



**TOGETHER**  
*for a sustainable future*

## OCCASION

This publication has been made available to the public on the occasion of the 50<sup>th</sup> anniversary of the United Nations Industrial Development Organisation.



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

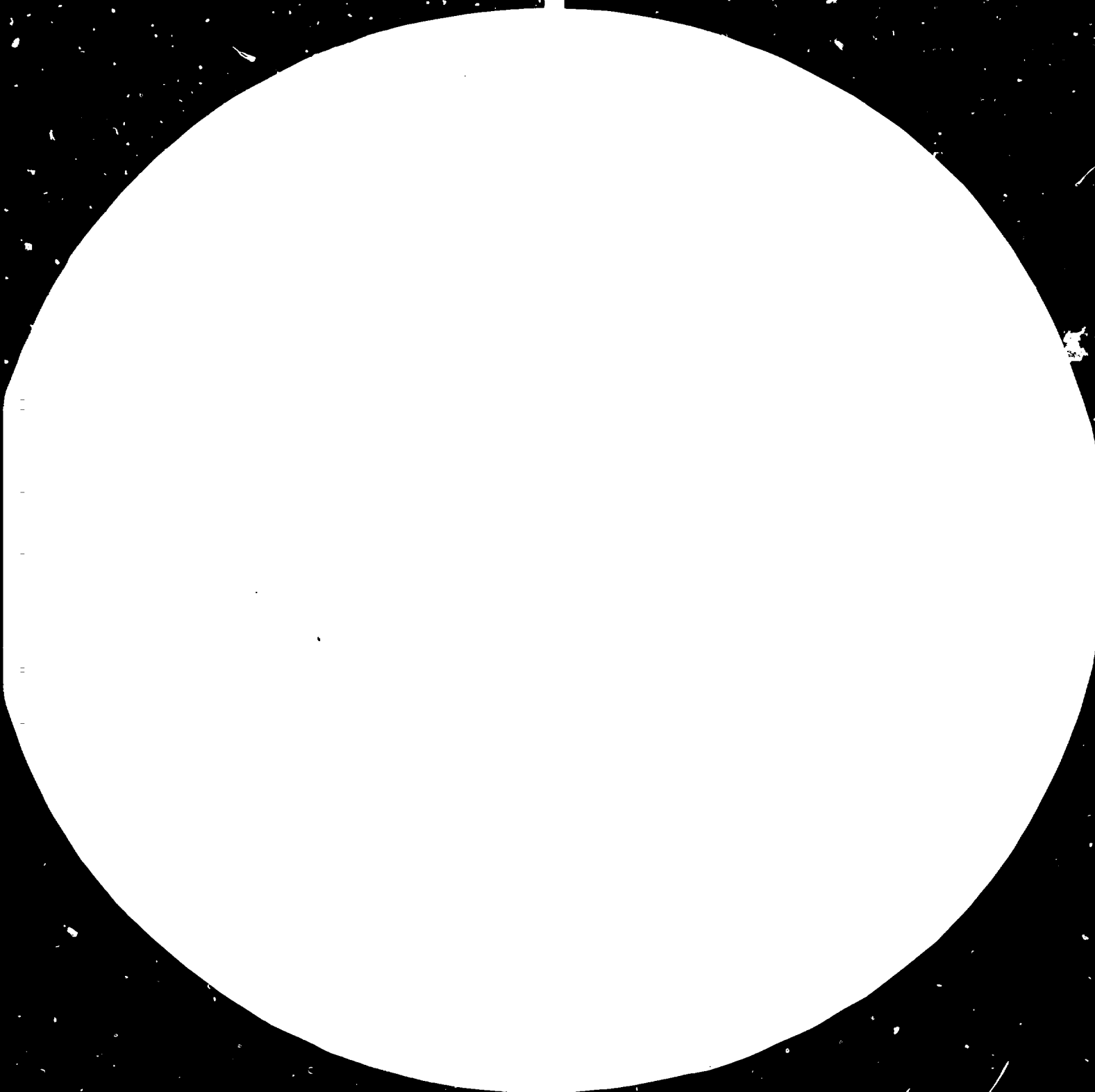
## FAIR USE POLICY

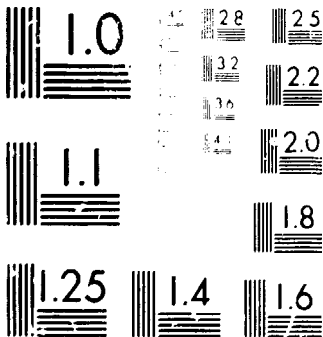
Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)





MICROCOPY RESOLUTION TEST CHART

NBS 1963-A MICROCOPY RESOLUTION TEST CHART



11138



United Nations Industrial Development Organization

---

Distr.  
LIMITED

ID/WG.361/18  
5 January 1982

ENGLISH

Workshop on regional project for co-operative research  
among metallurgical research and development  
centres in Asia and the Pacific

