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22497

PROJECT NO. US/RAF/96/183

# "ASSISTANCE TO COMESA COUNTRIES IN REHABILITATING THEIR METALLURGICAL INDUSTRIES WITH SPECIAL REGARD TO THE IRON AND STEEL SECTOR"

## FINAL REPORT ON CONTRACT NO. 99/046P

SUBMITTED TO:

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION (UNIDO)

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MARCH 2000

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## Introduction

This is a final report submitted by Uganda Metal Industries Development Association (UMIDA) after the completion of Contract No. 99/046P "TO RUN COMESA METALLURGICAL INDUSTRIES ASSOCIATION (COMESAMIA) FOR 1 YEAR". The assignment was to run from March 1999 to February 2000.

## Scope of The Assignment

UMIDA was contracted to run COMESAMIA for the first year during which time it should be well established.

Basically UMIDA was during the first year to ensure that:

1. COMESAMIA is legally registered in Uganda.
2. The COMESAMIA work programme is implemented as agreed during the Inaugural Annual general Meeting (See Annex for Work Programme).
3. Organise Board Meetings and one General Meeting of the Association.
4. Prepare reports of the Association.
5. Publish and circulate at least two Metallurgical Bulletins.
6. Organise meetings, training programmes and other activities of the Association.
7. Run the COMESAMIA office for one year.

## Background To COMESAMIA

The idea of forming a regional association to champion the interests and development of this very important industrial sub-sector was first introduced at the workshop on the development of a viable and sustainable iron and steel sector held in Nairobi, Kenya in February 1995. IT was recognised then that the industry faced numerous operational and technical difficulties many of which were common to most plants in member states. In addition, a free trade areas and economic community that COMESA is setting up among its 21 member states, requires that there be a regional body that will act as focal point for information on business opportunities, manpower and capacity development, technology, etc. Fro example, there is currently a major problem brewing in the region due to rampant steel dumping that is posing serious threats to the survival of some of the producers in the region.

The Austrian-funded UNIDO projects US/RAF/92/159 and US/RAF/96/183 - "assistance to COMESA countries in rehabilitating and upgrading their metallurgical industries with special regard to the iron ad steel sector" have over the past five years stimulated interest and generated momentum in manpower development, technical assistance, R&D particularly on sponge iron, cross-border investments, regional trade, information exchange and general cooperation that did not exist before. When the donor funding comes to an end, COMESAMIA is the natural agency to continue with this effort.

As required by the Nairobi meeting, the COMESA Secretariat produced a draft constitution for the association that was circulated. this was then discussed at a consultative meeting held in Kampala, Uganda in April 1997 where it was reaffirmed that the association be established.

At the Kampala meeting, Uganda offered to host the interim secretariat of the association and has already provided free office accommodation for this purpose.

Further, UMIDA was requested to organise the official launching of COMESAMIA which was successfully done on 1st February 1999 by the Minister of State for Trade and Industry Hon. Manzi Tumubweine on behalf of the Rt Hon. 2nd Deputy Prime Minister and Minister of Tourism, Trade and Industry of the Republic of Uganda. The venue was the Uganda Industrial Research Institute, Nakawa.

The Minister reiterated the offer of office space to COMESAMIA for at least one year and encouraged the strengthening of the cooperation effort.

After the launching members present from Egypt, Ethiopia, Kenya, Tanzania, Zimbabwe, Zambia and Uganda then held an Inaugural General Meeting at which a Board of Directors of eight (8) members was elected. the eight represented the countries present with Uganda having two (2) Directors to ease the operations of the Association.

**Assignment Accomplished**

As a result of implementing a UNIDO sponsored project under Contract No. 99/046P, 'To Run COMESA Metallurgical Industries Association for 1 Year' the following February 2000:

| | **Activity** | **Month** |
|---|---|---|
| 1. | Registered the COMESAMIA Constitution in Uganda and sent copies for registration in Egypt, Tanzania, Kenya, Zimbabwe, Zambia and Ethiopia , the countries where the founding Directors come from. | March 1999 |
| 2. | Opened a bank account for the Association | April 1999 |
| 3. | Set up the COMESAMIA office in the Uganda | April/May 1999 |

| | | |
|---|---|---|
| | Industrial Research Institute, Nakawa erected a signpost and furnished the office | |
| 4. | Received a computer system from the COMESA Secretariat and installed it in the office | |
| 5. | Recruited a secretary to run the office | April 1999 |
| 6. | Attended the 4th Summit Meeting of the COMESA Authority in Nairobi Kenya at which COMESAMIA was introduced as a COMESA Association | May 1999 |
| 7. | Produced the 1st two Issues of the COMESAMIA Journal | 1999/February 2000 |
| 8. | Participated in a study tour of Metallurgical Plants in India which was aimed at exposing engineers from COMESA Region to Indian technologies which would be appropriate for adaptation in the COMESA Region | |
| 9. | Participated in the COMESA Vision Setting Meeting in Lusaka Zambia | August 1999 |
| 10. | Have arranged for the testing of Uganda iron ore with Tanzanian Coal in Sponge Iron India Limited, a company visited during the study tour of India | |
| 11. | COMESAMIA was represented at the Committee on Industry meeting in Lusaka, Zambia | September 1999 |
| 12. | Participated in Tripartite Review Meeting of US/RAF/96/183 in Nairobi, Kenya | November 1999 |
| 13. | Participated in organizing the Training Workshop in Addis Ababa, Ethiopia | April 2000 |
| 14. | Sent Ugandan Iron Ores and Tanzanian Coals for testing in Harare | February 2000 |
| 15. | Organised a Sponge Iron Investment Meeting in Kampala, which has resulted in the formation of a company to implement the SPONGE IRON project. (More such meetings are planned throughout the region). | January 2000 |
| 16. | Carried out member recruitment drives in:<br>• Uganda - now 30 members<br>• Tanzania - 5 members (June 1999)<br>• Mauritius - 10 expected (December 1999)<br>• Zambia - 3 members (August 1999)<br>• Zimbabwe - 3 members<br>• Egypt - 1 member<br>• Ethiopia - 1 member | |

| | | |
|---|---|---|
| | • Kenya - 10 expected (visited November 1999) | |
| 17. | Wrote a business Plan for COMESAMIA for the period 2000 - 2003 | |
| 18. | Submitted the Business Plan to African Capacity Building Facility in Harare for funding | |

**Deliverables Already Submitted**

- Copy of Registered Constitution of COMESAMIA
- Office already functional at Uganda Industrial Research Institute with:
  - Furniture
  - Fittings
  - Computer System
  - Stationery (Letter Heads, receipt books, cash Book, Invoice Book Analysis Book, Requisition Book)
  - Secretary Recruited.
- Minutes of the COMESAMIA AGM
- COMESAMIA BROCHURE
- 1st Issue of COMESAMIA Journal
- Reports
  - Study Tour of India
  - COMESA Authority Meeting in Nairobi
  - Visits of Tanzania
  - COMESA Vision Setting Meeting (Zambia)
  - Committee on Industry Meeting (Zambia)
  - 2nd Tripartite Review Meeting.

**Deliverables With This Report**

(1). COMESAMIA's STRATEGIC PLAN
(2) CAPACITY BUILDING PROPOSAL
(3). 2nd Issue of COMESAMIA Journal
(4). Terms of Reference for Strengthening COMESAMIA
(5). Report on Kampala Sponge Iron Investment Meeting
(6). Certificate of Registration of Muko Iron-Ore Development Company

**Issues Being Followed Up**

- Formation of Kenya's Metallurgical Industries Association
- COMESAMIA Board Meeting
- 3rd Tripartite Review Meeting for US/RAF/96/183

- COMESAMIA AGM
- Formation of Ethiopia Metallurgical Industries Association
- Symposium on Sponge Iron in Harare, Zimbabwe
- Training Course in Kigali, Rwanda
- 3rd Volume of COMESAMIA Journal.

## CONCLUSIONS

The one -year funding of COMESAMIA provided by UNIDO and COMESA Secretariat has enabled the Association establish an institutional framework and recognition as COMESA Institution. The office has been equipped with computer facilities, which will enable data gathering and storage as well as quick communication.

A three-year business plan has been written and should enable the Association solicit funding from well wishers to implement the plan.

A second tranche of funding from COMESA/UNIDO will go along way to enabling the Association recruit more members and offer services to the metallurgical industry in the region.

## RECOMMENDATION

COMESA and UNIDO should assist the association solicit funding so as to be able to implement the three-year strategic plan and continue with the activities of project US/RAF/96/183.

# COMESAMIA's STRATEGIC PLAN

# COMESA

*STRATEGIC PLAN*

*FOR*

# COMESA METALLURGICAL INDUSTRIES ASSOCIATION (COMESAMIA)

*FOR 2,000 - 2,003*

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## 1.0 INTRODUCTION

This is a strategic plan for the COMESA Metallurgical Industries Association (COMESAMIA) which is aimed at enabling the Association build capacity to spearhead the development of the metallurgical and allied engineering **industries** in the COMESA Region.

## 2.0 BACKGROUND TO COMESA

COMESA was established in 1994, replacing the Preferential trade Area for Eastern and Southern Africa (PTA) which had been in existence since 1981. The PTA was established within the framework of the OAU's Lagos Plan of action and the Final Act of Lagos, to promote economic integration of the continent through creating regional economic communities and linking these together to create the African Economic Community (EAC).

The PTA, and hence COMESA, were established to take advantage of a larger market size, to share the region's common heritage and destiny and to ensure greater social and economic cooperation, with the ultimate objective of creating a regional economic community.

At present, the following are member countries of COMESA: Angola, Burundi, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.

In order to accelerate economic development and enhance the active participation of the private sector in regional integration initiative and Programmes, COMESA has established independent institutions to provide trade and development finance, provide re-insurance services and to offer technical and technological expertise and training in key economic sectors in the region.

Private Sector Development is vigorously promoted as evidenced by support towards the establishments and operation of private sector organizations for the region's business **community**.

COMESAMIA is **therefore one of the private sector Associations** of COMESA's independent institutions. COMESAMIA was established to assist member states to develop capability in the production, processing and marketing of metals and engineering products. COMESA **supports** COMESAMIA **in order** to strengthen linkage and networking **among the operators in the industry**.

## 3.0 BACKGROUND AND JUSTIFICATION

The crucial importance of metallurgical and allied engineering industries in COMESA is widely recognized as it offers tremendous linkage possibilities with, and stimulates the development of other **sectors of industry**. Most metal and engineering industries in the region are operating inefficiently due to a number of constraints. The major problems being poor management, weak finances, poor access to capital, lack of skilled manpower, run down plant conditions, obsolete technologies, shortages of raw materials etc.

The viability of any metallurgical industry depends on many factors. Prime among these factors is the maintenance of the plant and machinery. Today most metallurgical industries are just beginning to realize the importance of 'organized' maintenance management of their plants. However, a lot still remains to be done in the region for the metallurgical industries to attain self-sufficiency and proficiency in maintenance management. The maintenance function should no longer be viewed just as a 'cost centre', but as an integral function contributing to the overall viability of the industry.

Cooperation among the stakeholders in the metallurgical sector was first mooted in Nairobi, Kenya during a Workshop in 1995. The issue of cooperation was reiterated during a COMESA workshop in Kampala in 1997 during which Uganda offered to host the Secretariat **of COMESAMIA**. The establishment of COMESA Metallurgical Industries Asso0ciation in February 1999 was a fulfillment of these efforts. **The thrust of COMESA programmes on the metallurgical industry has been the iron and steel sub-sector.**

## 4.0 DESCRIPTION OF THE IRON AND STEEL SECTOR

The Metallurgical Industry contributes significantly to the economies of many COMESA member States. **The non-ferrous metals produced in the region are mostly for export while the iron and steel products are consumed in the domestic market.**

There are over 30 steel plants in the region located in Angola (1), Eritrea (1), Ethiopia (2), Kenya (14), Mauritius (2), Mozambique (2), Uganda (4), Tanzania (4), Zimbabwe (3), Zaire (1). With the exception of the 1 mtpa integrated ZISCO Steelworks in Zimbabwe, the rest are scrap-based mini steel plants or small re-rolling mills. The capacities are for the production of ordinary steel bars and small profiles. There is no plate or sheet production (except from imported hot rolled coils) nor special alloy steels. Most of the steel plants are operating inefficiently due to a number of constraints such as poor management, lack of skilled manpower, rundown plant conditions, use of obsolete technologies, shortages of raw materials such as scrap and/or sponge iron.

Intra-COMESA trade in iron and steel products is insignificant due to inter-alia, lack of information on availability, uncompetitive prices, quality and delivery terms and poor transport infrastructure.

Per capita steel consumption in COMESA currently averages less than 5Kg per year, which is miniscule compared with other regions of the World. The main constraints to increased local consumption are inadequate quantities and low quality of local production, low rates of economic growth and poverty.

Foundries and forges, which are necessary for the production of engineering and machine components, are poorly developed in most member states. Many of them operate on a jobbing basis producing simple items and spares. The majority of foundries produce grey cast iron in obsolete cupolas or oil-fired furnaces.

**However, m**any COMESA member states are richly endowed with raw materials resources for a variety of non-ferrous metallurgical industries ranging from precious metals (gold, silver, platinoids in Ethiopia, Tanzania, Zambia, Zaire and Zimbabwe), base metals (copper, cobalt, nickel, lead, zinc, tin in Burundi, Ethiopia, Uganda, Zambia, Zaire), ferro-alloys (chrome, manganese, vanadium, silicon, tungsten in Angola, Burundi, Ethiopia, Madagascar, Zaire and Zimbabwe), industrial minerals (refractories, fluxes, building materials), coal, petroleum, gas etc. Where these resources are being exploited, the products are virtually all exported in raw or semi-processed form.

There are some secondary manufacturing industries producing agricultural tools and implements, simple machines, tools, transport and materials handling equipment. These industries source all their special alloy steel raw materials from outside the region as there is no local production. Many of the companies were set up as import substitution monopolies to serve local markets only. They are finding it hard to compete in emerging liberalized economic climate.

The region still largely depends on imported technology, equipment, specialized skills and raw materials. Supporting infrastructures, institutions and services for the metal and engineering industries such as R&D, product design, manpower development and training facilities, information systems are still poorly developed.

## 4.1 Subregional Strategies

The central goal of COMESA is to attain sustainable growth and development of the member states by promoting a balanced and harmonious development of its production and marketing structures. To achieve this, COMESA places great

emphasis on regional co-operation and integration **through trade development and investment.**

The objectives of co-operation in the field of industrial development are to increase the availability, quality and competitiveness of goods and services for intra-COMESA trade; and to develop industrialists to manage and invest in these industries.

Furthermore, the COMESA Treaty enjoins member States to:

- promote linkages between the industrial sector and other sectors of the economy;

- promote industrial R&D, the transfer, adaptation and development of technology, training, management and consultancy services through the establishment of joint industrial support institutions and infrastructure facilities.

- share and maximize the use of existing and future industrial and scientific research institutions, consultancy and managerial experts to promote and accelerate the process of industrialization.

- exchange information on production of, and requirements of capital, intermediate and consumer goods, availability of facilities for industrial manpower development and training, industrial investment opportunities, processes, technologies and related information.

In response to these objectives, the Secretariat of COMESA has developed an Integrated Industrial Development Strategy which gives highest priority to the iron and steel branch in the basic metals sub-sector.

COMESA's plan also recognises the vital role that should be played by engineering industries in the process of industrialisation in their interactions and linkages with development of skilled employment, small scale entrepreneurship and subcontracting; in the production of transport, agricultural, mining, industrial tools, machinery and equipment, spares and consumables, structural components, repair and servicing.

The strategy, in line with economic adjustments and liberalization in member States, assigns a leading role to the private sector in a free market environment with the Secretariat playing a coordinating, facilitating and catalyzing role. Special emphasis is **placed** on those projects and programmes with a regional impact for which there is demonstrable demand for and support from the private sector.

COMESA has targeted the year 2005 for the introduction of a Customs Union, the total removal of all tariff and non-tariff barriers to internal trade, and the adoption of a common external tariff.

## 4.2 Prior and On-going Assistance

Since 1984, UNIDO has **supported** several project in this sector such as:

- RP/RAF/85/611 'A survey of the Iron and Steel Industries in African Countries. Subsequent UNIDO-assisted projects largely emanated from this study.

- US/RAF/87101, RP/RAF/86/262, XA/RAF/88/673, US/RAF/89/132 'Inplant Group Training Programmes in Maintenance Engineering in Steel Plants'. The programmes were targeted at maintenance personnel. Use was made of the Training centre at Ziscosteel and international experts.

- DP/RAF/88/072 'Development and Rationalization of Selected Small Scale Steel Plants in PTA Countries'. Technical assistance to upgrade production processes and on-the-job training to strengthen management and operation capabilities in selected steel plants.

- US/RAF/88/263 'Technical Assistance to **Rolmil (Kenya) Ltd.** in Plant Rehabilitation, Improving Production process and Overall Performance of the Company'. The project **is** funded by the Austrian Government.

- **US/RAF/92/153 EXTENDED AS** US/RAF/96/183 'Assistance to COMESA Countries in Rehabilitating and Upgrading metallurgical plants with special regard to the iron and steel sector'

## 5.0 OBJECTIVES OF COMESAMIA

COMESAMIA was inaugurated with the objectives of promoting development of Metallurgical and Metal working Industries in the COMESA region through:

- Promoting cooperation among metal working industries.

- Gathering and disseminating information useful to its members to advance their businesses individually.

- Stimulating and strengthening technical and economic cooperation and exchanges between **its members** to promote trade and growth.

- Playing an active role in technology transfer, trouble-shooting services and technical assistance programmes for the benefit of **the** members.

