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Agenda item 5(a) and (b)

PROGRAMME OF WORK FOR 1971 INCLUDING REPORT OF ACTIVITIES FOR 1969 AND UPDATING OF 1970 PROGRAMME

PART TWO

Group 2: Metallurgical Industries

id.70-056

NOTE

Documents ID/B/64/Add.1-15 contain a detailed description of the fifteen groups of activities of UNIDO for the years 1969 to 1971. A list of these fifteen groups appears in the preface to document ID/B/64.

The material in each addendum is organized as follows:

Introduction

A. Operational Activities

B. Supporting Activities

Section A on Operational Activities lists the field projects by technical assistance programmes (UNDP/SF, UNDP/TA, RP and SIS). Under each programme appears a detailed description of the projects approved as of 30 September 1969 and a forecast of new projects. The list of approved projects is followed by a summary of expenditures. Projects that have been completed in 1969 (barring possible extension) are indicated by an asterisk.

Section B on Supporting Activities is divided into "projects" corresponding to major areas of work, each project being subdivided into "components". Under each component, details of expenditure are given for the following items: staff man/months, meetings and consultants. The priorities A and B, under which the components are listed, apply to the programmed activities in 1970 and 1971, priority B indicating that implementation is subject to availability of funds. Unless otherwise indicated, expenditures on supporting activities are financed from the UNIDO Regular Budget. Because of the nature of the item, expenditures on publications are listed separately in this section. Finally, the section contains summary tables of expenditures on supporting activities by sources of funds for 1969, 1970 and 1971.

INTRODUCTION

1. In promoting industrialization of developing countries, account must be taken of the essential role of metals production. In this connexion, the establishment of metallurgical industries is a primary need, and one in which the assistance of UNIDO should be intensive.

2. The programme of UNIDO in the field of metallurgy has been guided by the general recommendations of the Industrial Development Board (see in particular, A/7617, para. 406, 409 d, f, g and j), of the Second Interregional Iron and Steel Symposium, Moscow, 1968 (ID/24, para. 46) and of the International Symposium on Industrial Development, Athens, 1967 (ID/11, para. 208, 219). These recommendations, as applied to the activities of Group 2, were that UNIDO should assist developing countries to utilize their natural resources of metallurgical raw materials and to establish their own supply of essential metallurgical products. Moreover, it was recommended that UNIDO should stimulate and support the creation in, and the transfer to, developing countries of metallurgical know-how.

3. The above recommendations have been supported by the pattern of requests received from the developing countries for technical assistance. In 1969, for example, twenty-seven projects in twelve countries were related to technical assistance for the utilization of local resources of metallurgical raw materials, and twenty-nine projects in fifteen countries provided technical assistance for the development of metallurgical industries to supply the local market. Other projects in the metallurgical sector dealt with special problems, but all involved the transfer of know-how related to both extractive metallurgy and transformation (rolling, forging, casting etc.).

4. Future requests for technical assistance may differ from the above pattern as increased interaction between field and supporting activities demonstrates the need and desirability of assistance in new areas. In particular, a shift of interest is anticipated towards quality control,

metal product characteristics, application and behaviour of alloys, applied research and development of new metallurgical processes and metal products, productivity, automation and engineering and design of metallurgical equipment. It is to be expected that the number of projects related to production of non-ferrous metals (especially aluminium) will increase appreciably. The same applies to projects related to metal transforming and application (as opposed to metal extraction) and to special aspects of management and operation of metallurgical industries.

5. Among the expert group meetings scheduled by UNIDO in 1969 was one on recent developments in lead and zinc production (ID/B/26, para. 58). The meeting dealt with ways of increasing domestic processing of these metals in developing countries. Another meeting, on the utilization of non-ferrous scrap metal (ID/B/26, para. 59), examined relevant technological and economic aspects of the utilization in developing countries of valuable non-ferrous scrap. An expert group meeting will be held in 1970 on the installation of alumina testing laboratories (ID/B/44, para. 82), to be followed by a group study, in co-operation with ECAFE, of alumina and aluminium production facilities in Asia (ID/B/44, para. 81). It is also planned to hold in 1970 a seminar on copper production (ID/B/44, para. 83); in the iron and steel sector, a seminar will be held on tin plate production (ID/B/44, para. 87) as well as a workshop, in co-operation with ECE, on pelletizing (ID/B/44, para. 86).

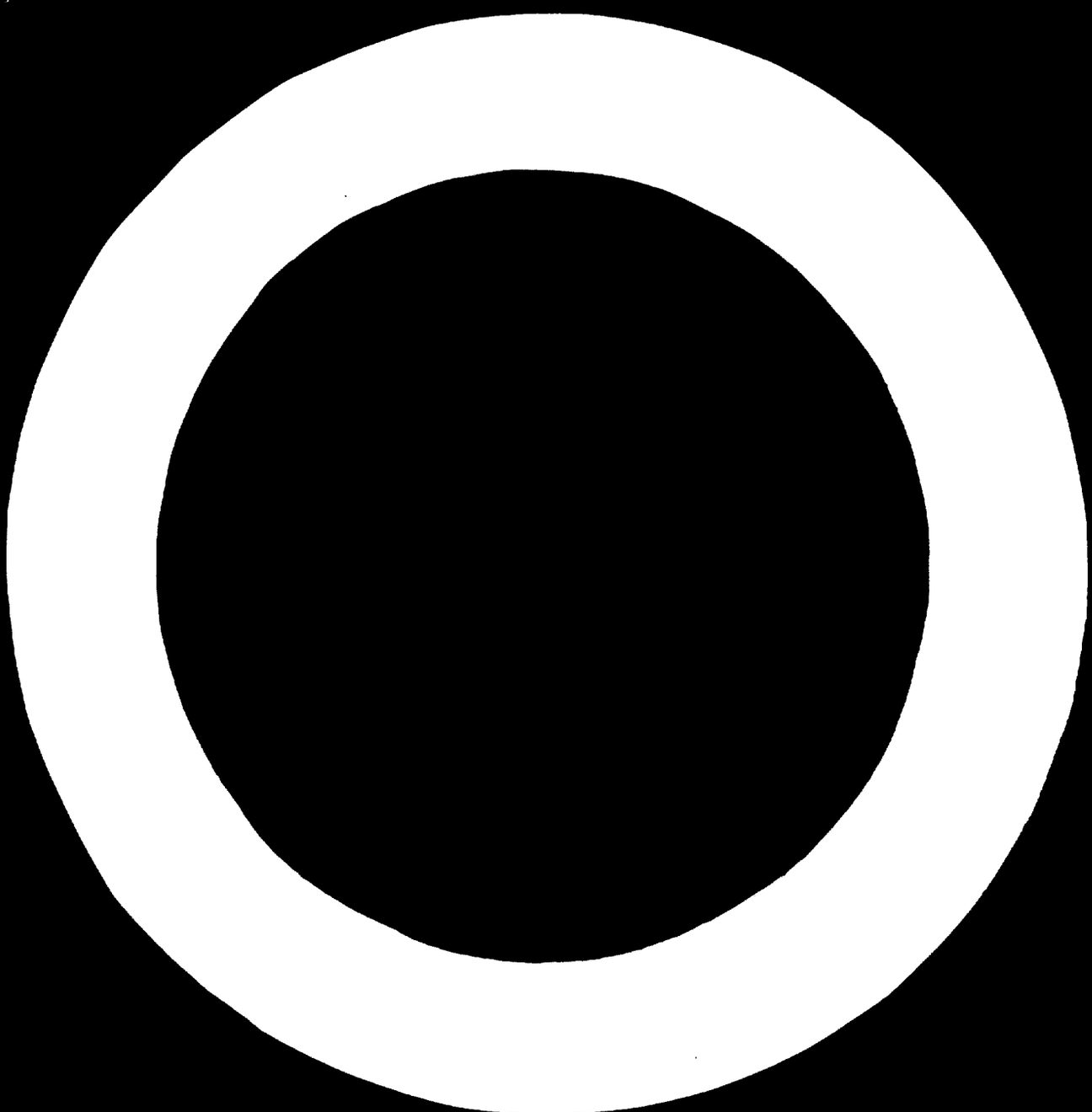
6. In keeping with the recommendations mentioned previously, and recognizing the interest of many countries in the exploration and industrialization of their natural deposits of complex titanium-iron ores, UNIDO proposes to hold a seminar in 1971 on the processing of such ores. Many problems common to certain developing countries have been identified by the findings of eight technical assistance projects processed by UNIDO in 1969.