Jamshedpur, India, 7-11 December 1981

REPORT

002273

V.82-20069

CONTENTS

<u>Chapter</u>	<u>Page</u>
INTRODUCTION.....	3
I. ORGANIZATION OF THE WORKSHOP.....	4
II. DELIBERATIONS OF THE WORKSHOP.....	6

Annexes

I.. List of participants.....	11
II. List of papers presented at the Workshop.....	13
III. Metallurgical R and D centres established with UNDP/UNIDO assistance.....	15
IV. Draft project document.....	16

## INTRODUCTION

Since its inception in 1967, UNIDO, within the framework of its technical co-operation programme, has assisted in establishing and strengthening metallurgical research and development (R and D) institutions in a number of developing countries - including several in the Economic and Social Commission for Asia and the Pacific (ESCAP) region. Other such projects are currently at the formulation stage.

In view of the plans for expansion of the metallurgical R and D centres of the region, and of the number and level of expertise of the personnel already engaged in R and D activities, UNIDO, jointly with the National Metallurgical Laboratory (India) decided to organize a workshop which would, inter alia, : consider R and D manpower requirements over the next decade, in the light of projected increases in iron and steel production; ascertain the degree of interests of countries of the region in launching a large-scale scheme aimed at strengthening the capabilities of existing R and D centres through co-operative efforts and with possible financial backing from the United Nations Development Programme (UNDP); and elaborate principles and guidelines for the "twinning" of metallurgical centres in the region. The Workshop, which was held at Jamshedpur from 7 to 11 December 1981, expressed itself strongly in support of co-operative activities and recommended the establishment of a regional centre which would co-ordinate such activities and identify areas where they might best be applied. The Workshop also approved a draft project document for submission to UNDP, New York.

## I. ORGANIZATION OF THE WORKSHOP

The Workshop on regional project for co-operative research among metallurgical research and development centres in Asia and the Pacific was held at the National Metallurgical Laboratory, Jamshedpur, India, 7-11 December, 1981. The list of participants is given in annex I.

The Workshop opened with the election of Messrs. V.A. Altekar (India) and Chang Xu Shih (China), as Chairman and Vice-Chairman, respectively.

The Chairman gave a general resumé of the activities and facilities at the National Metallurgical Laboratory, including its pilot plants, and invited the participants to visit the Laboratory. He also invited them to present their views and written contributions on the subject of co-operative research work. The list of papers presented is contained in annex II.

Mr. B.R. Nijhawan, Senior Interregional Adviser, UNIDO, outlined the objectives of the Workshop. He went on to describe the activities of UNIDO in general and of the Organization's Metallurgical Industries Section in particular in light of the objectives of the Workshop and other plans and projections related to the subject of co-operative research and development (R and D) work. He outlined the regional projects of UNIDO covering the metallurgical industries (iron and steel, standardization in general, standardization of iron and steel products etc.). He also outlined the work undertaken at the 18 metallurgical R and D centres (annex III) established under the technical co-operation programme of UNDP/UNIDO in various developing countries, and touched upon other projects in the pipeline. He invited the participants to give their views on the co-operative R and D work being carried out at their centres.

At the commencement of the working sessions of the Workshop, on 9 December, Mr. Nijhawan proposed possible courses of action to promote co-operation among the metallurgical R and D centres in the ESCAP countries:

(a) The exchange of technical publications and other documentation (classified and unclassified), including R and D technical papers and statistical data; the rotation of the centres, professional and technical personnel; and the periodic conduct of seminars, workshops and other technical meetings. This mode of co-operation would keep all relevant institutes and centres abreast of the activities pursued by the metallurgical R and D centres in the ESCAP countries. The personnel of such institutes and centres might well correspond with each other in order to obtain detailed information and other unclassified data on technical subjects of common interest;

(b) The forming of joint teams from different R and D centres to work on projects identified through the activities enumerated in (a) above. UNDP/UNIDO financial assistance would be sought for this joint work, on the basis of the inputs included in the draft project document (annex IV) - the detailed financial arrangements and United Nations contributions to be the subject of future follow-up action by UNIDO and the Regional Bureau of UNDP in New York;

(c) The establishment, at an existing centre, of the nucleus of a joint research team to identify joint research projects, including technical/metallurgical R and D projects for the ESCAP countries individually and as a whole. To start with, the nucleus would function on a skeleton basis, promoting the exchange of technical data and reports among the centres and monitoring the substantive work of joint research teams established at one or more of the centres. An example of such a nucleus is provided by the Regional

Centre for Transfer of Technology (RCTT) for the ESCAP countries at Bangalore (India). Financial resources for the nucleus would be sought from the United Nations system, counterpart funds being provided by the participating countries of the ESCAP region;

(d) The establishment of a new regional centre. As a long-range objective, during or after completion of the activities listed under (a), (b) and (c) above, the United Nations might consider establishing a new, well equipped and well staffed regional centre in an agreed location or country. This Centre would promote the activities referred to in (a), (b) and (c) above. Several such regional organizations are currently operating, with and without assistance from the United Nations system.