- Providing members with technical and commercial information through a business journal such as the metallurgical bulletin.

- **Conduct** studies for the benefit of promoting cooperation between members such as:

  - Investment studies
  - Engineering and technical studies
  - Standards improvement
  - Technological selection
  - New production and maintenance systems etc.

- The association would also take over activities of Project US/RAF/96/183 and continue spearheading the development of metallurgical industries in the COMESA region.

## 6.0 FORMATION OF COMESAMIA

As a result of the need to have a body that would champion the **interests** of the stakeholders in the iron and steel industries, a meeting to launch COMESAMIA was organized in Kampala in February 1999.

**The** draft constitution was circulated to all the **stakeholders in member states for comments after which** a meeting was held on 1st February 1999 to **consider** the constitution **and it** was adopted unanimously (see appendix - for copy of the constitution).

After the adoption of the constitution, the office bearers were elected at the 1st Annual General meeting **in accordance with the provisions of the constitution** (See appendix for minutes of the Annual General Meeting). The following were elected office bearers and members of COMESAMIA board.

| | | | | |
|---|---|---|---|---|
| (1). | Chairman | - | Eng. Dr. Byaruhanga | - Uganda |
| (2). | Vice-Chairman | - | Mrs. Sharrif Sadrudin | - Tanzania |
| (3). | Treasurer | - | Mr. Teddy Mapenzansuwa | - Zimbabwe |
| (4). | Member | - | Mr. Tesfaye Tamiru | - Ethiopia |
| (5). | Member | - | Mr. Mutumbi-Goma | - Zambia |
| (6). | Member | - | Mr. Bobby Johnson | - Kenya |
| (7). | Member | - | Prof. Kamal Ismail | - Egypt |
| (8). | Member | - | Mr. Kiyega Galiwango | - Uganda |

Mr. W. Balu-Tabaaro was elected Honorary Secretary.

The offer to host COMESAMIA was made by UMIDA and the Government of Uganda during the workshop held in Fairway Hotel in 1997. The offer of office **accommodation** was formally **confirmed** by the Minister of State for Tourism, Trade and Industry during the launching of COMESAMIA on 1st February 1999. The office is located at the Uganda Industrial Research Institute at Nakawa some 4kms from the centre of Kampala City.

## 7. MEMBERSHIP BENEFITS FROM COMESAMIA

**Like similar associations elsewhere in the world, COMESAMIA would endeavour to provide the following benefits to its members:**

**7.1 Publication of COMESAMIA Journal on a regular basis**
**7.2 Publishing books for sale to members at a discount**
**7.3 Annual meetings and exhibitions**
**7.4 Short specialised courses**
**7.5 Capacity building through seminars, symposiums and workshops**
**7.6 Educational outreach programmes in technical colleges, universities and study tours**
**7.7 Membership directory**

## 8.0 PROJECT US/RAF/96/183

COMESAMIA has been slated to take over the activities of the just- completed Project US/RAF/96/183 "Assistance to COMESA Countries in Rehabilitating and Upgrading their metallurgical plants with special regard to the iron and steel sector". This project was funded by the Austrian Government and implemented by UNIDO and the COMESA Secretariat from 1994 to March 2000. During this period, the project was able to:

- Train over 200 engineers and managers from industry through about 10 workshops in operations, management and maintenance of industrial plants.
- Benefit industries and individuals from Kenya, Uganda, Tanzania, Zimbabwe, Zambia, Egypt, Mauritius, Ethiopia.
- Promote cooperation among industries **in** the region through regional conferences and meetings. [COMESAMIA was formed as a result of such meetings].
- Prepare project profiles for use of local raw materials for development of the metallurgical sector in the COMESA region.
- Promoted cross-border investment such as Steel Makers from Kenya investing in a rolling mill in Zimbabwe.
- **Elaborated** projects for diversification of products in the engineering and metallurgical sector
- Initiate occupational health, safety, and environmental awareness campaigns

in metallurgical plants in the region.

Since the task of capacity building is barely started and many member states have not benefited, COMESAMIA is being charged **the task of taking up from where the project stopped through:**

- continuation of the training programmes
- extension of cleaner production and energy conservation programmes over the COMESA region
- ensuring that project proposals eventually become actual investments
- promotion of exchange programmes
- promotion of increased information exchange and networking
- coordination of technical assistance programmes
- promotion of research and development for the industrial sector

## 9.0 WORK PLAN FOR COMESAMIA: 2000 - 2003

COMESAMIA has therefore elaborated this proposal for the capacity building effort to enable it fulfil the above objectives. The major activities of the three year programme will include:

### 9.1 Recruitment of members

A recruitment drive of members was started immediately the association was launched. This exercise will continue and the Directors in each COMESA member country will carry out the recruitment in their countries.

### 9.2 Publishing the COMESAMIA Journal

COMESAMIA will continue to publish the Journal on a biannual basis so as to inform members and stakeholders of the developments taking place in the sector and the region as a whole. The first issue of the journal focussed mainly on the launching of the association, while the second journal focussed on Indian technology in the metallurgical sector.

### 9.3 Human Resource Development

COMESAMIA intends to make training of engineers **and production personnel the** main activity so that all member states benefit. The training courses will cover operations , maintenance **management and** quality control so that the **beneficiary** plants can realize better plant availability and productivity. The practice of identifying experts from within the COMESA region and strengthening their capacity to train others will be continued. Some training of trainers' workshops will have to be carried out.

Training will be extended to metal workers and artisans in the micro and small-scale sector. Metal workers at this level are very important for developing economies and include:

- blacksmiths
- sheet metal workers
- fabricators
- welders; etc.

They have some practical experience but can not improve their productivity and quality of their products because of lack of technical and theoretical skills. The training will be aimed at improving their technical skills hence their ability to produce better quality products.

### 9.4 Study Tours/Exchange Programme

Through training workshops, a lot of local expertise has bee built up in COMESA. By experts exchanging visits, they will be able to exchange ideas, information and technologies on the metallurgical industry COMESA. Other study tours will be made to countries in Asia, Latin America where problems similar to COMESA metallurgical sector and with levels of technology similar to COMESA's will be studied.

**A regional personnel exchange programme for personnel engaged in the industry will be initiated and vigorously promoted.**

### 9.5 Investment Meetings

A major activity of the Association will be to convene stakeholders' meetings so as to promote investments in various subsectors e.g.;

⇒ in sponge iron **production**
⇒ ceramics industry (refractories)
⇒ spare parts manufacture
⇒ rolling mills, foundries; etc

### 9.6 Marketing for Members

The Association will assist members to market their products through:

* Market Surveys to determine supply and demand data
* Provision of information on business opportunities in the COMESAMIA Journal
* Organization of Buyer-Seller Meetings etc.

### 9.7 Other Activities

The Association will coordinate other interventions such as

- technical assistance programmes
- research and development
- data base management
- organization of Board Meetings
- Organization of AGMs
- Organization of conferences **Symposiums,** review meetings **and short courses**

## 10.0 TARGETS TO BE ACHIEVED

The programme aims at the following targets

a) **Recruitment of members for COMESAMIA**

| | | |
|---|---|---|
| Year 1 | : | **40** |
| Year 2 | : | **60** |
| Year 3 | : | **100** |
| | | **200** |

b) **COMESAMIA Journals**

| | | |
|---|---|---|
| Year 1 | : | 2 |
| Year 2 | : | 2 |
| Year 3 | : | 2 |
| | | **6** |

**c) Human Resource Development**

Engineers/Managers trained on Operations and Maintenance Management.

| | | | |
|---|---|---|---|
| Year 1 | : | 50 | 1 Training Workshop in Ethiopia |
| Year 2 | : | 120 | 4 Training Workshops |
| Year 3 | : | 120 | 4 Training Workshops |
| Year 4 | : | 120 | 4 Training Workshops |
| **Total** | | **410** | |

Artisans trained in Metal Working

| | | | |
|---|---|---|---|
| Year 1 | : | 100 | 4 Training Workshops |
| Year 2 | : | 100 | 4 Training Workshops |

| | | | |
|---|---|---|---|
| Year 3 | : | 100 | 4 Training Workshops |
| | | --- | |
| | | **400** | |
| | | === | |

d) **Investment Projects Promoted.**

| | | |
|---|---|---|
| Year 1 | : | Sponge Iron in Uganda |
| Year 2 | : | Sponge Iron in Zambia, Zimbabwe |
| | | Steel Rolling Mill, Zambia |
| | | Foundries in 4 Countries. |
| Year 3 | : | Spare Parts Manufacture. |

e) **Research and Development**

Research Projects carried out to develop:

* A refractories industry in region
* Sponge iron technology (already underway in University of Zimbabwe)
* Manufacture of rolls for steel plants.
* Manufacture of rolling mill stands in the region.

**f) Study Tours For Technology Identification.**

| | | |
|---|---|---|
| Year 1 | : | 5 people to India |
| Year 2 | : | 5 people to SE Asia |
| Year 3 | : | 5 people to Egypt or Southern Africa. |

**g) Technical Assistance to Industrial Plants**

Interventions/Consultancies on:

* Cleaner Production
* Waste Management
* Energy Conservation.

## 11.0 PROGRESS MADE BY FEBRUARY 2000

As a result of implementing a UNIDO sponsored project under Contract No. 99/046P, 'To Run COMESA Metallurgical Industries Association for 1 Year' the following **have** been**achieved**:

- Registered the COMESAMIA Constitution in Uganda and sent copies for registration in Egypt, Tanzania, Kenya, Zimbabwe, Zambia and Ethiopia, the countries where the founding Directors come from.

- Opened a bank account for the Association.

- Set up the COMESAMIA office in the Uganda Industrial Research Institute, Nakawa erected a signpost and furnished the office.

- Received a computer system from the COMESA Secretariat and installed it in the office.

- Recruited a secretary **for COMESAMIA.**

- Attended the 4th Summit Meeting of the COMESA Authority at which COMESAMIA was introduced as a COMESA Association.

- Produced the 1st two Issues of the COMESAMIA Journal.

- Participated in a Study tour of Metallurgical Plants in India which was aimed at exposing engineers from COMESA Region to Indian technologies which would be appropriate for adaptation in the COMESA Region.

- Participated in the COMESA Vision Setting Meeting in Lusaka Zambia.

- Have arranged for the testing of Uganda iron ore with Tanzanian Coal **by** Sponge Iron India Limited, a company visited during the study tour of India.

- COMESAMIA was represented at the Committee on Industry meeting in Lusaka, Zambia.

- Participated in Tripartite Review Meeting of US/RAF/96/183 in Nairobi, Kenya during November 1999.

- **Organized** the Training Workshop in Addis Ababa, Ethiopia.

- Sent Ugandan Iron Ores and Tanzanian Coals for testing in Harare.

- Organized a Sponge Iron Investment Meeting in Kampala, which has resulted in the formation of a company to implement the SPONGE IRON project. (**Similar** meetings are planned throughout the region).

## 12.0 BUDGET (US $)

| | Activity | Year 1 | Year 2 | Year 3 | Total |
|---|---|---|---|---|---|
| 1. | Staff | | | | |
| | Executive Director | 48,000 | 48,000 | 48,000 | 144,000 |
| | Research Assistant (1) | 24,000 | 24,000 | 24,000 | 72,000 |
| | Secretary | 6,000 | 6,000 | 6,000 | 18,000 |
| | | **78,000** | **78,000** | **78,000** | **234,000** |
| 2. | Office Expenses | 5,000 | 5,000 | 5,000 | 15,000 |
| 3. | Board Meetings | 10,000 | 10,000 | 10,000 | 30,000 |
| 4. | Travel (23 countries) | 10,000 | 10,000 | 10,000 | 30,000 |
| 5. | Country Workshops (22 x 1,000) | 22,000 | 22,000 | 22,000 | 66,000 |
| 6. | Communication | 2,000 | 2,000 | 2,000 | 6,000 |
| 7. | COMESAMIA Journal - 2 per Year | 3,000 | 3,000 | 3,000 | 9,000 |
| 8. | AGMs | 3,000 | 3,000 | 3,000 | 9,000 |
| 9. | Training Workshops (4 per Year) | 140,000 | 140,000 | 140,000 | 420,000 |
| 10. | Investment Round Tables | 30,000 | 30,000 | 30,000 | 90,000 |
| 11. | Study Tours | 20,000 | 20,000 | 20,000 | 60,000 |
| 12. | Research and Development | 50,000 | 50,000 | 50,000 | 150,000 |
| 13. | Consultancies | 100,000 | 100,000 | 100,000 | 300,000 |
| 14. | Contingency | 15,000 | 15,000 | 15,000 | 45,000 |
| | **GRAND TOTAL** | **488,000** | **488,000** | **488,000** | **1,464,000** |

**Budget Notes:**

1. **Staff** :

| | |
|---|---|
| Executive Director | US$ 4,000 p.m. |
| Research Assistant | US$ 2,000 p.m. |
| Secretary | US$ 500 p.m. |

2. **Office Expenses**

- stationery
- consumables
- telephone.
- photocopying
- local travel.

3. **Board Meetings**

7 Directors from different countries to meet 2 times per year.

4. **Project Travel**

   Executive Director to visit member countries to recruit members, to assess the needs of industry and to make preparation for training Workshops

5. **Workshops** in member states to popularize COMESAMIA and the Programme as well as to get inputs from the target beneficiaries.

6. **Communications** : Mostly e-mail, web-site.

7. **COMESAMIA Journal**: 2 Issues per year @ US$ 1,500.

8. **Annual General Meetings**: Costs of venue, refreshments, stationery, publicity, organization. (Members to meet their own travel costs and DSA).

9. **Training Workshops**: 4 per year.

   * Organization, welfare, stationery, photocopying, venue, transport, field visits = US$ 20,000.

   * Consultants/Facilitators = US$ 15,000.

   Total cost per workshop = US$ 35,000.

   Participants : 30 persons from industry.

10. **Investment Round tables** to promote new investments about 6 per year @ US$ 5,000.

11. **Study Tours** for delegates from COMESA Countries to go to other countries to observe appropriate technologies and explore investment opportunities.

12. **Research and Development** into various materials, technologies for industry in COMESA Countries.

13. **Consultancies** to COMESA Industries to address various problems e.g. :

    - Cleaner Industrial Production
    - Energy Management
    - Waste Management.

14. **Contingency:** Expenses for audit and unforeseen programmes arising from Consultation with stakeholders.

# CAPACITY BUILDING PROPOSAL

**COMESA Metallurgical Industries Association**

COMESAMIA

**UGANDA INDUSRIAL RESEARCH INSTITUTE**

P.O.BOX 8752, Kampala-Uganda Tel: 075-694567 Fax: 041-259807

8th March 2000

The Chairman
African Capacity Building Foundation
Southampton Life Centre 7th Floor
Cnr Jason Moyo Avenue/Second Street
P.O. Box 1562
HARARE
Zimbabwe

Fax: 000-263-4-702915

Dear Sir,

**RE: CAPACITY BUILDING PROGRAMME FOR INDUSTRY IN COMESA REGION**

I have learnt of the existence of a new partnership for Capacity Building in Africa (PACT) and African Capacity Building Foundation (ABCF) both of which aim at capacity building for sustainable development in Africa.

I wish to submit the attached proposal, which aims at building capacity for industrial production in the COMESA region through:

- Training of engineers from industry so as to improve on engineering operations and maintenance of industrial plants hence improved plant availability and productivity
- Enhancing cooperation among engineering and metallurgical plants in the region
- Providing technical assistance for cleaner production, waste management and energy conservation in industrial plants
- Carrying out research and development for industry to promote new technologies and use of raw materials, which are abundantly available in the region.

The programme will be coordinated from Kampala, the Headquarters of our Association. However, workshops, conferences, consultancies will be conducted in as many of the COMESA member states as resources will allow.

I hope for your positive response.

Please do not hesitate to contact me for more information, which you may require.

# CAPACITY BUILDING PROGRAMME FOR INDUSTRY IN COMESA REGION

**FOCAL POINT :** COMESA Metallurgical Industries Association (COMESAMIA)

Uganda Industrial Research Institute
P.O. Box 8752, **KAMPALA**, Uganda.

E-mail : mech@starcom.co.ug
gatsby@techmuk.ac.ug

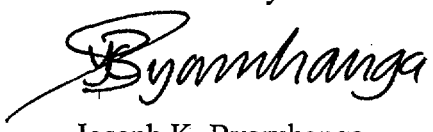
**PROGRAMME OBJECTIVE**: Programme focusses on training of engineers from COMESA industrial plants in plant operations and maintenance, promotion of cooperation among COMESA industry; and research and development for industry so as to contribute to regional industrialisation.

**IMPLEMENTATION**: The Programme will be coordinated by COMESAMIA's Kampala office with extensive travel to member states where workshops, conferences, consultancies will be carried out in turn. COMESA Secretariat will provide back-up support since COMESAMIA is a COMESA Institution.

**DATE OF DRAFTING**: MARCH 2000

Looking forward to future cooperation.

Yours faithfully



Joseph K. Byaruhanga
**CHAIRMAN**

**ABBREVIATIONS**

| | | |
|---|---|---|
| COMESA | : | Common Market for Eastern and Southern Africa |
| COMESAMIA | : | COMESA Metallurgical Industries Association |
| CMRDI | : | Central Metallurgical Research and Development Institute |
| UMIDA | : | Uganda Metal Industries Development Association |
| UNIDO | : | United Nations Industrial Development Organisation |

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COMESA member states include:

Egypt, Sudan, Ethiopia, Eriteria, Djibuti, Kenya, Uganda, Tanzania, Mauritius, Madagascar, Burundi, Rwanda, Democratic Republic of Congo, Zambia, Zimbabwe, Angola, Namibia, Swaziland, Malawi, Seychelles.

