processing
ID/RP/06-3 (Togo)	Food and light industries - cassava production; agro-industrial training
TOG/06/1/3	Food and light industries - food industries training

UNIDO HETILAP PROGRAMME (cont'd)

Africa (cont'd)

TUN/06/1/1	Food and light industries - agro-industrial
UGA/06/1/1	Food and light industries - leather production
ID/RP/06-6 (United Arab Republic)	Food and light industries - particle board industry
UAR/06/1/2	Food and light industries - leather production
ID/RP/06-2 (Upper Volta)	Food and light industries - agro-industrial training; meat processing; feasibility studies for food industries
UPV/06/1/1	Food and light industries - animal and vegetable products processing
ID/RP/06-9 (Regional)	Food and light industries - regional adviser, mechanical forest industries
AFR/06/1/3	Food and light industries - regional adviser, mechanical forest industries

The Americas

ID/RP/06-3 (Argentina)	Food industries - advanced techniques of food preservation
ARG/06/1/2	Food and light industries - leather production
BRA/06/1/2	Food and light industries - footwear industry
DOM/06/1/1	Food and light industries - flax board industry
HAI/06/1/1	Food and light industries - food processing
ID/RP/06-2 (Honduras)	Wood processing - secondary wood processing technology
ID/RP/06/3 (Jamaica)	Assistance to sugar industry
MEX/06/1/1	Food and light industries - agro-industrial development
PAN/06/1/1	Food and light industries - shoe manufacture
ID/RP/06-4 (Paraguay)	Food and light industries - tropical fruit processing technology
ID/RP/06-4 (Peru)	Food and light industries - agro-industrial seminar
ID/RP/06-3 (Uruguay)	Food and light industries - meat preservation
ID/RP-06-5 (Uruguay)	Food and light industries - lecture in "Modern knowledge and future trends in the use of wood for construction"

Asia and the Far East

FIJ/06/1/1	Food and light industries - agro-industrial development
IND/06/1/2	Food and light industries - agro-industrial development
INS/06/1/3	Food and light industries - silk industries
ID/RP/06-2 (Laos)	Food and light industries
LAO/06/1/1	Food and light industries
ID/RP-06-3 (Nepal)	Sugar technology
PAK/06/1/3	Food and light industries - rice processing
ID/RP/06-3 (Philippines)	Food and light industries - production of irradiated plastic impregnated soft wood; vegetable oil processing; rice processing; shoe marketing; furniture manufacturing
PHI/06/1/1	Food and light industries - furniture design; textile industry
PHI/06/1/2	Industrial research and standardization - quality control in furniture industry
ID/RP/06-4 (Singapore)	Food and light industries
ID/RP/06-7 (Regional)	Food and light industries - agro- and light industries
AFE/06/1/4	Light industries - food processing

UNIDO REGULAR PROGRAMME (cont'd)

Europe and the Middle East

BUL/06/1/1	Food and light industries - canned fish production.
ID/RP-06-4 (Romania)	Exploratory mission to study requirements for reconstruction of factories heavily damaged by the floods
ID/RP/06-6 (Yugoslavia)	Food and light industries

SIS PROGRAMME

Africa

67/85/Rev.1 ALG-2	Reactivation of industrial plants
69/559 ALG-9	Assistance to Société Nationale des Lièges
68/412 BDI-3	Establishment of milling industry
68/413 BDI-4	Feasibility study for a particle board plant
69/617 BDI-7	Study with a view to the manufacture of bags from local fibres, for coffee and other agricultural products
69/674 CHD-5	Vegetable oil technologist
69/676 CHD-7	Feasibility study for the establishment of a biscuit producing industry
69/665 DZH-6	Feasibility study for the establishment of a vegetable oil factory for cotton seed and groundnut processing
58/427 ETH-13	Study on a plant for soluble coffee
70/705 ETH-17	Marketing of cotton textiles
69/694 ETH-15	Assistance to the vegetable processing industry
70/993 ETH-18	Technological evaluation of four proposals for a freeze dry coffee plant
67/186 GUI-1	Research, test and control laboratory for vegetable and essential oils
67/122 KEN-1	Industrial processing of maize
67/154/Rev.1 NAO-4	Assistance to the Tulear Vegetable Oil Company
70/966 NAO-13	Assistance in promotion and marketing of fibreboard
70/702 NAO-9	Assistance to leather industry
57/225 NAR-4	Tuna fish project
67/69/Rev.3 NOR-2	Assistance to the SOHAFAP fish protein concentrate plant
68/328 RMA-11	Salt production.
68/381/Rev.1 RMA-8	Assistance to the Rwanzero blanket factory
69/574 RMA-19	Feasibility of local textile manufacturing
68/329 RMA-7	Fruit and vegetable processing
69/569 RMA-25	Alcohol production and marketing
69/571 RMA-17	Vegetable oil production and marketing
69/567 RMA-18	Animal feedstuff concentrates production and marketing
69/575 RMA-24	Feasibility study for establishing a match factory
69/570 RMA-26	Assistance to tobacco industry
69/686 RMA-28	Tobacco industry - feasibility study
69/568 RMA-22	Rubber and plastic products manufacturing
69/685 SEN-10	Assistance to furniture industry (through SOHAPI)
68/262 SUD-8	Technical assistance to the Khartoum tannery
68/377 SUD-16	Survey of edible oils and fats industry

SIS PROGRAMME (cont'd)

Africa (cont'd)

67/166 TOG-1
69/687 TOG-5
70/822 TOG-8
70/747 TUN-13
69/516 UGA-10
68/374 UAR-22
70/857 UAR-40
70/759 UAR-35
70/819 UAR-39
70/876 UAR-41
69/505 UPV-4 Phase I
69/688 UPV-14
68/364/Rev.1 APR-4

Cassava agro-industrial complex
Feasibility study in the field of the vegetable oil industry
Alcohol production and marketing expert
Assistance to the leather industry
Assistance to tannery project
Assistance to the textile finishing industry
Assistance to the furniture industry (quality control)
Processing of synthetic fibres on two-to-top converters
Quality control of leather and products
Assistance in production and quality control
Programme of agro-industrial development
Modern milling techniques
Textile study

The Americas

67/206 ARG-2
67/474 ARG-8
68/298/Rev.2 BOL-8

70/837 BRA-33

70/789 BRA-31
70/900 BRA-35
70/1018 BRA-38
63/337/Rev.1 CHI-3
70/886 COE-2
70/1027 COE-3

69/496 ECR-7
69/620 ECR-8
68/302 ECU-5
68/388 ECU-6
68/355/Rev.1 EUY-3
69/557 HON-2
70/1035 NIC-7
69/494 PAR-4
68/408 TRI-9 Rev.1
69/584 TRI-13
70/984 LA-8