The regional project for co-operative research would be based on the activities and inputs outlined in the draft project document (annex IV).



## II. DELIBERATIONS OF THE WORKSHOP

The participant from Yugoslavia outlined the computerized data and information system used at the Metallurgical Institute at Hasan Brkić. He favoured the idea of a regional data bank providing data not regularly published or otherwise available on new metallurgical developments and processes. An international network of experts to supply input data and process output data (collection and dissemination of information) should be established.

One possible approach, he suggested, would be to organize an index of the capabilities (based on human potential and equipment available) of the various metallurgical R and D centres willing to participate in the scheme. Regular updating of this information would be required, as the scope of the centres' activities would tend to expand. A number of activities common to most centres already existed - such as materials testing and other laboratory work. Regular meetings of the present kind should be held, to discuss the status of activities undertaken by the various centres and to exchange ideas on co-operative research. In view of the limited resources available, he suggested, UNIDO should look for means of financing the attendance of participants at the meetings - as was being done in the present case. State-of-the-art reports on specific topics should be available to the meetings: in the iron and steel field, direct reduction and the operation of mini steel plants were particularly important topics. He suggested that progress reports be made available on a regular basis; for example, Sponge Iron India Limited could prepare a project report on its activities - including any test programmes carried out - for dissemination among the developing countries of the region.

The participant from Turkey welcomed the proposals outlined by the UNIDO representative. He suggested that the first step should be to identify the type of information to be collected - account being taken of what was available. The use of existing facilities in the ESCAP region should also be considered at the initial stage, the experience of the UNIDO-assisted centres being drawn on for the benefit of the entire area.

The participant from Egypt agreed that the proposed scheme was a good one. He drew attention to the services of the Industrial and Technological Information Bank (INTIB), a UNIDO-established data bank from which experience could be drawn, even though the specialized metallurgical information required by the ESCAP countries might not be available.

The participant from Nigeria supported the idea of a central laboratory but suggested that existing facilities should also be used, to save on manpower and equipment.

The participants from Pakistan agreed that collaboration among R and D institutes was necessary for the exchange of expertise. A link-up of the existing centres should be co-ordinated by a central authority. UNIDO, he suggested, should assist individual countries of the region to upgrade their facilities in order to be in a position to offer better services. He noted, moreover, that the Metals Advisory Service established by UNDP/UNIDO in Pakistan could be developed into a national laboratory and linked with laboratories in other countries of the region. Further technical assistance - in the form of equipment - might, however, be required for the purpose.

The participant from China considered personal and professional contacts - such as those established at the workshop - most important. He was in favour of regional co-operation and in that connection pointed out that the Shenyang Institute of Metal Research was prepared to exchange technical information on, and offer training courses in advanced techniques of micro-structure analysis

for metals and alloys. The first such course could be organized in 1982, for a duration of two to four weeks. Moreover, the Institute would also be interested in the elaboration of joint projects in the fields of physical metallurgy, welding, mechanical working, precision casting and the like.

The participant from India (Sponge Iron India Limited), supported the idea of centralized co-operation. In the first place, he suggested, a means should be developed of identifying donors and recipients, i.e. assistance available and assistance needed. This opinion, he noted, was shared by the UNIDO Project Manager engaged in the establishment of a metallurgical R and D institute in Nigeria (and formerly manager of a similar UNDP/UNIDO project in Egypt). The facilities available had to be seen in the light of the facilities needed. He suggested that the priorities in information exchange, organization of training, and co-operative R and D efforts should include:

Evaluation and testing of raw materials (ores, coals, refractories etc.)

Quality and process control (expert services to be provided through a central organization)

Market, pre-feasibility and feasibility studies on specific areas in the metallurgical industries

Documentation collection and dissemination

Operation research

Standardization (establishment of a joint regional programme)

These activities, he suggested, could be taken in stages, emphasis in the first place being given to the collection and dissemination of information not readily available elsewhere on important metallurgical subjects.

Other participants supported the need to strengthen links between donor and recipient institutes. They also agreed that expertise should be pooled, to make it more effective, both as regards human and material resources. Joint research and development projects should be considered; due account should be taken of the aspirations of all countries in the region; and those with limited possibilities in the field of metallurgical R and D should be allowed to participate in and profit from the scheme.

A UNIDO consultant, Mr. Krouzek, stressed the importance of production control and computerized maintenance and suggested that these be included in the activities of the regional R and D project.

The UNIDO Industrial Development Field Adviser (SIDFA) in India, Mr. A. Krasiakov, elaborated on the ongoing projects assisted by UNDP/UNIDO in that country.

The participant from the Republic of Korea agreed with the need for establishing a regional metallurgical R and D centre. He pointed out, however, that a number of centres existed from which information could be obtained - e.g. the American Society for Metals Information Center. He considered that information on fundamental and basic metallurgical research could be obtained from such sources; information on specialized subjects - e.g. the production of sponge iron - would, however, merit collection and dissemination through a centralized system for the ESCAP region. He also felt that co-operation in the field of training would be required, as the training provided by the equipment suppliers, on the use of the equipment, was usually insufficient, seldom going beyond certain aspects of maintenance.