7. In the iron and steel sector, a number of developing countries have expressed interest in recent technological developments in the production of ferro-alloys, as intermediate raw materials, for export or for local use. On the basis of this interest, UNIDO proposes to convene a workshop on ferro-alloys in 1970.

8. Much attention has been devoted in developing countries to the possibilities of direct reduction processes through which iron can be produced without using blast furnaces and coking coal, a raw material that is lacking in most developing countries. Thus one UNIDO mission examined the possibility of the application of direct reduction processes in a developing country. The findings in this case indicated the complexity of the problem and the need for the development of further guidelines. Accordingly, a meeting is proposed for 1971, in co-operation with ECE, to deal with processes for direct reduction of iron ore in the expectation that a clearer pattern of the development of this technique will have emerged by that date.

9. Another group of problems facing the developing countries is related to the creation of foundry shops to produce cast iron, steel, aluminium and copper alloy castings for local industry and for the consumer market. Accordingly, a workshop on foundry technology is proposed for 1971 to identify problems and recommend action leading to their solution.

10. In recognition of the fact that practically all technical assistance projects in the metallurgical sector involve transfer of technology, a new project area has been included in the programme proposal for 1971. The new project will be based on a workshop on the creation and transfer of metallurgical know-how. The proposed workshop is to identify problems and to formulate plans with the aim of assisting the developing countries to develop, in the near future, autochthonous sources of highly specialized metallurgical expertise (for research and development of new processes, equipment and products; for planning, design and construction of metallurgical installations; and for effective transfer and adaptation of technologies developed elsewhere).



A. OPERATIONAL ACTIVITIES

UNDP/SPECIAL FUND - projects submitted to UNDP for approval

Project number

AFRICA

Swaziland

SWA-3 **Beneficiation of iron ore**

Purpose: To assist in investigating the technical and economic feasibility of beneficiation and pelletising of Swaziland's iron ore deposits by studies covering the extent and quality of available reserves, the most suitable methods of processing, type, size and location of plant, transportation, markets, financing, and others. The first phase of the project will be undertaken as an extension of the present Special Fund mineral survey project.

Duration: 9 months

Est. UNDP: $ 83,200
Est. Gov't: $ 53,200

United Arab Republic

UAR-63 **Central metallurgical research and development institute**

Purpose: To establish a central metallurgical research and development institute to work in co-operation with the existing enterprises in ore dressing, metal extraction, metal engineering, physical metallurgy and related fields.

Duration: 5 years

Est. UNDP: $1,050,000
Est. Gov't: $4,000,000

THE AMERICAS

Chile

CHI-42 **Centre for experimentation and investigation of industrial processes for minerals**

Purpose: To assist the National Mining Enterprise (ENAMI) in the establishment of an institute to study possibilities for exploitation and industrialisation of the country's mineral resources.

Duration: 5 years

Est. UNDP: $1,820,000
Est. Gov't: $5,300,000

UNDP/TECHNICAL ASSISTANCE - approved projects

Project number			1969	1970	1971
			(in US dollars)		
	AFRICA				
	Nigeria				
NIR-69-23	Assistance to the steel industry* - study tour				
	fellow	1/1 m/m	1,400	-	-
	Senegal				
SEN-69-5	Assistance to SAPAL - aluminium industries				
	expert	1/12 m/m	-	24,000	-
	THE AMERICAS				
	Argentina				
ARG-68-6	Assistance to the National Institute for Industrial Technology (INTI) - division of mechanical and metallurgical industries (mining technology)				
	expert	1/4 m/m	-	8,000	-
	fellow	1/6 m/m	3,400	-	-
ARG-68-5	Development of aluminium industry - aluminium chemistry, production of aluminium from local raw materials, assistance to the Commission for the Development of Light Metals (COPEDFSMEL)				
	expert	1/5 m/m	-	10,000	-
	ASIA AND THE FAR EAST				
	Mongolia				
MON-68-12	Manufacturing of precious and semi-precious stones - stone dressing				
	expert	1/6 m/m	5,775	6,000	-
	fellows	2/8 m/m	5,200	-	-
	equipment		6,000	-	-

UNIDO/TECHNICAL ASSISTANCE - [redacted] projects (cont'd)

Project number		1969	1970	1971
		(in US dollars)		
	ASIA AND THE FAR EAST (cont'd)			
	Pakistan			
PAK-69-5	Iron and steel manufacturing - assistance to the Ministry of Industry in the appraisal of existing feasibility studies for steel mill projects			
	expert 1/6 m/m	1,925	10,000	-
	Philippines			
PHI-68-2	Steel industry - assistance to the presidential economic staff			
	foundry specialist 1/3 m/m	-	6,000	-
	hot and cold roll expert 1/20 m/m	5,775	24,000	10,000
	EUROPE AND THE [redacted]			
	Bulgaria			
BUL-68-9	Solubility and interphase distribution in the refining processes of heavy non-ferrous metals*			
	fellow 1/4 m/m	2,600	-	-
BUL-68-11	Production of alloy steels* - LD and Kaldo converters			
	fellow 1/4 m/m	2,600	-	-
	Hungary			
HUN-69-10	Modern high-speed processes for aluminium production*			
	fellow 1/3 m/m	2,200	-	-

