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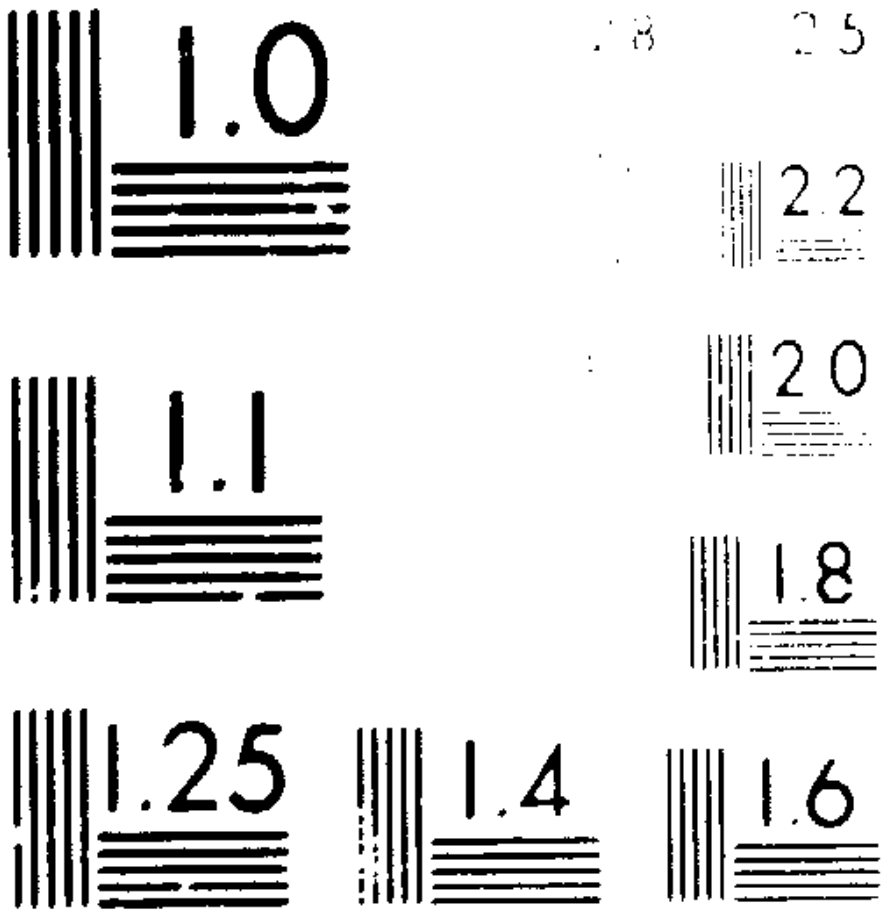
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Joint ECA/UNIDO Industry Division

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Engineering Industries Development Programme
Follow-up Mission of Expert Group Meeting
of Basic Metal and Engineering Industries
Development, December 1979. Addis Ababa

# REPORT OF THE FIELD MISSION IN BOTSWANA, ZIMBABWE, LESOTHO FOR UPGRADING EXISTING FOUNDRY, FORGING, HEAT TREATMENT, MACHINE SHOP, TOOL ROOM ETC. AND IDENTIFICATION OF THE LOCAL MANUFACTURE OF SELECTED AGRICULTURAL MACHINERY CAPITAL GOODS AND SPARE-PARTS

8 January 1982 - 14 February 1982

Prepared by:
A.K. Mitra
UNIDO Regional Adviser

Addis Ababa
15 March 1982



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ENGINEERING INDUSTRIES DEVELOPMENT PROGRAMME

## Mission Composition

The field mission on the follow-up of engineering industries development programme composed of:

Mr. Aloke Kumar Mitra (Indian) Tele. No. 447200 Ext. 181/155
Mechanical and Industrial Engineer
UNIDO Regional Adviser (Engineering Industries)
Joint FCA/UNIDO Industry Division
P.O. Box 3001
Addis Ababa
Ethiopia

## Countries Visited

| | | |
|---|---|---|
| 1. | The Republic of Botswana | - 5 January 1982 to 19 January 1982 |
| 2. | The Republic of Zimbabwe | - 20 January 1982 to 7 February 1982 |
| 3. | The Kingdom of Lesotho | - 8 February 1982 to 14 February 1982 |

SECTION I

INTRODUCTION

Mission Authority, Background Informations and Future Follow-up

Integrated development of engineering industries is part of the basic industries development reiterated in successive meetings of the Conference of African Ministers of Industry1/ and the meetings of the Follow-up Committee on Industrialization in Africa 2/ with particular reference to the Lima Declaration and Plan of Action set out for the developing countries in general and African countries in particular. In addition to this the Lagos Plan of Action has highlighted the development of input materials for the manufacture of essential machinery and equipment for the basic needs of African people.

Following the recommendations and resolutions adopted in the various meetings, ECA/UNIDO Joint Industry Division of the United Nations Economic Commission for Africa mounted a high level field mission during November-December 1978 for the integrated development of Basic Metal and Engineering Programme in Africa. The mission was funded from the United Nations Trust Fund for African Development (UNTFAD). The six members mission visited Kenya, Uganda, Zambia, Ethiopia, Lesotho, Mauritius, Sudan, Egypt, Tunisia, Nigeria, Mali, Senegal and prepared twelve country reports and a regional report for the integrated development programme for the Basic Metal and Engineering Industries in Africa3/.