The participant from the Welding Research Institute in India (established with UNDP/UNIDO assistance) suggested the roll wing methodology:

(a) Take stock of existing information, compare it with what is otherwise available, and disseminate as appropriate to participating countries for further dissemination within the countries themselves;

(b) Strengthen co-operation among the centres assisted or established by the United Nations and establish a co-ordination centre within the United Nations system that would provide experts and follow-up on liaison activities;

(c) Identify the services provided by and the requirements of each centre. This might be accomplished by issuing a questionnaire;

(d) Establish a storage and retrieval system for the distribution of information, particularly state-of-the-art reports on specific metallurgical issues. For greater effectiveness, a computerized keyword system should be used.

The participant from Thailand expressed support for a regional co-operative project. Thailand, he stated, had no national centre, but had a multi-disciplined institute - the Applied Scientific Research Corporation of Thailand - and other decentralized facilities. Within the country, individual centres' action priorities and requirements would have to be identified.

The participant from Sri Lanka informed the Workshop that although that country did not have any central metallurgical R and D institute, research was undertaken at the Ceylon Steel Corporation and a computerized data base was being established. Information could be provided on a small scale. He pointed to the need for training, particularly in the fields of welding, steel-making, continuous casting and foundry technology, and requested assistance, possibly through experts' advisory missions, in organizing on-the-spot training and short practical training courses in suitable plants.

The participant from the Philippines also referred to the priority that should be given to training, especially in the maintenance and operation of equipment. He stated that the Metal Industry Research and Development Centre would be prepared to accept trainees in certain fields as outlined in his paper. He stressed the importance of technical co-operation among developing countries, especially in such fields as the testing of raw materials and finished products, quality control, and the introduction of standards.

Participants in the Workshop discussed the possibility of institute "twinning" and agreed that this could be mutually beneficial under certain circumstances, especially if the Government were involved and pursuing technical co-operation projects. The co-operation that existed between Yugoslavia's Metallurgical Institute (Hasan Brkić) and Turkey's Marmara Scientific and Industrial Research Institute was cited. A team of experts from the two Institutes had been formed to establish a quality control system in a central steel mill in Turkey - a project which had proven very successful. Participants suggested that other institutes follow this example, on a bilateral basis or under the auspices of UNIDO.

The participant from Egypt agreed that a survey of available facilities was needed, as well as identification of specific problems. Co-operation among centres needed to be strengthened and common work should be initiated: UNIDO, he suggested, should co-ordinate and strengthen contacts among centres having common activities and facing the same problems. Joint efforts in the provision of consultancy services and common research work should be aimed at. Small research centres using locally available information should have access

to a centralized facility. In the latter connection, he pointed out that the World Association of Industrial and Technological Research Organizations (WAITRO) organized on a regular basis meetings aimed at promoting the effective exchange of information as well as other forms of co-operation. With respect to twinnings arrangements, however, difficulties had been encountered: for this purpose, WAITRO had possibly too broad a mandate, covering as it did all forms of R and D activity. The proposed scheme for twinning on specific metallurgical R and D subjects could possibly succeed, especially if it received financial support from an international organization such as UNIDO.

The participant from Yugoslavia pointed out that, with respect to twinning arrangements, the problem of organization was a major one and a common system of financing had to be elaborated.

The representative of the Regional Centre for Technology Transfer, of that region, welcomed the initiative for co-operative research. He suggested that countries of the ESCAP region not present at the Workshop be contacted to determine what their facilities and requirements were, as well as their degree of interest in participating in the proposed scheme. He suggested that one institution be nominated to act as a focal point for implementing the proposed activities. He agreed that the exchange of documentation, the organization of common training programmes, the undertaking of testing programmes and the preparation of directories and state-of-the-art reports should be the most important activities of the proposed centre. UNIDO, he suggested, should support centres of the region willing to accept trainees.

The UNIDO SIDFA in Pakistan referred again to the co-operation between institutes in Turkey and Yugoslavia and expressed the hope that this be emulated by institutes in other countries. In his opinion, close co-operation was needed in the following: investment casting (foundry sands, binders etc.); malleable cast iron; semi-killed steel; SG-iron; production of inoculants and ferro-alloys; tin-free steel; electro-plating; ore beneficiation; direct reduction; evaluation and processing of low-grade coals; testing and quality control; welding and maintenance. The proposed regional centre should study all of these, identify areas of common interest, and promote co-operation among institutions in these areas. Existing institutions should be strengthened and certain tasks entrusted to them to benefit participants in the scheme. Countries with no or less than adequate facilities should be given the opportunity of participating in the scheme and to benefit from the latest technical information as well as training possibilities.

The representative of the Marmara Scientific and Industrial Research Institute also favoured the gradual-growth approach suggested. Starting with an evaluation of existing facilities and a survey of the state of the metallurgical industries, followed by the establishment of priorities, the proposed project could eventually lead to the development of a regional centre for the metallurgical industries which would: act as a clearing house for the exchange of information; process requests; undertake institution-twinning arrangements; and provide sub-contracting services.

