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21313

Distr.
LIMITED

ITPD.21 (SPEC.)
27 September 1995

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ORIGINAL: ENGLISH

Expert Group Meeting on Cooperation on
Environmental Management of the Iron and Steel
Industry for the African Region

Pretoria, 10-13 July 1995

REPORT

V.95-57595T

Explanatory notes

The following abbreviations have been used:

AISA	African Iron and Steel Association
ARCEMISI	African Regional Committee on Environmental Management of the Iron and Steel Industry
COMESA	Common Market for Eastern and Southern Africa
MICOR	Metallurgical Industries Group of Egypt
SARSPCC	South African Rolled Steel Producers Co-ordinating Council
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization

Contents

Introduction

The Expert Group Meeting on cooperation in Environmental Management in the Iron and Steel Industry for the African Region was held at Pretoria, South Africa, from 10 to 13 July 1995. The meeting was organized by the South African Rolled Steel Producers Co-ordinating Council (SARSPCC) in cooperation with the African Iron and Steel Association (AISA).

Similar environmental management programmes in iron and steel have been developed by the United Nations Industrial Development Organization (UNIDO) in Latin America, South-East Asia and the Arab region in cooperation with the South-East Asian Iron and Steel Institute, the Instituto Latinoamericano del Fierro y el Acero and the Arab Iron and Steel Union.

The Meeting aimed at achieving an exchange of experience and technology development for eliminating pollution and promoting environment-friendly activities in the industry. It also aimed at enhancing the development of the African iron and steel sector by creating efficient and integrated mechanisms for cooperation among plants, institutes and Governments of the region.

Conclusions and recommendations, including outline of a regional programme

Conclusions and recommendations of the Meeting

The Meeting, having reviewed the conclusions and recommendations of other regional committees on environmental management in the iron and steel industry, agreed that they were relevant to the African region as well and co-opted them after having made amendments to suit the needs of the region:

1. A proper institutional framework is essential for progress towards and sustainability of improved environmental performance by the iron and steel industry. This framework consists of a set of agreements and arrangements among Governments, companies in the sector, the scientific community and linked institutions (consulting firms, suppliers, manufacturers, buyers etc.) on policies, priorities and planning, implementation and finance mechanisms. It should be capable of implementing policies and providing definite incentives for improved environmental performance.

2. Attempts to obtain acceptable common regional standards in monitoring, policy and regulation are essential for the efficient allocation of industrial, financial and technical assistance resources and for effective policy implementation.

3. Economic instruments (e.g. emissions permits and trading arrangements) should be implemented wherever feasible as they have proven more effective than regulatory instruments in motivating industry to comply with policies for pollution prevention and control.

4. Where economic instruments are not feasible, regulatory instruments must be developed and applied uniformly. Indeed, an effective regulatory system is essential for the successful application of economic instruments. Regulatory compliance is likely to require the establishment of special funds or cost-sharing arrangements between the regulators and the regulated.

5. Cost-benefit analysis, inclusive of environmental values, is an important tool for policy formulation and project planning.

6. Several approaches to local and regional capacity-building were suggested, including the exchange of experience through newsletters and networks, degree programmes, training centres, professional associations, development of local/regional auditing companies and companies that supply and service equipment.

7. Strategies and action plans should guide regional, national and subsectoral activities towards improved environmental performance. Targets should be set realistically, based on the comparative environmental and health risk assessments of the member countries and the constituent subsectors.

8. A programme of demonstration projects would be extremely valuable. The programme should demonstrate a range of technological strategies in all the major subsectors of the industry.

Outline of a regional programme

Objectives

The objectives of a regional programme supported by UNIDO would be as follows:

1. To reduce the negative environmental and health impacts of the iron and steel industry.

2. To enhance the capacity of member countries to manage industrial development in a sustainable manner.

3. To strengthen regional cooperation in iron and steel.

Outputs

The suggested outputs for a regional programme are as follows:

1. Identify negative environmental and health impacts of the industry and prioritize them according to the degree of environmental and health risk.

2. Identify and demonstrate appropriate technologies for waste minimization, pollution control and remediation.

3. Design and implement environmental and health monitoring systems.

4. Formulate regional, country and subsector strategies and action plans.

5. Put in place appropriate institutional frameworks for action plan implementation.

6. Identify and mobilize local, regional and international resources for ongoing environmental management within the institutional framework.