Recommended Studies and Projects for Engineering Industries by the Expert Group Meeting held in Addis Ababa - 3-8 December 1979

The regional report 3/ and a task force report 4/ were examined and discussed in Addis Ababa by the African Expert Group Meeting during 3-8 December 1979. The agreed conclusions and recommendations for engineering industries development programme are highlighted in the report of the Expert Group Meeting 5/. Among other important recommendations, the African experts have urged the ECA/UNIDO Secretariates to undertake immediately the following activities for engineering industries development e.g.

- to undertake studies at national and subregional level for the expansion of existing foundry, forging, heat treatment, machine shop, tool rooms, in order to utilize and upgrade existing railway workshops, large repair and maintenance workshops and local industries to manufacture selected agricultural machinery, transport equipment, spare parts and capital goods.

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1/ Report of Fourth Conference of African Ministers of Industry in Kaduna, November 1977(E/CN.14/609) Part II, para 7(c) item (iii) and (iv) page 12.

2/ Report of the Third Meeting of Follow-up Committee on Industrialization in Africa, December 1976 (E/CN.14/IND/21) Part II, para 9(D)Sec.(a) & (b) page 12.

3/ Report of the First ECA/UNIDO Basic Metal and Engineering Industries Development Programme. Mission (July-December 1978) - M79-3211.

4/ Task Force Report of Basic Metals and Engineering Industry Development Programme. ECA/IMR/B&E/Working Paper - M79-3463.

5/ Report of Expert Group Meeting for Basic Metal and Engineering Industry Development Programme. 3-8 December 1979. E/CN.14/IMR/233, pages 13,14 and 15.

- to identify specific projects at national and subregional levels for the manufacture of agricultural machinery and implements manufacture of machine tools manufacture of transport equipment and spare-parts including greater co-operation among the developing countries under the umbrella of TCDC.

- to undertake studies for the establishments of African Multinational Corporations as endorsed by the Fifth Conference of African Ministers of Industry held in Addis Ababa 6/ October 1979.

Follow-up of the above Recommendations and Mission Objectives

Within the framework of the above recommendations and ECA/UNIDO Work Programme for 1980-1983 for engineering industry development, the Secretariats of UNIDO and ECA mounted field missions to selected Eastern and Southern African countries in April - May 1980, e.g. Kenya, Uganda, Tanzania, Zambia and Mauritius for the development of engineering industries. The mission reports for these countries were submitted to the Government in July 1980. The present mission has covered the following countries : Botswana, Zimbabwe and Lesotho (8 January 1982 - 14 February 1982). The Proposed mission to Angola is postponed until end of April 1982 at the request of the Angolan Government.

Major Objectives of the Mission

The following are the major objectives of the present mission:

-identification of existing gaps at institutional and industry levels in the field of engineering industries;

-proposal for upgrading or establishing new foundry, forging, heat treatment, machine shop, tool room etc. at national level in order to expand production of agricultural machinery, transport equipment, selected capital goods and spare-parts manufacture;

-utilization of existing railway workshops and large repair and maintenance workshops for the manufacture of spare-parts and selected capital goods

-development of institutional capabilities in order to expand and rationalize the engineering industries for the inter-linked development of the sector;

-development of greater subcontracting arrangement for the inter-country industries;

-development and utilization of existing prototypes, designs and R&D activities related to engineering products for the sub-regional countries.

-development of engineering and technical manpower;

Field Mission (8 January 1982 - 14 February 1982)

The engineering industry development mission mounted by ECA/UNIDO during January-February 1982 visited Botswana, Zimbabwe and Lesotho. The mission to Angola is postponed unitl April 1982 at the request of the Government. The mission identified very specific projects in consultation with the Governments

6/ Report of the Fifth Conference of African Ministers of Industry, 17-20 October 1979. E/CN.14/INR/229 page 19 1(v), 2(i). 2(ii) and 2(v).

and UNDP at national levels. The mission has also identified specific projects where co-operation can be extended by specific countries by way of joint ventures and sub-contracting arrangements,whereby specific engineering industries can be promoted for sub-regional demand.

The projects, identified at inter-country level, require further investigation with the interested member States. The mission also identified major constraints at national and inter-country level for engineering and allied metal working industries.

The mission has endeavoured to pin point the existing gaps in the field of institutional activities, engineering and technological aspects, manpower requirement aspects at national levels.

The major constraint are:

- major gaps(institutional and technological) in engineering industries particularly the lack of engineering support facilities (a) in the case of Zimbabwe the tool room and related activities (b) in the case of Botswana and Lesotho foundry, forging, heat treatment, tool room
- lack of capabilities in the field of design and adaptation particularly in Botswana and Lesotho
- lack of availability special raw materials e.g. tool steel, die steel, high carbon steel etc.
- lack of information regarding the products or prototype already manufactured within these countries;
- lack of marketing and sub-contracting facilities among the countries.
- acute shortages of engineering and technical manpower both at management and operative level;
- inadequate policy measures for the engineering industry development
- lack of national capabilities to prepare and assess the feasibility studies, monitoring of industries and mobilization of internal resources.
- lack of industrial inter-linkage between local and inter-country industries.

Proposed Follow-up of Mission Report and Implementation Modalities

This report will be the stepping stone for the Governments to implement selected recommended engineering industries projects at national and subregional level.