Food industry development
Footwear industry production and management
Assistance in the establishment of a vegetable oil processing industry
Re-organization of traditional textile industry (exploratory mission)
Assistance to shoe industry
Reorientation of the textile industry
Reorientation of the textile industry
Assistance to the textile industry
Assistance to the footwear industry
Exploratory mission for establishment of a programme of technical assistance to the wood processing industries
Assistance to integrated cotton mill
Assistance in the field of food technology
Assistance in re-organization of textile industry sector
Assistance to fruit processing industry
Assistance to marketing corporation
Assistance to fruit processing industry
Central American school for training in textiles
Assistance to wood processing industry
Assistance to fruit processing industry
Assistance to the coconut growers association
Assistance to the Junta of Andean Integration Group (textile engineer)

Asia and the Far East

68/435 CEY-11
69/662 CEY-15
69/532 FIJ-2 Rev.1

Feasibility study for the manufacture of agar-agar
Modern rice-milling and oil recuperation
Tanning and footwear manufacturing expert

SIS PROGRAMME (cont'd)

Asia and the Far East (cont'd)

69/533 FIJ-4	Fruit and vegetable processing and marketing
70/870 FIJ-6	Exploratory mission on sugar cane based industry
70/909 FIJ-8	Feasibility study for establishment of a vegetable oil refining plant
68/288 IND-5	Development of chrome tanning processes for village tanneries
70/813 IND-14	Assistance to match manufacturing industry
69/614 LAO-4	Assistance to woodworking industry
69/489 MAL-5	Textile marketing study
69/504 MAL-8	Study for a particle board plant
69/507 MAL-9	Studies for establishment of joinery and furniture industries
69/473 PAK-7	Assistance to the East Pakistan Industrial Development Corporation (EPIDC) in the field of sugar technology
70/819 PHI-18	Assistance to the footwear manufacturing industry
70/818 PHI-19	Assistance to furniture and woodworking industry
68/334 SIN-6	Assistance to the woodworking industries
68/358 SIN-7	Assistance to printing industry
68/359 SIN-9	Assistance to leather products factory
68/403 SIN-10	Assistance to the footwear industry
69/609 SIN-13	Assistance to food processing industry
68/333 SIN-5	Assistance to industrial product design
68/416 THA-4	Feasibility study for industry based on Kenaf
68/386 THA-5	Assistance to rice processing industry
69/468 THA-8	Assistance to Sugar Institute and Sugar Advisory Board
69/594 THA-9	Development of rubber products industry
70/719 THA-14	Leather industry promotion

Europe and the Middle East

70/722 CIP-10	Preparation of call for tenders, evaluation of offers and final reception for an integrated wood processing plant
70/1029 CIP-13	Exploratory mission to identify basic problems of food industry
68/449 ICE-2	Expert sales promotion of products of integrated fish processing industry
69/481 IND-3	Evaluation of offers for manufacture of fibreboard from date-palm wastes
69/508 ISR-4	Assistance to Government Mint
69/511 ISR-5	Consultant to clothing industry
70/969 ISR-7	Assistance in quality control of furniture
70/914 ISR-6	Expert for fruit and vegetable preserves industry - problems of packaging and dispatching
70/863 ISR-8	Quality control in textile industry
70/710 JOR-9	Assistance to wood furniture industry
70/806 KLT-2	Adviser in light industries
70/998 ROM-17	Assistance to canning meat and meat products factory "Salconserv" (Medias)
70/1073 ROM-23	Flood emergency replacement of industrial equipment
70/792 SYE-4	Textile technologist

SIS PROGRAMME (cont'd)

Europe and the Middle East (cont'd)

69/579 SYR-22	Beer processing
68/346 YUG-12	Assistance in beer fermentation
69/455 YUG-14	Assistance to wood industrial enterprise
69/466 YUG-16	Assistance to wood industrial enterprise
69/700 YUG-18	Exploratory mission to Banja Luka to report on damages to various factories caused by the recent earthquakes
70/848 YUG-24	Assistance to food processing factory
70/845 YUG-23	Assistance to wood industrial combine

Interregional

70/737 INTRRG-13	Assistance to Industrial Development Centre for Arab States
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UNIDO GENERAL TRUST FUND

Interregional

6/3	Expert group meeting on quality control in the textile industry
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FUNDS-IN-TRUST

Africa

9020-70 (Congo, Democratic Republic of)	Industrial evaluation
9002-68 (Libyan Arab Republic)	Industrial development and productivity

The Americas

9016-70 (IDO-427)(Jamaica)	Industrial development and productivity
9017-70 (Paraguay)	National Institute of Technology and Standards

SUPPORTING AND OTHER ACTIVITIES

229. The supporting and other activities of group 6 are classified under the following projects:

Textile industry	6.01
Food industry	6.02
Wood processing industry	6.03
Leather and leather products industry	6.04

Textile industry (6.01)

230. In its supporting programme related to the textile industry, UNIDO has placed emphasis on activities that are of immediate and practical value. Thus, documentation has been prepared and meetings have been held on the selection of machinery in the cotton industry, the wool industry and in dyeing and finishing. UNIDO is also strengthening its co-operation with other international organisations dealing with the textile industry. A number of country projects are being prepared by UNIDO in co-operation with the International Wool Secretariat (IWS) with a view to establishing quality control programmes for the wool industry in selected countries. The programmes, if implemented successfully, will lead to the right to use the internationally advertised "WOOLMARK" trade mark in connexion with the products of the participating countries.

231. In 1970, UNIDO held an Expert Group Meeting on Quality Control in the Textile Industry (6.01.01). As the background documentation and reports of this meeting were well received by the industry, a recommendation was made that additional studies be prepared to complement the existing ones and, subsequently, that a composite document be written on quality control. As recommended by the Expert Group, four additional papers were prepared on quality control. In 1971, UNIDO proposes to complete the series of studies and to commission the writing of a composite document on quality control. The papers will be of practical use to the textile industry in general and to specific operational projects being carried out by UNIDO. The report and proceedings of the Meeting are scheduled for publication in 1972.

232. The report of the expert group meeting held in 1968 on processing problems and selection of machinery in the woollen and worsted industry, was published in 1970. This was the second in a series of meetings being held by UNIDO on the Selection of machinery (dyeing and finishing industry and knitting industry) (6.01.02). The third meeting in this series, which was originally scheduled for 1970 (ID/B/64/Add.15, para.16), was cancelled as considerably greater interest was shown in the Expert Group Meeting on Quality Control (cf. 6.01.01 above). In 1971, UNIDO proposes to hold, subject to availability of resources, a further meeting on machinery selection in the knitting industry (Priority B). In 1970, UNIDO prepared a study on the selection of equipment in the textile dyeing and finishing industry; the study is scheduled for publication in 1972.

233. The Second interregional workshop on textile industries (6.01.03) planned for 1971, has been postponed as the topics to be discussed were dealt with or will be touched on in the context of other activities such as the Expert Group Meeting on Quality Control (6.01.01), the ~~1971~~

training course, the proposed meeting on new yarn production techniques (6.01.04) and the seminars that are to be conducted, in co-operation with the International Wool Secretariat, as technical assistance operations.