7. Establish, equip and staff regional and country clearinghouses.

8. Deliver training in policy and regulation, technology, economic and financial appraisal of environmental management projects, internal management controls, operations and maintenance, and monitoring and evaluation.

Activities

Assessment and strategic planning

Working groups composed of representatives of government, industry, science and regional consultants/suppliers will be formed to develop assessments, policies and priorities for improved environmental performance and management of and by the industry. Special attention will be given to reform actions, tools, mechanisms and human resource development actions that institute capabilities and incentives for improved environmental performance. A framework for this activity was designed (see below).

Demonstration projects, planning, implementation and evaluation

The action plans generated under the preceding activity will identify a number of projects that can demonstrate and evaluate a range of technologies and institutional mechanisms. The projects should address the environmental and health issues in the iron and steel industry subsectors. They should also apply a range of interventions (waste minimization, pollution control, remediation) and demonstrate a variety of modes of public/private collaboration in planning, finance and implementation.

Institutional development

The action plans will identify and prioritize targets for environmental quality and appropriate strategies at regional, country and subsectoral levels for self-sustaining progress towards achieving these targets. The strategies may include legal and policy reforms, standardization of policies and regulations, training and facilities for licensing and environmental monitoring of industry activity, development of information clearing-houses and professional industrial environment associations, establishment of special funds and Government/industry cost-sharing arrangements for technological improvement projects, long-term technical assistance contracts between industry and local or international consultants, regional and international networks, training programmes at various levels and establishment of university-level industrial environment programmes.

Framework for assessment and strategic planning

Environmental impacts of the industry in general

Environmental impact assessment
Environmental assessment methodology
Characteristic impacts of specific industry processes
Review of existing regional and country studies
Priority industry-related environmental and public health risks in the region

Standards and regulation

International, regional and country standards
International, regional and country policy formulation and implementation
Environmental monitoring and auditing requirements
Industry responses to regulatory requirements

Towards compliance: technological strategies

Waste reduction
Process designs and substitution
Pollution control
Remediation

Towards compliance: institutional strategies

Benefits and costs of compliance
Cost-benefit analysis and the environment
Regulatory and economic instruments for pollution reduction
Analysis of opportunities for and constraints on the application of economic instruments, at subsectoral and country levels
Public/private roles in pollution control:
- Risk assessment
- Priority setting
- Standard setting
- Allocation of costs of achieving compliance
- Financial mechanisms

Legal and regulatory implications
Implications for company management

Regional and country subsector strategies

Prioritization of iron and steel environmental and health risks
Appropriate technologies and their costs
Strengths and weakness of the regulatory framework
Local resources (public and private):
- Funds
- Academic and research capabilities
- Monitoring and auditing capabilities
- Engineering design and supervision
- Manufacture of equipment

Opportunities for and constraints on local resource mobilization
Priority actions

Regional, country and subsector action plans

Policies
Priorities
Legal and regulatory reforms
Stakeholders and roles
Monitoring auditing systems and procedures
Information systems
Management systems
Communications systems
Baseline studies
Demonstration project identification
Training needs
- Management training
- Research and development needs
- Training
- Facilities
- Finance

I. Organization of the meeting

The Meeting was attended by 21 participants from eight countries* and representatives of UNIDO, the Common Market for Eastern and Southern Africa (COMESA), the Metallurgical Industries Group of Egypt (MICOR) and AISA. Annex I contains a list of participants.

Opening of the meeting

The Meeting was opened by the Secretary-General of SARSPCC, who introduced the keynote speaker, Trevor Jones, the Managing Director of the Highveld Steel and Vanadium Corporation. The Secretary-General of AISA, Sanussi Mohammed, as well as the Resident Representative of the United Nations Development Programme (UNDP) and the UNIDO representative made statements (see chapter II).

Election of officers

The following officers were elected:

Chairman:	Patrick van den Bon (South Africa)
Vice-chairman:	E. Mudiare (Nigeria)
Rapporteur:	M. M. Nzomo (Kenya)

Adoption of the agenda

The Meeting adopted the following agenda:

1. Opening of the Meeting.
2. Election of the Chairman, Vice-chairman and Rapporteur.
3. Presentation of UNIDO/AISA report.
4. Presentation of national papers and discussions.
5. Setting up of the African Regional Committee on Environmental Management of the Iron and Steel Industry (ARCEMISI).
6. Technical visit to Iscor Vanderbijlpark Works.
7. Conclusions and recommendations.
8. Adoption of the report.
9. Closure of the Meeting.