## 1.0 BACKGROUND

This Programme aims at building of capacity of COMESA Metallurgical Industries Association (COMESAMIA) to offer services to industries in COMESA countries through:

- training of engineers from industrial plants in operations and maintenance
- coordinating technical assistance programmes for industry
- coordination of investments in the metallurgical sector at regional level
- information gathering and dissemination for industry in the region
- coordinating regional research and development programmes in the sector

## 1.0 OBJECTIVES OF COMESAMIA

COMESAMIA was inaugurated with the objectives of promoting development of Metallurgical and Metal working Industries in the COMESA region through:

- Promoting cooperation among metal working industries.

- Gathering and disseminating information useful to its members to advance their businesses individually.

- Stimulating and strengthening technical and economic cooperation and exchanges between member companies to promote trade and growth.

- Playing an active role in technology transfer, trouble-shooting services and technical assistance programmes for the benefit of members.

- Providing members with technical and commercial information through a business journal such as the metallurgical bulletin.

- Carry out studies for the benefit of promoting cooperation between members such as:

    - Investment studies
    - Engineering and technical studies
    - Standards improvement
    - Technological selection
    - New production and maintenance systems etc.

## 2.0 FORMATION OF COMESAMIA

As a result of the need to have a body that would champion the needs of the stakeholders in the iron and steel industries, a meeting to launch COMESAMIA was organised in Kampala in February 1999.

A draft constitution was circulated to all the invited participants who studied it. a meeting was later on held on 1st February 1999 to edit/revise and after length deliberations, the constitution was adopted unanimously (see appendix - for copy of the constitution).

After the adoption of the constitution, with all the necessary amendments, office bearers were elected at the 1st Annual General meeting chaired by Mr. Alele Opio from the COMESA Secretarial. The following were elected office bearers and members of COMESAMIA board.

| | | | | |
|---|---|---|---|---|
| (1). | Chairman | - | Eng. Dr. Byaruhanga | - Uganda |
| (2). | Vice-Chairman | - | Mrs. Sharrif Saudrudin | - Tanzania |
| (3). | Treasurer | - | Mr. Teddy Mapenzansuwa | - Zimbabwe |
| (4). | Member | - | Mr. Tesfaye Tamiru | - Ethiopia |
| (5). | Member | - | Mr. Mutumbi-Goma | - Zambia |
| (6). | Member | - | Mr. Bobby Johnson | - Kenya |
| (7). | Member | - | Prof. Kamal Ismail | - Egypt |
| (8). | Member | - | Mr. Kiyega Galiwango | - Uganda |

Eng. W. Balu-Tabaaro of Uganda was elected Honourary Secretary.

The offer to host COMESAMIA was made by Uganda Metal Industries Development Association (UMIDA) and the Government of Uganda during the workshop held in Fairway Hotel in 1997. The offer of office was formally made by the Minister of State for Tourism, Trade and Industry during the launching of COMESAMIA on 1st February 1999. The office is located at the Uganda Industrial Research Institute at Nakawa some 4kms from the centre of Kampala City.

**PROJECT US/RAF/96/183**

COMESAMIA has been slated to take over the activities of the just- completed Project US/RAF/96/183 "Assistance to COMESA Countries in Rehabilitating and Upgrading their metallurgical plants with special regard to the iron and steel sector". This project was funded by the Austrian Government and implemented by UNIDO and the COMESA Secretariat from 1994 to March 2000. During this period, the project was able to:

- Train over 200 engineers and managers from industry through about 10 workshops in operations, management and amintenance of industrial plants.

- Benefit industries and individuals from Kenya, Uganda, Tanzania, Zimbabe, Zambia, Egypt, Mauritius, Ethiopia.
- Promote cooperation among industries n the region through regional conferences and meetings. [COMESAMIA was formed as a result of such meetings].
- Prepare project profiles for use of local raw materils for development of the metallurgical sector in the COMESA region.
- Promoted cross-border investment such as Steel Makers fromKenya investing in a rolling mill in Zimbabwe.
- Elaborate projects for diversification of products in the engineering and metallurgical sector
- Initiate occupational health, safety, and environmental awareness campaigns in metallurgical plants in the region.

Since the task of capacity building is barely started and many member states have not benefitted, COMESAMIA is being charged with continuing witrh what the project started e.g.;

- continuation of the trainng programmes
- extension of cleaner production and energy conservation programmes over the COMESA region
- ensuring that project proposals eventually become actual ivestments
- promotion of exchange programmes
- promotion of increased information exchange and networking
- coordination of technical assistance programmes
- promotion of research and development for the industrial sector

## 3.0 WORK PLAN FOR COMESAMIA

COMESAMIA has therefore elaborated this proposal for the capacity building effort to enable it fulfil the above objectives. The major activities of the three year programme will include:

### 3.1 RECRUITMENT OF MEMBERS

A recruitment drive of members was started immediately the association was launched. This exercise will continue and the Directors in each COMESA member country will carry out the recruitment in their countries.

### 3.2 PUBLISHING OF THE COMESAMIA Journal

COMESAMIA will continue to publish the Journal on a biannual basis so as to inform members and stakeholders of the developments takjing place in the sector and the region as a whole. The first issue of the journal focussed mainly on the

launching of the association, while the second journal focussed on Indian technology in the metallurgical sector.

### 3.3 HUMAN RESOURCE DEVELOPMENT

COMESAMIA intends to make traing of enginners a main activity so that all member states benefit. The training courses will cover opertios , maintanance, quality control so that the benefitting plants can realise better plant availability and productivity. The practice of identifying experts from within the COMESA region and strengthening their capacity to train others will be continued. Some training of trainers workshops will have to be carried out.

### 3.4 STUDY TOURS

Through training workshops, a lot of local expertise has bee built up in COMESA. By experts exchanging visits, they will be able to exchange ideas, information and technologies on the metallurgical industry COMESA. Other study tours will be made to countries in Asia, Latin America where problems similar to COMESA metallurgical sector and with levels of technology similar to COMESA's will be studied.

### 3.5 INVESTMENT MEETINGS

A major activity of the Association will be to convene stakeholders' meetings so as to promote investments in various subsectors e.g;

⇒ in sponge iron projects
⇒ ceramics industry (refractories)
⇒ spare parts manufacture
⇒ rolling mills, foundries; etc

### 3.6 MARKETING FOR MEMBERS

The Association will assist members to market their products through:

* Market Surveys to determine supply and demand data
* Provision of information on business opportunities in thwe COMESAMIA Journal
* Organisation of Buyer-Seller Meetings etc.

## 3.7 OTHER ACTIVITIES

The Association will coordinate other interventions such as

- technical assistance programmes
- research amd development
- data base management
- organisation of Board Meetings
- Organisation of AGMs
- Organisation of conferences and review meetings

## 4.0 TARGETS TO BE ACHIEVED

**The following targets are planned**

### a) Recruitment of members for COMESAMIA

| | | |
|---|---|---|
| Year 1 | : | 30 |
| Year 2 | : | 40 |
| Year 3 | : | 50 |
| | | **120** |

### b) COMESAMIA Journal

| | | |
|---|---|---|
| Year 1 | : | 2 |
| Year 2 | : | 2 |
| Year 3 | : | 2 |
| | | **6** |

### c) HUMAN RESOURCE DEVELOPMENT

Engineers/Managers trained on Operations and Maintenance Management/Training.

| | | | |
|---|---|---|---|
| Year 1 | : | 50 | 1 Training Workshop in Ethiopia |
| Year 2 | : | 120 | 4 Training Workshops |
| Year 3 | : | 120 | 4 Training Workshops |
| Year 4 | : | 120 | 4 Training Workshops |
| **Total** | | **410** | |

---

d) Investment Projects Promoted.

| | | |
|---|---|---|
| Year 1 | : | Sponge Iron in Uganda |
| Year 2 | : | Sponge Iron in Zambia, Zimbabwe |
| | | Steel Rolling Mill, Zambia |
| | | Foundries in 4 Countries. |
| Year 3 | : | Spare Parts Manufacture. |

e) **Research and Development**

Research Projects carried out to develop:

* a refractories industry in region
* sponge iron technology (already underway in University of Zimbabwe)
* manufacture of rolls for steel plants.
* manufacture of rolling mill stands in the region.

**f) Study Tours For Technology Identification.**

| | | |
|---|---|---|
| Year 1 | : | 5 people to India |
| Year 2 | : | 5 people to S.E. Asia |
| Year 3 | : | 5 people to Egypt or Southern Africa. |

**g) Technical Assistance to Industrial Plants**

Interventions/Consultancies on:

* Cleaner Production
* Waste Management
* Energy Conservation.

## 5.0 PROGRESS MADE BY FEBRUARY 2000

As a result of implementing a UNIDO sponsored project under Contract No. 99/046P, 'To Run COMESA Metallurgical Industries Association for 1 Year' the following progress had been made by November 1999:

- Registered the COMESAMIA Constitution in Uganda and sent copies for registration in Egypt, Tanzania, Kenya, Zimbabwe, Zambia and Ethiopia, the countries where the founding Directors come from.

- Opened a bank account for the Association.

- Set up the COMESAMIA office in the Uganda Industrial Research Institute, Nakawa, erected a sign post and furnished the office.

- Received a computer system from the COMESA Secretariat and installed it in the office.

- Recruited a secretary to run the office.

- Attended the 4th Summit Meeting of the COMESA Authority at which COMESAMIA was introduced as a COMESA Association.

- Produced the 1st two Issues of the COMESAMIA Journal.

- Participated in a Study tour of Metallurgical Plants in India which was aimed at exposing engineers from COMESA Region to Indian technologies which would be appropriate for adaptation in the COMESA Region.

- Participated in the COMESA Vision Setting Meeting in Lusaka Zambia.

- Have arranged for the testing of Uganda iron ore with Tanzanian Coal in Sponge Iron India Limited, a company visited during the study tour of India.

- COMESAMIA was represented at the Committee on Industry meeting in Lusaka, Zambia.

- Participated in Tripartite Review Meeting of US/RAF/96/183 in Nairobi, Kenya during November 1999.

- Participated in organizing the Training Workshop in Addis Abbaba, Ethiopia.

- Sent Ugandan Iron Ores and Tanzanian Coals for testing in Harare.

- Organized a Sponge Iron Investment Meeting in Kampala which has resulted in the formation of a company to implement the SPONGE IRON project. (More such meetings are planned throughout the region).

## 5.0 BUDGET (US $)

| | Activity | Year 1 | Year 2 | Year 3 | Total |
|---|---|---|---|---|---|
| 1. | Staff | | | | |
| | Executive Director | 48,000 | 48,000 | 48,000 | 144,000 |
| | Research Assistant (1) | 24,000 | 24,000 | 24,000 | 72,000 |
| | Secretary | 6,000 | 6,000 | 6,000 | 18,000 |
| | | **78,000** | **78,000** | **78,000** | **234,000** |
| 2. | Office Expenses | 5,000 | 5,000 | 5,000 | 15,000 |
| 3. | Board Meetings | 10,000 | 10,000 | 10,000 | 30,000 |
| 4. | Travel (23 countries) | 10,000 | 10,000 | 10,000 | 30,000 |
| 5. | Country Workshops (22 x 1,000) | 22,000 | 22,000 | 22,000 | 66,000 |
| 6. | Communication | 2,000 | 2,000 | 2,000 | 6,000 |
| 7. | COMESAMIA Journal - 2 per Year | 3,000 | 3,000 | 3,000 | 9,000 |
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| 9. | Training Workshops (4 per Year) | 140,000 | 140,000 | 140,000 | 420,000 |
| 10. | Investment Round Tables | 30,000 | 30,000 | 30,000 | 90,000 |
| 11. | Study Tours | 20,000 | 20,000 | 20,000 | 60,000 |
| 12. | Research and Development | 50,000 | 50,000 | 50,000 | 150,000 |
| 13. | Consultancies | 100,000 | 100,000 | 100,000 | 300,000 |
| 14. | Contingency | 15,000 | 15,000 | 15,000 | 45,000 |
| | **GRAND TOTAL** | **488,000** | **488,000** | **488,000** | **1,464,000** |

**Budget Notes:**

1. **Staff** :

| | |
|---|---|
| Executive Director | US$ 4,000 p.m. |
| Research Assistant | US$ 2,000 p.m. |
| Secretary | US$ 500 p.m. |

2. **Office Expenses**

- stationery
- consumables
- telephone.
- photocopying
- local travel.

3. **Board Meetings**

1 Director from different countries to meet 2 times per year.

4. **Project Travel**

   Executive Director to visit member countries to recruit members, to assess the needs of industry and to make preparation for training Workshops

5. **Workshops** in member states to popularize COMESAMIA and the Programme as well as to get inputs from the target beneficiaries.

6. **Communications** : Mostly e-mail, web-site.

7. **COMESAMIA Journal** : 2 Issues per year @ US$ 1,500.

8. **Annual General Meetings** : Costs of venue, refreshments, stationery, publicity, organisation. (Members to meet their own travel costs and DSA).

9. **Training Workshops** : 4 per year.

   * Organisation, welfare, stationery, photocopying, venue, transport, field visits = US$ 20,000.

   * Consultants/Facilitators = US$ 15,000.

     Total cost per workshop = US$ 35,000.

     Participants : 30 persons from industry.

10. **Investment Round tables** to promote new investments about 6 per year @ US$ 5,000.

11. **Study Tours** for delegates from COMESA Countries to go to other countries to observe appropriate technologies and explore investment opportunities.

12. **Research and Development** into various materials, technologies for industry in COMESA Countries.

13. **Consultancies** to COMESA Industries to address various problems e.g. :

    - Cleaner Industrial Production
    - Energy Management
    - Waste Management.

14. **Contingency** : Expenses for audit and unforeseen programmes arising from consultation with stake holders.

# 2ND ISSUE OF COMESAMIA JOURNAL

# TERMS OF REFERENCE FOR STRENGTHENING COMESAMIA

# PROJECT No. US/RAF/96/183

# "ASSISTANCE TO COMESA COUNTRIES IN REHABILITATING AND UPGRADING THEIR METALLURGICAL INDUSTRIES WITH SPECIAL REGARD TO THE IRON AND STEEL SECTOR"

# PROPOSAL FOR STRENGTHENING COMESA METALLURGICAL INDUSTRIES ASSOCIATION (COMESAMIA)

*SUBMITTED TO*

UNITED NATIONS INDUSTRIAL DEVELOPMENT
ORGANISATION (UNIDO)
VIENNA INTERNATIONAL CENTRE
P.O. BOX 300, A-1400
**VIENNA**
AUSTRIA

**Submitted By:**

COMESA Metallurgical Industries Association (COMESAMIA)
P.O. Box 8752
**KAMPALA,** Uganda
Tel. : 075-694567
Fax : 041-542377
Email : mech@starcom.co.ug

DECEMBER 1999

# PROPOSAL TO STRENGTHEN COMESA METALLURGICAL INDUSTRIES ASSOCIATION - COMESAMIA

## Introduction

This is a proposal submitted by COMESAMIA for assistance from UNIDO under US/RAF/96/183 to strengthen its operations.

## Background To COMESAMIA

The idea of forming a regional association to champion the interests and development of this very important industrial sub-sector was first introduced at the workshop on the development of a viable and sustainable iron and steel sector held in Nairobi, Kenya in February 1995. It was recognised then that the industry faced numerous operational and technical difficulties many of which were common to most plants in member states. In addition, a free trade area and economic community that COMESA is setting up among its 21 member states, requires that there be a regional body that will act as focal point for information on business opportunities, manpower and capacity development, technology, etc. For example, there is currently a major problem brewing in the region due to rampant steel dumping that is posing serious threats to the survival of some of the producers in the region.

The Austrian-funded UNIDO projects US/RAF/92//159 and US/RAF/96/183- "assistance to COMESA countries in rehabilitating and upgrading their metallurgical industries with special regard to the iron and steel sector" have over the past five years stimulated interest and generated momentum in manpower development, technical assistance, R&D particularly on sponge iron, cross-border investments, regional trade, information exchange and general cooperation that did not exist before. When the donor funding comes to an end, COMESAMIA is the natural agency to continue with this effort.

As required by the Nairobi meeting, the COMESA Secretariat produced a draft constitution for the association that was circulated. This was then discussed at a consultative meeting held in Kampala, Uganda in April 1997 where it was reaffirmed that the association be established.

At the Kampala meeting, Uganda offered to host the interim secretariat of the association and has already provided free office accommodation for this purpose.

Further, UMIDA was requested to organise the official launching of COMESAMIA which was successfully done on 1st February 1999 by the Minister of State for Trade and Industry Hon. Manzi Tumubweine on behalf of the Rt Hon. 2nd Deputy Prime Minister and Minister of Tourism, Trade and Industry of the Republic of Uganda. The venue was the Uganda Industrial Research Institute, Nakawa.

The Minister reiterated the offer of office space to COMESAMIA for at least one year and encouraged the strengthening of the cooperation effort.

After the launching, members present from Egypt, Ethiopia, Kenya, Tanzania, Zimbabwe, Zambia and Uganda then held an Inaugural General Meeting at which a Board of Directors of eight (8) members was elected. The eight represented the countries present with Uganda having two(2) Directors to ease the operations of the Association.

**1st YEAR OF COMESAMIA**

Uganda Metal Industries Development Association (UMIDA) was contracted to run COMESAMIA for the first year to ensure that the Association (COMESAMIA) is fully established and operational.

UMIDA has duly accomplished the task and:

1. COMESAMIA is a registered legal entity in Uganda.

2. COMESAMIA office located at Uganda Industrial Research Institute Nakawa is fully operational with:

   - Secretary
   - Furnishings
   - Computer System
   - Data Bank
   - Telephone/Email
   - Bank Account in Bank of Baroda.

