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Expert Group Meeting on the Preparation  
of Guidelines for the Establishment of  
Mini-Plants on Iron and Steel with  
Special Emphasis on Africa

Vienna, Austria, 1-5 December 1985

REPORT\*

Prepared by

UNIDO Secretariat

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## INTRODUCTION

1. The Expert Group Meeting on the preparation of guidelines for the establishment of mini-plants on iron and steel with special emphasis on Africa was held at Vienna, Austria, from 2 to 5 December 1985. The meeting was attended by 16 participants from 12 countries and 3 sub-regional organizations (see Annex I).

## BACKGROUND

2. The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held at Lima, Peru, in March 1975, stressed the importance of economic and technical co-operation among developing countries (ECDC/TCDC) by calling on the international community to make concerted efforts in support of the developing countries' endeavours to gain greater share in world industrial output through increased co-operation. The Caracas Plan of Action adopted by the High-level Conference on Economic Co-operation among Developing Countries, held at Caracas, 13 to 19 May 1981, reaffirmed the pertinent recommendations contained in the Buenos Aires Plan of Action for promoting and implementing TCDC. It further recommended that in supporting ECDC/TCDC efforts, priority attention should be placed on the utilization of technology, skills and resources available in the developing countries.

3. Through the System of Consultations, UNIDO has organized three Consultation Meetings on iron and steel to inter alia explore ways and means whereby it could promote and implement economic and technical co-operation among developing countries in the said field of the iron and steel industry. The third Consultation Meeting on the iron and steel industry held at Caracas, Venezuela, from 13 to 17 September 1982, in a very precise approach, recommended that especially the newcomers to this industry should seriously study and envisage the approach of the mini iron and steel plants. Such an approach could help them to develop faster their iron and steel industry and deliver the steel products needed for the expansion of their economies. Finally, such an approach could put them in a better position not only to master the iron and steel technology, but also to make the links with other sectors of activity.

4. It is within the above context that this meeting was organized by the Section for Economic Co-operation among Developing Countries in close co-operation with the Negotiations Branch, so available experience in South-South

co-operation in training and technical assistance including the evaluation of the existing and potential facilities could be shared. Moreover, it was felt that the basic parameters for the preparation of guidelines for mini iron and steel plants should be discussed, so that especially newcomers in developing countries could be oriented with regard to the planning and installation of their new iron and steel facilities. In order to be able to have a more concrete impact, the preparation of this meeting focused mainly on Africa, although the experiences of a few developing countries from other regions were also taken into account.

## I. CONCLUSIONS AND RECOMMENDATIONS

The meeting concluded that:

5. The documentation prepared by UNIDO presented well the problems faced by the African region in this sector and indicated the main parameters for the newcomers to this industry.

6. The concept of mini iron and steel plants for Africa was a correct one, especially when it related to the most actual pressing needs of Africa, namely the light long products, and it provides the answer for the expected needs of the region on a medium-term basis. The importance of this technological route was stressed also due to the lack of financial resources affecting developing countries in general, and the African region in particular.

7. Although the sector of the iron and steel industry is of paramount importance for the region, sometimes no consideration was given to the degree of relation between the iron and steel industry and the other sectors of the economy. Since this sector has important implications on social and economic aspects of the country concerned, the meeting concluded that in certain cases, even whenever this aspect was taken into consideration, the final objectives of the establishment of this type of industry were not kept in sight.

8. The financing of the establishment and operation of the mini-plants constituted a major difficulty for the developing country concerned which, especially in certain cases, became a large burden due to the low utilization of capacity and its consequences on profitability as well as due to the non-existence of adequate facilities.

9. In most of the countries, the cost of required infrastructure is usually included in the investment for an iron and steel plant which might lead to some confusion as far as the final productivity of this sector was concerned. If a mini-plant was situated in an urban area, the investment cost of the necessary infrastructure would be much less. However, in this case, the location of the plant might be far from the site of the raw materials and pollution problems may arise.

10. In most of the cases, the technology used in the actual mini-plants was not chosen in accordance with the existing resources, needs and size of the country. Special emphasis was placed on the fact that most of the countries import scrap which is not available in the countries concerned, constituting an additional burden on foreign currency, and other countries began to produce iron and steel products which were not their main need such as flat products, and still other countries have more than 50 per cent excess capacity because the iron and steel industry was not developed in accordance with the size of the country. It was also concluded that quality control tests were not always undertaken, which in certain cases affects the quality of the product and its acceptance by other countries which could be potential recipients.