At National Level (Implementation Modalities)

The identified projects at national level will be forwarded to UNIDO, UNDP and the Governments for their considrations in terms of feasibility studies, expert assistance etc.

At Multinational Level (Implementation Modalities)

The report will also be submitted to the regular meetings of the Lusaka-based MULPOC for consideration as a starting point for the promotion of industrial

co-operation within the framework of the PTA. In this connnexion member States are expected to discuss, inter alia, the possibilities for establishment multinational productive enterprises as the other means for promoting co-operation and which may be created entirely on commercial basis.

As a further follow-up activity, the Joint PTA/UNIDO Industry Division will undertake the preparation of project descriptions of identified projects as well as project profiles which will be submitted to the same meetings of the Lusaka ULPO. In order to stimulate the development of the engineering industry in the subregion PTA and UNIDO also proposed to organize a workshop for the development of foundry forging, heat treatment in 1983 and 1984 for participants of the countries of the Lusaka-based PULPOC. As resources become available within the framework of the training for basic industries, it is planned to organize study tours in other developing countries particularly in the field of engineering industry.

## SECTION II

## SUMMARY AND OVERALL RECOMMENDATIONS 1/

### SUMMARY

The three countries Botswana Zimbabwe and Lesotho visited by the ECA/UNIDO Engineering Industry Development Mission has identified the following important aspects and related institutional, technological and manpower development gaps within their existing engineering and allied metal working activities at national levels.

In the Republic of Botswana the engineering infrastructure is still at its primary stage with limited development of metal fabrication and constructional industries. The country is heavily dependent on South Africa and other foreign countries for continued import of engineering capital goods, durable consumer goods and consumer goods and spare parts. The reason for this state of affairs can best be attributed by the fact that Botswana does not have any basic engineering industries with back up support facilities in the field of foundry, forging, heat treatment, machine shop, tool room and metal coating activities. Being traditionally an agricultural country with a population of over one million, Botswana has no agricultural machinery industry. Although the country has produced number of prototype agricultural implements in the research stations, the locally developed implements have never been commercialized in the existing metalworking industries. It is important to note that there is no linkage between R&D activities and the engineering industries. The country heavily depends on South Africa and Zimbabwe for substantial import of agricultural hand tools, animal drawn implements and power operated implements. The limited metalworking industries are engaged in the manufacture of metal doors, windows, furniture and structural products. Although institutional arrangements for small-scale industries development exist in Botswana, yet most of the existing small-scale industries manufacture non-engineering products. The institutions responsible for the development of engineering industries severely lack policy measures for integrated development aspects. So far the country does not have any clear cut policy and strategy for the integrated development of engineering industries. The development corporations have promoted more non-engineering projects and thus created more (a) value added import content (b) imported spare-parts supply (c) high level drainage of foreign exchange. In addition to this there is an acute shortage of technical and engineering skills at all levels which is heavily substituted by expensive expatriate personnel both in governmental and non-governmental organizations, institutions and in industries. Therefore, there is an urgent need to develop the basic metalworking and related engineering industries in Botswana and maximum priority should be given to accelerate the manpower development in technical and engineering fields for greater industrialization. The Section III of this report further illustrates the proposed development of engineering industries in Botswana.

In the Republic of Zimbabwe the role and characteristics of engineering and allied metalworking industries sector is entirely different to those of Botswana and Lesotho. The manufacturing branch of Industry plays a dominent role in the industrial sector. The recent figures illustrate that the contribution of the manufacturing sub-sector to GDP is the highest in Zimbabwe followed by agriculture and forestry and other services. Moreover, the performance of metal and metal product

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1/ Individual country recommendations are reflected in Section III, IV and V for Botswana, Zimbabwe and Lesotho respectively.

branch of industry played a significant contribution during the first quarter of 1981. It is to be noted that among the member States of ECA and OAU, Zimbabwe has the maximum number of engineering enterprises mostly in the private sector. The engineering industries in Zimbabwe cover wide range of establishments manufacturing selected capital goods, agricultural machinery, mining equipment, transport equipment electrical and electronic equipment, durable engineering consumer products, wide variety of spare-parts etc. The country has large numbers of foundry establishments producing wide variety of engineering products in malleable, S.G. iron and grey iron, brass and aluminium. These foundry establishments have wide range of technology e.g. arc furnace, induction furnace and cupola. ZISCO which is the parastatal iron and steel complex produces pig iron, high carbon and mild steel commercial sections from local ores. In addition to this a sizeable number of industries are engaged in forging, heat treatment, machine shop and tool room. activities. The concentration of engineering industries are mainly located in Salisbury and Buawayo.

Although Zimbabwe's engineering industries activities are much higher than those of the neighbouring countries, there are certain physical gaps existing in engineering industries sector. The mission has identified number of these gaps particularly the institutional technological and manpower development aspects. For instance at the institutional level the country requires back up support facilities in product design, technical advisory services, small-scale institutional development, prototype development centres etc. At the technological and engineering levelthe country requires the establishment of major capital goods industry e.g. manufacture of conventional machine tools, heavy prime-movers and generators, heavy engineering products, diesel engines and locomotives, road construction machinery etc. It is also necessary for ZISCO to manufacture plate and sheets, tool steel, die steel, high speed steel etc. In addition to this the country requires a Central Tool Room for the essential manufacture of moulds, dies. jigs, fixtures, special purpose tools etc. in order to promote automotive industry, tractor industry and related industries for production of durable and semi-durable engineering products. Moreover, Zimbabwe urgently requires an establishment manufacturing consumable metal cutting tools e.g. drills, taps, reamers etc. At the manpower development level the country essentially requires massive inplant training programme for all levels of technical and engineering personnel. In addition to this the existing training centres require immediate expansion in order to over-programme the technical training aspects. The existing railways, transport and other industrial training schools also require further expansion. In reality the Government of Zimbabwe in co-operation with private and public sector industries should formulate a comprehensive long-term engineering manpower development programme. It is of paramount importance that Zimbabwe will have to play a major role in extending greater technical co-operation to the less developed neighbouring African countries. in the field of the promotion of joint venture projects, technological and manpower development aspects in the subregion. The Section IV of this report describes the proposed priority development aspects of engineering industries in Zimbabwe.