The work programme of the Meeting is attached to the report as annex II. At the closure of the Meeting a motion of thanks to UNIDO and support for that organization was adopted (annex III).

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*Ethiopia, Kenya, Mauritania, Nigeria, Senegal, Togo, South Africa and Zimbabwe.

II. Keynote speech and opening statements

South African Rolled Steel Producers Co-ordinating Council

In his keynote speech, the Secretary-General of SARSPCC gave a brief overview of the South African iron and steel industry. He told the meeting that South Africa was concerned about environmental management in the industry. A great deal had been achieved in recent years, he said, in industrial air pollution abatement. He pointed out, however, that it was becoming more and more difficult to meet environmental standards without compromising competitiveness in world markets.

Mr. Jones went on to say that with the scarcity of water in South Africa, it was essential that streams, rivers and reservoirs should be kept as free from pollution as possible. He gave an account of the efforts in this area by both the iron and steel industry and the public sector. He also said that mining sites were being rehabilitated extensively in South Africa.

On the involvement of non-governmental organizations in the area of environmental management, Mr. Jones reported formation of the Industrial Environmental Forum, made up of 47 South African industries. The Forum had been instrumental in adapting United States environmental self-assessment programmes for use in South Africa. He said the Committee on Environmental Affairs of SARSPCC was also addressing important issues that had arisen following the introduction of environmental management in South Africa.

Mr. Jones added that, like many countries in the rest of the world, South African steel and allied industries were applying up-to-date management practices and standards. Those standards included the ISO 9000 series (quality management) and the South African Bureau of Standards Environmental Management System code of practice No. 0251:1993, based on British Standard 775, which would soon be superseded by the ISO 14000 series (the ISO committees are still meeting to finalize and agree on the requirements).

Those internationally accepted standards were expected to make it possible to compete on equal terms with foreign companies. In addition, environmental auditing was being introduced as a management tool to ensure that responsible controls were maintained. The accreditation of auditors was being discussed; it was one of the more controversial issues and required careful consideration.

Throughout the mining industry, an environmental management programme report was required by law and was being implemented. Mr. Jones described the document as a practicable one that would be controlled by the mine management and monitored only by the Department of Mineral and Energy Affairs. It was, he believed, one of the first of its kind in the world. It specifically covered all the environmental issues, including the various phases of operation, from commissioning to closure and after-care. Environmental impact assessments were being used for all new industrial projects.

Good environmental management had many benefits, Mr. Jones said, and should create opportunity, employment and financial returns. That was particularly true in the field of recovery and recycling of certain materials, which in the steel and alloy industry would include steel scrap, refractories, oils, slags and collected dusts from fumes and smoke.

Developing countries had to be aware that to meet environmental standards was often both costly and difficult to justify. The technicalities needed to be understood, so that expedient and short-term goals would not be agreed to without considering long-term objectives.

The expectations of the masses of people in South Africa had been raised, causing informal housing areas to be developed overnight. Water and air pollution from domestic use alone were of great concern. The steel industry realized that education was an essential component and was making large contributions to correct the situation.

Mr. Jones finished by saying that there was room for optimism: many structures were already in place in South Africa, both non-governmental (for example, SARSPCC) and governmental. However, it was apparent that a great deal of ground needed to be covered as quickly as possible so that what he called "no regret" policies could be implemented.

African Iron and Steel Institute

The Secretary-General of AISA, Sanussi Mohammed, welcomed efforts by UNIDO to promote industrial development activities in Africa and commended South Africa for agreeing to share its experiences with the rest of the continent. He said the menace of pollution had been well anticipated and thus Africa needed to reset its priorities to ensure a better environment, which would lead to a healthier population and improve productivity and inventiveness.