11. A basic problem affecting the operation of the plant and its technological requirements is due to the lack of skilled personnel and comprehensive training programmes both at the in-plant group training level as well as programmes for trainers who could carry on this important aspect. Some of the participants concluded that there are no comprehensive programmes for the solving of the problems faced by maintenance of the plants, where in most cases, these programmes have to be implemented at the plants themselves.

12. Another basic problem affecting the efficient operation of existing plants is the lack of spare parts.

13. The role of the market aspects is of crucial importance for those who have already existing facilities as well as for newcomers to this industry. In addition, completely different markets for long products, flat products and tubes exist and in certain cases - even within the same country - competition could be found creating other important problems for the country. On the other hand, due to the fact that some countries represent small markets, one can see that there are difficulties to amortize the huge investments that have been made in this respect. Furthermore, in certain cases, the importance of the problems created by a pre-supposed demand was referred to which, by not materializing, caused several financial problems. It was further concluded that in most of the cases, difficulties for solving the market problems were arising through lack of co-operation among producers at national, sub-regional and regional levels.

14. Co-operation among developing countries faces several obstacles due to the lack of confidence in their own capabilities and resources, having as a consequence a disbelief in the pulling together of resources, and in certain cases, complementing activities at national, sub-regional and regional levels.

15. There is a serious lack of communication between the real actors operating these types of plants, even in the same sub-region, and that no central reference unit exists for identifying needs and existing capabilities at all levels of the sub-region and region, which could increase co-operation among the partners.

16. This type of exercise such as convening this expert group meeting constitutes a valuable tool to promote this type of industry by discussing the main difficulties faced by the existing mini iron and steel plants and paving the way for the newcomers to this industry.

17. The above aspects reflect not only the actual situation faced by African countries in this sector, but could also be the basic parameters to be taken into account along with specific guidelines for the newcomers to this industry.

The meeting recommended that:

18. High priority should be accorded to the iron and steel industry in general and to mini-plants in particular in the process of planning the industrial development.

19. In planning the iron and steel industry, great emphasis should be given to the linkages with the other sectors of the economy, mainly capital goods, agricultural machinery, the construction sector and the spare parts industry. Due attention should be given to the real market capacity and the availability of resources.

20. The financial resources should be generated both internally and externally. The Governments of the developing countries should allocate from their budgets considerable financing resources for the establishment and successful operation of the mini-plants of the iron and steel industry, in accordance with its high priority. At least at the beginning, Governments should provide financial support to the plants as well as to ensure a stable



market through appropriate measures. In order to generate interest for investment, it is desirable to design the mini-plant or to up-grade the existing mini-plant to make it commercially viable. It was further recommended that the international financial institutions including regional development banks should accord high priority to providing financial assistance for the mini-plants in the iron and steel industry. UNIDO, at the request of developing countries, should provide assistance in finding the most appropriate sources and provide consultancy advice in this field.

21. In the selection of the location of the plant, due consideration should be paid to the existing infrastructure. Furthermore, the technical and economic study should take into account also the problem of pollution. In case that important infrastructural elements do not exist for the establishment and operation of these plants, the Government should provide facilities to enable the establishment and operation of mini-plants. Such costs should not be included in the investment cost of the iron and steel plant.

22. In order to implement in a co-ordinated manner actions to solve the problems referred to in the conclusions, namely in the area of technology and training, information, production and commercialization, a regional association of African producers should be created, which could include the following initial functions:

- (a) To ensure that careful attention is given to the importance of the direct inputs of this sector to other sectors such as capital goods, agricultural machinery, the construction industry and the spare parts industry.
- (b) To provide information on several experiences towards solutions found in obtaining the best primary metal production.
- (c) To establish a data bank providing information on needs and capabilities of the iron and steel industry at sub-regional or regional level.
- (d) To prepare training programmes tailored to the needs of its associates.
- (e) To organize technical meetings for the exchange of experiences at operational level.
- (f) To co-ordinate with the African regional standardization organizations and the international standardization organizations the relevant aspects important for the development of this industry.