In the Kingdom of Lesotho the engineering and allied metalworking industries status is still in the embryonic stage. In reality beside the limited development of metal fabrication industry, Lesotho does not have any form of engineering infra-structure. The country has no foundry, forging, heat treatment, machine shop tool room and metal coating facilities. The heavy dependency on imported engineering goods and services from South Africa and a foreign countries is primarily responsible for this state of affair. The country's major male working population has been

shifted to the South African mines. Most of the labour force from Lesotho is engaged in unskilled work at the mines. In reality the country's vital engineering activities are carried out by expatriate engineers and technicians. Although the Government of Lesotho is endeavouring its best to train up local citizens through their technical training programme abroad, the mission feels that the total output from this training programme will still be inadequate for the future requirement of the country. The mission has identified selected priority projects in the field of engineering industry development with the limited resources available in the country. As a LDC, Lesotho requires substantial intra-African and foreign assistance particularly in the field of joint venture projects. Technical co-operation from the neighbouring countries like Zimbabwe, Zambia, Kenya may help in developing the engineering industries in Lesotho. The industrial policy and strategy related to the engineering industry development requires institutional re-orientation, establishment of engineering back-up support services, integrated small-scale and rural industries development programme, centre for design and development of engineering prototype products, restructuring of manpower development programme and the revision of country IPF for greater UNDP, UNIDO assistance for engineering industries promotion. Some of these aspects of development processes have been reflected in the Section V of this report on Lesotho.

## OVERALL RECOMMENDATIONS

The following are the overall recommendations for upgrading and development of engineering industries in Botswana, Zimbabwe and Lesotho:

1. At the institutional level it is recommended that each Government should establish an Engineering Industries Advisory Team in Ministry of Industry. The final objective of the team will be to set up a Metal and Engineering Industries Development Unit within the three Ministries concerned.

2. It is recommended to integrate the scattered activities of engineering industries development in respective countries and to establish a National Centre for Engineering Design and Manufacturing in each country. Such a Centre should be planned in line with the African Regional Centre for Engineering Design and Manufacturing (ARCEDEM), Ibadan, Nigeria. It is suggested that the Ministry of Industry in each country should contact Mr. S. Kundu, Executive Director, African Regional Centre for Engineering Design and Manufacturing, PMB-19 U.I. Post Office, Ibadan, Nigeria, (Gram ARCEDEM PMB-19,UI, Ibadan). The mission takes this opportunity to request the member States to become a member of ARCEDEM and to utilize ARCEDEM for the greater benefit in national activities for engineering industries development.

3. It is recommended that priority should be given to establish the following industries in Botswana and in Lesotho.

- Integrated foundry, fabrication and machine shop complex
- Local manufacture of improved agricultural animal drawn and selected power operated implements.

As far as Zimbabwe is concerned priority should be given to establish:

- Special alloy Steel Tool Steel Manufacture in ZISCO for sub-regional requirements
- Central Tool Room,
- Manufacture of low cost transport equipment for rural sector,
- Increase in production of agricultural implements in existing manufacturing units for subregional requirements.

4. It is highly recommended to upgrade the existing training institutions, training schools in railway workshops, PWD workshops and transport whorkshops to over programme the engineering manpower development activities. The ECA, UNIOD, ILO, UNDP should be requested, if necessary, to formulate such ungrading programme.

5. It is highly recommended to ungrade the existing polytechnic to engineering colleges and to introduce specific specialized courses such as:

- Industrial Engineering Course - 3 years
- Production Engineering Course - 2 years
  (both quantity and quality production
- Quality Control Engineering - 1 year
- Specialized Course in foundry
  forging, heat treatment, tool room,
  workshop practice. etc. - 2 years

The government of Botswana and Lesotho may take a special note of this proposal.

6. It is recommended to create post graduate and post diploma engineering training programmes within the country/subregional countries. Such practical training courses within the industries should be designed for 2 to 3 years duration.

7. It is recommended to organize national workshops at the country level for the manpower and technological development for engineering industries development. The UNECA may be requested for the formulation of the workshop programme.

8. It is recommended to promote subregional:

- joint venture projects;
- greater sub-contracting arrangement at factory level·
- exchange of engineering prototypealready developed in Botswana Lesotho and Zimbabwe for local adaptation;
- extensive institutional visits by the three countries.

9. It is recommended that the representatives of the Ministry of Industry, Development Corporations and Select Private Sector industries of Lesotho Botswana and Zimbabwe may arrange to meet once in a year to promote engineering industries development aspects, resource based joint venture projects, marketing of locally manufactured products and examination of common policy and strategy for the integrated and inter-linked development of engineering industries sector.