The participant from Pakistan was of the opinion that one institution in each participating country should be strengthened in order to be able to discharge the tasks of supplying information to the regional centre and disseminating information received from it throughout the country.

Representatives of the National Metallurgical Laboratory (Jamshedpur, India) expressed their willingness to co-operate fully in the scheme and welcomed the preparation of an index of capabilities. They considered that the areas that would best lend themselves to co-operation were mineral beneficiation (undertaking of tests), activities in the energy sector, and corrosion protection.

The UNIDO Senior Interregional Adviser, having heard the opinions of the participants in the Workshop, made reference to various institutions of a regional character working mainly in the field of information exchange and suggested that the proposed centre be established along the same lines. He cited in particular the activities of ILAFA (Latin American Iron and Steel Institute), SEAISI (South East Asia Iron and Steel Institute) and AISU (Arab Iron and Steel Union). With respect to training, he suggested that, in addition to the UNIDO-financed training programmes regularly being organized for countries in the region, the countries themselves should make bilateral arrangements; in this connection, direct contacts among the appropriate institutions should be established. He further suggested that the National Metallurgical Laboratory (India), the Institute of Metals Research (China) and other metallurgical R and D institutions in the region consider expanding the range of training possibilities they have to offer and seek UNDP/UNIDO financial support in organizing the courses resulting from such expansion.

The participants concluded that the establishment of a regional centre for co-operative R and D in metallurgy was highly desirable and should be given priority rating. A draft project document was elaborated by a Working Group for approval by UNIDO and for submission to the Regional Bureau of UNDP, New York, for clearance and approval and to elicit the necessary financial support for the project, which would be implemented by UNIDO. It was agreed that the draft project document would subsequently be submitted to the Governments in the region. The draft project document, as approved by the participants, is contained in annex IV.

Annex I

LIST OF PARTICIPANTS

D.T. Abeysiri, General Manager, Ceylon Steel Corporation, Athurugiriya, Sri Lanka

J.C.F. Adigwe, Assistant Director, Central Metallurgical Research and Development Institute, National Steel Council, Zaria Road, Post Box 2116, Jos, Plateau State, Nigeria

V.A. Altekar, Director, National Metallurgical Laboratory, Jamshedpur, India

Ahmed Adel Abdul Azim, Professor and Director, Central Metallurgical Research and Development Institute, National Research Centre, Dokki, Cairo, Egypt

J. Bautista, Assistant Executive Director, Metals Industry Research and Development Centre, Ortigas Building, Ortigas Avenue, Pasig, Metro Manila, Philippines

P.P. Bhatnagar, Project Manager, c/o Central Metallurgical Research and Development Institute, Zaria Road, Post Box 2116, Jos, Plateau State, Nigeria

Abo-Al-Kasem El-Sherif, Director of Experimental Research, Egyptian Iron and Steel Company, El-Tabbin, Helwan, Egypt

Dogan Gucer, Professor and Deputy Director In-charge of Research, Marmara Research Institute, P.K.21, Gebze, Kocaeli, Turkey

P.K. Gupta, Assistant Director, National Metallurgical Laboratory, Jamshedpur, India

Kamal M. Hussein, Senior Industrial Development Field Adviser, UNDP, Post Box 1051, Islamabad, Pakistan

Kemal Kapetanovič, Professor and Dean of Metallurgical Faculty, University of Zenica, Zenica 72000, Ul. Matije Gubca 1, Yugoslavia

In Sup Kim, Principal Research Scientist, Korea Advanced Institute of Science and Technology, Post Box 131, Dong Dae Mun, Seoul, Republic of Korea

A. Krasnikov, Senior Industrial Development Field Adviser, UNDP, 55 Lodi Estate, New Delhi, India

R. Krishnamurthi, Head, Welding Research Institute, Tiruchirapalli, India

J.V. Krouzek, Head, Project Development Department, INORGA Institute, Prague, Czechoslovakia

R. Kumar, Scientist (Director), National Metallurgical Laboratory, Jamshedpur, India

G.P. Mathur, Deputy Director, National Metallurgical Laboratory, Jamshedpur, India

M. Nasim, Head, Quality Control Department, Pakistan Steel, Pakistan

B.R. Nijhawan, Senior Interregional Adviser, Metallurgical Industries Section, UNIDO, Vienna International Centre, Post Box 200, A-1400 Vienna, Austria

K.P. Patnaik, Manager (Engineering and Projects), Sponge Iron India Limited, SIIL Campus, Post Box 507154, Paloncha, Kothagudem, India

Asaf Ali Qureshi, Chief Scientific Officer, Pakistan Council of Scientific and Industrial Research, Lahore, Pakistan

C.V.S. Ratnam, Adviser on Science and Technology Policy, Regional Centre for Technology Transfer, United Nations (ESCAP), Manickvelu Mansions, 49 Palace Road, Bangalore 52, India