- (g) To promote, in co-operation with existing regional organizations, trade among the countries of the region.
- (h) To look for opportunities for the establishment of multinational production enterprises in the region such as for instance, for spare parts, in co-operation with other regional and international organizations such as UNIDO.

23. UNIDO assists in the preparation of the first draft of the statutes of such an association and that if resources permit, UNIDO organizes a meeting in Africa in April 1986 to discuss:

- (a) the issues to be discussed at the Consultation meeting on the iron and steel industry, to be held in June 1986 in Vienna;
- (b) the draft statutes of such an association by inviting the countries present at this meeting;
- (c) the preliminary draft of the guidelines for which the main items were approved by this meeting.

24. Co-operation among developing countries in this sector should be made on a step-by-step approach:

- (a) Countries should start co-operating with the neighbouring countries either through joint purchase of raw materials, direct exchange of information, small technical assistance activities, and so on;
- (b) To exchange training programmes that could be applicable for their specific situations. An offer was made by Nigeria regarding its installations to be made available to other developing countries.
- (c) Joint purchase, when applicable and required, of spare parts, or even joint production of the same;
- (d) After building up a good technology of their partners in the above activities, joint production undertakings might be envisaged.

25. UNIDO should continue to provide technical assistance to Africa and attention should be given to the following aspects:

- In order to alleviate the shortage of raw materials for some of the mini-plants especially in Africa, UNIDO should provide assistance by studying in depth the scrap situation in Africa and evaluate the production of sponge iron.

- In view of the important role of the iron and steel industry in industrial development and in light of the problems faced by the existing mini-plants, UNIDO should continue to assist in the rehabilitation of the existing mini-plants and in the establishment of new ones.
- In order to facilitate the manufacture of spare parts for mini-plants, UNIDO should assist in the establishment of foundries, forges and fabrication facilities.
- In order to assist in the adaptation of technology in the iron and steel industry, UNIDO should provide assistance in the establishment of metallurgical technology centres.
- In view of the financial constraints faced by developing countries especially in Africa, and taking into account the importance of training in the iron and steel industry, UNIDC should continue to assist in the field of training in the iron and steel industry, especially in-plant training and training for trainers.

26. Participants attending the meeting outside of the African region recommended that UNIDO should undertake the same exercise in other regions in view of the importance that the in-depth discussion of problems affecting the actors of this industry has for the development of the region concerned.

27. UNIDO sends to all participants examples of information on projects that have been or are being executed, at the request of developing countries.

## II. CONCRETE RESULTS EMERGING FROM THE MEETING

### A. Main Items to be Included in the Preparation of Guidelines for Newcomers to Mini Iron and Steel Plants

28. Based on the documentation presented to the meeting as well as the extensive debate which took place, participants agreed on the following:

The guidelines to be prepared should be oriented towards helping developing countries - in accordance with the conclusions and recommendations adopted by this meeting - especially newcomers to the steel industry, in the planning and installation of their new iron and steel facilities.

Newcomers should be defined in relation to the following three elements: type of production, type of plants and capacity.

#### (a) Type of production

Only light steel casting products, i.e., bars and possibly some wire rod or merchant iron.

#### (b) Type of plants

It could be - at least at the beginning - only a rolling mill. It can be semi-integrated (production of steel) at the beginning, or later, a fully integrated plant (step-by-step expansion).

#### (c) Capacity

It seems that capacity has to be planned taking into account the availability of natural resources, market and funds. In any case, a capacity of around 30 000 tonnes/year could serve as a basis of reference.

For newcomers, only light long products could be envisaged, since flat and heavy products require:

- previous experience
- large capacity with corresponding expenses.

Although a number of plants already exist, the need for newcomers arises from the following factors:

- There are large imports of such products;
- A number of plants are not operating at full capacity, but probably, several of them will never operate at high production levels due to structural problems;
- There is a need for integration of several plants which are only re-rollers.

New projects have to be developed after rationalizing the existing plants of the sub-region and region through increasing their efficiency and avoiding unnecessary duplications.

Particular attention should be paid to the following aspects:

- i) In planning the project, it is important to take into account aspects related to the linkages with other sectors, the need for an appropriate physical and technical infrastructure, and training.
- ii) In the feasibility study phase, clear definition of the investments required, as well as economies to be achieved should be made. In addition, attention should be given to aspects related to:
  - market
  - inputs (raw materials, energy)
  - technology (in accordance with the results of the questionnaire)
  - level and qualifications of personnel
  - cost structure
  - financial structure and ways of financing the plant
  - infrastructure
  - evaluation parameters (macro and micro, including the social and economic aspects).
- iii) Regional and sub-regional co-operation and possible establishment of multinational production enterprises.