SECTION III

# COUNTRY REPORT

# OF

# THE REPUBLIC OF BOTSWANA

## ECA/UNIDO ENGINEERING INDUSTRY DEVELOPMENT

## FOLLOW-UP MISSION

8 January 1982 - 19 January 1982

## SECTION III

## THE REPUBLIC OF BOTSWANA

### A. RECOMMENDATIONS

1. It is recommended that an Engineering Industry Advisory Team to be established within the Ministry of Industry and Commerce to promote and monitor the engineering industries activities. This Advisory Team will finally establish a Metal and Engineering Industries Development Unit within the Ministry. (Tanzania has already established such unit which should be examined by the Government).

2. It is recommended that an Inter-ministrial National Co-ordinating Committee be established for metal and engineering industry development.

3. It is recommended to organize national workshops for metal and engineering industry development in the field of technological and manpower aspects. Such workshops should be organized as a follow-up to the subregional workshop organized by ECA/UNIDO in Zambia and Zimbabwe in November/December 1980. UNIDO should be requested to assist such workshops at the national level.

4. It is recommended that a Commission for the Small-Scale and Rural Industries be established in Botswana. The purpose of the Commission will be to direct the Botswana Enterprises Development Unit(BEDU), the National Development Bank(NDB) and the Botswana Development Corporation(BDC) to have statutary obligations to promote and establish physical inter-linked development of small-scale and rural industries in Botswana. In times to come the BEDU may be converted into Small-Scale Industries Development Centre(SIDO), similar to those in Zambia, Tanzania, India etc. BEDU should be a parastatal unit under the Ministry of Commerce and Industry.

The proposed Commission's immediate task will be to inter-link BEDU with NDB and BDC where BEDU's representatives must be posted in these organizations. Finally BEDU should control the financial investment of small-scale industries through NDB.

The immediate objective of the Government through the Ministry of Commerce and Industry will be to reorganize BEDU and render maximum autonomy for BEDU to implement its work programme at national level. Notwithstanding what is mentioned above, it is recommended that BEDU should immediately undertake to implement Rural Artisanal Development Programme BOT/80/003 prepared by UNCDF expert Dr. D.N. Kherdekar in 30 April 1981. In addition to this BEDU should promote industrial estates and entrepreneuer promotion both at small-scale and rural levels.

5. It is recommended to develop the project proposals identified during this mission in Botswana (refer to page 31). It is further recommended that the Ministry of Industry may approach UNDP and UNIDO to include the priority projects in country IPF for Botswana.

6. The National Development Bank(NDB) should play a significant role particularly by incorporating a Technical Advisory Team in its industrial projects division such team should include a mechanical engineer, an industrial engineer, a feasibility study analyst, a value engineer, industrial economists etc. in order to improve and promote local capabilities for engineering industry development.

7. It is recommended to up-grade the existing polytechnic to an Engineering and Technical College(Similar to that of Bulawayo in Zimbabwe).The syllabus of the present polytechnic should include comprehensive courses in:

- foundry technology (ferrous and non-ferrous)
- forging and heat treatment technology
- industrial engineering

8. It is recommended to centralize the development, R&D and operational activities of:

- Botswana Enterprises Development Unit (BEDU)
- Botswana Technology Centre (BTC)
- Rural Development Association (RDAS)
- Rural Development Brigades (RDSs)
- Rural Industries Innovation Centre (RIIC)
- Rural Industries Promotion (Botswana)
- Brigade Development Centre (BDC)
- Agricultural Research Station (prototype manufacturing unit in content farm)
- Metal Estate Maintenance and Prototype manufacturing Centre under BEDU

into a National Centre for Engineering Design and Manufacturing. Such a Centre should liaise closely with the Ministry of Industry, Agriculture, Works and Communication, Botswana Polytechnic and finally should be linked with the African Regional Centre of Engineering Design and Manufacturing (ARCEDEM), Ibadan, Nigeria. The main objective of the Centre will be to design and prototype manufacture agricultural machinery and implements, selected capital goods, transport equipment, spare-parts and rural industries products and to train technical manpower.

BEDU's role will be to promote the industrial entrepreneur to manufacture these products locally. The proposed National Centre should be under BEDU.

9. It is recommended to set up a joint venture project with companies in Zimbabwe for the manufacture of agricultural animal draw implements 7/. UNIDO/UNDP's short term assistance may be requested for the formulation of a project proposal.

10. It is recommended to implement the foundry project described on page of this report at an early date.

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7/ BEDU's representative Mr. C.K. Lesolle visited Zimbabwe on 1 February 1982 with the UNIDO Regional Adviser with the approval of Botswana Government to visit the factories in Bulawayo, Zimbabwe for future sub-regional co-operation.