UNDP/TECHNICAL ASSISTANCE - approved projects (cont'd)

Project number			1969	1970	1971
			(in US dollars)		
	EUROPE AND THE MIDDLE EAST (cont'd)				
	Poland				
POL-69-1	Industrial technology* - training in modern processes in metallurgical industries				
	fellows	10/30 m/m	12,000	-	-
POL-69-21	Cold extrusion of steel*				
	fellow	1/6 m/m	2,400	-	-
	Romania				
ROM-69-2	Metallurgical production quality control* - assistance to the Metallurgical Research Institute, Bucharest				
	expert	1/1 m/m	1,925	-	-
	fellows	3/9 m/m	6,600	-	-
	equipment		1,475	-	-
ROM-69-6	Industrial metrology* - electronic measurement and automation of metrology operations				
	fellows	2/6 m/m	4,400	-	-
	Turkey				
TUR-68-1	Industrial planning*				
	expert	1/12 m/m	23,100		-
TUR-68-2	Upgrading and briquetting of lignite - lignite utilisation; continuing project				
	expert	1/12 m/m	23,100	-	-

UNDP/TECHNICAL ASSISTANCE - approved projects (cont'd)

Project number			1969	1970	1971
			(in US dollars)		
	EUROPE AND THE MIDDLE EAST (cont'd)				
	Turkey (cont'd)				
TUR-68-11	Metallurgical industry - hot calcine reverbertory furnaces				
	expert	1/12 m/m	1,925	22,000	-
TUR-68-12	Assistance to the aluminium industry - critical path method application in the erection and management of an aluminium complex (project started under SIS 68-313)				
	expert	1/12 m/m	3,850	20,000	-
	Yugoslavia				
YUG-68-8	Modern technology mastering in Bosnia and Herzegovina in iron and steel metallurgy - steel vacuum treatment, quality control in rolling mills, development of mathematical models, electronic microscope technique				
	experts	6/10 m/m	7,700	6,000	6,000
	fellows	19/61 m/m	17,600	11,400	14,400
	equipment		4,700	12,225	12,425

Table 1

Estimated expenditures for approved UNDP/TA projects, 1969-1971

	1969		1970		1971	
	m/m	US$	m/m	US$	m/m	US$
Experts	10/39	75,075	11/68	136,000	3/8	16,000
Fellows	31/103	54,800	5/15	11,400	6/20	14,400
Other	-	12,175	-	12,225	-	12,425
Total		142,050		159,625		42,825

UNDP/TECHNICAL ASSISTANCE - forecast of new projects for 1971

	Experts m/m	Fellows m/m	Other US$
AFRICA			
Establishment of small-scale foundry	3/9	-	-
Assistance in establishing an aluminium industry	2/12	3/12	-
Utilization of titanium-iron ores	3/18	3/18	75,000
Iron ore beneficiation and agglomeration	1/4	-	-
Direct reduction of iron ores for the production of sponge iron	2/12	-	-
Assistance in utilization of bauxite deposits	2/24	-	-
Evaluation of studies on copper industry	2/6	-	-
THE AMERICAS			
Utilization of aluminium silicate ores for production of aluminium-silicon alloys	2/12	-	-
Assistance in the improvement of secondary non-ferrous metals utilization	1/6	2/12	-
Utilization of titanium-iron ores	2/8	2/12	-
Direct reduction of iron ores for the production of sponge iron	1/6	-	-
Development of coal and coke industry	1/6	-	-
Assistance in quality control of tin plate production	2/12	6/36	-

UNDP/TECHNICAL ASSISTANCE - forecast of new projects for 1971 (cont'd)

	Experts m/m	Fellows m/m	Other US$
ASIA AND THE FAR EAST			
Iron and steel industry establishment surveys	2/12	-	-
Utilization of titanium-iron ores	3/18	3/18	100,000
Direct reduction of iron ores for the production of sponge iron	3/18	-	-
Assistance in the production of tin plate	1/12	6/36	-
Assistance in the establishment of lead-zinc smelting complex	2/12	2/12	-
Assistance in the development of aluminium industry	2/12	-	-
Ferro-alloy industries	2/12	-	-
Assistance in establishing an aluminium industry	1/12	-	-
Assistance in the improvement of secondary non-ferrous metals utilisation	1/4	1/6	-
EUROPE AND THE MIDDLE EAST			
Assistance for the development of aluminium industry	1/12	2/12	-
Direct reduction of iron ores for the production of sponge iron	2/12	-	-
Assistance in the improvement of secondary non-ferrous metals utilisation	2/11	1/6	-
Modern technologies in iron and steel industries	-	7/42	-

UNIDO REGULAR PROGRAMME - approved projects

Project number			1969	1970
			(in US dollars)	
	AFRICA			
	Morocco			
RP-02-59	Metallurgical industry*			
	expert	1/6 m/m	12,400	-
	United Arab Republic			
RP-02-3	Metallurgical industry - assistance with modern techniques in the metallurgical industry (quality control)			
	experts	2/6 m/m	-	11,550
	Regional			
RP-02-7	Metallurgical industries			
	regional adviser	1/12 m/m	-	24,500
RP-02-45	Iron and steel industry*			
	regional adviser	1/12 m/m	27,000	-
	THE AMERICAS			
	Chile			
RP-02-2	Metallurgical industries - industrial processing of copper			
	fellows	2/8 m/m	-	5,200
	Colombia			
RP-02-91	Steel industry* - manufacture of iron and steel and steel rolling			
	fellows	3/15 m/m	8,000	-

UNIDO REGULAR PROGRAMME - approved projects (cont'd)

Project number			1969	1970
			(in US dollars)	
	THE AMERICAS (cont'd)			
	Ecuador			
RP-02-2	Metallurgical industries - basic metals			
	fellow	1/6 m/m	-	3,400
RP-02-94	Steel industry*			
	expert	1/6 m/m	11,550	-
	Venezuela			
RP-02-107	Metallurgical industries* - iron and steel processing			
	fellows	3/7 m/m	4,800	-
	Regional			
RP-02-3	Metallurgical industries			
	regional adviser	1/12 m/m	-	24,500
RP-02-108	Metallurgical industries			
	regional adviser	1/12 m/m	23,600	-
	ASIA AND THE FAR EAST			
	India			
RP-02-57	Iron and steel industry* - foundry			
	fellows	2/12 m/m	6,800	-
	Republic of Korea			
RP-02-74	Metallurgical industries* - iron and steel industry			
	fellow	1/6 m/m	3,400	-

UNIDO REGULAR PROGRAMME - approved projects (cont'd)