United Nations Development Programme

The UNDP Resident Representative thanked SARSPCC for hosting this first UNIDO meeting in South Africa and spoke of the important role that country could play in the environmental management of the iron and steel industry in all of Africa. He reviewed environmental issues in Africa and emphasized the need to come up with concrete solutions to the problems and constraints faced by African countries in their development process. He said UNDP would be available and willing to join the efforts so far developed by UNIDO in environmental management of the iron and steel industry.

United Nations Industrial Development Organization

The UNIDO representative welcomed the participants to Pretoria and conveyed to them the greetings of the Director-General of UNIDO. He described the environmental management programme for the iron and steel industry so far developed by UNIDO in South-East Asia, Latin America, the Arab region and Africa. That programme had formulated various cooperation schemes and established regional committees on environmental management of the industry in three of the regions. He urged Africa to also establish a regional committee, as a concrete result of the Meeting within the overall strategy of interregional cooperation. He also informed the participants of the forthcoming interregional meeting on environmental management in the iron and steel industry, to be held in Brazil, probably in October 1995, and the global consultations on metallurgy/clean technology, dates and venue for which had not been determined. He then thanked the South African authorities for their hospitality and said he would support any action that the Meeting might recommend for attaining the objectives of the environmental programme in the iron and steel industry in the African region.

III. Summary of organization presentations and national papers

United Nations Industrial Development Organization presentation

The representative of UNIDO presented the programme developed by his organization for environmental management of the iron and steel industry. After explaining that the UNIDO consultant who had been scheduled to present the background paper on the Latin American experience was unable to be there, he described in detail the UNIDO regional programmes in Africa, the Arab Region, Latin America and South-East Asia and its interregional/global programmes as well. He spoke of the establishment of committees on environmental management in the above-mentioned regions and their roles and objectives. He explained the overall objectives that had been achieved in the South-East Asian region and said that the experience gained there would probably benefit the African region.

The UNIDO representative completed his presentation by making specific observations and recommendations on the situation, constraints and obstacles that African countries were facing in environmental management in the iron and steel industry.

African Iron and Steel Association presentation

In his presentation, the Secretary-General of AISA, Dr. Sanussi, said that African leaders must rely more on African experts to advise and implement policies relevant to Africa, particularly in the area of iron and steel. He strongly supported the formation of a regional committee on environmental management in the iron and steel industry. There was need to ensure continuity in the sector, which would, he hoped, culminate in working with other regional committees to come up with a global policy. He also suggested the floating of an iron and steel fund for the development of that sector in Africa.

National papers

Ethiopia

The participant from Ethiopia informed the Meeting that although the iron and steel sector was relatively small in his country, industrial plants in general had pollution problems and waste management was needed. The most offending sectors were leather, textiles and some food processing plants, especially those for meat. Currently there was no legislation regulating the management of waste or the discharge of pollutants into the water or air.

Because it was concerned for the environment, the transitional Government of Ethiopia was finalizing a policy to protect land, air and water from domestic and industrial waste, including discharges of hazardous materials and other pollutants, such as noise.

There were very few iron and steel plants in Ethiopia, so the damage caused by the sector was insignificant. However, the steel-making plants that did exist used outdated technology and equipment, some of which was operated manually, and that had a negative impact on the environment.

The iron and steel plant at Akaki was causing pollution, the participant said. The gases emitted during the process, the cooling water, the sludges from the cooling circuits and the waste water from the rolling mill were being discharged into streams.

Kenya

The participant from Kenya informed the Meeting that the iron and steel industry in Kenya, one of the country's core industries, had contributed significantly to the development of other industries. It had five categories of production: steel melting and hot rolling; wire rod producing and wire drawing; cold rolling and galvanizing; castings and foundry products; and piping and tubular products.

He also told the Meeting that there were several steel mills scattered across the country. The sector was a source of some environmental problems, among them air pollution, by way of emissions of waste gases and dust; solid waste, particularly slag and debris; noise; and water pollution.

He spoke of his country's National Environment Secretariat, which was the body responsible for coordinating all environmental matters. The country was also finalizing an environmental master plan.

Mauritania

The participant from Mauritania informed the Meeting that his country had recognized the importance of environmental management in the iron and steel industry. Mauritanian industry needed to commit itself, he said, to the use of cleaner technologies and to actively participate in the legislative process, so that the most efficient mix of government regulations and self-regulation could be developed.