5. Identification of Needs and Capabilities among the Participants

29. A questionnaire was distributed to all participants, the basic objective of which was to identify existing needs and capabilities among the participants that could be matched through the initiation of co-operation arrangements among those present at the meeting. The questionnaire was structured as follows:

1. RAW MATERIALS:

- a) Which type of raw materials do you need to operate your plant and which country of the region or sub-region do you think can provide such raw materials?
- b) Which type of raw materials do you have in excess and which countries in the sub-region/region do you think could need them?

2. SPARE PARTS:

- a) Which type of spare parts do you need to operate your plant and which country of the region or sub-region do you think can provide such spare parts?
- b) Which type of spare parts do you have in excess and which countries in the sub-region/region do you think could need them?

3. TECHNOLOGY:

- a) What are the needs in terms of technical assistance to improve the efficiency of your existing technological processes and what country of the region/sub-region can provide it?
- b) What is your capacity for providing technical assistance to other plants of the region/sub-region according to your knowledge?

4. TRADE OF SEMI-FINISHED PRODUCTS:

- a) What are your needs for semi-finished products required for the operation of your plant?
- b) What semi-finished products do you have in excess that could be sold to other countries?

5. TRAINING:

- a) What are your actual needs for training for the operation and management and maintenance of your plant?
- b) What are your possibilities for training personnel from other countries?

6. a) What are the possibilities to develop joint production in the region?  
b) The main requirements for such undertakings?  
c) Assistance required?
7. Please specify:  
a) Any other requests that you may have.  
b) Any other offers of co-operation that you may wish to make.

30. On the basis of the answers to the above questionnaire, the following comments were drawn up and presented to the participants:

1. Regarding inputs to the plants, (Table I), the main needs were, of course, scrap and billets.  
A. Scrap, or as a substitute another primary metal such as pig iron or D.R.I. (Directly Reduced Iron) is available:  
SCRAP: In neighbouring countries, such as Togo (specially in developing scrap collection and preparation)  
PRIMARY METAL SUBSTITUTE: Countries which have excess facilities to produce D.R.I. (Malaysia) or pig iron (Egypt).  
B. Billets: possibilities exist in Malaysia and also Kenya and Ghana.
2. Regarding operations of the plants (Table II), the main needs concern spare parts on the one side and training and new technology often associated on the other side. As far as spare parts are concerned, there are needs practically everywhere. In addition, specific needs depending on the type of plant were also identified. These are very often associated with rolling mills (rolls, guides, etc.), and, sometimes specific, such as heavy castings, bearings, etc. The possibilities are, for the time being, limited in this region but it seems that some co-operative arrangements are being initiated between neighbouring countries (Ghana - Togo - Ivory Coast). Regarding technology, especially new technology and training, a number of needs and possibilities exist in Africa and it seems that at least a part of the needs could be satisfied by regional possibilities through co-operation.
3. Finally, regarding joint production in the region, a number of suggestions have been made (Table III). Of course, they depend - as has been mentioned - on:

- mutual economic interest
- preliminary evaluation of such interest
- financial assistance from international organizations such as UNIDO
- regional co-operation.

In addition, the exercise gave in principle, a clear picture of the situation in Africa regarding the main inputs which are not available in the region. This can be used as an important tool for:

- a) Newcomers who should be careful in establishing mini iron and steel plants based on scrap iron, since it seems that there is a shortage of the same, and alternative solutions should be sought.
- b) Defining areas of co-operation on an inter-regional basis in areas such as training, specially in required programmes for new technology, maintenance and management.