234. UNIDO proposes to hold in 1972 an expert group meeting on New yarn production and modification techniques (6.01.04) to discuss the technical and economic feasibility of introducing certain new spinning techniques, such as open-end spinning, and yarn modification techniques into the textile industries of developing countries. The meeting, which would be held in collaboration with the International Institute for Cotton, would take place at the University of Manchester, United Kingdom. Consultants and experts in technology, economics, marketing and finance, from both industrialized and developing countries, as well as manufacturers of spinning machinery would be invited to the meeting. The report of the meeting would be published the same year.

235. A textile seminar (6.01.05), sponsored by IDCAS, will be held in Baghdad in 1971 to review the situation of the textile industry in the Arab countries. UNIDO has been invited to participate and plans to send a staff member and submit three papers which have been prepared for the seminar.

Food industry (6.02)

236. In addition to providing technical assistance in long-range planning and in defining priorities in this sector, UNIDO is advising the developing countries in the reorganisation, expansion, modernisation and establishment of processing plants for fruits and vegetables; vegetable oils; fish protein concentrate; animal feedstuff; grain milling (i.e. sorghum, millet and rice); meat; sugar; and cassava. UNIDO is also giving assistance in research in food processing technology and in agro-industrial development. A UNIDO regional industrial adviser on agro-industries is assisting ECAFE in its work in this sector. In its programme in this field, UNIDO is maintaining close contact and co-operation with FAO.

237. The report and proceedings of the joint UNIDO-FAO Expert Group Meeting on Fish Protein Concentrate (6.02.01), held in 1969, are scheduled for publication in 1971. As a follow-up of this Meeting, UNIDO in 1970 assisted the Government of Morocco in preparing a UNDP/SF project aimed at developing the industrial production of fish protein concentrate and assisted also in the negotiations for a joint venture to manufacture this product.

238. As a direct consequence of the 1969 Expert Group Meeting on Soyabean Processing and Use (6.02.02), various requests for the establishment of plants for the manufacture of soya protein products were received and acted upon by UNIDO in 1970.

239. The expert group meeting on the Selection of food processing equipment (6.02.03), planned by UNIDO for 1970 (ID/B/64/Add.6, para.26), had to be cancelled owing to difficulties in securing host facilities.

240. The expert group meeting on Cassava processing (6.02.04; Priority B), which UNIDO had proposed for 1970 (ID/B/64/Add.6, para.28), had to be cancelled owing to the lack of available resources.

241. The objectives of the expert group meeting on oils and fats, which UNIDO had proposed to convene in 1970 (ID/B/64/Add.6, para.29, 31) have been revised and broadened. UNIDO now proposes to hold in 1972 an expert group meeting on Technical and economic criteria in the oil seed processing industry (6.02.05). The objective of the meeting would be to prepare recommendations that would define the main technical and economic criteria for investments in the vegetable oil industry and that would lead to optimum utilization of oilseed raw materials. Recommendations could be made as to technical and economical industrial processes for the production of oilseed products which would meet both domestic and export market requirements. Special attention would be given to the economic importance of processing oilseeds indigenously. Representatives of leading financial, industrial and commercial organizations dealing with oilseed processing would be invited, as well as manufacturers of equipment. Group 12 (Industrial Programming and Project Planning) would collaborate in this meeting, and the co-operation of other United Nations organizations would be sought through appropriate contacts.

242. In 1971, UNIDO, in co-operation with ECAFE and FAO, will hold an interregional seminar on the Industrial processing of rice (6.02.06) in Madras, India (ID/B/64/Add.6, para.32, 33). To encourage new investment in the rice processing industry for the purpose of either modernizing existing plants or replacing them, or to establish additional plants, it is necessary to provide potential investors with criteria regarding the technical and economic viability of modern rice processing. It is the plan of UNIDO to provide such data through this seminar. The participants will be expected to formulate criteria which can be used by potential investors as a basis for investment in the rice processing industry in the light of presently available modern technology. Observers from governmental and non-governmental organizations that are engaged in the rice processing industry in the developed and developing countries will be invited to attend. Although it was originally planned to hold an expert group meeting in 1971 to prepare recommendations for presentation at this seminar, it was decided that such a meeting was unnecessary. The report and the proceedings of the seminar are scheduled for publication in 1972.

243. In the Food industry series (6.02.07) work was continued in 1970 on two papers, cassava processing and wood as a packaging material. The latter is scheduled for publication in 1971. In 1971, the series will be expanded by two further studies: one on meat processing and the other on vegetable oil processing. These two studies are scheduled for publication in 1972.

244. In 1971, UNIDO will hold an expert group meeting on Processing selected tropical fruits and vegetables for export to premium markets (6.02.08) (ID/B/64/Add.6, para.35, 36) in Salvador (Bahia), Brazil. This meeting will be attended by a number of experts who will discuss the main aspects related to the requirements for producing processed fruit and vegetable products suitable for the international market. Problems related to marketing, the types of import restrictions etc. will also be discussed. Representatives of financial and industrial organizations from various developing countries will attend the meeting, and owners of food processing industries, investors, machinery manufacturers and import organizations will be invited to send observers. United Nations organizations and agencies such as ECLA, UNCTAD, FAO and IAEA will also be invited to participate. The meeting is being organized in collaboration with groups 12 (Industrial Programming and Project Planning) and 14 (Export Industries) and with the co-operation of the Institut Français de Recherches Fruitières Outre-Mer (IFAC), Paris, the Tropical Products Institute, London, and the Tropical Centre of Food Research and Technology, Campinas, Brazil.

245. Various requests for technical assistance were received and processed by UNIDO in 1970 as a follow-up to the 1969 Expert Group Meeting on Problems of Preservation and Refrigeration of Food in Developing Countries (6.02.09).

246. In 1972, UNIDO plans to prepare background documentation on the Prospects for industrial meat processing in developing countries (6.02.10). The setbacks suffered by industrial meat processing plants in developing countries clearly indicate the need to revise the basic technology and economy of this industry. It is feasible that some of the more recent processes will prove suitable for use in tropical countries. UNIDO therefore proposes to examine the new meat processing technologies in the light of the conditions prevailing in certain developing countries. In addition to being of particular interest to the African "cattle-belt" countries, this subject is of note for certain Latin American countries and for potential importers of meat products from Africa. If sufficient interest is shown, UNIDO will look into the feasibility of holding a meeting on this theme, at a later date. The co-operation of national institutions and international organizations such as FAO will be sought through appropriate channels.

Wood processing industry (6.03)

247. In this sector, UNIDO is providing assistance for the establishment and modernisation of industries engaged in the manufacture of furniture, modular components for prefabricated wooden houses, wooden components used in the manufacture of agricultural equipment, matches, and particle boards from bagasse and other agricultural wastes. Assistance is also being given in the selection of machinery, production methods, quality control and marketing.

248. The report of the 1969 Study Group on Production Techniques for the Use of Wood in Housing under Conditions Prevailing in Developing Countries (6.03.01) is scheduled for publication in 1971. As a direct consequence of this meeting, the Canadian Government invited UNIDO to become a co-sponsor of the World Consultation on the Use of Wood in Housing, with special emphasis on the needs of developing countries (see 6.03.06 below).