B. ORGANIZATION OF MISSION/COUNTERPART

The mission composed of:

Mr. Aloke Kumar Mitra
UNIDO Regional Adviser Engineering Industries
Joint ECA/UNIDO Industry Division, ECA
Addis Ababa

and was assisted by the following Government Officials:

(a) Government Counterpart

Mr. J. Mbaakanye
Director of Industrial Affairs
Ministry of Commerce and Industry
Gaborone

(b) Government Representative in Mission

Mr. C.K. Lesolle
Engineering Training Officer, Metal Estate
Botswana Enterprise Development Unit, (BEDU)
Ministry of Commerce and Industry
Gaborone

C. REPORTS OF VISITS AND MEETINGS

| | | |
|---|---|---|
| Monday, 11 January 1982 | 10:00 hrs. | Director Industrial Affairs Ministry of Commerce & Industry, Gaborone |
| Tuesday, 12 January 1982 | 09:00 hrs. | Acting Director BEDU, Gaborone |
| Tuesday, 12 January 1982 | 10:00 hrs. | Metal Estate Manager BEDU, Gaborone |
| Tuesday, 12 January 1982 | 11:00 hrs. | Tumelo Steel Industries Metal Estate, Gaborone |
| Tuesday, 12 January 1982 | 12:00 hrs. | Prototype Workshop Metal Estate, Gaborone |
| Tuesday, 12 January 1982 | 15:00 hrs. | Resident Representative, UNDP |
| Wednesday, 13 January 1982 | 08:00 hrs. | Iron and Steel Construction (Pty) Ltd., Gaborone |
| Wednesday, 13 January 1982 | 09:00 hrs. | Chief, Agricultural Economist Ministry of Agriculture, Gaborone |
| Wednesday, 13 January 1982 | 10:00 hrs. | Hanoya Agricultural Engineering (Pty) Ltd. Gaborone |

| | | |
|---|---|---|
| Wednesday, 13 January 1982 | 11:00 hrs. | Cliffe Engineering (Pty) Ltd. Gaborone |
| Wednesday, 13 January 1982 | 15:00 hrs. | Agricultural Research Station Content Farm Sebele Gaborone |
| Thursday. 14 Janaury 1982 | 09:00 hrs. | Central Transport Organization Ministry of Works and Communication, Gaborone |
| Thursday, 14 January 1982 | 10:15 hrs. | Railway Adviser Gaborone |
| Thursday, 14 January 1982 | 11 [illegible] hrs. | Botswana Development Corporation Gaborone |
| Thursday, 14 January 1982 | 15 00 hrs. | Foundry Project Meeting Ministry of Commerce & Industry Gaborone |
| Friday, 15 January 1982 | 11:00 hrs. | National Development Bank Gaborone |
| Friday, 15 January 1982 | 14:00 hrs. | Rural Industries Innovation Centre, Kanye |
| Monday, 18 Janaury 1982 | 08 00 hrs. | BCL Ltd. Selebi-Phikwe |
| Monday, 18 January 1982 | 14:45 hrs. | National Development Bank Gaborone |
| Tuesday, 19 January 1982 | 09:00 hrs. | Botswana Polytechnic Gaborone |
| Tuesday, 19 January 1982 | 10:15 hrs. | Brigade Development Centre Gaborone |
| Tuesday, 19 January 1982 | 12:30 hrs. | Ministry of Finance and Development Planning Gaborone |
| Tuesday, 19 January 1982 | 14:30 hrs. | Inter-Ministrial Meeting Ministry of Commerce & Industry Gaborone |
| Tuesday, 19 January 1982 | 16:00 hrs. | Resident Representative UNDP, Gaborone |
| Wednesday, 20 January 1982 | 08:00 hrs. | Left for Salisbury. |

Discussion with various Institutions, Industries and Establishments in Botswana

(a) UNDP, Gaborone , JPO/UNV.(11.1. 82)

The ECA/UNIDO mission visited UNDP office and explained the purpose of the mission. UNDP informed that the Ministry of Commerce and Industry had prepared a programme for the mission and various projects under UNDP were discussed.

(b) Director of Industrial Affairs, Ministry of Commerce and Industry, Gaborone(12.1.82)

The mission was received by the Senior Industrial Officer who arranged a work programme for the mission and organized meeting with the Director of Industrial Affairs. ECA/UNIDO mission explained the objective of the mission for the engineering industry development programme. Among other things discussed attention was directed for the development and establishment of selected projects for the inter-linked development of engineering industries.

It was highlighted by the Director that so far Botswana has no integrated foundry and mechanical engineering workshps. Agricultural machinery industry is non-existant in Botswana, although there are number of research prototypes manufactured in the local R&D units.

It was decided that the mission should identify priority projects in engineering and allied metal working industries sector. Attention should be given to develop the following areas:

- integrated foundry development;
- agricultural machinery and implement manufacture;
- promotion of small-scale and rural industries;
- BEDU's future role;
- manpower development aspects.

The Senior Industrial Officer highlighted the important activities in field of engineering industries development in Botswana. He handed over the executive summary of the Feasibility Study for foundry prepared by German Group of Consultatns. The BEDU's role was also explained by the officer.

(c) Botswana Enterprises Development Unit (BEDU) Gaborone(12.1.82)

The Acting Director of BEDU welcomed the mission and explained the role of BEDU in the promotion of small-scale industries in Botswana. At present BEDU is within the Ministry of Commerce and Industry. It was mentioned that the National Development Bank controls some of BEDU's activities in the field of industrial financing and related matters which were originally controlled by BEDU. The mission was requested to visit BEDU's Metal Estate in Gaborone.

(d) BEDU Metal Estate, Gaborone(12.1.82)

The mission visited the metal estate where a number of small metal working fabrication shops were inspected by the mission. Most of the activities of the Estate are confined to small-scale level. It was suggested by the mission to explore the

possibility of manufacturing small items like gem clips, paper pin, hair pin, nails, windowings etc. in future. Here the Estate Manager referred to the recent report prepared by Mr. D.N. Kherdekar, UNIDF expert on 'Rural Mechanics/Blacksmith workshop Rural Artisanal Development Programme BOT/80/003'. Some of the recommendations are of great value to the small-scale and rural industries development in Botswana.