31. The following tables were reviewed in depth by the participants before the closing of the meeting.



TABLE I

INPUTS

NEEDS			POSSIBILITIES		
Raw Materials	Metallics	Semi Products	Raw Materials	Metallics	Semi Products
<u>IRON ORE</u> Nigeria Malaysia China	<u>SCRAP</u> Ghana Kenya Egypt Mauritania	<u>BILLETS</u> Nigeria Togo Tanzania Egypt Mauritania Cameroon	<u>IRON ORE</u> Tanzania Angola Mauritania	<u>SCRAP</u> Togo	<u>BILLETS (+ INGOTS)</u> Kenya Ghana Zimbabwe
<u>BAUXITE</u> Nigeria	<u>USED RAILS</u> Togo		<u>REFRACTORIES FLUXES</u> Nigeria Tanzania China	<u>D.R.I.</u> Malaysia Nigeria	<u>BILLETS</u> Malaysia
<u>CHARCOAL</u> Malaysia			<u>BAUXITE AND MANGANESE</u> Angola Ghana	<u>PIG IRON</u> Egypt Algeria Zimbabwe	<u>INGOTS</u> Algeria Egypt (pencil ingots)
			<u>COAL</u> China Tanzania etc ...		

TABLE II

OPERATIONS

NEEDS			POSSIBILITIES		
Spare Parts	Technology	Training	Spare Parts	Technology	Training
Egypt Nigeria Malaysia Kenya Tanzania Algeria Ghana Mauritania Angola	<p>Malaysia to update technology</p> <p>Kenya for continuous casting</p> <p>Ghana for continuous casting</p> <p>Mauritania</p> <p>Tanzania for using titan- iferous iron ores</p>	<p>and for manage- ment training of junior staff</p> <p>Theoretical and practical training</p> <p>Egypt Electronics and automa- tion</p> <p>Algeria Management maintenance</p>	China Egypt (C.I. Moulds) Ghana (spare parts for Togo and Ivory Coast) Cameroon	China Malaysia Kenya Ghana Planned main- enance oxygen pro- duction	China Malaysia Kenya Ghana Maintenance  Mauritania technical assistance to new mini-steel plant projects Togo rail re-rolling Algeria organization of the training - specialized training China

TABLE III

JOINT PRODUCTION

Needs and possibilities mentioned

<b>NIGERIA</b>	Through regional co-operation
<b>KENYA</b>	For raw materials and sponge iron (D.R.I.)
<b>TANZANIA</b>	For alloyed steels Flat products
<b>ALGERIA</b>	Foundry with other countries
<b>GHANA</b>	
<b>MAURITANIA</b>	Foundry for spare parts CEAO
<b>PTA</b>	Establishment of sponge iron and flat product plants
<b>UDEAC</b>	Specially for iron ore and steel plants

C. Bilateral Discussions on Economic Co-operation  
among the Participants

32. Below is a summary of the bilateral discussions which took place:

<u>Country</u>	<u>Country</u>	<u>Subject(s)</u>
Angola	Algeria	Possibilities of Algeria helping Angola with several training programmes. Visits to Algerian installations.
Angola	Nigeria	Discussions on the supply by Nigeria of spare parts. Training of Angolan personnel at Nigerian installations. Angola may export some raw materials to Nigeria (iron ore). Supply of refractories to Angola.
Angola	UDEAC	Transport problems.
Cameroon	Mauritania	In-depth discussions regarding spare parts and co-operation on foundries.
Cameroon	UDEAC	Transport problems.
China	Algeria	Discussions on rationalization of existing steel plants ranging from production technology to personnel training. Discussions regarding Algerian involvement in new iron and steel project.
China	Nigeria	Exchange of opinions on supply of spare parts from China, technical services, exchange of personnel as well as payment compensation. Further contacts necessary.
China	PTA	Both sides agreed that there were many opportunities for co-operation in different areas such as: planning, consultancy, training of personnel, natural resources, surveying (mainly refractory and flux materials). China supplying the PTA with the required mining and metallurgical equipment. Both parties should exchange visits to further discuss and agree on concrete co-operative arrangements.
Ghana	Nigeria	Discussions on possibilities and modalities of importing bauxite and manganese ore from Ghana. Discussion of the formation of an iron and steel association in the sub-region.