249. At the Expert Group Meeting on the Production of Panels from Agricultural Wastes (6.03.02), held by UNIDO in 1970, discussions centered around the identification of hitherto unutilized raw materials and the modifications that would be necessary in the established processes if such materials were to be used. The report of the Meeting is scheduled for publication in 1971.

250. In 1971 UNIDO will hold, in collaboration with the Government of Finland, a seminar on Furniture and other secondary wood processing industries (6.03.03) (ID/B/64/Add.6, para.42). Although the main emphasis of the seminar will be placed on the furniture and joinery industry, it is planned that the problems faced by other secondary wood processing industries, such as the manufacture of mouldings and parquet for export, will also be dealt with. The proceedings are scheduled for publication in 1972.

251. The expert group meeting on the Selection of woodworking machinery (6.03.04) that had been planned for 1971 (ID/B/64/Add.6, para.43), has been postponed in view of the involvement of UNIDO in the World Consultation on the Use of Wood in Housing (cf. 6.03.06). As UNIDO feels

that this subject is of special importance to the developing countries, it is proposed to prepare commission papers and studies which would be published and/or used as background documentation for a possible meeting.

252. In accordance with the suggestions made at the fourth session of the Industrial Development Board (A/8016, para.160), UNIDO proposes to hold in 1972 an expert group meeting on the Manufacture of adhesives for the wood processing industries (6.03.05; Priority B). A group of some ten to fifteen chemical engineers, specialized in the production of adhesives for the wood processing industry, and wood technologists would be invited to Vienna to recommend types of adhesives for manufacture in developing countries and to suggest model schemes for the establishment of factories manufacturing adhesives in developing countries. The establishment of an adhesives industry would greatly assist the development of plywood and particle board industries which have been hampered by their reliance on imports.

253. As a consequence of the 1969 Study Group on Production Techniques for the Use of Wood in Housing under Conditions Prevailing in Developing Countries (cf. 6.03.01), UNIDO was invited by the Government of Canada to participate as a co-sponsor in the World Consultation on the Use of Wood in Housing (with special emphasis on the needs of developing countries) (6.03.06), which will be held in 1971 in Canada. Other participants include the UN Centre for Housing, Building and Planning, FAO and the International Union of Forestry Research Organizations (IUFRO). The Consultation will provide a forum for all participating countries to discuss mutual problems and to exchange information with the objective of increasing or extending the use of wood in residential construction. It will assist in making housing authorities more aware of the important role which wood can play in housing and thus help to raise living standards in many countries throughout the world. Particular emphasis will be given to problems of housing in developing regions. UNIDO's contribution will be in the form of studies on the production of prefabricated wooden houses, which are scheduled for publication in 1971.

Leather and leather products industry (6.04)

254. In this sector, the principle objectives of UNIDO in its programme of technical assistance are the introduction of modern methods for the production of semi-finished and finished leathers from indigenous and imported hides and skins, and the manufacture and marketing of well-designed leather footwear and leather goods acceptable to both domestic and foreign markets. In keeping with the suggestions made by the Industrial Development Board at its fourth session (A/8016, para.161), emphasis is being placed on quality control of products, market studies and export promotion.

255. In preparation for the seminar on the Development of the leather and leather products industries in Africa (6.04.01), to be held in Vienna in early 1971 (originally planned for 1970; ID/B/64/Add.6, para.50), UNIDO completed the following six studies in 1970:

The problems and prospects for the development of the leather industry in developing countries;

The industrial production of semi-processed chrome leather from hides and skins under conditions encountered in developing countries;

The tanning and industrial production of reptile leather under conditions encountered in developing countries;

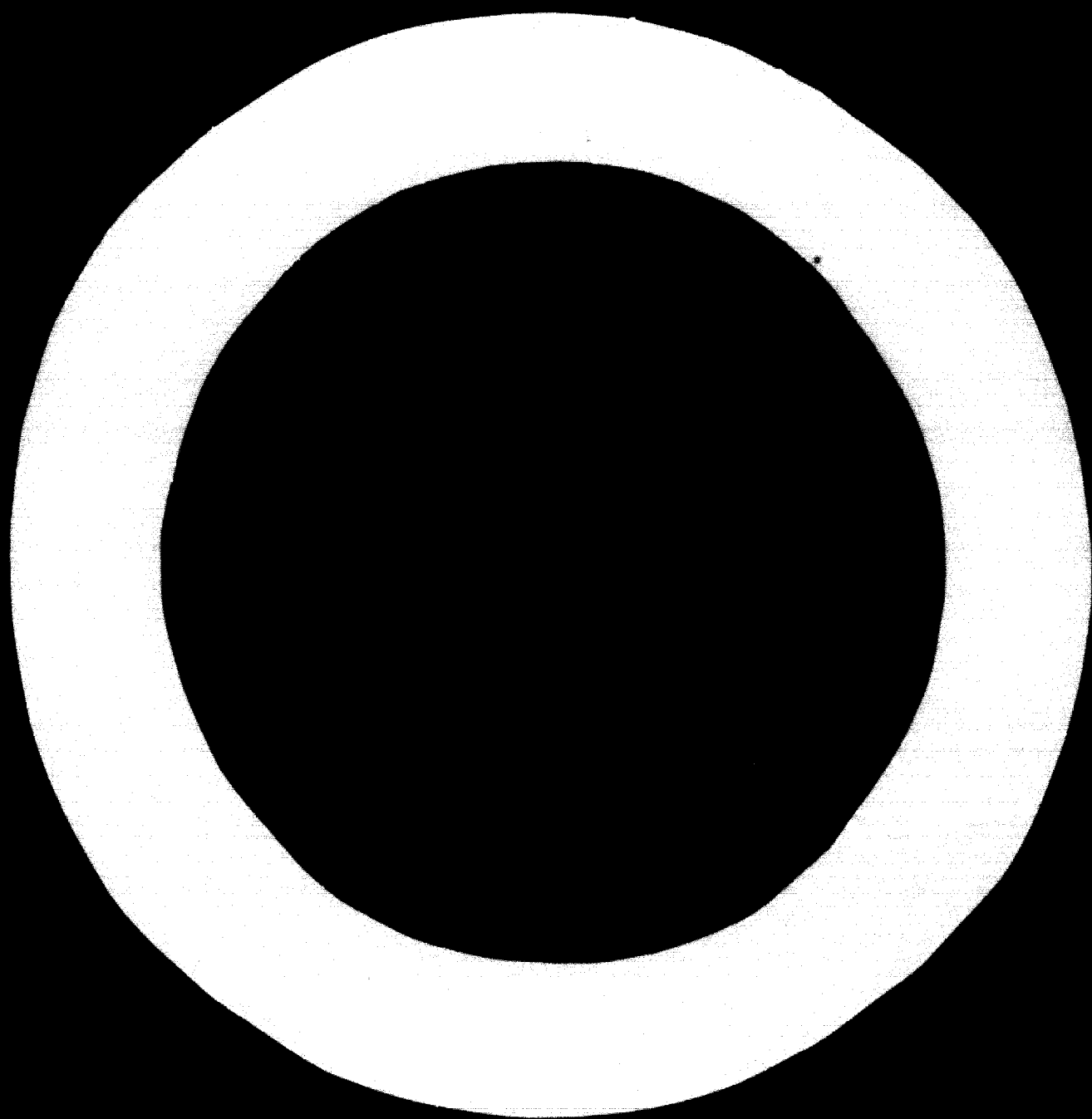
Fancy leather goods factory for developing countries;

The elaboration of programmes for hides and skins, improvement and marketing;
The marketing and export possibilities of semi-processed and finished leather, of
leather footwear and other leather products.