3. Published and circulated two Journals of COMESAMIA.

4. Participated in COMESA meetings at all levels so that now COMESAMIA is recognised as one of the COMESA private sector bodies. The meetings included COMESA Authority meeting in Nairobi, Strategy setting in Lusaka, Committee on Industry in Lusaka.

5. Participated in Tripartite Review Meeting of US/RAF/96/183 in Nairobi during November 1999.

6. Written a Business Plan for COMESAMIA for 2000 - 2003.

7. Published COMESAMIA Brochures and stationery.

8. Organised several meetings to encourage investment in Sponge Iron Plants, Foundries, Rolling Mills, Equipment Manufacture.

9. Participated in Study tours of India to identify investment opportunities and sources of technology and equipment which is appropriate to the region.

**The 3 Year Business Plan**

The 3 Year Business Plan sets out the activities aimed at promoting and strengthening the Association and includes:

- Recruitment of members
- Publishing COMESAMIA Journal
- Human Resource Development, Training Workshops
- Sponge Iron Projects
- Investment Round Tables
- Development of Foundries, Refractories
- Study Tours
- Technical Assistance To Engineering Industry
- Income generating activities etc.

The strengthening assistance which is estimated to last from April 2000 to March 2001, is aimed at enabling the Association to start on implementation of the Business Plan.

Furthermore, this period should enable the Association take over the activities of US/RAF/96/183 which ends during March 2000 including:

* Manpower development and training including exchange programmes

* Compilation and updating of database, information gathering and dissemination.

* Promotion of co-operation among engineering and metallurgical industries

* Lobbying for and representing the industry at local, regional and international levels.

* Studying, analysis and recommending appropriate action to be taken to safeguard the industry, particularly on the issue of dumping and tariffs.

As a start, COMESAMIA will co-organize the Training Workshop in Addis Ababa, Ethiopia during February/March 2000.

**Budget**

| **Item** | **US$** |
|---|---|
| Secretary 12 months @ $250 | 3,000 |
| Office Consumables | 2,000 |
| Local Transport | 1,000 |
| COMESA Meetings | 2,000 |
| Regional Travel | 3,000 |
| Communication | 1,000 |
| Meetings Directors/AGM | 2,000 |
| Publicity/Journals | 3,000 |
| Consultancy | 15,000 |
| Training Courses | 8,000 |
| **TOTAL** | **40,000** |

**PROJECTED SOURCES**

| | |
|---|---|
| UNIDO | 25,000 |
| Secretarial/Information Services | 5,000 |
| Membership Fees | 5,000 |
| Training Course Surplus | 5,000 |
| **TOTAL** | **40,000** |

UNIDO's Contribution

| | |
|---|---|
| • Strengthening COMESAMIA | US$ 10,000 |
| • Natioal Consultants | US$ 15,000 |
| | **US$ 25,000** |

**DELIVERABLES**

2 Journals
Progress Reports
Reports on Meetings
Reports on Training Courses
Report on Office Activities
Report on Implementation of Business Plan.

# REPORT ON KAMPALA SPONGE IRON INVESTMENT MEETING

# REPORT ON THE KAMPALA SPONGE IRON INVESTMENT MEETING HELD AT HOTEL AFRICANA, JANUARY 20, 2000.

## OPENING

**The investment meeting which was organised to bring together stake holders in the Sponge Iron Project in Uganda, was opened by the Minister of Energy and Mineral Development Hon. Syda Bbumba. The meeting was attended by thirty (30) participants who included Landowners and concession holders from Muko, operators of Steel plants and foundries, bankers, Government officials, Chairmen of Kabale, Kisoro and Mbale Districts, private sector Associations and COMESA.**

**In her opening statement the Minister said:**

- **The Government of the Republic of Uganda was wholly behind the efforts to establish a sponge iron plant based on Ugandan iron ores and Tanzanian coal as a concrete steep towards building a base for economic growth of the region**
- **Uganda has been spending over US$250-300 million per year on importation of metal products, hence any new investment, which would not only substitute for some of these imports but also earn the countries of the region some foreign exchange would be a welcome one.**
- **Uganda's steel mills which have an installed capacity of about 85,000 tonnes per year are operating below 50% capacity mainly because of lack of raw materials inputs such as scrap, billets; etc.**
- **Her Ministry would continue to evaluate the country's mineral resources so as to promote investment in the sector**
- **The donor community and the private sector were welcome to assist Government in the evaluation of the country's mineral resources**

**In a statement read on his behalf by Mr J.A. Alele Opio, the Secretary General of COMESA, he:**

- **Thanked the Government and people of Uganda for having supported the COMESA programmes very strongly as testified by**

the hosting of the COMESA Metallurgical Industries Association [COMESAMIA] Secretariat in Uganda.

- Informed the meeting that the establishment of a Sponge Iron Plant in the region was decided by the Council of Ministers of PTA as far back as 1985, hence any concrete steps taken to set up such a plant are in line with the aspirations of the region.
- Informed the members present that an Austrian funded project had since 1994, been implemented to assist COMESA countries in rehabilitating and upgrading their metallurgical industries with special regard to the iron and steel sector with considerable success. The establishment of COMESAMIA to enhance co-operation among the region's metallurgical sector and spearhead its development, was a direct result of the project
- Informed members that the Austrian funded project was going to finance the transportation of bulk iron ore samples to Zimbabwe and their testing at the University of Zimbabwe to determine the appropriate technology for their processing.
- Appreciated that the investment meeting was taking place at an opportune time following a study tour to India by five people from COMESA where it was determined that technologies existed for small scale sponge iron plants which could be appropriate for the region
- Encouraged Uganda, Tanzania and neighbouring states to see that the establishment of the sponge iron plant in their region becomes a reality.
- Commended COMESAMIA for initiating the investment meetings as a service to her prospective members and encouraged the Association to organise many more meetings of this kind for the development of the metallurgical sector in the region
- Concluded by saying that COMESA looked forward to the day when the sponge iron plant would become a reality.

In his welcome speech, the Chairman of COMESA Metallurgical Industries Association, Eng. Dr. Joseph K. Byaruhanga, briefed members present as follows:

- He had gone on the COMESA organised study tour of metallurgical plants in India where he had been impressed by the level of development there as well as the existence of technologies

appropriate to the region for foundries, rolling mills and mini-steel plants.

- He toured a sponge iron plant belonging to Sponge Iron India Limited (SIIL) in Hyderabad where;
  - ⇒ Iron ore was transported some 350 kms from the mine to the plant using 8-10 tonne trucks owned by contract transporters
  - ⇒ Coal was also transported some 100kms to the plant
  - ⇒ Only 1.1 MW of electrical power was required to run two modules of kilns of 30,000 tonnes each
  - ⇒ A waste heat boiler and steam turbine had been added to utilise the sensible heat of the waste gases to generate power, which could be used not only to run the plant but also to sell to the national grid.

- This approach could be applied to the Muko Iron Ore and form the basis for the establishment of a sponge iron plant; viz.:
  - ⇒ The people of MUKO or those with mining concessions could under take to do the mining of the ore and preliminary beneficiation
  - ⇒ Coal could be supplied from Tanzania to the sponge iron plant
  - ⇒ The sponge iron plant itself could be established in Kabale town which is already served by road and electricity
  - ⇒ The plant could also generate power from waste heat hence be self-sufficient in her energy needs

- Having seen the possibility of setting up a sponge iron plant in the region, it was decided to call the stake holders to consult and map out a way forward, hence the Sponge Iron Investment Meeting

PAPER PRESENTATIONS

The meeting received the following presentations:

1. Iron ore resources in Muko by Mr E. Kato of Ministry of Energy and Mineral Development who said that there are about 4 million Tonnes of proven reserves in two hills that have been surveyed. He added that, for a sponge iron plant producing 60,000 tonnes per annum about 100,000 tonnes of iron ore would be required giving a project life of at least 40 years.

2. Chemical anlysises of Tanzanian coal and Muko iron by W. Balu-Tabaaro of Geological Mines and Survey Department, which showed very high quality of the Muko, iron ore.
3. Coal-based Sponge Iron Production using the SL-RN direct reduction technology; the Sponge Iron India Limited experience by Eng. Dr. J.K. Byaruhanga.
4. Medium to long term project financing, the experience of East African Development Bank, by Mr Godfrey Ruhurira who recommended that a feasibility study be carried out to determine the economic viability of the proposed project.
5. Sponge Iron for steel making by Mr S. K. Singh of Steel Rolling Mills Limited who pointed out that sponge iron can be used for feedstock of electric arc furnaces up to 70%. He welcomed the project and said that his company was willing to participate when the viability of the project has been proven.

## WAY FORWARD

It was resolved by the participants that:

1. The reports on the quantification work carried out by Geological Survey and Mines Department be availed to COMESAMIA.
2. COMESAMIA should expedite the formation of a company to spearhead the establishment of the Sponge Iron Project.
3. The Muko concession holders and Landowners should facilitate COMESAMIA to obtain 5-10 tonnes of iron ore samples for testing at the University of Zimbabwe.
4. COMESAMIA calls another meeting to consider memoranda and articles of Association of the proposed Company as soon as possible.

## CLOSURE

The meeting was closed by Hon. Kweronda Ruhemba, Minister in President's Office in charge of Economic Monitoring who also commended the steps being taken to establish an iron and steel industry in Uganda and assured the meeting that they had Government's support. He further informed the meeting that where a lot of investment was needed in vital sector like the iron and steel sector, Government can invest in partnership with the private sector

**and divest her interest when the project has matured.**

# CERTIFICATE OF REGISTRATION OF MUKO IRON-ORE DEVELOPMENT COMPANY

NO. 43285

THE REPUBLIC OF UGANDA

# Certificate of Incorporation

(Under section 16 (1) of the Companies Act)

*I CERTIFY that* ..... MUKO IRON - ORE DEVELOPMENT COMPANY LIMITED .....

.....

*has this day been incorporated with Limited Liability.*

*Dated at Kampala, this* ..... 27TH ..... *day*

*of* ..... JANUARY ..... *the year* ..... 2000 .....

BISEREKO KYOMUHENDO

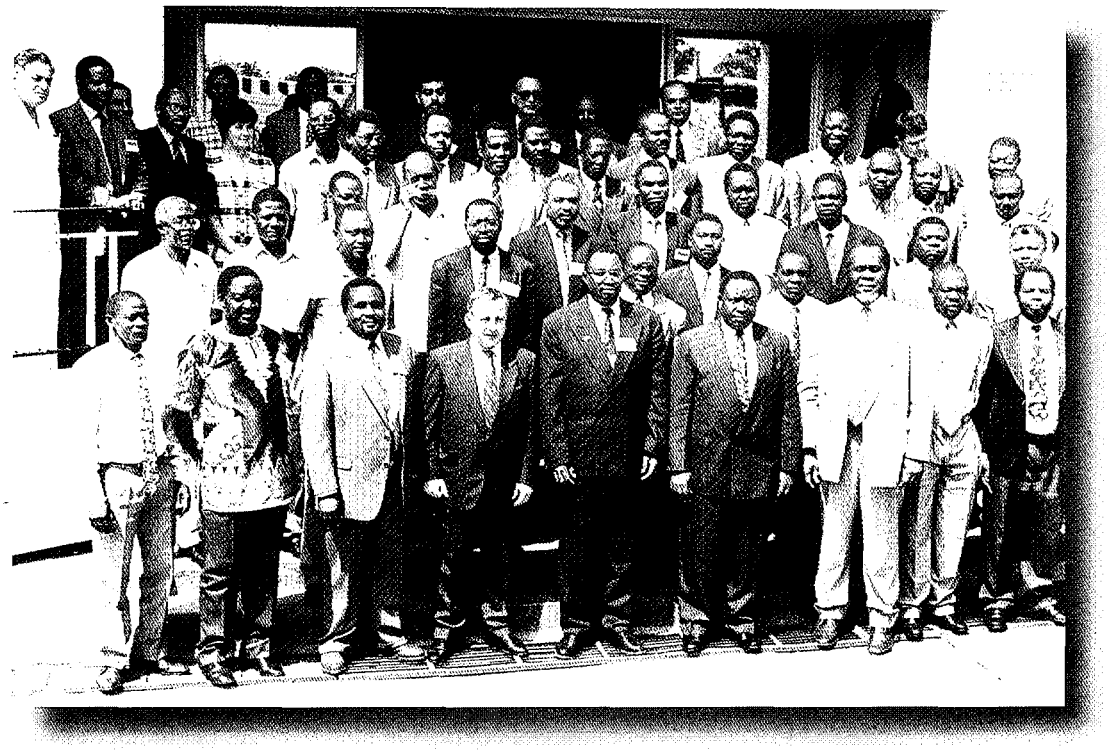
.....

ASST. Registrar of Companies.

# COMESAMIA JOURNAL

A Publication of COMESA Metallurgical Industries Association

Volume 2 No.1 February 2000



*Founders of Iron and Steel Promotion Project in COMESA at Fairway Hotel, Kampala pose for a group photograph, in 1997.*

*Minister Hon. Saida Bumba about to launch the Uganda Sponge Iron Project - A baby of US/RAF/96/183 "Assistance to COMESA Countries in rehabilitating and upgrading their Metallurgical Industries with special regard to the Iron and Steel Sector"*

# COMESAMIA JOURNAL

***A Publication of COMESA Metallurgical Industries Association***

**Volume 2, Issue 1**
**February, 2000**

**Inside This Issue**



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## Editorial Comment
**By: Eng. Dr. J.K. Byaruhanga**

Greetings and Best wishes for a new millennium. I hope that you are all compliant.

This journal contains a special feature on a study tour undertaken by Mr. J A A Opio, Dr. M. Kanyangarara, Mr. Mtumba Goma (Zambia), Laurence Manyama (Tanzania) and Dr. J.K. Byaruhanga (Uganda). The study tour, which lasted two weeks, took the group through eight (8) states of India with the main aim being to:

- Observe and make judgments on Indian technology that would be appropriate for metallurgical plants in the COMESA Region.

- Explore possibilities for investments, joint ventures and

technology transfer to the COMESA Region especially in the metallurgical sector.

The main findings were positive in that there were very strong possibilities for:

- Cooperation between COMESA and various Indian organizations for the exchange of knowledge and experience.

- Technology transfer between India and the COMESA region especially in:

  - Small scale sponge iron plants
  - Small rolling mills
  - Small foundries
  - Manufacture of metallurgical plant in the COMESA region
  - Training and human resource development.

## COMESAMIA COMPLETES ONE YEAR

In accordance with UNIDO's new practices, Uganda Metal Industries Development Association (UMIDA) was contracted to run COMESAMIA for the first year to ensure that the Association (COMESAMIA) is fully established and operational.

UMIDA has duly accomplished the task and:

1. COMESAMIA is a registered legal entity in Uganda.
2. COMESAMIA office located at the Uganda Industrial Research Institute Nakawa is fully operational with:
   - Secretary
   - Furnishings
   - Computer System kindly donated by the COMESA Secretariat
   - Data Bank
   - Telephone/Email
   - Bank Account in Bank of Baroda, Udyam House.
3. Two Journals of COMESAMIA have been published and circulated.
4. Participated in COMESA meetings at all levels so that now COMESAMIA is recognized as one of the COMESA private sector bodies. The meetings included COMESA Authority Meeting in Nairobi, Strategy setting in Lusaka, Committee on Industry in Lusaka.
5. Participated in Tripartite Review Meeting of US/RAF/96/183 in Nairobi during November 1999.
6. Written A business Plan for COMESAMIA for 2000 - 2003.
7. Published COMESAMIA Brochures and stationery.
8. Finalized plans to organize several meetings to encourage investment in

Sponge Iron Plants, Foundries, Rolling Mills, Equipment Manufacture in the Region.

9. Participated in Study tours of India to identify investment opportunities and sources of technology and equipment which is appropriate to the region.

* * * *

**The 3 Year Business Plan**

The 3 Year Business Plan for 2000 - 2003 sets out the activities aimed at promoting and strengthening the Association and includes:

- Recruitment of members
- Publishing COMESAMIA Journals biannually.
- Human Resource Development, Training Workshops.
- Sponge Iron Projects.
- Investment Round Tables.
- Development of Foundries, Refractories.
- Study Tours
- Technical Assistance to Engineering Industry (Energy Management, Cleaner Production etc.).

Furthermore, this period should enable the Association take over the activities of US/RAF/96/183, which ends during March 2000 including:

* Manpower development and training including exchange programmes.
* Compilation and updating of database, information gathering and dissemination.
* Promotion of co-operation among engineering and metallurgical industries.
* Lobbying for and representing the industry at local, regional and international levels.
* Studying, analysis and recommending appropriate action to be taken to safeguard the industry, particularly on the issue of dumping and tariffs.

As a start, COMESAMIA will co-organize the Training workshop in Addis Ababa, Ethiopia during February/March 2000.

UNIDO has committed US$ 10,000 towards COMESAMIA's activities during 2000 - 2001. The Association will endeavor to solicit funding from various sources to enable her implement the three-year plan in totality.

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## REPORT ON COMESA DELEGATES STUDY TOUR TO INDIA 24 JULY - 6 AUGUST, 1999

**Background and Objective**

The COMESA Secretariat has been implementing a programme for the development of the metal and engineering industries with a special focus on iron and steel. The technology, investments and expertise from India have played a crucial role in the evolution of this industry in the COMESA region, particularly in East Africa.

An analysis made by the project showed that India has the most appropriate technology for the development of the steel industry in the COMESA region based on small-

scale mini plants. Large scale, capital intensive plants have proved problematic for the small economies of the region, as they demand large amounts of capital, technology and expertise to set up, operate and maintain.

Specifically, delegation wished to investigate:

1. Investments and joint venture possibilities between Indian and local entrepreneurs for the production and processing of metals - especially steel production.