Country	Country	Subject(s)
Ghana	Togo	Discussions on preparation of scrap and production capacity of the various plants and discussions on exchange of technical information. Possibilities of purchase of ingots from Ghana. Togo to provide Ghana with assistance in commissioning their caster.
Ghana	Kenya	Discussions on preparation of scrap and production capacity of the various plants and discussions on exchange of technical information.
Ghana	SADCC	Discussions on technical assistance and collaboration in the field of engineering services and construction. Discussions on the formation of an iron and steel association.
Kenya	Togo	Discussions on possible co-financing of new steel mill project. Possibilities of the purchase of scrap from Kenya.
Malaysia	Egypt	Billets: will further discuss the matter of Turkish transport and dumping. Possibilities of supply of billets to Egypt.
Malaysia	Mauritania	Possibilities of supplying Mauritania with D.R.I. Possibilities of using Mauritanian iron ore for direct reduction and export of D.R.I. to Mauritania. Offer to be involved in study to utilize Mauritanian iron ore to replace scrap in the iron and steel industry.
Malaysia	Nigeria	Possible supply of billets to Nigeria.
Malaysia	Paraguay PTA	General offer for further detailed discussion on charcoal blast furnaces.
Mauritania	Algeria	Possibilities of establishing a tripartite group between Mauritania, Algeria and Tunisia to develop co-operative actions. This group might be enlarged later on if so required.

Country	Country	Subject(s)
Nigeria	Mauritania	Possible supply of iron ore to Nigeria.
Nigeria	PTA	Regional co-operation on raw material and training.
Nigeria	Togo	Supply of rail scrap to Togo. Supply of processed scrap to Nigeria.
Nigeria	SADCC	Discussions on training possibilities. Discussions on technical assistance and collaboration in the field of engineering services and construction. Discussions on the formation of an iron and steel association.
SADCC	Algeria	Discussions on the formation of an iron and steel association. Discussions on technical assistance and collaboration in the field of engineering services and construction.
SADCC	PTA UDEAC	Co-operation between the regional organizations.
UDEAC	Algeria	Training.

### III. ORGANIZATION OF THE MEETING

#### A. Opening of the Meeting

33. The meeting was addressed by the Director of the Division of Policy Co-ordination of UNIDO. He thanked the participants for their contribution to the meeting, namely the completion of the questionnaire which helped UNIDO very much in preparing the background documents for the meeting.

34. The Director of the Division of Policy Co-ordination referred to the importance of the iron and steel industry as it is a key sector in industrial development and, as referred to by the third UNIDO Consultation Meeting held on the iron and steel industry in Caracas, Venezuela, in September 1982, the mini iron and steel plant was a practical approach for newcomers to this industry.

35. With regard to the stage of development of most of the African countries, he referred to the responsibility of those present regarding the discussions of the main items of the guidelines for the establishment of such mini-plants, due to their experience in this matter and he hoped that areas of co-operation among them would be identified.

#### B. Election of the Chairman

36. The meeting decided to elect as Chairman Mr. Mohamed Tawfik Ahmed, Chairman of the Egyptian Copper Works.

#### C. Adoption of the Programme of Work

37. The participants approved the provisional programme of work (see Annex II).

#### D. Adoption of the Conclusions and Recommendations

38. The conclusions and recommendations, the main items to be included in the guidelines for newcomers to the iron and steel industry and the answers to the questionnaire as well as the resumé of the bilateral discussions were adopted by consensus on Thursday, 5 December 1985 at the closing session of the meeting.

#### E. Closing Session of the Meeting

39. During the closing session of the meeting, the Chief of the Section for Economic Co-operation among Developing Countries of UNIDO thanked the participants for their efforts in contributing to the success of the meeting. He referred to the fact that the concrete results which had emerged from the

meeting were beyond the expectations of such an expert group meeting. He said that not only had the participants shared their experiences in the iron and steel industry, but they had also agreed on the main items to be included in the guidelines for the establishment of mini iron and steel plants and had discussed in depth among themselves concrete areas of co-operation which would surely contribute to a better rationalization of this industry in developing countries.

40. He also said that the Section for Economic Co-operation among Developing Countries, within its limited resources, would do its best to implement the recommendations of the meeting and he hoped that the participants would also inform UNIDO on the implementation of their bilateral co-operation arrangements.

41. Several participants stressed the role of international organizations in assisting developing countries, especially in the African continent, through the convening of such events and expressed their thanks to all parties concerned for the organization of the meeting. They referred to the fact that only through such practical approaches could co-operation among developing countries be achieved in a results-oriented manner.

42. The Chairman of the meeting thanked all the participants for their contributions to the discussions and their positive approach as well as to those involved in the planning, organization and servicing of the meeting. He then officially closed the meeting.