The first four studies on this list are scheduled for publication in 1971. The seminar will deal with problems of, and prospects for, the development of the leather and leather products industries for developing countries, with the aim of working out practical recommendations with regard to specific technical and managerial problems in this sector. Visits to leather and footwear factories will also be arranged. A tentative work programme will be drawn up for an advisory group in technology and management which is to be established in the region in order to follow-up the recommendations of the seminar. International organizations, leather trade organizations, equipment producers, exporters and importers of leather and leather products and other interested parties will be invited to participate as observers at the seminar. The report of the seminar is scheduled for publication in 1971.

256. At the fourth session of the Industrial Development Board (A/8016, para.161), attention was drawn to the importance of developing the leather footwear and leather goods manufacturing industries in developing countries, with special emphasis on the design and marketing of such products. UNIDO therefore proposes to hold in 1972 a regional seminar for Asia and the Far East on the Development of the footwear manufacturing and the leather goods manufacturing industries (6.04.02). The seminar would be held in co-operation with the Central Leather Research Institute and the Central Footwear Training Centre, Madras, India. The possibility of holding the seminar in co-operation with ECAFE will be ascertained through appropriate contacts. International organizations, financial institutions, equipment producers, importers, exporters and other trade representatives will be invited to participate as observers in the seminar.

257. In view of the interest shown by a number of developing countries in strengthening and expanding their fur processing industries, UNIDO proposes to commission a study in 1972 on the Fur industries and their development (6.04.03). The study will include an investigation of the feasibility of utilizing the skins of various types of indigenous wild and domestic animals, with a view to creating export industries for semi-finished and ready made fur products.



PRINTED PUBLICATIONS

1970 publications programme

		<u>Languages</u>	<u>Cost (US\$)</u>
ID/33	Processing problems and selection of machinery in the woollen and worsted industry Report of expert group meeting (6.01.02)	E	
	<u>Food industries series (6.02.07)</u>		
ID/SER.I/3	Water-saving techniques in food-processing plants	F S	
ID/SER.I/4	Modern sterilization methods for milk processing	F	
ID/SER.I/5	Packaging and packaging materials with special reference to the packaging of food	F S	2,548

1971 publications programme

ID/3	Production techniques for the use of wood in housing under conditions prevailing in developing countries Report of the study group (6.03.01)	E F S	
ID/48	Integrated food processing in Yugoslavia Report of seminar and digest of technical papers	E F S	
ID/60	The production of fish protein concentrate Vol.I: Report of the joint UNIDO - FAO expert group meeting (6.02.01) Vol.II: Proceedings of the joint UNIDO - FAO expert group meeting (6.02.01)	E F S E	
ID/WG.49	Production of prefabricated wooden houses (6.03.06)	E F S	
ID/WG.79	Development of the leather and leather products industry in Africa Report of the seminar (6.04.01)	E	
ID/WG.83	Production of panels from agricultural wastes Report of the expert group meeting (6.03.02)	E F S	
-	The role of wood as a packaging material in the developing countries (6.02.07)	E F S	
-	The problems and prospects for the development of the leather industry in developing countries (6.04.01)	E	
-	The industrial production of semi-processed chrome leather from hides and skins under conditions encountered in developing countries (6.04.01)	E	

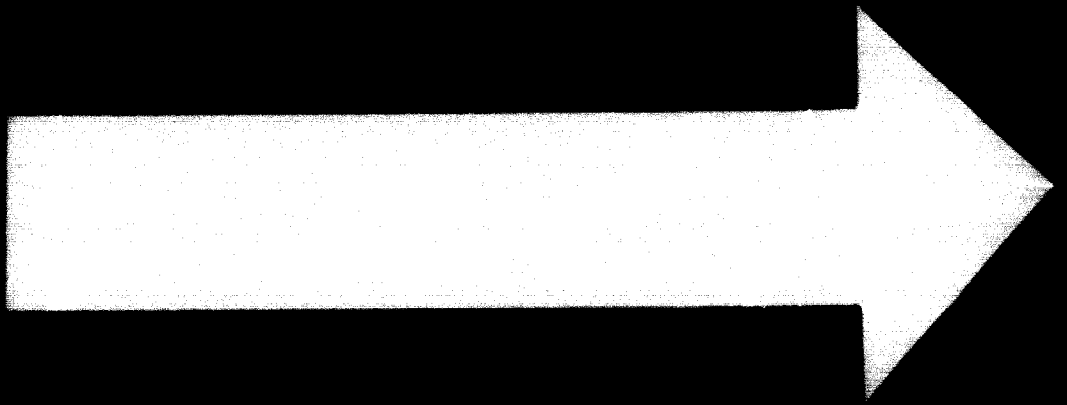
1971 publications programme (cont'd)

- The tanning and industrial production of reptile leather under conditions encountered in developing countries (6.04.01) E
- Fancy leather goods factory for developing countries (6.04.01) E

17,000

Forecast of 1972 publications programme

- IB/60 The production of fish protein concentrates
Vol.II: Proceedings of the joint UNIDO - FAO expert group meeting (6.02.01) P S
- WQ/66 Processing selected tropical fruits and vegetables for export to premium markets
Report and proceedings of the expert group meeting (6.02.06) E
- Study on quality control in the textile industry
Report and proceedings of the expert group meeting (6.01.01) E
- Selection of equipment in the textile dyeing and finishing industry (6.01.02) E P
- New yarn production and modification techniques
Report of the expert group meeting (6.01.04) E
- Industrial processing of rice
Report and proceedings of the seminar (6.02.06) E P S
- Study on meat processing (6.02.07) E
- Study on vegetable oil processing (6.02.07) E
- Furniture and other secondary wood processing industries in developing countries
Report and proceedings of the seminar (6.03.03) E
- Development of the leather and leather products industries in Africa
Report of the seminar (6.04.01) P S
- The problems and prospects for the development of the leather industry in developing countries (6.04.01) P
- The industrial production of semi-processed chrome leather from hides and skins under conditions encountered in developing countries (6.04.01) P



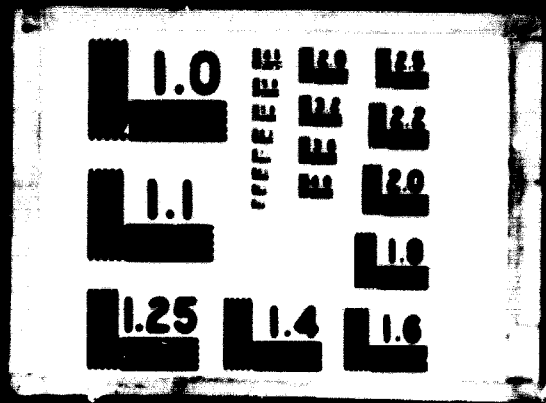
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3 OF 3

DO

4212 -

4219



Forecast of 1972 publications programme (cont'd)

- The tanning and industrial production of reptile leather under conditions encountered in developing countries (6.04.01) P
- Fancy leather goods factory for developing countries (6.04.01) P

24,600

GROUP 15b: INDUSTRIAL BRANCH REPORTS AND ACROSS-THE-BOARD TECHNIQUES

258. Within the over-all work programme of UNIDO, groups 1 to 6 cover branch-oriented field projects and related supporting activities. These projects and activities are supplemented by branch reports involving the collection and analysis of information on demand, consumption patterns, investments, production capacities and their utilization, trade policies and other aspects of sectoral developments.