Project number			1969	1970
			(in US dollars)	
	ASIA AND THE FAR EAST (cont'd)			
	Pakistan			
RP-02-4	Metallurgical industries - iron and steel production			
	fellows	2/12 m/m	-	6,800
	Regional			
RP-02-8	Metallurgical industries			
	regional adviser	1/12 m/m	-	24,500
RP-02-82	Metallurgical industries*			
	regional adviser	1/12 m/m	23,600	-
	EUROPE AND THE MIDDLE EAST			
	Jordan			
RP-02-128	Metallurgical industries*			
	fellows	2/12 m/m	6,800	-
	Poland			
RP-02-2	Metallurgical industries - iron and steel production			
	fellows	2/6 m/m	-	3,000
RP-02-118	Metallurgical industries - steel production			
	fellows	6/18 m/m	7,200	-

UNIDO REGULAR PROGRAMME - approved projects (cont'd)

Project number			1969	1970
			(in US dollars)	
	EUROPE AND THE MIDDLE EAST (cont'd)			
	Romania			
RP-02-120	Metallurgical industries* - soldering of light alloys			
	fellows	5/15 m/m	6,000	-
	Turkey			
RP-02-2	Metallurgical industries			
	iron and steel industries			
	fellow	1/6 m/m	-	3,400
	aluminium industries			
	fellow	1/6 m/m	-	3,400
	copper industries			
	fellow	1/5 m/m	-	3,000
	INTERREGIONAL			
RP-02-3	Metallurgical industries			
	interregional adviser	1/12 m/m	-	24,500

Table 2

Estimated expenditures for approved RP projects, 1969-1970

	1969		1970	
	m/m	US$	m/m	US$
Experts	5/48	98,150	5/54	109,550
Fellows	22/85	43,000	10/50	28,200
Other	-	-	-	-
Total		141,150		137,750

UNIDO REGULAR PROGRAMME - forecast of new projects for 1971

	Experts m/m	Fellows m/m
AFRICA		
Aluminium industries	1/6	-
Industrial processing of copper	-	1/12
Iron and steel industry	-	2/12
Regional adviser - iron and steel industry	1/12	-
THE AMERICAS		
Coal and coke industry development	-	2/12
Regional adviser - iron and steel industry	1/12	-
ASIA AND THE FAR EAST		
Modern techniques in the metallurgical industry - quality control	-	2/12
Iron and steel production	-	1/12
Aluminium production	-	1/6
Basic metallic industry	-	1/6
Regional adviser - iron and steel industry	1/12	-
EUROPE AND THE MIDDLE EAST		
Iron and steel industry	-	3/9
Aluminium industries	-	2/6
INTERREGIONAL		
Interregional adviser on metallurgical industries	1/12	-

SPECIAL INDUSTRIAL SERVICES - approved projects

Project number			1969	1970
			(in US dollars)	
	AFRICA			
	Liberia			
67/133 LIR-5	**Assistance to steel project co-ordinating unit*** - study on the establishment of an integrated iron and steel industry (iron and steel industrial engineer)			
	adviser	1/8 m/m	18,700	-
	Morocco			
69/480 MOR-11	**Iron ore pelletising marketing study**			
	expert	1/2 m/m	2,500	2,500
	Senegal			
67/191 SEN-2	**Development of an aluminium foundry shop*** - foundry specialist			
	expert	1/15 m/m	31,000	-
	fellow	1/6 m/m	3,600	-
	Tunisia			
67/74 TUN-4	**Assistance for the development of the Société de Fonderie et de Mécanique (SOFONECA)** - produotion engineer			
	expert	1/12 m/m	19,500	6,500
	United Arab Republic			
68/234 UAR-16	**Advisory mission on the techno-administrative structure of heavy mineral black beach sands project** - management and administration, marketing economist, and mineral benefication adviser			
	experts	3/5 m/m	15,000	-

SPECIAL INDUSTRIAL SERVICES - approved projects (cont'd)

Project number			1969	1970
			(in US dollars)	
	AFRICA (cont'd)			
	United Arab Republic (cont'd)			
68/425 UAR-25	Assistance to Aswan steel project - metallurgical advisers			
	experts	3/11 m/m	4,000	20,000
	THE AMERICAS			
	Argentina			
68/286 ARG-6	Assistance in the establishment of an aluminium industry			
	consulting firm		3,500	14,000
69/498 ARG-10	Steel products marketing* - marketing study on the pattern of metal products (iron and steel adviser)			
	expert	1/3 m/m	7,000	-
	Chile			
69/514 CHI-5	Capacity study of iron and steel industry* - iron and steel adviser			
	expert	1/1 m/m	2,000	-
69/587 CHI-6	Assistance to Instituto Nacional de Investigacion Tecnologicas y Normalizacion (INDITECNOR) - iron and steel adviser			
	expert	1/1 m/m	2,300	-
	ASIA AND THE FAR EAST			
	Ceylon			
68/285 CEY-4	Assistance to the Mineral Sands Corporation* - metallurgical adviser			
	expert	1/5 m/m	8,500	-

SPECIAL INDUSTRIAL SERVICES - approved projects (cont'd)

Project number		1969	1970
		(in US dollars)	
	ASIA AND THE FAR EAST (cont'd)		
	Ceylon (cont'd)		
69/563 CEY-13	**Development of the gem industry** - technical adviser		
	expert 1/3 m/m	-	6,000
	China		
68/443 CHA-10	**Assistance to Taiwan Aluminium Corporation*** - production of aluminium beer cans		
	expert 1/4 m/m	7,000	-
69/540 CHA-14	**Metal industry research and development** - metallurgist		
	expert 1/6 m/m	2,000	10,000
	India		
69/486 IND-13	**Assistance to Indian glass industry** - marketing adviser, processing adviser		
	experts 2/6 m/m	1,925	9,625
	Indonesia		
68/322 INS-9	**Assistance to the Tjilegon steel plant - wire drawing mill*** (steel wire mill expert)		
	expert 1/12 m/m	22,000	-
	Iran		
69/519 IRA-20	**Comparative study of Iranian and Greek iron ores*** - exploratory mission		
	expert 1/1 m/m	1,900	-

SPECIAL INDUSTRIAL SERVICES - approved projects (cont'd)

Project number			1969	1970
			(in US dollars)	
	EUROPE AND THE MIDDLE EAST			
	Israel			
69/502 ISR-2	Assistance to metal-finishing industry - mechanical/chemical engineer			
	expert	1/6 m/m	1,925	9,625
	Romania			
68/315 ROM-1	Welding of lightweight alloys - mechanical/ production consultant			
	experts	2/6 m/m	7,700	3,850
	equipment		3,500	-
69/530 ROM-6	Metal corrosion prevention			
	experts	3/5 m/m	-	12,000
	fellows	3/8 m/m	7,600	4,400
	equipment		-	3,500
	Syria			
68/306 SYR-8	Assistance to steel rolling mill - steel rolling adviser			
	expert	1/14 m/m	3,000	23,500
69/513 SYR-18	Assistance to integrated iron and steel industry - iron and steel adviser			
	expert	1/4 m/m	2,000	6,000
	Turkey			
67/195 TUR-4	Assistance in surveying the iron and steel industry* - iron and steel adviser			
	expert	1/6 m/m	15,000	-
68/313 TUR-11	Feasibility study on the establishment of an aluminium industry - production adviser, fabrication adviser, and application adviser			
	experts	3/14 m/m	12,200	16,200