2. The possibility of manufacturing mini-steel making and rolling equipment and consumables in the region under licensing or other suitable arrangements.

3. Small-scale sponge iron/DRI plants using Indian technology.

4. Co-operation in training (both in India and locally), personnel exchange and technical assistance programmes, R&D, technology transfer etc.

5. Economies of scale by pooling requirements and orders for materials and other inputs required by local metallurgical plants in COMESA from India.

6. Ship-breaking technology to extract maximum value from scrapped ships.

The delegation comprised:

1. Mr. J.A.A. Opio, Senior Programme Analyst and team leader.
2. Dr. M. Kanyangarara, Metallurgy Consultant
3. Dr. J.K. Byaruhanga, Chairman of the COMESA Metallurgical Industries Association (Uganda)
4. Mr. M. Goma, Director of the COMESA Metallurgical Industries Association and project promoter for a rolling mill to be set up in Lusaka, Zambia
5. Mr. L. Manyama, Secretary General of the Tanzania Iron and Steel Association

The sixth team member, Dr. N. Dube of the University of Zimbabwe who is also the lead researcher on sponge iron development in COMESA did not make it.

Institutions visited and identified potential.

The Chamber of Indian Industry (CII) in New Delhi arranged a very comprehensive, but tight, programme for the delegation. In all localities visited, staff members of CII received the delegation. Wherever possible one of their staff accompanied the delegation on company and factory visits.

**1. Committee of COMESA High Commissioners and Ambassadors, New Delhi. Contact: H. E. Lazarus Amayo – Kenya High Commission and Chairman of the Committee. 25.07. 99**

Envoys from the D R Congo, Kenya, Mauritius, Rwanda, Somalia, Tanzania, Uganda,

Zambia and Zimbabwe attended the meeting where Mr. J. A. A. Opio briefed them about COMESA.

The envoys expressed concern at the paucity of information they get from or on COMESA. As a result, they are not as visible and active as they should be.

It was reported that hundreds of products from the COMESA region suffered up to 300% import tariffs into India.

COMESA was advised to have a section that deals with the identification of joint venture partners, organization of guarantees etc.

There would be value-added in consulting them prior to follow up missions.

2. **Ministry of Foreign Affairs, New Delhi. Contact: Mr. Bangar, Director, and Africa. 26.07.99**

India is serious about strengthening its economic ties, particularly trade with Africa. It has finalized MoUs with some RECs in Africa and is keen to have one with COMESA.

Non-tariff barriers such as visa restrictions and investment regulations in some countries still stood in the way. The issue of guarantees for partners was also mentioned as a bottleneck.

India will continue to offer training and manpower development opportunities to personnel from Africa and would favorably look at any specific proposals.

Regarding technology transfer in the area of building materials, for which funding has been sought from UNIDO, the finalized programme and coordination arrangements were still awaited before progress can be made.

3. **Essar Steel LTD, New Delhi. Contact: Mr. J M Bhasin, Adviser. 26.07.99**

This 2 million ton per annum integrated steel plant is part of a much larger group whose other interests are in oil, shipping, power, telecoms and financial services. The plant makes steel from iron ore via sponge iron and electric arc furnaces. 10 – 15% of the company's output of Hot Briquetted Iron (HBI) is available for export.

4. **UNIDO Technology Bureau for International Industrial Partnerships, New Delhi. Contact: Mr. Rajiv Bhatnagar – National Project Leader.**

The objective of this UNIDO-funded Bureau is to promote investment and technology transfer to and from India and to facilitate partnerships with Least Developed Countries. This is achieved through capacity building, electronic networking and promoting linkages to financing systems. The guiding principle is that investment and technology are intrinsically linked.

They are presently involved in a steel plant project in Zimbabwe.

The Bureau actively wishes to cooperate with COMESA.

5. **Chamber of Indian Industry, New Delhi. Contact: Mr. Tapas Datta, Deputy Director, Steel Industry.**

   The division deals with issues of membership, statistics, dumping, associations, and relations with industry and government.

   The issue of dumping and measures adopted to deal with it in India was discussed. This has been of major concern to Indian producers since the partial liberalization of the economy. An efficient legal system is a prerequisite for the speedy resolution of dumping cases otherwise they can drag on. To speed up the process, India has adopted a system of floor prices for the various steel products affected. So far India has been successful in prosecuting anti-dumping cases against imports from the CIS countries.

   The country sometimes experiences problems with inter-state movements of steel as the factor costs vary from state to state just as in the COMESA region. Rather than standardizing the factor costs, bands based on weighted averages have been established within which the costs can vary. To survive, companies must exploit to the full the competitive advantages of their locations.

6. **Jindal Strips LTD, New Delhi. Contact: Mr. N C. Mathur, Chief Executive. 27.07.99**

   The company is part of a much larger group with other interests in pipes, oxygen, power, Ferro-alloys, among others. All their companies are ISO 9000 and 14000 certified. Some of the products made by the group are exported to COMESA member states.

   Steel is made from iron ore via a 500,000 tonnes per annum sponge iron complex. A 1.6 million tonne per annum Corex-based steel plant is being put up. They also operate two plants in the USA, one for plates and the other for pipes.

7. **M N Dastur & Co Ltd. New Delhi. Contact: Mr. G D Kaushik, Technical Director. 27.07.99**

   This is the largest private sector consulting firm in India employing over 3 000 people. Their basic strength is in large-scale industrial metallurgical plants, especially iron and steel. They are a world-renowned consulting company that has the added advantage of not being tied to any particular supplier.

8. **Steel Authority of India Ltd (SAIL) 27.07.99 (Delhi) and 02.08.99 (Ranchi)**

   SAIL is owned by the government, and is the largest steel producing company in India. It operates over 30 mines producing iron ore, limestone and dolomite.

   They have a very well equipped and staffed Centre for engineering technologies, world class R&D laboratories. Services

offered range from concept to commissioning of plant and equipment. The expertise developed so far can be applied to other areas such as non-ferrous metals, chemicals etc.

Many technological advances made by the company could be of interest to other plants in the COMESA region. Particularly impressive is their environmental management and pollution control expertise that incorporates cleaner production. Examples are:

- Production of cement with up to 35% blast furnace slag
- Recycling of steel making slags via the blast furnace
- Use of mill scale as ore replacement in LD converters
- Palletizing burnt lime fines for use in LD converters
- Recycling of used refractories
- Reclamation of used rolls
- The Rhomelt process for the direct smelting of iron ores to make liquid iron. The process was developed in conjunction with Russia. A 300 000 TPA commercial plant using this technology will be commissioned in the next 2 – 3 years. It has advantages over competing new technologies such as the Corex process in that it can use any size or quality of coal and iron ore.

Regarding energy conservation and management, they have developed an elaborate system of conducting energy audits and measures to control consumption. They have been contracted by the government of India to study the energy efficiency of the mini steel plants in the country. The government also relies on them for policy advice on how best to develop the steel industry. If requested, they are prepared to assist COMESA develop a master plan for the development of the iron and steel industry in the region.

Their human resources development efforts rest on a state of the art management development Centre. The training offered is systematic and hierarchical. After audits to identify training needs, competency appraisals are carried out to ensure the training is needs based and results in enhanced competencies at all levels. Personnel exchanges within SAIL and at other steel plants within India and abroad are actively encouraged.

Because of their accumulated steel plant management experience, they are in a position to offer turnaround management services with payments linked to performance.

All these facilities and services are available to interested parties in COMESA subject to suitable arrangements. SAIL is truly a one-stop-shop source for much that is required by the steel industry in the COMESA region.

**9. Modern Steels Ltd., Chandigarh and Mandi Gobindgarh. Contact: Mr., Amarjit Goyal, Chairman (Also steel Furnace Association of India Chairman). 28.07.99**

Economic liberalization has led to a surge in imports ushering in stiff competition across the board. Companies have thus been forced to revise their strategies in order to survive.

There are now more than 1000 induction furnaces of capacity 1 – 5 tonnes in operation in India. These have replaced the costlier small capacity electric arc furnaces. Only about 30 electric arc furnaces are in operation, mostly with capacities above 25 tonnes producing specialty steels. The number of rolling mills exceeds 3000.

To survive, Modern Steels has had to curtail its production from 100 000 tonnes per annum general-purpose steels to about 40 000 TPA special steels. It has also diversified into dairy products and information technology.
The company is willing to share its technology and expertise with other steel plants in COMESA as well as assisting others set up steel plants.

**10. Tai Raj Ispat Ltd., Hyderabad. Contact: Mr. S K Goenka, Managing Director. 29.07.99**

This is a small steel company producing about 50,000 TPA of mostly reinforcing bars. Their survival strategy is by cutting costs to the bare minimum. For instance they use very light scrap which they bale on site, iron borings and sponge iron fines as feed for their induction furnaces. This gives them a 30% cost advantage on the small size ingots, which they sell to local rolling mills on more favorable terms than the larger steel plants. Very simple but effective automation reduces the labor force. The company also generates its own power.

The type of scrap this company uses is very similar to what is available in scrap-deficient COMESA member states such as Kenya Tanzania and Uganda. Also the strategy of cost reduction would be most appropriate to many mini steel plants facing stiff competition from cheap/dumped imports of steel.

**11. Sonali Castings Pvt. Ltd., Hyderabad. Contact: Mr. K R Koteswara Rao, General Manager. 29.07.99**

This is a specialty foundry producing mostly automotive components in SG iron. Much of their output is exported to automakers in SE Asia, Europe and the USA. It is a fine example of how relatively small investments when properly planned and managed can be effective and competitive in a global economy.

**12. Kayfor Metallurgical Services, Hyderabad. Contact: Mr. S N Dave, Chief Executive. 29.07.99**

Mr. Dave had previously identified equipment that could be suitable for relocating in the COMESA region. Extensive discussions were held centering on the technology, requirements and other considerations in setting up:

- Small capacity steel meltshops and rolling mills
- Induction furnace-based steel foundries

Mr. Dave is prepared to provide the complete consulting services from the feasibility report up to plant commissioning and management for such plants in COMESA.

**13.Precision Incremental Motion Technologies Pvt. Ltd.**

Contact: Mr. K. Ranga Reddy (Director)

- Machine shop specialised in railway and automotive spare parts.
- A good example of specialisation.

**14. Gomathi Castings Pvt. Ltd.**

Contact: Mr. P.G.V. Gandhi- Executive Director.

- Company linked to Precision Incremental Motion Technologies by supplying $Co_2$ moulded castings mainly ductile iron.
- Foundry uses induction furnace to make ductile iron castings, again a good example of specialisation.

**15. UNI-Metal Alloys Ltd.**

Contact: Mr. Samir Kumar Bhagat- Director.

- Foundry specialises in pipefittings for water transport.
- Foundry operates 2No. 2 Tonne induction furnaces.
- Foundry also makes steel pencil ingots for rolling mills.

**16. Sponge Iron India Ltd. (SIIL)**

A sponge iron plant having 2 lines of 30,000 TPA coal based DRI technology.

**SIIL** was established in the 1980s with the assistance of UNIDO. They operate a plant of Palonca some 300kms from Hyderabad.

This was found to be the most appropriate DRI technology for Africa to adopt because of:

- Small infrastructure requirement the ore was being trucked using 8-10 tonne lorries some 300kms from Palonca. The DRI was sold over 500kms to Madras and beyond again transported by contractors with similar small trucks.
- Fairly manageable Investment- the investment could be about US$20m or so. Other companies do the mining, transportation by contractors.
- Easy to handle technology which is similar to cement plant operations.

Possible expansion to include a power plant which changes the economics for the better and improves the environment conditions of the project. The Palonca plant uses only about 1MW when on external power but can generate 4-5MW when the hot gases are used generate steam and power. The company then sells the 3MW excess greatly changing the economics.

*Persons Met*

**Head Office in Hyderabad :**

Rajat Chakrabortty; Chairman-Cum- Managing Director

**Plant at Palonca**

V.K. Uppal : Chief General Manager
Suryanarayana:I/C General Manager (Works)
G.V. Subramanyam: Deputy Manager (Marketing)

**Agreed**

- Send 50kgs of iron ore and 50kgs of coal for each proposed project to SIIL for testing through UNIDO office in New Delhi.
- Mobilise funds for Kayfor Metallurgical Services and SIIL to send two people to come to COMESA for a mission to carry out preliminary studies on the sponge iron project and eventually the feasibility studies. UNIDO to be involved at the start.
- COMESA contact personnel start modalities for the implementation of the sponge iron projects in their respective countries.

**17. National Institute of Small Industry Extension Training (NISIET)**

**Participating Organisations**

- Government of India
- UNIDO
- Asian Pacific Centre for Technology Transfer
- Small Industries Development Bank of India

The Institute that is interested in signing a Memorandum of Understanding with similar institutions in Africa deals in:

- Technology Promotion
- Networking
- Counselling and Consultancy
- Short Term Training Courses
- Promotion of Small Industries

**Persons Met**

Mr. S.V. Prabhath: Principal Director
Mr. V. Chaturvedi: Head, Focal Point P, and UNIDO- TBIIPO.

**Agreed**

To follow up with COMESA countries.

**18. Orissa Sponge Iron Ltd. (OSIL), Bubaneshwar. Contact: Mr. M A Khan, General Manager. 30.07.99**

This company participated in a consultative meeting organized by the project in Kampala in 1997 where they expressed an interest in supporting the setting up of a sponge iron plant in the COMESA region.

They themselves are successfully operating a 30 000tpa coal-based sponge iron plant. However, due to the tight market conditions and escalating power costs, they have temporarily closed down their meltshops. In the meantime, they are putting

up a larger capacity 100 000 TPA DRI plant. They will use the sensible heat of the waste gases and the char residue of the coal-based DRI process to generate approximately 10 MW of electricity, which will be adequate for the requirements of the integrated plant. Electricity generated this way costs less than a third of that purchased from the grid. The new plant is scheduled for commissioning in March 2000.

In fact, so attractive is the generation of electricity in conjunction with DRI that the Hindustan Electrode Group generates the power for baking the electrodes it manufactures this way. The DRI is sold to steel meltshops fully off-setting the cost of the electricity used in electrode production.

This approach of DRI production and co-generation of power is of paramount interest to the COMESA region where several iron ore deposits were considered too small to justify the infrastructure and capital investment requirements for profitable exploitation using traditional large-scale methods. Quantities involved in a down-scaled operation can be moved competitively by road, thus removing the large capital requirement for railways. In India, many of the sponge iron and steel plants rely solely on road transportation. Electric energy self-sufficiency removes the need for bringing in grid power. Furthermore, 100% DRI feed has been used to make commercial quality mild steels in induction furnaces further reducing **capital** costs compared to the electric arc furnace route.

With this knowledge, the steel from iron ore projects in Ethiopia, Tanzania, Uganda, Zambia, Zimbabwe and others should be revisited.

**19. Tata Iron and Steel Company (TISCO), Calcutta. Contact: Mr. Vivek Tamhane, General Manager Tata International. 31.07.99**

This is part of the famous Tata conglomerate, the largest and most successful private family enterprise in India.

TISCO is the largest privately owned steel plant in India with a turnover exceeding US$10bn annually. All its equipment is relatively modern at less than 15 years of age.

They have their own patented Tata Direct Reduction process based on coal and rotary kiln. This technology is employed in their 120 000 TPA DRI plant. The company also boasts wide experience in the successful operation of mini blast furnaces.

Tata International is already well established in many COMESA member states such as: Namibia, Tanzania, Zambia, and Zimbabwe while Tata products are marketed throughout the region. Africa accounts for about 20% of Tata's exports

The company would be interested in pursuing projects in the following areas:

- Mining supplies and equipment
- Manufacturing plant operations and management
- Training and manpower development
- Hotels and tourism

**20. Usha Martin Industries Ltd. – Alloys and Steels Division, Calcutta. Contact: Dr. P Bhattacharya, Executive Director. 31.07.99.**

This steel company is unique in that it operates the most productive mini blast furnace (MBF) in India that makes about 3 tonnes per cubic metre (t/m $^3$) of working volume – for comparison, ZISCO's recently commissioned No 4 blast furnace is designed for 1.35 t/m $^3$. This furnace supplies up to 65% of the electric arc furnace feed, with the balance being DRI and scrap. Such a high rate of production is made possible through deliberate selection of highest quality raw materials, oil injection, and high furnace top pressure and state of the art burden distribution in a completely automated furnace operation. The company believes it can attain a productivity level of 3.6 t/m $^3$.

The combination of MBF, DRI and electric arc and ladle furnaces offers unparalleled flexibility in operations as the complex can be operated on 100% DRI or up to 80% MBF metal. This is a big advantage in view of the special grade wire rope qualities the company produces.

The company is willing to pass on its acquired expertise to interested parties in the COMESA region such as ZISCO Steel.

**21. Orient Steel and Industries Ltd., Calcutta. Contact: Mr. Nawal Rajgarhia, Managing Director. 31.07.99**

This company operates mini steel plants as well as supplying melting furnaces, rolling mills and foundry equipment.

It is prepared to assist companies in COMESA that wish to obtain Indian technology.

**22. MECON Ltd., Ranchi. Contact: Dr. L K Singhal, Chairman and Managing Director. 03.08.99**

MECON is the largest metallurgical and engineering consulting company in India. It is owned by the government and started off as a division of the Steel Authority of India. It became independent of SAIL in 1973.

Their major strength is in the design construction and commissioning of large capacity metallurgical plants including non-metallics, chemicals, power generation and distribution. They have also assisted many ailing companies turnaround. They can also handle small DRI integrated steel plants such as those preferred in the COMESA region. They gave demonstrations of their capabilities in various fields even in ship-breaking.