#### IV. SUMMARY OF DISCUSSIONS

43. Several participants thanked UNIDO for organizing this meeting and expressed their appreciation for the analysis presented in the UNIDO documents regarding the current situation of the iron and steel industry in Africa. The participants made a brief exposé of the situation of the iron and steel industry in their respective countries and/or regions. These exposés reflected the main constraints faced by this industry as well as in some cases, the successful experience had so far in the planning, operation and management of such plants. At the same time, in view of other experiences, some suggestions were made regarding the planning, production and co-operation arrangements related to the iron and steel industry.

44. One of the participants referred to the fact that production capacity in his country was rather disappointing as the nominal capacity of the plant had never been achieved, not even when the plant had been managed by the designers and constructors. In this specific case, the nominal capacity was 30,000 tonnes per annum but due to certain constraints and obsolete technological processes, this capacity was never achieved. Programmes for modernization of the plant had been implemented to raise the production level of the plant to over 45,000 tonnes per annum, consisting of replacing the rolling machines with a more modern, complete mill. In his case, improvement of scrap preparation and rehabilitation of overhead cranes in the factory were of highest priority.

45. Another participant explained that the main problems in the operation of the plant in his country were related to the lack of adequately trained personnel for operating and maintaining the plant, as well as the lack of administrative organization.

46. Several participants referred to the fact that some of the bad results of their plants arose from studies commissioned to outside contractors who misled them regarding the organization and functioning of the plant.

47. Several participants said that in some countries, the cost of the required infrastructure was also included in the investment costs for an iron and steel plant which in some cases led to confusion as far as the final productivity of the plant was concerned. Other participants referred to the fact that economic projections would have to be made on a purely commercial basis.

48. Another participant referred to the need for an in-depth study before countries took measures vis-à-vis the development of this industry, in order to have a clear picture of the old plants to decide whether it would be better to rehabilitate, modernize or scrap the plants. In most of the cases, the technology was not chosen in accordance with the existing resources, needs and size of the countries concerned. Other countries were importing scrap which was not available locally to produce iron and steel products and still other countries began to produce iron and steel products which were not their main need, such as flat products.

49. Certain participants referred to the need for standardization of the iron and steel products and more specifically, the establishment of quality control parameters as well as the production of spare parts needed for this industry.

50. Several participants stressed the importance of the market aspects for the successful economic output of such plants.

51. Another participant referred to the fact that when considering new plants, the available capital was not always used economically, the real and specific markets did not exist, and a natural sound resource base to work from was not available.

52. Another participant representing a regional organization referred to the fact that his organization was studying the subject of the establishment of joint industrial projects in the region and that the iron and steel sector would be subject to a study beginning in early 1987. The participant mentioned that they were planning to establish a common iron and steel facility in the six countries concerned and in their case, due to the high price of electricity, they were planning to use natural gas or charcoal which were available in the region.

53. Several participants referred to the fact that one of the main constraints for the rationalization and development of this industry in Africa was the lack of an appropriate transportation network in Africa.

54. Another participant said that one of the main problems facing the successful operation of the plants in his country was the lack of communication with other producers in Africa, either regarding operation or even sources of imports of basic raw materials.

55. Several participants stressed the importance of regional co-operation as a way of overcoming certain difficulties due to the fact that this sector has high investment costs, in certain cases small markets, and in most cases, these markets were very similar in the various countries concerned. Furthermore, the actors who should participate in this co-operation scheme were discussed and several participants referred to the need for such co-operation, which should be started or expanded among the real actors in this industry.

56. Several participants referred to the need to establish inter-State agreements as far as transport was concerned, which could be the basis for the establishment of joint central units of production as well as facilitating the availability of supply of spare parts.

57. Another participant referred to the efforts that some regional organizations were making by taking steps towards the removal of tariff barriers among the countries concerned and the continual up-dating of a common list of products subject to reduced tariffs.

58. Several participants made specific offers for co-operation in several areas of assistance to some other African countries, which have been reflected before.

59. Another participant referred to the scheme of co-operation on joint purchases of spare parts among the countries in question and for future joint production of the same.

60. Several participants referred to the fact that in most of the cases, no consideration was given to the degree of relation between the iron and steel industry and other sectors of the economy, despite the high priority of the iron and steel industry in the overall development of their countries.