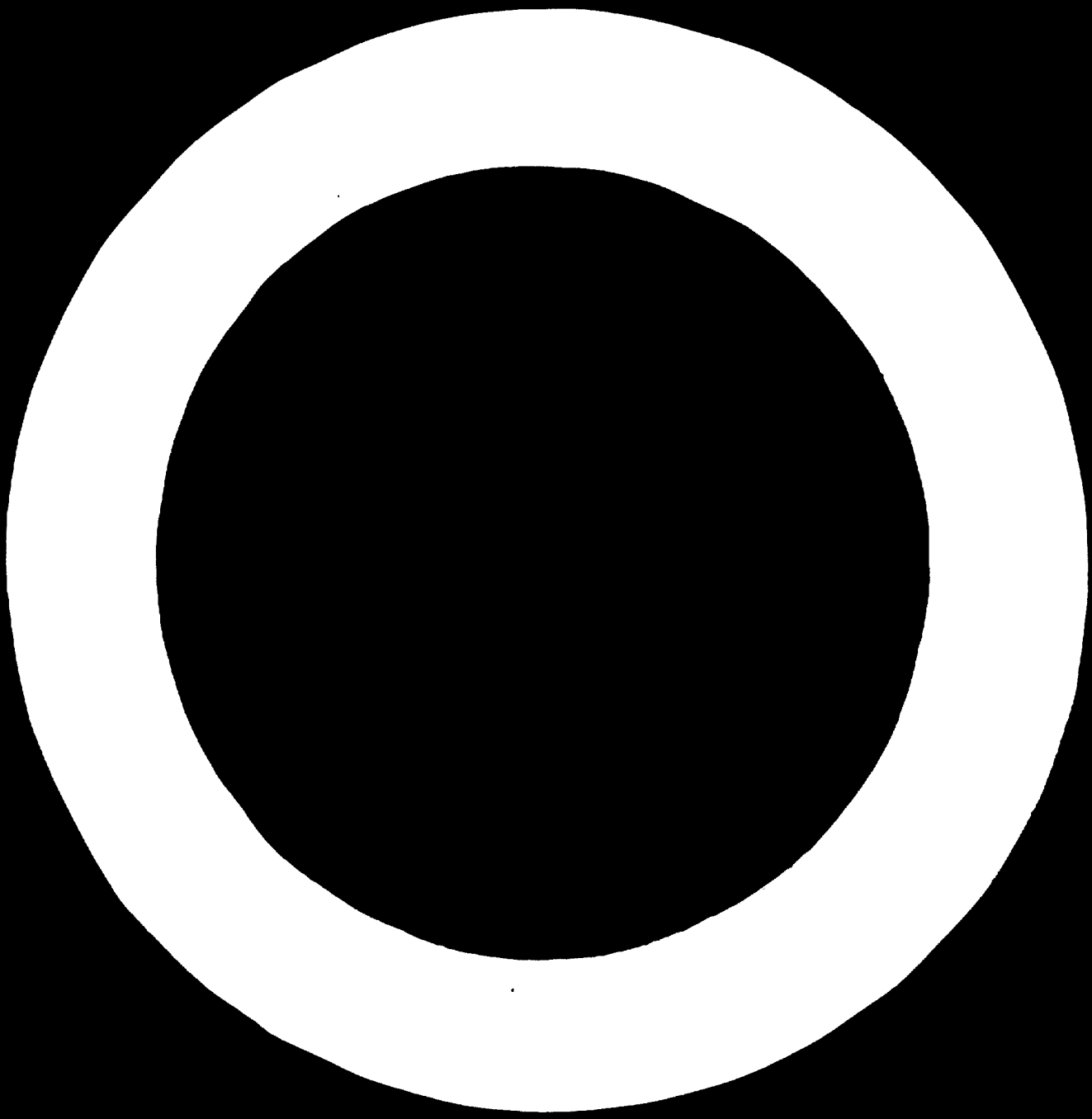
SPECIAL INDUSTRIAL SERVICES - approved projects (cont'd)

Project number		1969	1970
		(in US dollars)	
	EUROPE AND THE MIDDLE EAST (cont'd)		
	Yugoslavia		
68/456 YUG-7A	Vacuum steel degassing project - steel vacuum degassing adviser		
	expert 1/6 m/m	2,000	10,000
69/457 YUG-7B	Roll pass design expert* - roll pass design adviser		
	expert 1/2 m/m	5,000	-
69/459 YUG-7B	Stainless and alloy steel rolling - stainless and alloy steel rolling adviser		
	expert 1/3 m/m	2,000	5,000
69/460 YUG-7B	Assistance to the Zenica Plant on iron and steel production - iron and steel adviser		
	expert 1/4 m/m	-	8,000
69/461 YUG-7P	Steel ingot re-heating and soaking project		
	expert 1/2 m/m	-	5,000

Table 3

Estimated expenditures for SIS projects, 1969-1970

	1969		1970	
	m/m	US$	m/m	US$
Experts	32/89	195,750	24/75	153,800
Fellows	4/14	11,200	-	4,400
Others	-	7,050	-	17,500
Total		214,000		175,700



B. SUPPORTING ACTIVITIES

11. The supporting activities for 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

12. As was mentioned in the prefatory remarks to the section on supporting activities in Part One (ID/B/64), the objective of the supporting activities is to establish a two-way flow of information and experience between the supporting activities at headquarters and the field. A great deal of material on which headquarters' studies and meetings are based is derived from information received from the field. In turn, the studies and meetings are intended to improve the substantive support given by headquarters to the field operations. In many cases these results are fed directly to the field in the form of reports. In all cases, they constitute an accumulation of knowledge and experience on which both headquarters and field staff are able to draw in response to the needs arising in the technical assistance operations.

Light non-ferrous metals (2.01)

13. The supporting activities under this heading cover a wide range of activities in the field of non-ferrous metallurgy - from ore preparation to metal fabrication and forming for aluminium, titanium and magnesium. Many developing countries export bauxite, some export alumina, and a few produce aluminium largely for internal consumption. Moreover, certain developing countries have deposits of titanium-bearing ores that can be processed into valuable titanium-oxide-rich products and pig iron.

14. The interest of developing countries in this industrial activitiy is reflected by the requests for technical assistance received by UNIDO. During 1969, seven requests were related to aluminium metallurgy in four

countries and eight projects were related to processing of titanium-iron ores in four countries. Preliminiary findings indicate that many developing countries are faced with similar problems that need further analysis leading to the establishment of guidelines.