259. One of the important tasks of UNIDO is to keep abreast of major developments in various industrial sectors. Further, a new emphasis has been added to the activities of UNIDO by the Second United Nations Development Decade in the elaboration of trends and projections for the major industrial branches in the developing countries. The preparation of branch reports and perspective studies is carried out by group 15b in close co-operation with the relevant groups of activities both within the Industrial Technology Division and in the Industrial Policies and Programming Division.

260. In addition to projects within specific industrial sectors, there are major fields of activities that are relevant to several industrial branches. Two such fields are packaging and environmental engineering. Activities in these two fields, as well as in other relatively minor ones, fall under the heading of "Across-the-board techniques".

OPERATIONAL ACTIVITIES

261. The operational activities of UNIDO in this group are directed towards technical assistance programmes in the areas defined by the industrial branch reports (15b.01) and the perspective studies (15b.02) and towards the provision of technical assistance in fields of activities requiring a multisectoral or intersectoral approach.

262. The following examples are illustrative of operational activities carried out by UNIDO within this group. Through a UNDP/SF project in Algeria, UNIDO is providing assistance in carrying out sectoral studies of industry. In 1970, an SIS mission helped to formulate, in cooperation with other groups of activities, proposals for projects in specific industrial branches. This mission was part of the technical assistance programme to member countries of the Organization of Senegal Riparian States (OERS), i.e. Guinea, Mali, Mauritania and Senegal.

263. With regard to packaging, UNIDO consultants advised on the establishment of a national packaging centre in Thailand. Another type of project, which aims at the improvement of packaging for specific products or groups of products, is exemplified by the sending of an expert to Bulgaria to advise on the production of plastic bags and wrappings or by an SIS project in Lebanon to modernize processed foods packaging systems. A third category involves surveys on the packaging industry of the requesting countries, e.g. the project carried out by UNIDO in Tunisia.

264. In the field of product improvement and process control, UNIDO participated in the preparation of a UNDP/SF project for setting up in India a demonstration plant for radiation processing. In the implementation of this project, the marketing and packaging aspects as well as the evaluation of the impact of this plant on industry are expected to fall within the responsibility of UNIDO. In 1971 and 1972, exploratory and advisory missions will be sent to several countries, upon request, to analyse their need for product improvement and process control methods and, accordingly, to propose measures and a plan of action.

265. The current technical assistance activities of UNIDO in environmental engineering are shown under the relevant groups of activities, i.e. the groups covering the particular industries that cause pollution or that are developing technological measures to solve environmental problems. In 1971 and 1972, additional types of environmental projects are expected to be developed, particularly with regard to environmental policy, economics and legislation.

266. In 1970, one UNDP/SF project to the value of \$800,000 and involving 554 man-months was in operation. A request for a UNDP/TA project to provide assistance to a packaging institute, at a cost of \$500,000 and involving 101 man-months, has been submitted to the UNDP for approval. It is envisaged that additional requests will be submitted to UNDP for assistance in the establishment of technical centres for packaging in Africa, Asia and Latin America; two such requests are expected in 1971 and three in 1972.

261. The total number of projects carried out by UNIDO within this group of activities in 1970 was 14; this figure is expected to rise to 26 in 1971 and to 30 in 1972.

Value of approved field projects and forecast of requirements, 1970 to 1972
(in thousands of US dollars)

	1970	1971		1972	
	<u>estimated expenditure</u>	<u>Approved projects</u>	<u>Forecast of requirements</u>	<u>Approved projects</u>	<u>Forecast of requirements</u>
UNDP/SF	112.1	334.0	-	193.0	-
UNDP/TA	2.0	-	50.0	-	293.0
RP	-	-	6.0	-	24.0
SIS	25.7	19.7	23.0	-	52.0
QTY	-	-	72.0	-	147.8
FIT	-	-	-	-	-
Total	139.8	353.7	151.0	193.0	516.8

List of Approved Operational Projects

UNDP/SPECIAL FUND

Africa

ALG-18

Centre for industrial and technological studies

UNDP/TECHNICAL ASSISTANCE

Europe and the Middle East

SPA/70/1

Technology of packaging

SIS PROGRAMME

Africa

70/1038 MAR-16

Packaging exploratory mission

70/904 MOR-15

Packaging survey mission

70/769 AFR-12

Industrial studies with a view to the industrial harmonization of the Riparian States of the Senegal River - exploratory mission

Asia and the Far East

70/734 HONK-2

Exploratory mission on promotional and protective packaging for consumer products for world markets

70/746 SIN-18

Packaging exploratory mission

70/990 THA-22

Consultant on the establishment of a national packaging centre

Europe and the Middle East

70/777 BUL-5

Assistance in the development of the packaging industry

70/739 CYP-11

Packaging survey mission

70/1023 ROM-22

Exploratory mission in packaging

70/740 TUR-14

Packaging survey mission

Interregional

70/898 INT-REG-12 Phase II

Consultation with IDC'S on Regional Packaging Institute

UNIDO GENERAL TRUST FUND

Interregional

00/9 (b)

Participation of UNIDO in missions and expert meetings to examine and discuss textile, fertilizers, petrochemicals and iron and steel industries in the Arab countries (in co-operation with the Industrial Development Centre for Arab States)

SUPPORTING AND OTHER ACTIVITIES

268. The supporting and other activities of group 15b are classified under the following projects:

Industrial branch reports	15b.01
Perspectives for selected industrial branches in the 1970s	15b.02
Across-the-board techniques	
Packaging	15b.03
Environmental engineering	15b.04
Product improvement through process control techniques	15b.05

Industrial branch reports (15b.01)

269. The preparation of the industrial branch reports is a major item in the supporting activities undertaken by group 15b. The branch reports were initiated with the objective of assessing the main industrial branches in the developing countries in order to help in the diagnosis of their growth potential and to devise ways and means of encouraging the growth thus identified.

270. The collection and analysis of data for the branch reports generally require the use of outside consultants as well as the co-operation of the regional economic commissions, UNESOB and other international bodies. Consultations with individual developing countries in the course of data collection have proved most fruitful.