He indicated the need to carry out national and regional environment surveys on a regular basis and increase the visibility of environmental management activities by the iron and steel industry. He articulated other needs as well: the development of hands-on operational programmes, the production of guidelines and operative manuals to address problems in the iron and steel sector, and funding for environmental programmes for the iron and steel sector. He sought the continued cooperation of UNIDO, AISA and SARSPCC in all these matters.

Nigeria

One of the participants from Nigeria told the Meeting that the country had two integrated steel plants, the Delta steel plant at Aladja and the Ajaokuta steel project, which were based on the direct reduction and the conventional blast furnace routes, respectively. Three independent rolling mills sourced their billets partly from the Delta plant and partly from imports. The participant said that pollution was generated by a number of activities: preparation of the mines raw material, iron making, steel making and continuous casting, hot rolling and cold rolling and the manufacture of steel-based products. Environmental problems included emissions to the atmosphere, water pollution, solid wastes and noise and vibration.

The Meeting was informed that Nigeria had in place the National Environmental Protection Authority.

Senegal

The participant from Senegal informed the Meeting that although his country did not have an iron and steel industry, it had a large iron ore mining operation at Falcme. The mine was a major source

of environmental pollution. The country was undertaking an environmental impact study of the mining operation.

Togo

The participant from Togo told the Meeting that the main industrial activity in his country was the mining of phosphate, and that that activity posed a significant environmental threat. He said that the production process included washing the ore in the sea, which polluted the water at that location and affected the fauna. There was no legislation on the environment in Togo, he said.

Zimbabwe

The participant from Zimbabwe informed the Meeting that environmental issues in his country were governed by legislation such as the Atmospheric Pollution Prevention Act and the Water Act. That legislation stipulated the maximum tolerable levels of undesirable contaminants in waste gases and waste waters discharged to the atmosphere and to water courses. He said that the iron and steel industry in Zimbabwe revolved around Ziscosteel, an integrated iron and steelworks that comprised raw materials preparation, a sinter plant, coke ovens, blast furnaces, a steel plant and rolling mills. The environmental wastes produced at the various stages of converting raw materials into steel products included dust emissions (iron, coal, limestone), coke ovens emissions and wastes (ammonia liquor, aromatic hydrocarbons, tar), blast furnace and steel plant sludge and slag, rolling mill scale and waste oils.

Ziscosteel was implementing a waste management programme that involved the mechanical separation of suspended solids, the biological treatment of effluents and the adoption of environmental-friendly technologies.

South Africa

One of the participants from South Africa told the Meeting that within the South African iron and steel industry there was a drive towards self-regulation. The South African Government had opted for motivation and cooperation rather than policing. The industry must comply with the standards set out in a number of laws and for a number of processes a permit system was in place. One of the conditions for obtaining a permit was that performance figures were to be reported monthly; non-compliance had to be reported immediately.

All effluents and emissions were controlled, and all iron and steel manufacturers had their own pollution prevention equipment and water treatment plants, it was learned. Moreover, the manufacturers were responsible for their own waste disposal. Waste minimization, recycling and marketing of waste products had become more important.

Awareness of environmental issues had increased, the Meeting was told, and projects were continuously initiated to upgrade plants so that they would conform to international standards for emissions and effluents. A number of companies were busy developing an environmental management system, and ISO 14001 was being used as a reference framework.

IV. Establishment of the African Regional Committee on Environmental Management of the Iron and Steel Industry

The participants at the Meeting acknowledged the need to address environmental matters in the iron and steel industry both nationally and regionally. They believed strongly that no country could successfully address environmental issues in isolation and that regional cooperation was therefore likely to produce tangible results.

After deliberating, participants agreed that the mining of iron ore was an integral part of the industry. They also noted that the new ISO 14000 series (environmental management) would have as great an effect on world trade as the ISO 9000 series (quality management). African countries, in particular iron- and steel-producing countries, had to brace themselves for changes. However, as funding for environmental programmes was a problem for the region, they suggested that UNIDO and other international organizations should come to the region's assistance.

The transfer of technology from the more developed countries to the less developed countries in Africa should be vigorously promoted. South Africa could take the lead role, especially in the iron and steel sector.

As an integrated approach to environmental concerns would be the best approach to management of the environment, both the upstream mining industry and the downstream industries that consumed iron and steel products should be covered by the national and regional committees on the environment.