B.M. Sarangi, Assistant Manager, Sponge Iron India Ltd., SIIL Campus, Post Box 507154, Paloncha, Kothagudem, India

Chang Xu Shih, Professor and Director, Institute of Metal Research, Academia Sinica, Shenyang, China

Narong Sukapaddhi, Head, Metallurgical and Ceramic Engineering Laboratory, Thailand Institute of Scientific and Technological Research, Thailand

S. Vangala, Managing Director, Sponge Iron India Limited, SIIL Campus, Post Box 507154, Paloncha, Kothagudem, India

Annex II

LIST OF PAPERS PRESENTED AT THE WORKSHOP

Copies may be obtained from: Metallurgical Industries Section, UNIDO,  
P.O. Box 300, A-1400 Vienna, Austria.

A brief introduction of the Institute of Metal Research, Academia Sinica  
Chang Xu Shih

A centre for co-operative research - WRI  
R. Krishnamurthi

Central metallurgical research and development institutes of Egypt and  
Nigeria - A Case Study  
Prem P. Bhatnagar

Contributions of the Pakistan Council of Scientific and Industrial  
Research for Mineral and Metal Industry  
Asaf Ali Qureshi

Development of cheaper cryogenic steels and high strength maraging steels  
M. Nasim

Egyptian Iron and Steel Company and activities for research and development  
of the production  
Abo-Al-Kasem El-Sherif

Facilities available and activities of the demonstration plant for the  
production of sponge iron, Kothagudem, Andhra Pradesh  
S. Vangala

Metallurgical research and development activities in Egypt  
Ahmed Adel Abdul Azim

Metallurgical research and development activities in the Republic of  
Korea  
I.S. Kim

Metallurgical research and development in Sri Lanka  
D.T. Abey Siri

Metallurgical research and development in Thailand  
Smith Kampempool and Narong Sukapaddhi

Modern maintenance system activities  
J.V. Krouzek

Research and development activities of the Metals Industry Research and  
Development Centre  
Jose Bautista

Some metallurgical research and development activities in the People's  
Republic of China  
Chang Xu Shi



UNIDO's assistance to the Metals Advisory Service, Pakistan  
M. Kamal Hussein

UNIDO's technical assistance to the Marmara Scientific and Industrial Research  
Institute, Turkey  
Dogan Gucer

UNIDO'S technical assistance to the National Metallurgical Laboratory,  
Jamshedpur  
V.A. Altekar

Annex III

METALLURGICAL R AND D CENTRES ESTABLISHED  
WITH UNDP/UNIDO ASSISTANCE

Central Metallurgical Research and Development Institute, Cairo, Egypt  
Mineral and Metallurgical Research Centre, Santiago, Chile  
Metallurgical Research Institute, Zenica, Yugoslavia a/  
Marmara Scientific and Industrial Research Institute, Gebze, Turkey a/  
Argentine Iron and Steel Research Institute, Buenos Aires, Argentina a/  
Mexican Iron and Steel Research Centre, Mexico a/  
Metals Advisory Services, Lahore, Pakistan  
Central Creep Testing Laboratory (NML), Jamshedpur, India  
Central Metallurgical Research and Development Institute, Jos, Nigeria  
Welding Research Institute, Tiruchirapalli, India  
Metallurgical Research and Development Centre attached to the Demonstration  
Plant for the Production of Sponge Iron at Kothagudem, India  
Upgrading Scientific and Technological Capabilities of the Jamaica Bauxite  
Institute Kingston, Jamaica a/  
Aluminium Development Institute, Titograd, Yugoslavia  
Aluminium Development Centre, India  
Development Centre for Silicon Technology, Rawalpindi, Pakistan  
Institute of Metal Research, Shenyang, China a/  
Chemical Reaction Engineering Laboratory for Extractive Metallurgy,  
Beijing, China  
Zheng Zhou Light Metal Research Institute, China a/

---

a/ Assistance provided in strengthening or expanding the Institute.

Annex IV

DRAFT PROJECT DOCUMENT

UNITED NATIONS DEVELOPMENT PROGRAMME

Inter-country regional programme for  
Asia and the Pacific, 1982-1986

Title: Regional project for co-operative research among metallurgical research  
and development centres in Asia and the Pacific

Project No.:

Scheduled start:

Duration: 4 years

Primary function: Direct support

Secondary function: Industry

Sector: Industry  
Government class

UNDP classification and code: 31.8  
Development of industry

Sub-sector: Industry  
Government class

Iron and steel industry 31.8.C  
UNDP class code

Government implementing agency: Ministry for Industries

Executing agency: UNIDO

Estimated starting date:

Government inputs:

UNDP inputs:  
\$US 1,941,700

Signed: \_\_\_\_\_  
on behalf of the Government

Date: \_\_\_\_\_

Signed: \_\_\_\_\_  
on behalf of the Executing Agency

Date: \_\_\_\_\_

Signed: \_\_\_\_\_  
on behalf of UNDP

Date: \_\_\_\_\_

## THE PROJECT

### A. Development objectives

1. The development objectives are to promote co-operative research among metallurgical research and development centres in the ESCAP countries, the ultimate, overall aim being to establish and expand metallurgical industries in these countries, on the basis of their mineral resources and natural wealth.