Alumina and aluminium production (2.01.01)

15. In recognition of the need for guidelines, and in line with the recommendations made by the expert group meeting that studied the production of alumina from various ores in November 1967, UNIDO proposes to prepare a special study in 1970 on the installation of alumina testing laboratories (ID/B/44, para. 82), to be followed by an expert group meeting on alumina and aluminium production facilities in Asia, to be held in co-operation with ECAFE (ID/B/44, para. 81). The report of the meeting is expected to provide guidance to governments of the ECAFE region for the development of their aluminium industries.

16. In preparation for these activities, two studies will be completed in 1969 on purposes, methods and costs of bauxite and alumina testing laboratories; two other studies have been commissioned on problems of interest to the aluminium industry of Asia. It is envisaged that these special studies will be presented at the Second Asian Conferenoe on Industrial Development.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	3	-	3,600
1970	4	11,200[a/]	6,000[a/]
1971	4	-	-

a/ From the General Trust Fund of UNIDO.

Seminar on complex titanium-iron ore processing (2.01.02)

17. UNIDO proposes to hold a seminar of one week's duration in 1971 to examine the processing of complex titanium-iron ores, including such problems as the separation of valuable components, the processing of titanium-rich concentrates to titanium-bearing intermediate products, the manufacture of pigment grade titanium oxide and the possible utilization of the iron contained in these ores. A number of developing countries have extensive deposits of these ores, and several field projects have been carried out in some of these countries. It is tentatively planned to hold this seminar in the Union of Soviet Socialist Republics where know-how in processing of titanium ores has been highly developed. About twelve experts from developing and developed countries will be invited, as well as ten to twelve other partioipants and observers.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	-	-	-
1971	5	12,000[a/]	8,500[b/]

a/ Inoluding $6,000 from the General Trust Fund of UNIDO and $6,000 from UNDP/TA

b/ Inoluding $7,500 from the General Trust Fund of UNIDO

Heavy non-ferrous metals (2.02)

18. The supporting activities in this projeot area are related to the production and fabrication of heavy non-ferrous metals suoh as oopper, tin, lead, sino, oobalt and niokel. Many developing oountries are suppliers of heavy non-ferrous metal ores and conoentrates and, in some instanoes, of primary metal. Most of these oountries aspire to inorease the extent of local processing of these ores, oonoentrates and metals, in order to raise the export value or to satisfy the internal market.

Expert Group Meeting on Lead and Zinc Industries (2.02.01)

19. Sponsored by UNIDO, an Expert Group Meeting on Lead and Zinc Industries was held in London in 1969 (ID/B/26, para. 58). The meeting was attended by 54 participants from 22 countries; two experts and seventeen observers came from developing countries. At the meeting, fourteen papers were presented on the subject of recent technological developments in lead and zinc production and their significance for developing countries. In addition, two papers were presented on the prospects for establishing lead and zinc industries in developing countries in the near future. Among the recommendations for action that were made at the meeting were assistance to developing countries in assessing ore bodies and advice on the most appropriate metallurgical processing methods. The information and advice have already been of use to at least one developing country at a critical stage of the planning of its lead and zinc industry. UNIDO is now in a better position to define and implement technical assistance in this branch of metallurgy. A draft report of the meeting was prepared and approved by the participants; it will be published in 1970.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	4	2,643	4,000
1970	1	-	-
1971	1	-	-

Seminar on copper production and group study tour of copper plants (2.02.02)

20. There is great interest on the part of a number of developing countries in expanding their copper production for export, while others intend to produce for their domestic markets. In recognition of the importance of the

copper industry to developing countries, UNIDO plans to hold a seminar[1] in 1970, probably in the Union of Soviet Socialist Republics, in conjunction with a study tour of copper plants (ID/B/44, para. 83), which will assess the present state of the technology of production of copper with reference to the possibilities of expanding the production of this metal in developing countries. Representatives of ILO and the regional economic commissions will be invited to attend the meeting. The report of the seminar and study tour will be issued in 1971.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	2	21,600[a]	4,500
1971	4	-	-

a/ Including $11,600 from the General Trust Fund of UNIDO and $10,000 from UNDP/TA.

Iron and steel (2.03)[2]

21. This project area includes the preparation of iron ores, coke making, iron making, steel making, rolling and finishing operations in the production of steel as well as the metallurgical aspects of welding, forging and other metal forming techniques. Most developing countries plan to establish or expand their own iron and steel industries. The interest of developing countries for assistance in this branch of industry can be gauged from the fact that in 1969 some 30 technical assistance projects were active, corresponding to requests from sixteen countries.

1/ It should be noted that the type of the meeting has been changed from expert group meeting to a seminar and group study tour, and the scope reduced from "copper, cobalt and nickel" to "copper".

2/ Attention is also called to the in-plant training programme in iron and steel industries being carried out by Group 10 in Zaporoshye, USSR.

Report and proceedings of the Second Interregional Iron and Steel Symposium (2.03.01)

22. The second interregional symposium on the iron and steel industry, held in Moscow in 1968,[3/] was attended by a total of 148 participants from 43 countries. In connexion with the symposium, plant study tours were held in Czechoslovakia, France, India, Poland, the Union of Soviet Socialist Republics and the United Kingdom.

23. During the course of the symposium, a draft report was prepared which was approved by the participants. The report of the symposium, which contained a summary of the information presented in the papers and a summary of the relevant discussions, was issued during the third quarter of 1969. The proceedings of the symposium are being prepared and will be published in 1971. Plans for a third interregional symposium are under study.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	10	-	3,000
1970	2	-	-
1971	2	-	-

Workshop on ferro-alloys (2.03.02)

24. Ferro-alloys are essential intermediate raw materials for steel production. A number of developing countries have exceptionally good deposits of the ores needed for ferro-alloy production and possess a potential for inexpensive electric power generation, thus meeting two of the prime requisites for developing ferro-alloy production. Technical assistance in this field has been requested from UNIDO by several countries. Initial findings show a need for a review of recent technological developments in, and

3/ It will be recalled that the first interregional symposium on the iron and steel industry was held in Prague and Geneva in 1963.

economic aspects of, the production of ferro-silicon, ferro-manganese, ferro-chromium and other ferro-alloys.

25. Subject to availability of funds, UNIDO plans to hold a workshop in Vienna in 1971 to examine this problem and to provide recommendations for action on the part of developing countries and UNIDO. The proposed duration of the meeting is five days, and ten experts are expected to attend. The workshop will also assess the possibilities for the development of this industry in a number of developing countries in order to ensure a domestic supply of ferro-alloys and, in certain instances, to permit an increase in the earnings of foreign exchange through exports. Experience gained through technical assistance projects will be considered. Representatives of ILO and of the regional economic commissions will be invited to the meeting.