Various issues were raised and discussed in detail in relation to the negative impact of the iron and steel industry on the immediate environment and to measures for protecting that environment.

The participants realized the difficult situation of the iron and steel industry in Africa, which faced demands from environment-conscious steel markets that environment-friendly practices should be put into effect. They emphasized the need to raise awareness of environmental management issues among all the parties and at all levels of the iron and steel industry and to identify actions for developing and strengthening cooperation, including the creation of a mechanism for pollution prevention in the region.

To promote intra-African cooperation in the steel industry and build a legal framework for protecting the environment, the participants set up the African Regional Committee on Environmental Management of the Iron and Steel Industry (ARCEMISI). At that point, the representative of MICOR, Mohammed Adel El-Danaf, made a statement to the Meeting regarding the experience of the Arab Regional Committee on Environmental Management of the Iron and Steel Industry.

The participants elected Patrick van den Bon (SARSPCC) as chairman of ARCEMISI (subject to confirmation by SARSPCC) and Edeki Mudiare (Nigeria) as vice-chairman. The other members of ARCEMISI, who would also serve as national coordinators, were as follows: D. Gebregiorgis (Ethiopia), M. M. Nzomo (Kenya), M. Salem (Mauritania), H. N. Ofili (Nigeria), A. Camara (Senegal), T. Ouro Gblao (Togo) and R. Meyer (SARSPCC) (subject to confirmation by that body). A member/national coordinator for Zimbabwe would be appointed later.

Annex I

LIST OF PARTICIPANTS

Egypt

Mohamed Adel El-Danaf, Chairman, Holding Company for Metallurgical Industries, 5 Tolombat St., Garden City, Cairo

Ethiopia

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Annex II

WORK PROGRAMME OF THE MEETING

Monday, 10 July 1995

0900-0930	Registration of participants.
0930-1045	Opening ceremony with speeches and statements by the following: Secretary-General of SARSPCC to introduce the Managing Director of Highveld Steel and Vanadium. Managing Director welcomes participants on behalf of the South African steel industry. Secretary-General of the African Iron and Steel Association. UNDP representative. UNIDO representative.
1045-1100	Participants introduce themselves.
1130-1200	Election of officers.
1400-1700	Presentations by AISA and UNIDO.

Tuesday, 11 July 1995

0900-1230	Presentation of national papers on environmental management issues of iron and steel and prospects of cooperation in Africa: Ethiopia, Kenya, Mauritania, Nigeria and Senegal. Discussion.
1400-1630	Presentation of national papers: Togo, Zimbabwe and South Africa. Discussion.
1630-1700	Setting up of the African Regional Committee on Environmental Management of the Iron and Steel Industry.

Wednesday, 12 July 1995

0800	Visit to the Iscor Vanderbijlpark Works in Vanderbijlpark, about one and a half hours' drive from Pretoria. The visit will take up most of the day.

Thursday, 13 July 1995

1000-1200	Adoption of the report, including recommendations and inputs for the Global Consultation on Environmental Management in the Metallurgical Industry, scheduled to be held at Vienna, 16-18 October 1995.
1200	Closing ceremony.

Annex III

MOTION OF THANKS TO AND SUPPORT FOR THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Recognizing the important role that UNIDO is playing in the industrial development process in general and in Africa in particular, the participants at the meeting on cooperation in environmental management of the iron and steel industry in Africa, held at Pretoria from 10 to 13 July 1995, give their full support and appreciation to UNIDO.

The first ever meeting held in South Africa, organized by UNIDO in cooperation with the South African Rolled Steel Producers Coordinating Council and the African Iron and Steel Association, has fully achieved its objectives and opened up means of and prospects for cooperation within and outside Africa.

Convinced and aware of the valuable efforts made by UNIDO for the success of the Meeting for the benefit of African countries in their economic development, the participants congratulate the Director-General of UNIDO for the excellent preparation of the Meeting, which enabled it to attain its objectives. In this connection, the participants have elected members and officers of the African Regional Committee on Environmental Management in the Iron and Steel Industry.

In view of the importance of environmental concerns to the African region, the participants urge that the report of the Meeting on environmental management in the iron and steel industry should be distributed as widely as possible to subregional groupings for consideration and action by their respective policy organs.