2. One of the main development objectives is to assist in the selection and adoption of appropriate metallurgical technology; to promote co-operative efforts in finding solutions to problems in the metallurgical fields of particular interest to the countries of the regions; and to assist in establishing linkages among the metallurgical R and D centres of the ESCAP region.

3. Specific development objectives of the project are to establish the nucleus of a regional project for co-operative research among metallurgical research and development centres in Asia and the Pacific which could meet the metallurgical industries' rapidly growing need for technological support; provide technical know-how for the improvement of metallurgical processes; and promote application of the latest technological innovations in the metallurgical fields for the optimum exploitation of the mineral wealth and natural resources of the country concerned. Essentially, the main purpose will be to stimulate and assist the development of sound metallurgical industries in the countries of the region.

### B. Immediate objectives

The immediate objectives are to promote co-operative research among metallurgical research and development centres in Asia and the Pacific by, inter alia:

(a) Establishing the capability for obtaining and disseminating information concerning the development of the metallurgical industries in the world in general and the region in particular, covering both technical and economic aspects, through:

- (i) Exchanging information and reports on the activities of the various R and D centres in the region;
- (ii) Preparing, on request, bibliographical data on the status of specific technologies, and the proven route of a particular metallurgical technology;
- (iii) Surveying the status of the mineral and metal industries, their plans and projections for the future;
- (iv) Compiling on request, monographs or profiles on metallurgical technology, such as sponge production, continuous casting, energy economy, pollution and environment control;

(b) Organizing seminars and workshops on topics of common interest in the region;

(c) Initiating co-operative programmes among countries in region for the development and utilization of technologies of common interest;

(d) Assisting countries of the region in appraising technologies, conducting economic investigations prior to the establishment of new metallurgical plants and industries, and carrying out sectoral studies on the metallurgical industries - thereby helping the Governments to fulfil their development plans;

(e) Assisting the countries of the region in the assessment and evaluation of technologies most suited to individual countries;

(f) Assisting the countries of the region in evaluating, testing and upgrading local metallurgical raw materials to acceptable levels and specifications;

(g) Studying and appraising new processes and technologies and their possible adaptation, with the aim of adopting the most appropriate process for the metallurgical industry in a given country.

#### C. Special considerations

Implementation of the project would result in co-operation in the metallurgical field among the developing countries of the ESCAP region. Moreover, the recipient countries will benefit from the experience of the donor countries. Subcontractual activities, on interregional and national levels, will be undertaken for specific projects needed by a country or countries in the region.

#### D. Background information and justification

(a) In the general context of the development plans of the countries of the ESCAP region - and the objectives of individual countries vis-à-vis the exploitation of their own mineral resources and the development of their metallurgical industries - regional co-operation is of paramount importance;

(b) It may be envisaged that, besides readily identifiable short-term problems, the solving of long-range problems will need the experience of specialized teams of metallurgists, backed by adequate applied research and pilot plant facilities. The correct and optimum utilization of metals and alloys in the metallurgical industries will call for the provision of technical expertise and assistance on a continuous and intensive basis. Similarly, technical assistance in the diagnosis of service failures, their causes and prevention, corrosion and its prevention, standardization in the metallurgical industries etc. would be rendered through a regional metallurgical centre;

(c) Given their present state of development, it is not possible for each country in the region to have its own full-fledged metallurgical R and D centre; their objectives could be achieved, however, through a regional metallurgical centre that would also promote co-operation among the various centres of the region;

(d) The proposed regional co-operation among the developing ESCAP countries would go a long way towards meeting the technological support needs of the region's metallurgical industries; provide technical know-how for the improvement of metallurgical processes and products; and promote application of the latest technological innovations in the metallurgical fields for the optimum exploitation of the mineral wealth and natural resources of each country;

(e) The countries of the ESCAP region see the need for a regional metallurgical centre that would support the development and growth of the metallurgical and engineering industries in the region;

(f) Justification for the Centre is based on the urgent need to curtail imports of fully manufactured metal products. The simple process of technological adaptation raises many problems which can be solved only by trained personnel with local and regional facilities to do so. The centre would aim at meeting these requirements, effectively filling the "technological gaps" and promoting the adaptation and modification of proven processes and products on the one hand and the development of new processes and products to suit local conditions on the other;

(g) The centre would provide assistance to broad sectors of the metallurgical industries to ensure their development along sound lines. Areas covered would include extraction; refining; transformation and application of ferrous and non-ferrous metal and alloys in various shapes and forms; corrosion prevention and surface protection; metals specification; selection and specific application of metals and alloys; refractory production and standardization; fuel and energy balance and economy; and consultancy work;

(h) The centre would also undertake such activities as cataloguing and dissemination of technical information and documentation; evaluation, testing and beneficiation of metallurgical raw materials; preparation of feasibility studies, market surveys and project reports; providing technical training for industry and research personnel; arranging the exchange of personnel for on-the-spot study - as well as other activities calculated to promote the growth and expansion of the metallurgical industries in the ESCAP region.