They have previously tendered for large jobs in Zambia and Zimbabwe. However, they are not in a position to offer long term financing packages. They are registered with the AFDC.

**23. Mukand Ltd., Kalwe District, Kane, (Nr Bombay). Contact: Mr. S C Khanna, General Manager. 04.08.99**

This company, which started as a small foundry in 1937, is the largest special alloy steel producer and private foundry in India. They export stainless steels, bright bars, ball bearing steels. Apart from that, they also manufacture world class equipment for iron and steel making and railways in their state of the art workshop set in park-like surroundings.

Equipment produced include: heavy duty electric overhead cranes, container handling cranes, blast furnaces, hot metal mixers, ultra high power eccentric bottom tapping electric arc furnaces, secondary metallurgy stations, continuous casters, rolling mill stands, cement plants, rocket launchers, CNC machines and many more. All their divisions are ISO 9000 certified.

They have extensive experience as pioneers at the high end of the business. This is reflected by their impact at the international level where they are partnered with the best.

**24. Export-Import Bank of India (Exim bank), Bombay. Contact: Mr. Raragbhai A Makwana, Deputy General Manager. 04.08.99**

The Bank was set up as an export credit agency to support India's foreign trade. They have extended lines of credit to many banks in Africa including the PTA Bank.

The Bank also supports investments by Indians in joint ventures abroad. There is a MoU with the AfDB to co-finance such projects where the equipment is sourced from India.

Pre-investment studies can also be supported through the IFC's Africa Project Development Facility.

They have had some bad experiences with poorly performing investments in Africa, hence their move to co-financing. Africa is regarded as a high political risk area – hence some sort of guarantee is required. In this regard they are helping the Reserve Bank of Zimbabwe to set up a guarantee scheme.

Many useful publications by this Bank are available and the COMESA Library should subscribe.

**25. Gujurat Ship-breakers Association, Bhavnagar. Contact: Mr. Subodh Kumar. 05.08.99**

The state of Gujarat is renowned worldwide for its ship breaking activities. It boasts over 180 ship breaking clubs over an 11-Km stretch of beach.

Scrap ships are purchased on the open market. Everything on

the ship from generator sets, furniture, linen etc is recovered and sold.

Over 100 steel rolling mills depend on ship scrap for their input.

The Association is prepared to assist with expertise and training anyone in COMESA who wants to set up a ship breaking operation.

**26. Eastern and Southern African Trade and Development Bank (PTA Bank), Nairobi, Kenya *(On the way back)*. Contact: Mr. Patrick Ogwang, Projects Officer. 06.08.99.**

The meeting was to discuss the possibility of the Bank financing iron and steel projects in the COMESA region.

There is a Board resolution that the Bank should support projects in this area. So far three iron and steel projects in Kenya, Uganda and Tanzania have benefited from funding by the Bank.

In response to experience, lending conditions of the Bank are now stiffer than before. Minimum lending by the Bank is still US$ 250 000. In addition they only finance a maximum of 50% of the project value, in other words they can only get involved with projects costing US$ 500 000 and above. The amount advanced by the Bank must be covered 1.5 times by suitable security/collateral. The project must have a debt to equity ratio of 1:1.

The Bank however does not finance used equipment or refinance projects.

**Conclusions**

**1. Cooperation framework**

Negotiating and finalizing a memorandum of understanding between COMESA and India is in the best interests of both parties and as such should be accorded high priority. Separate MoUs with specific institutions such as SAIL, Mecon, Technology Bureau for International Industrial Partnerships, etc should be derived from this overall MoU.

The companies visited should be invited to participate in some of the project activities such as consultative meetings, workshops and conferences.

**2. Investments and joint ventures**

With a few notable exceptions, there is a general reluctance on the part of the Indian business community to invest in Africa as it is regarded as a high-risk region. It must also be borne in mind that India is also a developing country, which like any other, would like to maximize local job creation and exports of locally produced items.

It is however not necessary to enter into joint ventures in order to benefit from the technologies available from India. Local investors can and should make

their own investments using this technology.

**3. Technology transfer**

- Small scale sponge iron and steel plants

In India, up to 40% sponge iron has been successfully used in induction furnaces to make special alloy steels. With such technology, shelved/stalled iron and steel projects in Ethiopia, Madagascar, Tanzania, Uganda, Zambia and Zimbabwe should be revisited.

Downscaled plants such as those popularized in India will be most appropriate for the African region at the moment. Interested parties can come through the Secretariat.

- Ferro-alloys

In India, many Ferro-chrome plants briquette their chromite ore fines before charging into the arc furnace without any problems. Two plants pre-roast the briquettes to achieve 15 – 20% metallisation before hot charging into the furnace.

This technology would be useful for Ferro-alloy producers in the region, particularly in Zimbabwe where high-grade chromite ore fines are prevalent.

- Information

A map of COMESA showing the major raw material deposits, available infrastructure such as road, rail, power, water, etc, location of steel meltshops and rolling mills as well as their capacities will be of great value.

An interactive page on the COMESA website should be developed as a matter of urgency in collaboration with the Information and Networking Division.

**4. Training and manpower development**

COMESA companies should take advantage of the excellent training opportunities in India to complement those being offered locally.

The Ziscosteel Technical Training and Management Development Centers should be encouraged to link up with SAIL in a mutually beneficial way.

**5. Ship-breaking**

Steel Makers (Kenya) that had requested for technical assistance from the project in this regard should take up the offer by the Gujarat Ship breaking Association.

On the other hand, Mecon can also provide such a service.

**6. General**

There is no doubt that the study tour was a big eye opener for the entire delegation. It was quite clear wherever we went that insufficient time had been allocated for each of the companies visited, and it was not possible to see all the plants of interest.

However, the visit can be regarded as exploratory in

nature to be followed up by more focused visits to firm up on specific issues.

Many thanks are due to the Government of India, the Indian High Commission in Lusaka, the Chamber of Indian Industry, UNIDO, COMESA and all the companies and institutions that played a role to make this tour a success.

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## Demonstration Foundry Takes Shape at Makerere University

### Background

Uganda Gatsby Trust (UGT) is a Non-Governmental Organization whose mission is to assist in developing the technological base of the small enterprise sector in Uganda and enabling the growth of such industries.

The headquarters of the Trust are based at the Faculty of Technology –Makerere University with the aim of enhancing University-Industry co-operation. Eng. Dr. J.K. Byaruhanga, a senior Lecturer in the Department of Mechanical Engineering, manages the Project.

### The UGT Demonstration Foundry

In July 199, UGT launched a demonstration foundry with the following aims:

- to assist small –scale foundry operators in testing of raw materials and demonstration.
- To act as a demonstration unit and provide practical training for the Faculty students in the departments of mechanical and agricultural engineering.
- To act as an income generating activity for the Project.

### Manpower and Factors of Production

The foundry is managed by Mr. B.M. Katongole who is also the manager and proprietor of Mawakato Technical services, a small-scale foundry located in Najjanankumbi in the outskirts of Kampala City. He manages a workforce of six men who include molders, a pattern maker and porters.

The foundry project got seed funding from the Gatsby Charitable Foundation (GCF), of UK, which was used to purchase the equipment and to provide the working capital. The foundry started with a crucible of 150kgs, but immediately managed to get big orders, which superseded that capacity such that now it operates with the following equipment and tools:

- A 250kgs crucible furnace
- 10 molding boxes
- 1 grinding machine for fettling
- and many other assorted hand tools.

The current capacity of the foundry is 500kgs per day, which is achieved in two shifts per day. Currently the foundry operates six days a week.

The main source of raw material is scrap is scrap, which is normally purchased from Kisenyi, the main scrap collection center in Kampala. The foundry capacity can manage to

cast the following metals and/or alloys:

- cast irons
- aluminum
- brass
- bronze

The current products of the foundry include:

- Brake blocks for train wagons and locomotives
- Man hole covers
- Table stands
- Fans
- Various spare parts for medium and large scale industries

**Market and Current Orders**

The demand for cast products in Uganda is growing at a very terrific speed, yet the number of foundries, which can make quality products and say spare parts for industry are still very few. With in this short time, i.e. since July 1999, and with the above mentioned machines and tools, the foundry has been able to get some good orders from the following organization, individuals and companies:

- 3,000 brake blocks from Uganda Railways Corporation wagons.
- 1,000 brake blocks from Uganda Railways Corporation locomotives.
- Fans for Uganda Clays Limited for their Kiln
- Man hole covers from Livingstone Hall, Makerere University
- Various order from individuals.

**Future Plans**

With the current demand and forecast demand for next year the foundry has the following plan:

- Expand the capacity by acquiring two furnace with a capacity of about 700kgs per shift
- Set up an induction furnace to be able to melt various metals including steel, alloy steels etc.
- Introduce a variety of casting techniques like die casting, $Co_2$ molding, shell molding
- Make the demonstration foundry a fully-fledged training institute for the region.

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## PLANNED COMESAMIA WORKSHOPS

1. **January 20, 2000, KAMPALA**

Theme: Investment In Sponge Iron Project based on Ugandan (Muko) Iron Ore and Tanzanian Coal.

Duration : 1 day
**Expected** : Participants from Kenya, Tanzania, Uganda, Rwanda, Burundi, DRC and COMESA Secretariat.

2. **PROCESSING OF COMPLEX IRON ORES**

**Venue** : Central Metallurgical Research and Development Institute, Cairo, Egypt.

**Participants** : Egypt, Ethiopia, Tanzania, Zimbabwe, and Zambia.

**Duration** : 2 - 3 days

**Dates** : March 2000

3. **Small Foundries and Steel Rolling Plants**

**Venue** : Lusaka, Zambia

**Dates** : May 2000

**Participants** : From all COMESA member States.

4. **Ethiopian Training Workshop.**

Training Workshop for Engineers from Industrial Plants in COMESA Region.

**Venue** : Akaki Spare Parts, Addis Ababa Ethiopia

**Dates** : 13 - 31 March 2000

**Modules :**

- Melting and Casting of Iron and Steel
- Steel Rolling
- Maintenance Management

**Duration** : 3 weeks

5. **ZISCO Renaissance Workshop April 2000**

**Theme** : African Renaissance in Iron and Steel Production.

6. **Symposium on Test-work carried out at the University of Zimbabwe on Iron Ores and Coals from COMESA Region.**

**Date:** June 2000

7. **Training Workshop for Engineers on CAD/CAM Operations:**

**Mauritius, June** 2000.

**8. SYMPOSIUM ON DIRECT REDUCTION IN AFRICA:** An International Symposium on Unlocking Africa's Iron and Steel Potential Through Direct Reduction Technology.

Organized By COMESA Metallurgical Industries Association (COMESAMIA)

In Collaboration with: COMESA, UNIDO and the Department of Metallurgical Engineering, University of Zimbabwe.

**Venue: University of Zimbabwe**
**Date: 26 –27 June 2000**

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## REPORT ON THE KAMPALA SPONGE IRON INVESTMENT MEETING HELD AT HOTEL AFRICANA, JANUARY 20, 2000.

### OPENING

The investment meeting which was organised to bring together stake holders in the Sponge Iron Project in Uganda, was opened by the Minister of Energy and Mineral Development Hon. Syda Bbumba. The meeting was attended by thirty (30) participants who included Landowners and concession holders from Muko, operators of Steel plants and foundries, bankers, Government officials, Chairmen of Kabale, Kisoro and Mbale Districts, private sector Associations and COMESA.

In her opening statement the Minister said:

- The Government of the Republic of Uganda was wholly behind the efforts to establish a sponge iron plant based on Ugandan iron ores and Tanzanian coal as a concrete steep towards building a base for economic growth of the region
- Uganda has been spending over US$250-300 million per year on importation of metal products, hence any new investment, which would not only substitute for some of these imports but also earn the countries of the region some foreign exchange would be a welcome one.
- Uganda's steel mills which have an installed capacity of about 85,000 tonnes per year are operating below 50% capacity mainly because of lack of raw materials inputs such as scrap, billets; etc.
- Her Ministry would continue to evaluate the country's mineral resources so as to promote investment in the sector
- The donor community and the private sector were welcome to assist Government in the evaluation of the country's mineral resources

In a statement read on his behalf by Mr J.A. Alele Opio, the Secretary General of COMESA:

- Thanked the Government and people of Uganda for having supported the COMESA programmes very strongly as testified by the hosting of the COMESA Metallurgical Industries Association [COMESAMIA] Secretariat in Uganda.
- Informed the meeting that the establishment of a Sponge Iron Plant in the region was decided by the Council of Ministers of PTA as far back as 1985, hence any concrete steps taken to set up such a plant are in line with the aspirations of the region.
- Informed the members present that an Austrian funded project had since 1994, been implemented to assist COMESA countries in rehabilitating and upgrading their metallurgical industries with special regard to the iron and steel sector with considerable success. The establishment of COMESAMIA to enhance co-operation among the region's metallurgical sector and spearhead its development, was a direct result of the project
- Informed members that the Austrian funded project was going to finance the transportation of bulk iron ore samples to Zimbabwe and their testing at the University of Zimbabwe to determine the appropriate technology for their processing.
- Appreciated that the investment meeting was taking place at an opportune time following a study tour to India by five people from COMESA where it was determined that technologies existed for small scale sponge iron plants which could be appropriate for the region
- Encouraged Uganda, Tanzania and neighbouring states to see that the establishment of the sponge iron plant in their region becomes a reality.
- Commended COMESAMIA for initiating the investment meetings as a service to her prospective members and encouraged the Association to organise many more meetings of this kind for the development of

the metallurgical sector in the region

- Concluded by saying that COMESA looked forward to the day when the sponge iron plant would become a reality.

In his welcome speech, the Chairman of COMESA Metallurgical Industries Association, Eng. Dr. Joseph K. Byaruhanga, briefed members present as follows:

- He had gone on the COMESA organised study tour of metallurgical plants in India where he had been impressed by the level of development there as well as the existence of technologies appropriate to the region for foundries, rolling mills and mini-steel plants.
- He toured a sponge iron plant belonging to Sponge Iron India Limited (SIIL) in Hyderabad where;
  - ⇒ Iron ore was transported some 350 kms from the mine to the plant using 8-10 tonne trucks owned by contract transporters
  - ⇒ Coal was also transported some 100kms to the plant
  - ⇒ Only 1.1 MW of electrical power was required to run two modules of kilns of 30,000 tonnes each
  - ⇒ A waste heat boiler and steam turbine had been added to utilise the sensible heat of the waste gases to generate power, which could be used not only to run the plant but also to sell to the national grid.
- This approach could be applied to the Muko Iron Ore and form the basis for the establishment of a sponge iron plant; viz.:
  - ⇒ The people of MUKO or those with mining concessions could under take to do the mining of the ore and preliminary beneficiation
  - ⇒ Coal could be supplied from Tanzania to the sponge iron plant
  - ⇒ The sponge iron plant itself could be established in Kabale town which is already served by road and electricity
  - ⇒ The plant could also generate power from waste heat hence be self-sufficient in her energy needs
- Having seen the possibility of setting up a sponge iron plant in the region, it was decided to call the stake holders to consult and map out a way forward, hence the Sponge Iron Investment Meeting

**PAPER PRESENTATIONS**

The meeting received the following presentations:

1. Iron ore resources in Muko by Mr E. Kato of Ministry of Energy and Mineral Development who said that there are about 4 million Tonnes of proven reserves in two hills that have been surveyed. He added that, for a sponge iron plant producing 60,000 tonnes per annum about 100,000 tonnes of iron ore would be required giving a project life of at least 40 years.

2. Chemical analysis of Tanzanian coal and Muko iron by W. Balu-Tabaaro of Geological Mines and Survey Department, which showed very high quality of the Muko, iron ore and Tanzanian coal.
3. Coal-based Sponge Iron Production using the SL-RN direct reduction technology; the Sponge Iron India Limited experience by Eng. Dr. J.K. Byaruhanga.
4. Medium to long term project financing, the experience of East African Development Bank, by Mr Godfrey Ruhurira who recommended that a feasibility study be carried out to determine the economic viability of the proposed project.
5. Sponge Iron for steel making by Mr S. K. Singh of Steel Rolling Mills Limited who pointed out that sponge iron can be used for feedstock of electric arc furnaces up to 70%. He welcomed the project and said that his company was willing to participate when the viability of the project has been proven.

**WAY FORWARD**

It was resolved by the participants that:

1. The reports on the quantification work carried out by Geological Survey and Mines Department be availed to COMESAMIA.
2. COMESAMIA should expedite the formation of a company to spearhead the establishment of the Sponge Iron Project.
3. The Muko concession holders and Landowners should facilitate COMESAMIA to obtain 5-10 tonnes of iron ore samples for testing at the University of Zimbabwe.
4. COMESAMIA calls another meeting to consider memoranda and articles of Association of the proposed Company as soon as possible.

**CLOSURE**

Hon. Kweronda Ruhemba, Minister, in President's Office in charge of Economic Monitoring who closed the meeting, also commended the steps being taken to establish an iron and steel industry in Uganda and assured the meeting that they had Government's support. He further informed the meeting that where a lot of investment was needed in a vital sector like the iron and steel sector, Government can invest in partnership with the private sector and divest her interest when the project has matured.

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**COMESA DEVELOPMENT/ MANPOWER**

***WHO ARE WE AND WHERE WE ARE***

***Thoughts from Mauritius***

If we have to count the number of hands we have in the COMESA Region, the total will be a complete surprise, yet we are not able to compete in many a field of economic, scientific and technological environment.

If we are to take stock of the resources available among the

COMESA members, there again, we are in for a surprise because we note that our resources are exploited in many a way as to fill the pockets of others. Nearly thirty years after the decolonisation of this part of the world, we are poor and exploited - our human resources have been kept mostly for menial labour jobs while EXPERTISE is always imported.