271. Four studies are scheduled for publication in 1971: Iron and steel industry (15b.01.01); Non-ferrous metals industry (15b.01.02)^{2/}; Cement industry (15b.01.03); and Agricultural machinery industry (15b.01.04). Further in 1971, UNIDO plans to undertake a study on Industrial machinery and especially the machine tools industry (15b.01.05).^{3/}

272. In 1972, UNIDO proposes to continue this project with a study on selected branches of the Inorganic basic chemicals industry (15b.01.06). Some of these chemicals, such as sulphuric acid, caustic soda, soda ash and chlorine, are among the most important basic chemicals and are key products of the chemical industry. Subject to availability of resources, it is also proposed to study the Leather industry (15b.01.07) in 1972.

Perspectives for selected industrial branches in the 1970s (15b.02)

273. In keeping with resolution 24 (III), adopted by the Industrial Development Board at its third session, UNIDO is developing its contribution to the Second United Nations Development Decade. The perspective studies programme of group 15b is being carried out within the framework

^{2/} Previously listed under 15b.01.01 in ID/B/64/Add.15.

^{3/} Previously listed as 15b.01.02 in ID/B/64/Add.15.

of this contribution. Although the nature of these studies requires the use of statistical techniques for projecting future developments, every effort is made to obtain direct information from the industry surveyed on actual projects planned for the Decade. The studies include: projections on an individual country-by-country basis, whenever practicable; analyses of minimum plant sizes and economies of scale as well as of capital and other requirements; and identification of potential areas for technical assistance activities. Since the preliminary results are fed back to the developing countries, these studies have led to the establishment of a fruitful dialogue between UNIDO and the industrial sector of individual countries with beneficial effects both to UNIDO's assessment of the real needs of the countries and to its technical assistance operations.

274. During 1970, four perspective studies have been carried out in the following fields: Petrochemicals (15b.02.01), Textiles (15b.02.02), Fertilizers (15b.02.03) and Automotive industry (15b.02.04). Three of these studies are scheduled for publication in 1971. Supplementary work will be done on the studies carried out in 1969 on the Copper industry (15b.02.05) and the Pharmaceuticals industry (15b.02.06).^{4/} Studies on the Tin-plate industry (15b.02.07) and on the Impact of major steel works projects on the steel industry of the developing countries (15b.02.08) are currently in progress.

275. In 1971, the programme will be continued with a study on the Demand for industrial machinery (15b.02.09). As this study will focus on future demand for industrial machinery, it will complement the industrial branch report dealing with the existing production of such machinery in the developing countries (cf. 15b.01.05). UNIDO also plans to carry out in 1971 projections for the Agricultural machinery industry (15b.02.10) as well as a perspective study of the Electrical machinery industry (15b.02.11).

276. In 1972, UNIDO proposes to continue this series with a study on the Construction industry (15b.02.12). In this study, an analysis will be made of the magnitudes involved in, and the impact of this sector on, the manufacturing industries of developing countries during the Second Development Decade. UNIDO also proposes to carry out in 1972 a perspective study of the Inorganic basic chemicals industry (15b.02.13). These chemicals are not only indispensable basic materials for the chemical industry itself, but are also of considerable importance for other industrial branches.

277. The projections and forecasts for the different industrial branches surveyed will subsequently be tested against the over-all projections carried out by the Industrial Policies and Programming Division.

Across-the-board techniques^{5/}

Packaging (15b.03)

278. Packaging, an essential component of many branches of industry, is still at an early stage of development in most of the developing countries. In addition to the technical

^{4/} Previously listed as 15b.02.04 in ID/B/61/Add.15.

^{5/} Across-the-board techniques, previously listed as 15b.03 in ID/B/61/Add.15, have been divided into three projects: packaging (15b.03); environmental engineering (15b.04) and product improvement through process control techniques (15b.05).

assistance that UNIDO has provided to packaging manufacturers and packers alike, assistance has also been given to individual countries in setting up institutions to co-ordinate and develop their packing industries. The activities in this field are threefold: surveys of the packaging industry and recommendations for its development; improvement of packaging techniques; and establishment of national and regional packaging research and promotion centres.

279. UNIDO has established contacts with the main regional packaging federations as well as with the World Packaging Organisation, under the auspices of which an international packaging congress will be held in Barcelona in 1972. UNIDO has been asked to participate in this congress.

280. Forms of technical assistance as well as the most efficient ways of generating and implementing projects in this field will be discussed at an Expert group meeting on packaging (15b.01.01)^{6/} to be held in the second half of 1971.

281. One of the recommendations of the joint UNIDO/ECLA Seminar on Tin-plate Production in Developing Countries held in 1970 (cf. 2.03.04) was that UNIDO should organize in 1972 a seminar on the Production and use of tin-plate containers in the developing countries (15b.01.02). The interest shown by ECLA in this seminar will be followed up and its co-operation sought.

282. In view of the interest shown by several developing countries, UNIDO plans to hold In-plant training programmes in packaging (15b.03.01). The first such programme, scheduled for 1972 in Spain, will concentrate on market requirements, technical facilities and institutional factors. Additional training programmes are planned for the English and French-speaking developing countries.

Environmental engineering (15b.04)

283. In recent years, developing countries have been giving increased attention to environmental engineering. The establishment of appropriate institutions to prevent environmental deterioration, the setting up and enforcing of environmental standards, and the introduction of appropriate techniques for reducing or abating pollution are problems related to industrial development and represent areas where technical assistance can be provided. Environmental considerations influence the selection of plant sites and also have an effect on the decisions regarding the technology to be introduced. UNIDO is assisting in the implementation of several projects in this field which are reported under the relevant groups of activity.

284. The preparations for the United Nations Conference on Human Environment, to be held in Stockholm in 1972, have given a new emphasis to the recognition of environmental problems. The contribution of UNIDO to the Conference will focus on the examination of the impact of environmental considerations on industrial development, with recommendations regarding preventive and remedial action. This contribution will take the form of a paper entitled Industrial development and human environment (15b.04.01).

^{6/} Previously listed as 15b.03.02 in ID/B/64/Add.19.

Product improvement through process control techniques (15b.05)

85. The role of product improvement through process control techniques as a factor in increasing industrial efficiency cannot be overemphasized. Isotopes and radiation processing is one of the means of improving quality and reliability in industrial production. In this context, UNIDO is co-operating in the preparation of several requests in such diverse branches as the sterilization of medical instruments, the development of cheap construction materials for housing, the introduction of radiation techniques in the cotton industry and the non-destructive testing of materials. In 1970, UNIDO commissioned a study on Radio-isotopes and radiation in industrial development (15b.05.01)^{1/} to consolidate the experience gained so far and to estimate the economic efficiency of the industrial applications already developed or presently envisaged.

86. National and international competition to improve quality as well as the interest of the developing countries in obtaining easier access to international markets have further strengthened the need for technical assistance related to product improvement through the application of more appropriate control techniques. It is expected that additional requests for technical assistance in this field will be submitted by the developing countries. UNIDO proposes therefore to conduct in 1972 Consultations on product improvement and process control techniques (15b.05.02: Priority B) in order to ascertain how its programme in this field can be strengthened and enlarged.