61. Finally, on the subject of the establishment of multinational production enterprises, participants took note of the efforts made by UNIDO in promoting such a concept and referred to the fact that this would constitute an ideal scheme of co-operation among the countries of the region. It was felt however, that to attain such an objective, co-operation among the countries should start on a step-by-step approach, either through joint purchase of raw materials, direct exchange of information, small technical assistance activities and so on. It was felt that the creation of an Association among the producers in the region would constitute a sound basis for the establishment of such types of multilateral co-operative programmes for the iron and steel industry.

Annex I

LIST OF PARTICIPANTS

Algeria

Fayçal Boudraa, Directeur Général, Entreprise Nationale de Sidérurgie,  
E.P. 342, Annaba

Angola

Henda da Cunha, Chef de Production, Sidérurgie Nationale, B.P. 3460,  
Luanda

Cameroon

Jacques Beaugrand, Administrateur-Délégué, Société Camerounaise de  
Métallurgie, B.P. 1022, Yaoundé

China

Zhou Zheng, President, China Metallurgical Construction Corporation,  
46 Dongsì Xidajie, Beijing

Dong Shaoji, Vice Chief Engineer and Senior Engineer, Beijing Central  
Engineering and Research Corporation of Iron and Steel Industry,  
4 Baijuang Road, Beijing

Egypt

Mohamed Tawfik Ahmed, Chairman, Egyptian Copper Works, Alexandria

Ghana

Edward K. Tackie, General Manager, GIHOC-Steelw Company Ltd.,  
P.O. Box 320, Tema

Kenya

Shailesh Rajani, Kenya United Steel Company Ltd., P.O. Box 90550,  
Mombasa

Malaysia

Choo Kean Hin, General Manager, Malayawata Steel Berhad, P.O. Box 60,  
Butterworth, Penang

Mauritania

Ahmedou Ould Jiddou, Directeur Général, Société Arabe de Fer et de l'Acier en Mauritanie, B.P. 42, Nouadhibou

Nigeria

Musa B. Wakawa, Deputy General Manager (Production), Ajaokuta Steel Company Ltd., P.M.B. 1123, Okene, Kwara State

Paraguay

Roberto P. Knopfmacher, President, Acero del Paraguay S.A., Azara 197, 8º Piso, Asunción

Diógenes Benítez Trulls, Director-General, Lacontinental S.A.C.I., Av. Eusebio Ayala Nº. 2269, Asunción

Togo

John Moore, Président, Directeur Général, Société Togolaise de Sidérurgie, B.P. 13 472, Lomé

International Organizations

Preferential Trade Area for Eastern and Southern Africa (PTA)

Charles O. Okui, Director of Industry, P.O. Box 30051, Lusaka, Zambia

Southern African Development Co-ordination Conference (SADCC)

S.A. Njare, P.O. Box 9503, Dar es Salaam, United Republic of Tanzania

Union Douanière et Economique de l'Afrique Centrale (UDEAC)

Antoinette Dinga, Expert Principal, Département de l'Harmonisation Industrielle, B.P. 969, Bangui, Central African Republic

Annex II

PROGRAMME OF WORK

Monday, 2 December 1985

- Opening of the meeting
- Election of the Chairman
- Presentation of the UNIDO papers prepared for this meeting
- Brief exposé (10 minutes) of each participant

Tuesday, 3 December 1985

Discussion on:

- a) Ways and means regarding the solving of the main problems of the existing plants.
- b) Main items to be included in guidelines for the establishment of new mini iron and steel plants.
- c) Possibilities of co-operation among the participants regarding the solving of the main problems of the existing plants.
- d) Mechanism of co-operation for the establishment of such plants either on a regional or on an international basis, including the possibility of establishing multinational production enterprises among the countries of the region.

Wednesday, 4 December 1985

Morning: Free

Afternoon: Continuation of the discussion

Thursday, 5 December 1985

Morning: Adoption of the Conclusions and Recommendations

Annex III

LIST OF DOCUMENTS PRESENTED AT THE MEETING

1. Possible Programme of Action in the Iron and Steel Sector for Developing Areas Through the Mini-Plant Concept
2. Resumé of UNIDO's Activities to Promote Industrial Co-operation among Developing Countries - The Case of the Iron and Steel Processing Industry
3. Report of the Third Consultation on the Iron and Steel Industry (UNIDO document no. ID/WG.374/6)