Even though in many parts, foreign expertise is used in the spirit of transfer of technology, very often, the chance to be able to perform is denied to our qualified local people. In short, we are a majority of illiterate or semi-literate nation, victim of pre-colonial and post-colonial division, tribal divisions and of military domination.

The big talk these days is production and marketing. What can a hungry, illiterate man produce?

If we want to produce, we can and we must create the market - but as we cannot live in a vacuum, we need outside markets, we need not be subjected by unfair competition by multinationals. We can react, survive in a competitive world but not in an unfair and dominating atmosphere. This is what we are!!!

## WHERE WE WANT TO GO

Despite all our differences, disagreement and nationalism, we agree on our objective i.e. the improvement of our standard of living, access to knowledge - basic knowledge - acquiring technical know-how to help us develop our resources, (human and natural) for economic and political stability to achieve the freedom from want that was the ideal of the founding fathers of many a nation, and members of the COMESA. We have in mind JULIUS NYERERE, Sir S. RAMGOOLAM, KENNETH KAUNDA and many other leaders.

On the eve of the next millennium, it is with pleasure that we would note the real desire to promote the ideals of Regional Co-operation to attain the benefit of the region by the region. The courage of the leaders to create forums like COMESA, SAB etc. constitutes the creation of a local force and a regional force which can pull all available resources and talents to develop this region, always referred to as a dark continent into a leading force of the next millennium. We do not have to engage in basic research. Our state of development as it is today will perhaps exempt us from royalties while importing knowledge and technology putting our heads together we stand to benefit on all fronts.

## HOW DO WE GET THERE

There is not limit and no frontier that cannot be crossed once there is a will to move forward collectively with well-defined objectives and priorities.

It is for us to audit our own situation in a rational manner, set our priorities - define our action forward and just set about achieving them in a sincere and generous manner. Petty considerations, tribal or national reactions should be set aside. We do not lack funds, we do not lack resources, we are not short of labour neither we are too poor in terms of expertise, which all the same is to be improved by namely

organizing training programmes from our place of work and extending them to the region.

- Organization of frequent seminars and Workshops

The present ongoing workshop in Mauritius is another step towards the achievement of sustained manpower planning and monitoring of our semi-skilled, skilled and professional working force.

The creation of what we could name "C.A.M.E." - COMESA ASSOCIATION OF MAINTENANCE ENGINEERS - can be the bridging element to enhance advanced technical formation to the huge manpower available in our region.

Furthermore, determination, seriousness and faith in our objective are sine qua non conditions, which will bring us to a successful conclusion to our targeted objectives. It is imperative that our respective Governments realize the importance of such a platform and waive all sorts of hurdles that may be found on our way so that such a platform perform with utmost professionalism. Examples are:

- Establishment of communications links
- Creation of websites for fluidity of information
- Pledging for facilities from local and regional industries
- Changing Top Management's attitude towards investment in manpower development
- Elimination of red tape.

A good programme of exchange coupled with HONESTY and FAIRPLAY should trace the way for us to make this part of the world an example of development, wealth creation and health service improvement.

IF ASIAN AND CARRIBEAN REGIONAL ORGANISATIONS and other such organizations can boast of collective actions to ensure a fair distribution among their members, there are no reasons why AFRICA cannot succeed.

**WHAT DO WE NEED**

We need expertise we need finance
We need help for external markets
We need to be treated as grown-ups
We need freedom from western paternalism
We need to be given an opportunity to express our desires and needs
We need to be given a chance to show our abilities
We need to be helped and guided - not exploited
We need aid, not part of it as it is today, the case with some feeding programmes, of the FAO or healthcare by the OMS or platitudes used by the ILO for rights.
We need fewer arms; locally we need more freedom
We need democracy in its very essence
We need the opportunity to progress
We need above all to be considered on an equal basis by one and all
W need our dignity
We need education
And finally we need to be left free to decide upon our fate without any external intervention whatsoever
We need to be allowed to stand on our feet without any intervention whatsoever.

It is only when we realize that our basic needs are satisfied, our stomach is full, our security is ensured, our future has got a

meaning and we have free access to knowledge, we can then raise our heads to assume the role of benefactor and pioneers in improving the lot of the people. This is what to me COMESA stands for - a forum for sharing for the mutual benefit of one and all.

## HOW WE KNOW WE ARE THERE

We shall - if all things being equal and the right opportunities being available one day, see a regional production pattern, satisfying the needs of the local market and praising to tap foreign markets. We shall witness a different scene in our villages our children will be neat, disciplined, going to schools and studying to take up future challenges. It is our own challenge to dream of the day where the mortality rate goes down, the lifespan increases, population controlled, agriculture is mechanized, our mines are automated and computerized. It is our duty to propose to see at least the foundation be laid for the society. We still have to set up the basis for FREE and FAIR COOPERATION. We still have to compete - we still have to know what we want - we have to set aside our timidity and hesitation to acquire knowledge and riches. Above all we still have to master all our courage to be able to choose when necessary between two words - YES or NO. We should not be complacent.

Despite all we have set, let us be sure of one fundamental aspect - WE SHALL NEVER BE THERE - The road will stretch itself further and further but we have the responsibility to set the parameters. straight so that as the roads becomes longer, we march forward.

## SECOND TRIPARTITE REVIEW MEETING FOR PROJECT US/RAF/96/183

The second Tripartite review (TPR) meeting for the Austrian-funded UNIDO project US/RAF/96/183 "Assistance to COMESA Countries in Rehabilitating and Upgrading their Metallurgical Industries with special regard to the Iron and Steel Sector" was held on 8 - 9th November, 1999 at Hotel Intercontinental Nairobi, Kenya. Delegates came from Austria, Egypt, Kenya, Mauritius, Uganda, Tanzania, Zambia, Zimbabwe, UNIDO and COMESA Secretariat.

Mr. J.A. Alele Opio, the Senior Programme Analyst (Industry) at the COMESA Secretariat Chaired the meeting while Dr. J.K. Byaruhanga, the COMESAMIA Chairman, was elected the Rapporteur.

Tripartite Review Meetings are usually held to enable the donor, beneficiary and implementing agencies sit together to evaluate the implementation of the project and map out a way forward. The meetings also give the beneficiaries an opportunity to state what they wanted and report on the benefits derived from the project.

The meeting was hosted by the Ministry of Tourism, trade and Industry and officially opened by the Assistant Minister of Tourism, Trade and Industry of the Republic of Kenya, Hon A.A. Ekirapa.

His Excellency Franz Horlberger the Austrian Ambassador to Kenya also addressed the meeting.

It was a unanimous agreement that the project had been one of the most successful in COMESA in promoting cooperation, increasing intra-COMESA trade and demonstrating that capacity and expertise exists in the region for taking on the challenges of development n the industrial sector.

These Workshops and interventions have been carried out in Kenya, Uganda, Zimbabwe, Tanzania, Zambia and Mauritius. Another workshop is to be conducted in Ethiopia during March 2000.

Congratulations go to the donor, the Austrian Government, UNIDO and COMESA the implementing agencies and Dr. M. Kanyangarara the CTA of the project. Bravo.

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**Overview of the achievements of the project**

**Output 1**

**At least 60 national experts from COMESA Metallurgical Plants, Foundries, Engineering and metal manufacturing enterprises, R&D and consultancy firms trained through six workshops, three study tours and six on the job training programs.**

During the period under review there was one training workshop on maintenance management held in Kitwe, Zambia. It was attended by 26 engineers, 3 of whom were from Zimbabwe. This brought to 138 the total number of engineers trained by the project. Two more workshops are scheduled for Mauritius and Ethiopia.

Two on-the-job training/technical assistance programmes were initiated during this period on:

- Cleaner Production, and
- Industrial Energy Conservation and Management.

Quality Management focusing on ISO 9000 and 14000 will be tackled under the recently launched COMESA Standardization, Quality, Metrology and Testing (SQMT) programme.

At the first Tripartite Review Meeting in Harare last year, it was resolved that what was important was the effectiveness of the training given and not just the numbers of people trained. Missions were thus made to Ethiopia, Kenya, Tanzania, Uganda and Zimbabwe for this purpose. The majority of participants benefited personally from the training. In those companies where there was support from the executive management, significant benefits were reported.

Three study tour fellowships were awarded to the National Project Manager, a project consultant from Tanzania and a businessman from Zambia to visit India. They were accompanies by the Chief Technical Adviser and the Chairman of COMESAMIA.

**Output 2**

**A sustainable system of information exchange, among entrepreneurs, professionals and**

**policy makers in the region established**

The COMESA Metallurgical Industries Association (COMESAMIA) was inaugurated on the 1st February 1999 in Kampala, Uganda. The project awarded the association a grant of $ 18,000 to help finance its operations for the first year.

COMESAMIA publishes a quarterly Journal the first issue of which commemorated the inauguration of COMESAMIA. The second volume will be out in December.

The project contributes to the COMESA web site, **http://www.comesa.int,** a section on the COMESA metal and engineering industries. This is being further developed into an interactive site where people with access to the Internet can discuss and exchange ideas.

**Output 3**

**Project profiles for the use of local iron ore, coals and hydrocarbon resources for the production of sponge iron/DRI in the region identified and elaborated.**

A sub-contract between UNIDO and the University of Zimbabwe to undertake testwork on ores from the region was finalized and awarded.

100 Kg of iron ore, coal and copper ore samples from Tanzanian deposits were collected and delivered to the University of Zimbabwe.

Mr. Dube, the lead researcher, went on a mission to the Central Metallurgical Research and Development Institute (CMRDI) at Helwan, Cairo and the University of Leoben in Austria. A co-operative research arrangement involving the three institutions was worked out.

The study tour of India also aimed at gaining an insight into the downscaled technology for the production of sponge iron. If such technology is adopted in COMESA, then several iron ore deposits that had been shelved because of insufficient quantities come alive again. Plants producing 30,000 tonnes per annum are being successfully operated in India. The quantities involved can be effectively carried by road transport, thus obviating the need for expensive railway lines. Furthermore, the sensible heat of the DRI gases and the char residue can be used to generate electricity. This is a more attractive proposition than bringing in the grid.

**Output 4**

**Projects for the diversification of products elaborated.**

A project for the production of grinding mill balls by rolling is being elaborated in association with a Russian company. Interest has been shown by promoters in Ethiopia, Tanzania and Zimbabwe.

A request was received by the project for technical assistance in the setting up of new steel rolling mills in Malawi, Zambia and Zimbabwe. Contacts with Indian companies that can supply the equipment as well as enter into joint venture arrangements with local investors in COMESA. Tentative

offers for the equipment have been received and are being evaluated.
A project proposals for the establishment of a steel foundry in Kampala, Uganda is also in the process of being developed. The project has assisted in getting quotations for the equipment.

**Output 5**

**Occupational health, safety and environmental awareness campaigns initiated in metallurgical plants in COMESA**

This topic is included in all the training programmes organized by the Project. Several plants have reported significant improvements on this front after attending these training programmes.

An expert on Cleaner Production (CP) was commissioned to provide technical assistance to Ziscosteel and Steelmakers on the implementation of CP in their plants. This will be used as a case study to be replicated in other plants in the region.

**Progress Reports were presented by:**

- Dr. J.K. Byaruhanga on COMESAMIA
- Dr. Dube on Sponge Iron test work at the University of Zimbabwe
- Mr. L. Manyama on Cleaner Production at ZISCOSteel and Steelmakers (Zimbabwe)
- Prof. F.D. Yamba on Energy Conservation.

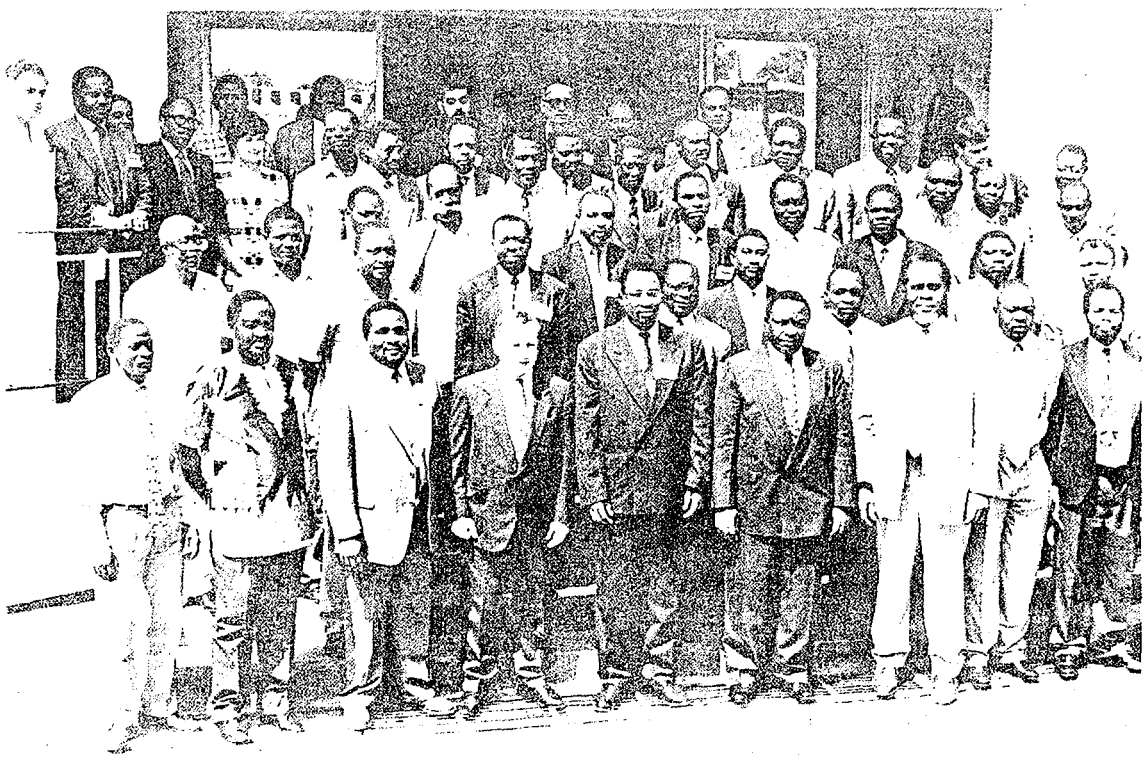
**Way Forward**

As the project comes to an end early during early 2000, the recently launched COMESA Metallurgical Industries Association (COMESA) should take over most of the well established project activities such as:

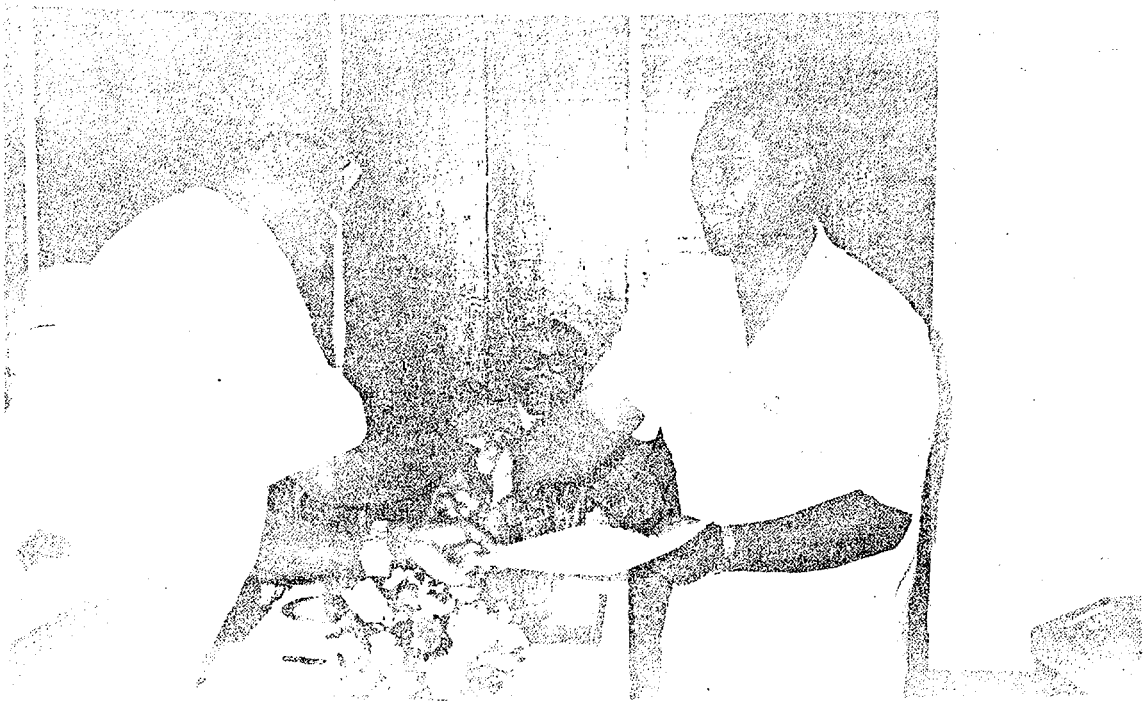
- Manpower development and training including exchange programmes.
- Compilation and updating of the database, information gathering and dissemination
- Promotion of co-operation
- Lobbying for and representing the industry at local, regional and international levels
- Studying, analyzing and recommending appropriate action to be taken to safeguard the industry, particularly on the issues of dumping and tariffs.

The CTA made a presentation on possible follow-up activities. He stressed that the programme was a COMESA programme and not a UNIDO programme. Some of the activities that were enumerated included:

1. Continuation of the training programmes
2. Extension of Cleaner Production and Energy Conservation and Management Programmes to other member State
3. Promotion of investment in direct reduced iron and foundries in the COMESA region.
4. Production of grinding mil balls through rolling.
5. Compilation and production of training case studies and manuals.
6. Extensions of sponge iron/ DRI technology to complex iron ores such as those in Ethiopia.