The mission also visited the prototype, manufacture, repair and maintenance shop of the Estate. Up-grading the activities of this workshop into a tool room was discussed.

(e) Tumelo Steel Industries, Metal Estate, Gaborone, (12.1.82)

This is a general metal fabricating shop manufacturing iron tables, furniture, doors, windows etc. It was suggested that the company should diversify its product range. It is to be noted that all the metalworking units under metal Estate produces similar type of products e.g. metal doors, windows, furniture etc. It is suggested that they manufacture items like second plant suggested. The Adviser has already supplied about 30 product descriptions to BEDU on 22 February 1982. It is worthwhile that BEDU should follow-up these proposals.

(f) Maintenance and Prototype Manufacturing Workshop, Metal Estate, BEDU (12.1.82)

The workshop has reasonable number of conventional machinery and equipment. There is also a mobile van for extension service for auto-repair. There are some design activities in this workshop. It is suggested that this workshop should be extended into a central tool room with centralized manufacture of all types of equipment. It should include jig boring machines, precision drilling and tapping machines, one bar automatic machine, one capstan lathe, strengthening of the inspection unit, one crear shaper and heat treatment furnaces for case hardening, through hardening and annealing. It is suggested that the design office be enlarged and it is recommended that the Estate Manager should contact Mr. S. Kundu, Executive Director, African Regional Centre for Engineering Design and Manufacturing (ARCEDEM) PMB-19, U.I. Post Office, Ibadan, Nigeria. (Cable - ARCEDEM - PMB-19, U.I. Ibadan), in order to promote the design activity of the metal Estate.

(g) Resident Representative, UNDP, Gaborone (12.1.83)

The mission briefed the Resident Representative on the ECA/UNIDO Programme on Engineering Industry Development in African Region. The Resident Representative gave an over view of the status of engineering industries development in Botswana. He also requested the mission to examine the UNIDF report on rural industry development the foundry project feasibility study and the mixed episode of small-scale industries performance. He requested the ECA/UNIDO mission to advise UNDP on future institutional arrangements for inter-linked development of small-scale and rural industries sector. The UNDP Officer assisted the mission throughout its stay in Botswana.

(h) Iron and Steel Construction (Pty) Ltd., Gaborone (13.1.82)

This light metalworking industry produces profiles of sheet metal for roofing etc. The company employs about 18 persons and is involved in construction activities. It is suggested that the company should manufacture grain silos for farmers.

(i) Ministry of Agriculture, Gaborone (13.1.82)

The Chief, Agricultural Economist explained about the ALDEP Project (Arable Lands Development Programme), water development and farm machinery - supply and service. The Ministry also requested the mission to visit the Research Stations in Botswana.

(j) Hanoya Agricultural Engineering (Pty) Ltd. Gaborone, (13.1.82)

The factory manufactures fabricated tanks etc. for farmers. construction steel structure and imports agricultural diesel engines for pumps. The company employs about 200 persons and has developed a submersible pump. The company Director was very eager to set up an integrated foundry project and discussed with the mission the foundry feasiblity study prepared by BC Berlin Consult GmbH/Dr. Rudolf Stotz Engineers. The company has already contacted an Indian firm for the supply of technology, plant and machinery. They would like to establish a foundry and a machine shop complex. It was told that the company wishes to install a high frequency induction furnace for cast iron melting. The mission suggested that it would be more economical for the company to introduce cupola technology as Botswana has vast deposit of rich coal. The cupola technology was also recommended by the German consultant. (The mission's view and the future UNDP/UNIDO assistance and the reaction of UNDP have already been transmitted to UNIDO on 12 March 1982 by the Adviser).

(k) Cliffe Engineering (Pty) Ltd., Gaborone, (13.1.82)

The company is a light metal fabrication industry manufacturing spare-parts, general fabrication parts, trailers and truck bodies and has construction activity as well. The mission suggested that with the existing plant and machinery the company can manufacture agricultural implements. Some of the implements parts e.g. shave, C.I. wheels, mouldboard etc. could be procured from Bulawayo, Zimbabwe. The mission suggested that the company should visit Zimbabwe and Zambia to explore possible future co-operation with selected manufacturing units of these two countries. It is also suggested that Hanoya Agr. Eng (Pty) Ltd. and Cliff Eng. could jointly establish a foundry and machine shop complex in Botswana.

(l) Agricultural Research Station, Content Farm Sebele, Gaborone Gaborone (13.1.82)

The mission visited the "Evaluation of Farming System and Agricultural Implements Project" (EFSAIP) of this research station. The following prototypes have been developed by this project.

- plough planter
- planter/fertilizer single row ox or donkey drawn
- two row ox drawn planter/fertilizer
- weeder conversion/top dresser

The animal Draught System Study Reports nos. 1,2,3 and 4 were handed over to the mission by the agricu tural engineer. It is to be pointed here that Botswana has no implements manufacturing plant. Only prototype samples in batch size are produced for farm testing. It is necessary for the Government of Botswana to establish a unit for the commercial manufacture of the tested prototypes.