Priority B

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	2	-	-
1971	4	10,000[a/]	6,600[b/]

a/ Including $2,000 from the General Trust Fund of UNIDO and $8,000 from UNDP/TA.

b/ Including $1,600 from the General Trust Fund of UNIDO.

Expert group meeting on direct reduction processes (2.03.03)

26. Direct reduction processes have been a subject of great interest to the iron and steel industry as they may offer an alternative to conventional blast furnace operations. These processes are of particular importance to the great majority of developing countries which do not possess domestic deposits of coking coal.[4/] Continuous and intensive efforts have been made to obviate

4/ The most widely-used direct reduction process, the Hojalata y Lamina (HYL) process, was developed in Mexico.

the need for blast furnaces; many inventions, patents, proposals, research and development projects and reports are available on the subject. However, conflicting views exist as to their relative merits. In order to assess the technological and industrial potentialities of these processes, and to make recommendations for the operational programme of UNIDO in this sector, it is proposed to convene an expert group meeting, in co-operation with ECE, subject to availability of funds, in Geneva in 1971. Eight experts are expected to evaluate direct reduction processes from technical and economic points of view and to assess their applicability in developing countries. The meeting is to be attended by a small number of participants and is expected to last five days. Representatives of the regional economic commissions will be invited to attend this meeting.

Priority B

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	2	-	-
1971	4	7,000[a/]	8,100[b/]

a/ Including $5,000 from the General Trust Fund of UNIDO.

b/ Including $800 from the General Trust Fund of UNIDO.

Seminar on tin plate production (2.03.04)

27. In 1970, a seminar on tin plate production will be held in Latin America, in conjunction with ECLA (ID/B/44, para. 87). The report of this seminar, which will be published in 1971, will review recent technological developments in tin plate production with particular emphasis on the experience obtained in certain developing countries. The report will also contain an evaluation of the physical requirements of tin plate for use in food canning and other industries in developing countries.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	2	8,000	6,000
1971	2	-	-

Workshop on pelletising (2.03.05)

28. A workshop on iron ore preparation and pelletising is planned to be held in Geneva in 1970, in conjunction with ECE (ID/B/44, para. 86). The report of the workshop will contain a review of the economic and technical factors determining the future role of pelletising in iron and steel making. This information will be of particular interest to developing countries that export iron ore.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	2	6,000a/	5,000a/
1971	2	-	-

a/ From the General Trust Fund of UNIDO.

Foundries (2.04)

29. UNIDO has carried out a number of technical assistance projects under this heading that covers production of castings of iron, steel, aluminium, copper, bronze and other metals. Included are foundries ranging from small sand-casting installations for simple products to large, highly automated installations for centrifugally cast iron pipes and automotive castings,

together with specialised forms of casting. Foundries depend to a great extent on scrap which, in many cases, is the only raw material available.

Expert Group Meeting on the Utilization of Scrap Metal in Developing Countries (2.04.01)

30. This meeting (ID/B/26, para. 59), which was held in Vienna in November 1969, examined nine papers on the topic of utilising valuable non-ferrous scrap. The report will be published in 1970.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	4	7,000	4,778 a/
1970	1	-	-
1971	1	-	-

a/ Including $778 from the General Trust Fund of UNIDO.

Workshop on foundry technology for developing countries (2.04.02)

31. The first step towards a metallurgical industry usually involves the establishment of small foundries, which can be installed with a relatively low initial investment and which may grow into larger installations for mass production of castings of all sizes and types. Most developing countries have foundries, and many have a well-developed foundry industry. A background study of the problems related to the installation of small-scale training and demonstration foundry shops in developing countries will be prepared in 1970 preliminary to the holding of a workshop in Vienna in 1971. During the five-day workshop, ten experts from both developed and developing countries will discuss foundry technologies pertinent to conditions in developing countries. The report of this workshop will be published in 1972.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	1	-	-
1971	5	10,000a/	8,000b/

a/ Including $4,000 from the General Trust Fund of UNIDO and $6,000 from UNDP/TA.

b/ Including $4,000 from the General Trust Fund of UNIDO.

Creation and transfer of metallurgical know-how (2.05)

32. It is estimated that, in the course of the next decade, developing countries will invest in the development of their metallurgical industry about $20 billion (including infrastructure investment), a sizeable portion of which will be utilised for the acquisition of direct and indirect know-how. Many developing countries feel that they cannot afford to remain dependent on commercial imports of required know-how. UNIDO plans to assist in the development of local know-how so that a substantial amount of the required investment can be supplied from domestic sources of know-how and equipment. In other instances, the need for nationally based know-how arises from special conditions when the national economy is especially dependent on exports of certain metallurgical products.

Workshop on creation and transfer of know-how in metallurgy (2.05.01)

33. The workshop, planned for a duration of five days in Vienna in 1971, is expected to provide an assessment of the needs for know-how in developing countries and to make recommendations on how to meet these needs. An evaluation will be made of the advisability of setting up or assisting local establishments to prepare feasibility studies and projects, to carry out research

and to develop new processes and produots. Consideration will be given to factors governing the development of national sources of know-how suoh as training of specialists, incentives and appropriate meohanisms for acquiring know-how. The experts and partioipants are expected to prepare a plan of action in this area. In this oonnexion, it may be noted that the Seoond Interregional Iron and Steel Symposium (1968) recognised the significanoe of this problem and recommended that UNIDO investigate the possibilities of furthering research, development, design and engineering services and metallurgical equipment manufacturing industries in developing oountries.

Priority A

	Staff (in m/m)	Meetings (US$)	Consultants (US$)
1969	-	-	-
1970	1	-	-
1971	5	12,000[a/]	12,000[b/]

a/ Including $6,000 from the General Trust Fund of UNIDO and $6,000 from UNDP/TA.

b/ Including $6,000 from the General Trust Fund of UNIDO.

PRINTED PUBLICATIONS

		Language	Cost (US$)
Publications issued in 1969			
ID/24	Report of the second interregional iron and steel symposium (Moscow, 1968)	E	
			1,250
1970 publications programme			
ID/24	Report of the second interregional iron and steel symposium (Moscow, 1968)	F S R	
ID/45	Report of expert group meeting on lead and zinc industries (London, 1969)	E	
-	Report of expert group meeting on the utilisation of scrap metal in developing countries (Vienna, November 1969)	E	
-	Manual on foundries	E	
			6,000
Forecast of 1971 publications programme			
Proceedings: Second interregional iron and steel symposium (Moscow, 1968)		E	
Report: Seminar on copper production (Moscow, September 1970)		E	
Report: Seminar on tin plate production (Latin America, August 1970)		E	
			10,400

Note: In the computation of the printing costs a standard formula was applied based on averaging the cost of printing inside UNIDO and by an outside firm. The standard formula is used to provide for comparability of the cost of printing.