Participants of the Policy Defining Workshop held at Fairway Hotel in Kampala during April 1997. Recognisable in front raw are Dr. M. Kanyangarara, Mr. T. Grof of UNIDO, Hon. Z. W. Nsimbi then Deputy Minister of Mines Republic of Zimbabwe and Hon. Kajura Minister of Trade and Industry of the Republic of Uganda.



Mr. D. Bukalamye, receives a Certificate of participation from Mr. Kapasi Kakama Commissioner for Industry who officiated at the close of the Training Workshop in Kampala in 1997 held under the auspices of US/RAF/96/183.

7. Evaluation of the special needs of the foundry industry.
8. Training of Trainers to improve the teaching capability of resource persons
9. Promotion of exchange programmes.
10. Promotion of increased information and networking and
11. Strengthening of COMESAMIA
12. Technical assistance programmes.

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**REPORT OF THE MAINTENANCE MANAGEMENT WORKSHOP FOR ENGINEERS FROM COMESA INDUSTRIES HELD IN MAURITIUS, ON NOVEMBER 29 TO DECEMBER 17, 1999**

## 1. Introduction

This was the fifth such training workshop for middle level personnel from the metal and engineering industries in COMESA. The last workshop in this series is planned for Ethiopia during the first quarter of 2000.

As with the previous training workshops the objective was to encourage group learning using actual examples from the plants themselves as case studies to sharpen the participants' overall skills and self confidence in problem-solving, handling complex decisions, improving productivity, quality and overall efficiency. The workshop also gave participants an opportunity to discuss with peers from other plants and form collaborative/co-operative networks among themselves for sharing knowledge and experiences, exchange of ideas and solutions etc. for mutual benefit.

## 2. Attendance

Thirty (30) participants attended the workshop mostly from Mauritius. There was only one foreign participant from Uganda.

## 3. Organization of the Workshop

All the administrative arrangements for the workshop such as booking the venue, hotels, transport, typing and photocopying, stationery, teaching/visual aids, teas and lunches, plant visits, communications and publicity, were handled by the Faculty of Engineering of the University of Mauritius.

The workshop was held at Faculty of Engineering, University of Mauritius.

Plant visits were made to the following companies:

(a). Deep River Beau Champ S.E.
(b). Forges Tardieu Ltd (Engineering Shop and Foundry)

## 2. Official Opening Ceremony

The workshop was officially opened on the 29th November, 1999 by the Honourable Mr. Satish Faugoo, Minister of Labour, Industrial Relations, Employment and Human Resources Development.

The Vice Chancellor of the University of Mauritius, the Dean of the Faculty of Engineering and Mr.

JAA Opio from COMESA Secretariat also made statements.

## 3. Account of Workshop proceedings

The workshop facilitators, their nationality and field of lectures were:

(a). Mr. N.M. Mashanyare (Zimbabwe) - **Maintenance Management**
(b). Mr. G. Kabaso (Zambia) - **Condition based maintenance**
(c). Mr. L. Manyama (Tanzania) - **Cleaner Production and Principles of Man Management**
(d). Mr. C. Kateeba Abboki (Uganda) - **Design Considerations in Maintenance**
(e). Mr. Alber Alphonse Sadek (Egypt) - **Welding : Metallurgy Processes**
(f). Mr. J. Byaruhanga (Uganda) - **Materials Selection**
(g). Mr. F.D. Yamba (Zambia) - **Energy Management**
(h). MR. R. Fayolle (Mauritius) - **Predictive Maintenance**
(I). Mr. G. Jawaheer (Mauritius) - **Predictive Maintenance**
(j). MR. M. Kanyangarara (COMESA/UNIDO) - **Regional Co-operation and Integration; back to office action plans.**

## 2. Course Evaluation and Recommendations

The Mauritius workshop can be described as one of the most successful so far of the workshops organized by the project. The preparations worked very well. The group was very well composed and interacted very well among themselves as well as with the resource persons. There was a deep willingness to learn and share experiences among the participants and very useful contacts and connections were made. All participants prepared case studies from their plants which they hoped to get solutions for during the course of the workshop.

All workshop participants completed a course evaluation form. The pertinent observations, comments and recommendations made in the evaluations and in interviews carried out by the CTA with participants and resource persons are summarized below.

- The majority requested for more case studies in the local context in all subjects covered. They should deal with implementation of maintenance management on specific fields such as compressors, boilers, furnaces etc.
- Such courses should be held more frequently at the national and regional levels. Similar courses should be organized for supervisors and shop floor workers.
- An Association for Maintenance Practitioners should be established to enable them to network, share information, methods and techniques. This will facilitate continuous interaction between resource persons and participants.
- More visual aids should be used and the quality of some needs improvement as well as more clarity. The same applies to handouts.
- There should be group discussions on each topic

lectured.

- The excellent resources at the Faculty of Engineering could have been put to more use during the training programme. For instance, participants should have been allowed access to the Information Resource Centre of the University. The Faculty could have organised documents on its workshop and allowed participants to see new technologies being developed there.
- Lecturers from the Faculty should have complemented the resource persons by giving lectures that dealt with the specific situation in Mauritius.
- Most participants expressed appreciation for the efforts made by COMESA in this regard and would like to see the programme continued.

## 3. Back to office Action Plans

All participants prepared back to office action plans detailing what innovations and strategies they had learnt during the course that they would implement at their workplaces (see Annex 3). These will be monitored and followed up by the CTA in subsequent missions.

## 4. Closing Ceremony

The closing ceremony was held on 17th December, 1999. The guest of honour was Prof. GTG Mahomedbhai, Vice Chancellor, University of Mauritius.

## 4. E-maintenance Network

As a result of the intense and fruitful interaction among the workshop participants, most of whom were seeing each other for the first time, it became abundantly clear that there was much more benefit from a continuous interaction. This interaction can be made much easier if the convenience of the Internet was exploited. The proposed Association of Maintenance Practitioners was thus a major landmark in the history of the project. It was the first time such a suggestion has ever been made by participants at such workshops.

this association will be housed within and managed by the Faculty of Engineering. The Dean of the Faculty as well as the Vice Chancellor of the University all pledged their full support for the proposed association. The Faculty will designate one IT specialist to develop the framework of the association.

Initially, the association will build an electronic network of maintenance practitioners in Mauritius. Through this network, the engineers will be able to tap each other's expertise using the Internet. Those with maintenance problems will post them on a specially crated web page. If any member of the network has solutions to the problem, he/she will post it on the same page so that with time a directory of problems and solutions will be built up.

The advantage of this approach, as in tele-medicine, is that specialists can help solve problems in distant locations without having to travel. This will also promote much closer ties among the engineers than before. Starting the project in Mauritius is ideal, as the country is small enough for everyone to be easily accessible. Besides most of

the companies there are on the Internet thus it will be much easier to get started there. When the project has been fully proven, it will be extended to other COMESA member States.

It is expected that by the time of the next COMESA Heads of Sate and Government Summit in Mauritius in May 2000, it will be possible to give a live demonstration of how this E-maintenance programme works to the delegates.

## 6. Conclusions

These training workshop have definitely gathered momentum that must be kept up. It has now been amply demonstrated that the capacity and capability exists in the region for organizing and conduction successful training workshops. Local organizers/collaborators should be encouraged to organize similar programmes on their own without inputs from the project.

The proposed E-maintenance network will be the first COMESA undertaking to be hosted by Mauritius. The other point is that it came unsolicited form private sector engineers. This shows the way for future private sector development initiatives that COMESA may embark upon. It is therefore strongly suggested that COMESA fully supports this endeavor as it will give a lot of mileage for very little input. Many more such associations can be launched to bring together professionals in several disciplines and practices.

**TRAINING COURSE IN COMPUTER AIDED DESIGN AND MANUFACTURE (CAD/CAM)**

UNIVERSITY OF MAURITIUS
FACULTY OF ENGINEERING
REDUIT, MAURITIUS

MECHANICAL AND PRODUCTION ENGINEERING DEPARTMENT

## 1. INTRODUCTION.

Computer Aided Design and Computer Aided Manufacture (CAD/CAM) has gained widespread applications in industries. The use of specialised software and CNC machines has not only considerably reduced the lead-time but also helped in enhancing quality of products and optimising materials usage. With CAD/CAM integration drawing data created on CAD is transferred to a CAM system so that geometry is readily defined and the user just proceeds to create tool path without having to re-define the geometry. The appropriate use of these technologies will lead to cost effective and high performance systems for the manufacturing industry.

## 2. THE UNIVERSITY OF MAURITIUS.

The University of Mauritius was created in 1968 and now consists of the following five faculties; Engineering, Agriculture, Law and Management, Social Studies and Humanities, Science. The Faculty of Engineering is the largest.. There are 6 departments attached to the Faculty of Engineering. The Mechanical and Production Engineering Department runs the B.Eng (Hons.) in Mechanical Engineering, B.Eng (Hons.) in Manufacturing Engineering, and the B.Eng (Hons.) in Mechatronics in collaboration with the Electrical and Electronics Engineering. The department controls the following laboratories used mainly for undergraduate courses; Thermodynamics, Structures, Metallurgy, Metrology, CAD/CAM, Fluid Power, and Mechanical Workshop.

## 3. OBJECTIVES

The main objective of the course is to encourage the use and to develop the essential application knowledge and skills in the various CAD/CAM technologies.

At the end of the course, the participants are expected to;

- Understand the basics of Computer Aided Drafting
- Use CAD software to make 2D and 3D models.
- Do parametric design and manufacture the part on a VMC
- Understand the basics of CNC machines

## 4. DURATION

The duration of the course is four (4) weeks, from 05 June 2000 to 01 July 2000.

## 5. CURRICULUM

**Computer Aided Design**

- ✓ Introduction to CAD
- ✓ CAD Hardware
- ✓ Types of CAD Systems
- ✓ Common 2D CAD Software Features
- ✓ Common 3D CAD Software Features
- ✓ AutoCAD R14
- ✓ Mechanical Desktop R4
- ✓ CAD System Selection and Implementation

**Computer Aided Manufacture**

- ✓ Introduction to CAM
- ✓ Numerical Control Production Systems
- ✓ CAM Software, Hardware and Applications
- ✓ Mechanical Desktop and Hypermill
- ✓ Post processing

**CAD/CAM**

- ✓ Integrating CAD and CAM
- ✓ Machining of Complex Parts on the Vertical Machining Center
- ✓ Demonstration on the CNC Boxford Lathe
- ✓ Demonstration on the CNC Harrison Lathe
- ✓ Demonstration on the EDM

## 6. TRAINING METHODOLOGY

The course will be conducted in the form of lectures, presentation, group study and discussion, application, demonstration and hands on sessions. In addition industrial visits will be arranged for participants to complement the various topics acquired during the workshop.

## 7. FACILITIES

The CAD/CAM laboratory consists of about 50 Pentiums loaded with different softwares for Computer Aided Design and Computer Aided Manufacture. There are also simulation softwares for manufacturing systems, Hydraulic Systems and Pneumatic Systems. Mechanical Desktop and Hypermill. The Laboratory also houses a Vertical Machining Centre, 2 Computer Numerically Controlled Lathes and an Electro Discharge Machine

*LANGUAGE OF INSTRUCTION*

The course will be conducted in English. All participants should have a good command of spoken and written English.

*VENUE*

The course will be held at the Faculty of Engineering, University of Mauritius, Reduit, Republic of Mauritius.

*CERTIFICATE*

Participants who have successfully completed the course will be awarded a certificate jointly issued by UoM, COMESA.

*INVITED COUNTRIES*

The Nationals of the countries forming the COMESA are invited to apply.

*NUMBER OF PARTICIPANTS*

The number of participants from the invited countries should not exceed twenty (20) in total.

*ADMISSION REQUIREMENTS*

To be eligible for admission, participants should;

- Be nominated by their respective Governments;
- Be those who are working in the manufacturing industries or technical institutions with more than three (3) years relevant working experience in
- Be in good health, both physically and mentally, to complete the course
- Be proficient in the use of the English language, both spoken and written.

**PROCEDURES FOR APPLICATION.**

Each interested Applicant should write to:

COORDINATOR, CAD/CAM COURSE
DEPARTMENT OF MECHANICAL ENGINEERING, UNIVERSITY OF MAURITIUS, REDUIT, MAURITIUS.
E-mail: menon@uom.ac.mu

*COUNTRY REPORT*

Participants are required to prepare a Country Report on the present

situation of Computer Aided Desisn and Computer Aided Manufacture in their country. The report must be typewritten and submitted to the University of Mauritius before their arrival in the Republic of Mauritius. The Country Reports are to be presented by the participants during the course.

*TRAINING COSTS AND ALLOWANCES: Tuition Fees will be US$1,200 per person.*

*ACCOMODATION: Participants will meet their hotel costs (about US$ 40 per night)*

*REGULATIONS VISA*

Before leaving their country, participants should obtain a visa for entry to the Republic of Mauritius, if required, which will be issued by the diplomatic missions of the Republic of Mauritius accredited to their country.

*AIR TICKET*

Participants will meet their own travel costs

*PHOTOGRAPHS*

For administrative purposes, participants are requested to bring two (2) recent photographs.

*INSURANCE*

Participants are advised to purchase personal overseas travel insurance from their home country to insure themselves for travel to and from the Republic of Mauritius, and during the period of the training if they so wish.

*COURSE SCHEDULE* (see table 1)

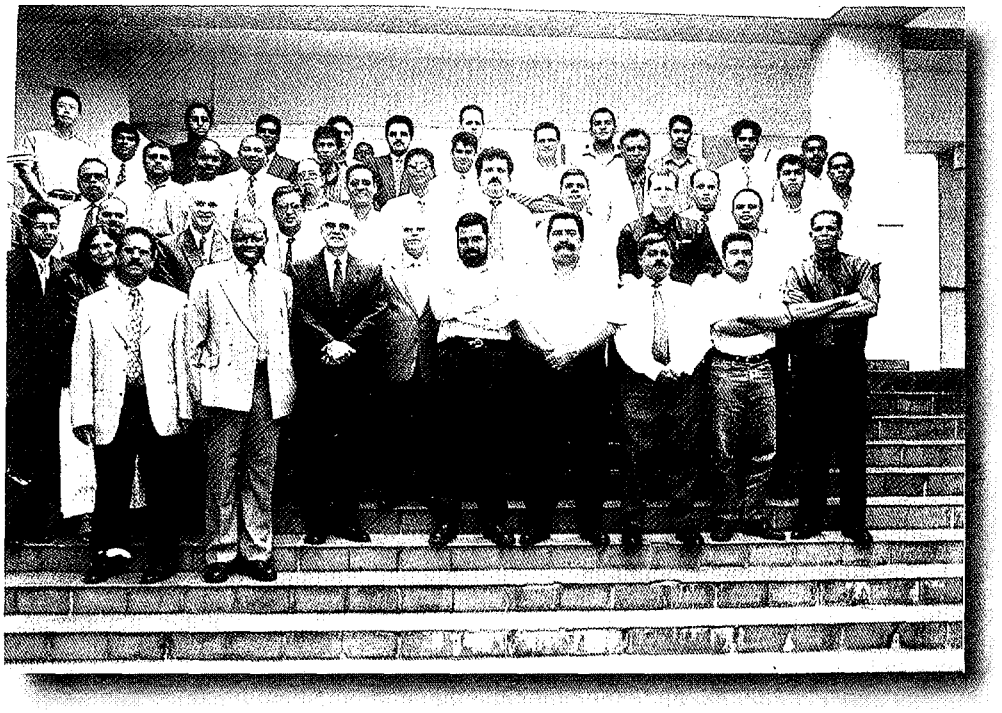
**Table 1: Course schedule for weeks 1 and 2**

| Day No. | Day/Date | Activity |
|---|---|---|
| 1 | Sunday | Arrival In Republic of Mauritius and check in at hotel |
| 2 | Monday | Welcoming ceremony<br>Orientation |
| 3 | Tuesday | Overview of CAD/CAM<br>Campus and training facilities visits |
| 4 | Wednesday | Lecture/Hands on : Autocad |
| 5 | Thursday | Lecture/Hands on : Autocad |
| 6 | Friday | Lecture/Hands on : Autocad |
| 7 | Saturday | Free |
| 8 | Sunday | Free |
| 9 | Monday | Lecture/Hands on : Autocad |
| 10 | Tuesday | Lecture/Hands on : Mechanical Desktop |
| 11 | Wednesday | Lecture/Hands on : Mechanical Desktop |
| 12 | Thursday | Lecture/Hands on : Mechanical Desktop |
| 13 | Friday | CAD System Selection and Implementation |
| 14 | Saturday | Free |
| 15 | Sunday | Free |
| 16-26 | | As Per Table 2 below |
| 27 | Friday | Evaluation Meeting<br>Certificate presentation ceremony |
| 28 | Saturday | Check out of hotel and departure |

The participants will be separated into four groups A, B, C and D and will follow the course as per table 2 below;

**Table 2: Course schedule for weeks 3 and 4**

| **Day No.** | **Day /Date** | **VMC** | **Mechanical Desktop/Hypermill** | **CNC lathe** | **EDM** |
|---|---|---|---|---|---|
| **16-17** | **Mon. Tues.** | A | B | C | D |
| **18-19** | **Wed. Thurs.** | B | C | D | A |
| **20** | **Fri.** | Site Visit | | | |
| **23-24** | **Mon Tues.** | C | D | A | B |
| **25-26** | **Wed. Thurs.** | D | A | B | C |



*Group photograph after the opening of the Mauritius Training Workshop at the University of Mauritius, at the end of November 1999.*

*The participants at the opening ceremony of the Mauritius Training Workshop inside the Lecture venue.*