^{1/} Previously listed as 15b.03.01 in ID/B/64/Add.15.

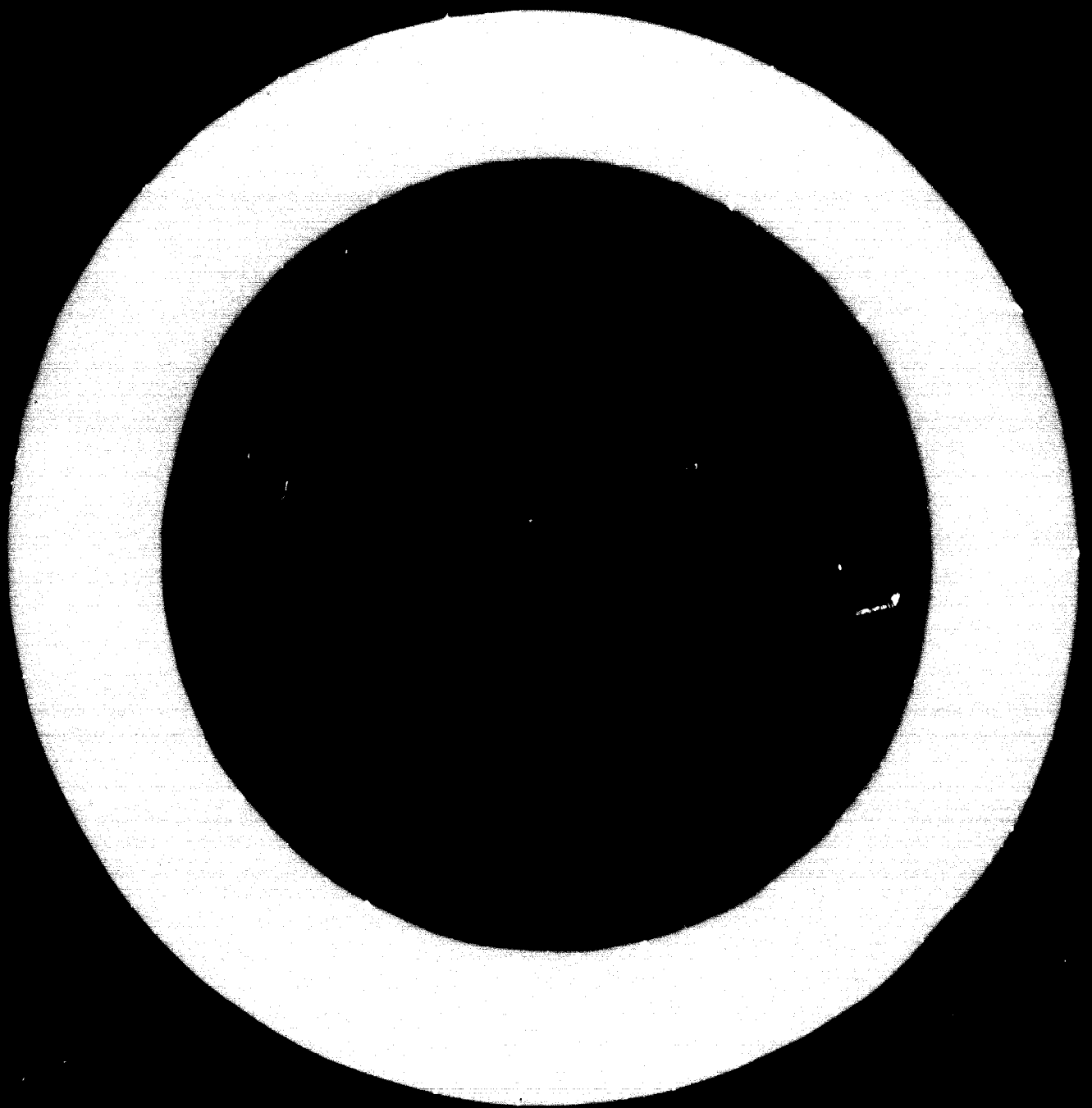


Table 2

Expenditures and estimated costs for manufacturing and other activities, 1970 - 1972
(in thousands of US dollars)

Project (Priority A)	Regular budget						Extra-budgetary resources				
	Staff m/a		Consultants			Report group meetings			1970	1971	1972
	1970	1971	1972	1970	1971	1972	1970	1971			
15b.01 Industrial branch reports											
15b.01.01	2.0	1.0	-	2.5	-	-	-	-	9.3 GTF	6.4 GTF	-
15b.01.02	1.0	1.0	-	-	-	-	-	-	-	5.9 GTF	-
15b.01.03	4.0	2.0	-	6.0	-	-	-	-	-	-	-
15b.01.04	3.0	2.0	-	4.0	-	-	-	-	-	-	-
15b.01.05	-	4.0	3.0	0.5	5.0	-	-	-	-	-	-
15b.01.06	-	-	3.0	-	-	5.0	-	-	-	-	-
15b.01.07	-	-	3.0	-	-	-	-	-	-	-	-
15b.02 Perspective studies for selected industrial branches in the 1970s											
15b.02.01	1.0	1.0	-	2.5	-	-	-	-	-	-	-
15b.02.02	1.0	-	-	-	-	-	-	-	-	-	-
15b.02.03	-	1.0	1.0	-	-	-	-	-	-	-	-
15b.02.04	2.0	1.0	-	-	-	-	-	-	-	-	-
15b.02.05	1.0	2.0	1.0	-	1.0	-	-	-	-	-	-
15b.02.06	2.0	2.0	1.0	-	1.0	-	-	-	-	-	-
15b.02.07	2.0	1.0	-	4.0	-	-	-	-	-	-	-
15b.02.08	1.0	2.0	2.0	6.0	1.0	-	-	-	-	-	-
15b.02.09	1.0	3.0	2.0	-	7.0	-	-	-	-	-	-
15b.02.10	-	3.0	2.0	-	-	-	-	-	-	-	-
15b.02.11	-	3.0	3.0	-	-	-	-	-	-	-	-
15b.02.12	-	1.0	6.0	-	-	10.0	-	-	-	-	-
15b.02.13	-	-	3.0	-	-	5.0	-	-	-	-	-

PRINTED PUBLICATIONS

1971 publications programme

Language

Cost
(USD)

Industrial branch reports

Iron and steel industry (15b.01.01)	E
Non-ferrous metals industry (15b.01.02)	E
Cement industry (15b.01.03)	E
Agricultural machinery industry (15b.01.04)	E

Prospectives for selected industrial branches in the 1970s

Petrochemicals industry (15b.02.01)	E
Textile industry (15b.02.02)	E
Automotive industry (15b.02.04)	E

Forecast of 1972 publications programme

Report of the expert group meeting on packaging (15b.03.01)	E
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Note: In the computation of the printing costs a standard formula was applied based on an average cost of internal and external printing.





22.7.74