Table 4

Expenditures for supporting activities in 1969[a/]

Project components	UNIDO Regular Budget				UNDP/TA	UNIDO General Trust Fund	Total[b/]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Staff m/s	Meetings US$	Consultants US$	Publications US$	US$	US$	US$
2-01-01	3	-	3,600		-	-	3,600
2-02-01	4	2,643	4,000		-	-	6,643
2-03-01	10	-	3,000		-	-	3,000
2-04-01	4	7,000	4,000		-	778	11,778
Total	21	9,643	14,600	1,250	-	778	26,271

a/ Expenditures have been calculated on the basis of actual expenditures up to 30 September 1969, projected to the end of the year.

b/ The totals in column 7 do not include the cost of publications. Thus the total of the items in this column does not correspond to the last line of the column.

Table 5

Estimated expenditures for supporting activities in 1970

Project components	UNIDO Regular Budget				UNDP/TA	UNIDO General Trust Fund	Total[a/]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Staff m/m	Meetings US$	Consultants US$	Publications US$	US$	US$	US$
Priority A							
2-01-01	4	-	-		-	17,200	17,200
2-02-01	1	-	-		-	-	-
2-02-02	2	-	4,500		10,000	11,600	26,100
2-03-01	2	-	-		-	-	-
2-03-04	2	8,000	6,000		-	-	14,000
2-03-05	2	-	-		-	11,000	11,000
2-04-01	1	-	-		-	-	-
2-04-02	1	-	-		-	-	-
2-05-01	1	-	-		-	-	-
Total	16	8,000	10,500	6,000	10,000	39,800	74,300
Priority B							
2-03-02	2	-	-		-	-	-
2-03-03	2	-	-		-	-	-
Total	4	-	-		-	-	-

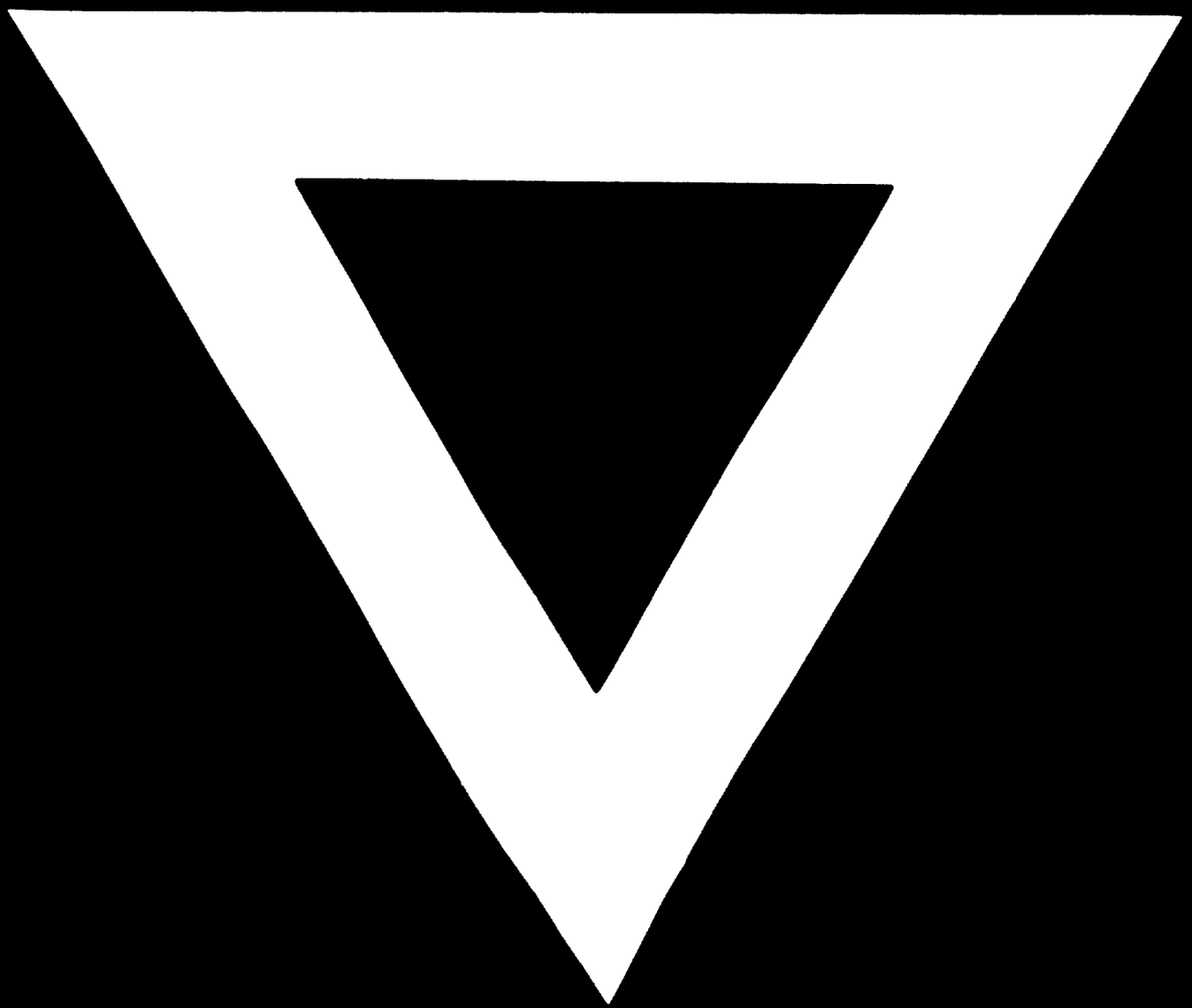
a/ The totals in column 7 do not include the cost of publications. Thus the total of the items in this column does not correspond to the last line of the column.

Table 6

Estimated expenditures for supporting activities in 1971

Project components	UNIDO Regular Budget				UNDP/TA	UNIDO General Trust Fund	Total[a/]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Staff m/m	Meetings US$	Consultants US$	Publications US$	US$	US$	US$
Priority A							
2-01-01	4	-	-		-	-	-
2-01-02	5	-	1,000		6,000	13,500	20,500
2-02-01	1	-	-		-	-	-
2-02-02	4	-	-		-	-	-
2-03-01	2	-	-		-	-	-
2-03-04	2	-	-		-	-	-
2-03-05	2	-	-		-	-	-
2-04-01	1	-	-		-	-	-
2-04-02	5	-	4,000		6,000	8,000	18,000
2-05-01	5	-	6,000		6,000	12,000	24,000
Total	31	-	11,000	10,400	18,000	33,500	72,900
Priority B							
2-03-02	4	-	5,000		8,000	3,600	16,600
2-03-03	4	2,000	7,300		-	5,800	15,100
Total	8	2,000	12,300		8,000	9,400	31,700

a/ The totals in column 7 do not include the cost of publications. Thus the total of the items in this column does not correspond to the last line of the column.



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