(i) Thus, the centre would play an active part in the transfer and adaptation of metallurgical technology to suit the conditions and requirements of the region and, in addition, promote technical co-operation. This multiple approach and collaborative functioning of the centre would amply justify its establishment. The centre is urgently needed, not only for solving existing problems, but also for implementing the more important long-term plans and objectives of the metallurgical industries in the region;

(j) The objectives of the project are therefore to establish a regional metallurgical centre that would, in its first phase, provide documentation and information services and use the services and facilities of existing metallurgical R and D centres in the region in sponsoring co-operative investigations into the problems being experienced by a given ESCAP country or sub-region or by the region as a whole, thus promoting technical co-operation among the countries of the region and ensuring the fullest use of existing facilities for metallurgical R and D in the region. A second phase - should the need emerge from the experience gained in carrying out the activities of the first phase - would involve the establishment of specialized research and pilot plant facilities at the centre.

#### E. Outputs

Specific outputs for the project, as related to the immediate objectives, would be involved in:

(a) Establishing computerized capacity for obtaining and disseminating information concerning technical and economic aspects of the development of the metallurgical industries;

(b) Initiating a co-operative programme among the countries of the region for the development and utilization of metallurgical technologies most suited to and of common interest in the region;

(c) Designating focal points in the region for co-operation and collaboration on problems peculiar to a given country or sub-region, or to the entire region;

(d) Establishing a well equipped regional library and documentation centre.

F. Programme of activities

The programme of activities of the proposed centre would include:

(a) Disseminating, on a continuous basis, data and information about the latest technological processes and developments in metallurgy;

(b) Undertaking technological appraisals and economic investigations of proposed new metallurgical plants and industries; carrying out sectoral studies on the metallurgical industries; and assisting the Governments concerned in their development plans;

(c) Carrying out technical feasibility and pre-investment studies in the metallurgical industries fields, using its own staff of highly trained technical consultants and experts;

(d) Arranging applied R and D work in connection with national or regional programmes for the utilization of mineral resources, and finding uses for the by-products;

(e) Arranging co-operative R and D work on metallurgical topics of interest to the region;

(f) Organizing comprehensive training for personnel at the established metallurgical centres in the region.



**PROJECT BUDGET/REVISION**

3. COUNTRY regional	4. PROJECT NUMBER AND AMEND. DP/RAS/82	5. SPECIFIC ACTIVITY 31.8.C
10. PROJECT TITLE Co-operative research among metallurgical R and D centres in Ashia and the Pacific		

UNDP contribution (in US dollars)

15. 10.	PROJECT PERSONNEL 11. EXPERTS / Post title	16. TOTAL		17. 1982		18. 1983		19. 1984		20. 1985	
		m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
11-01	CTA metallurgical technologist	36	245 400	6	38 400	12	82 800	6	82 800	6	41 400
02	Technical data logging expert	18	124 200			12	82 800	6	41 400		
03	Computerized data dissemination expert	18	124 200			12	82 800	6	41 400		
04	Ad hoc consultants	12	82 800			4	27 600	4	27 600	4	27 600
05											
06											
07											
08											
09											
10											
11											
12											
13	Support personnel		37 000		6 000		12 000		12 000		7 000
14											
11-00	<b>SUBTOTAL:</b>		613 600		44 400		288 000		205 200		76 000
21. REMARKS											

-21-





PROJECT BUDGET/REVISION

2. PAD NUMBER

4. PROJECT NUMBER	16. TOTAL		17.		18.		19.		20.	
	m/m	\$	m/m	\$	m/m	\$	m/m	\$	m/m	\$
12.01										
13.00										
14.00										
15.00		48 000		8 000		16 000		16 000		8 000
16.00		36 000		6 000		12 000		12 000		6 000
17.01										
17.02										
19.00	84	697 600	6	58 400	40	316 000	28	233 200	10	90 000
20. SUBCONTRACTS;										
29.00		500 000 <sup>a/</sup>		150 000		120 000		120 000		110 000
30. TRAINING										
31.00	30	59 100	6	11 100	10	20 000	10	20 000	4	8 000
32.00		50 000				30 000		20 000		
33.00										
34.00		100 000				50 000		50 000		
35.00										
39.00	30	209 100	6	11 100	10	100 000	10	90 000	4	3 000
40. EQUIPMENT										
49.00		470 000		350 000		40 000		40 000		40 000
50. MISCELLANEOUS										
51.00										
52.00										
53.00										
55.00										
59.00		65 000		10 000		15 000		25 000		15 000
99. GRAND TOTAL:		1 941 700		579 500		591 000		508 200		263 000

a/ US\$ 400,000 regional and US\$ 100,000 local expenditure.