(m) Central Transport Organization Ministry of Works and Communication, Gaborone (14.1.82)

CTO is a centralized transport maintenance organization with workshop and maintenance facilities. The mission was told that the present population of vehicles is as follows:

- 80,000 units motor vehicles.
- 2,500 units upto 15 tons capacity light vehicles (Government only)
- 1,100 transport equipment including tractors (Government only)

The CTO has 9 workshops in different parts of the country. At present the workshop facilities are inadequate. The mission suggested that the CTO needs to be reorganized and all the 9 workshops should be standardized throughout the country Therefore, it is necessary to assist CTO in formulation of a factory module for repair and maintenance of commercial vehicle. The proposed integrated foundry complex will help considerably to CTO for the supply of transport parts and component. The foundry project should include the manufacture of the following parts 8/

- Drake Drum
- Brake Discs
- Hub and Hub Cover
- Brackets;
- Water pump bodies, and
- Other Cast Parts

(n) Railway Adviser, Ministry of Works and Communication, Gaborone, (14.1.82)

The Railway Adviser indicated that Botswana will have new railway organization. At present Zimbabwe railways own and control railway track, rolling stocks and signalling equipment in Botswana. He mentioned that Botswana will have railway maintenance shop about 150 km. from Selebi-Phikwe in Francistown. He also indicated that for the next few years to come, Botswana will procure railways parts from the Bulawayo railway workshop in Zimbabwe. The ECA/UNIDO mission fully agrees with the policy of the Botswana Government to procure railway spares and large maintenance activities in Zimbabwe. This will create sub-regional co-operation and reduce investment costs.

(o) Botswana Development Corporation Limited (BDCL) Gabor Gaborone, (14.1.82)

The BDCL is not a parastatal organization. It is financed by international bankers and related institutions. The total number of projects 9/ BDCL

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8/ At least five foundries are engaged in manufacturing the above mentioned spare-parts in Bulawaya and Salisbury in Zimbabwe.

9/ Refer to BDCL 10th Annual Report for the Year Ended 30 June 1980, page 3.

assisted increased from 30 in 1975 to 82 in 1980, 49 of which are in the small enterprises sector. In fact BDCL's role has been to improve the consumers products manufacturing sector with high imported input materials. BDCL has played a very small role to improve the basic metal and engineering industry sector and small-scale industries. At present there is virtually no linkage between BEDU and BDCL. It is recommended to change the role of BDCL. At present, the BDCL's main role is to promote industries, agriculture and tourism etc. so far BDCL has no concrete development policy and strategy for small-scale industries development. The page 17 of the annual report of BDCL 30 June 1980 clearly strengthens the missions conclusions regarding the BDCL's present role.

(p) Investment Promotions Meeting for Foundry Development, Ministry of Commerce and Industry, Gaborone, (14.1.82)

The Division of Industrial Affairs under Ministry of Commerce and Industry organized a meeting with local industries and the ECA/UNIDO mission to discuss the promotion of the foundry project, based on the feasibility study prepared by the German consultants. The following companies participated (i) Hanoya Agricultural Engineering (Pty) Ltd., (ii) Cliff Engineering (Pty) Ltd., and chaired by the Ministry official. The following recommendations were adopted

- the foundry project should include a machine shop complex for secondary transformations of cast parts
- the cost of land indicated in the feasibility study is too low
- the cost of foundry equipment is too high and in fact the plant and machinery for the foundry can be procured at a cheaper price from Korea, India, China etc.
- foundry technology should be based on cupola process as Botswana has an abundant supply of high quality coal
- as the local industries have no capabilities and experience in foundry work, it is suggested that UNDP/UNIDO should be approached to set up the metallurgical Laboratory for the proposed foundry US$120,000 in 1984;
- it is also recommended that Government may request UNCDF to provide US$240,000 for the procurement of capital goods for the foundry complex
- it is suggested that BDCL should be approached for financing of the project
- it is suggested to establish the foundry project in a phased programme;
- it is recommended that the Botswana Polytechnic should be informed to introduce practical training courses in foundry, forging heat treatment etc.

The mission informed the outcome of this meeting to the UNDP Resident Representative on 19 January 1982.

(q) The National Development Bank (NDB), Gaborone (15.1.82 and 18.1.82)

The Bank has prepared a number of papers for industrial development in Botswana, e.g. report by UNIDO December 1979, report by SIDA 1975-1976 ( two reports) and various reports prepared by consultants. Due to lack of industrial and economic development policy, the performance of the Bank is very limited in industry promotion. The role of NDB, BEDU and BDCL is still not well defined by the Government of Botswana. There is an urgent need to rationalize these three important institutions for the inter-linked development of the industrial sector. The NDB requires a clear cut policy guideline for its future role in industrialization.

(r) The Rural Industries Innovation Centre (RIIC), Kanye (15.1.82)

The RIIC has developed a number of prototypes of agricultural machinery and at present involved in the development of:

- c op processing equipment
- solar energy
- bio-gas generator (with Indian model)
- low cost housing
- farm implements

The RIIC has made prototype sorgum decorticator called RIIC Dehuller and integrated it with hammer mill equipment. A manual of Dehuller was handed over to the mission The centre requires design assistance.

(s) B.C.L. Selebi-Phikwe, (18.1.82)

The company mines copper ores and produces blister copper and cobalt etc. The company has a medium size mechanical workshop for repair and maintenance of mining and processing equipment. It comprises of general machine shope, fabricating shop, electrical maintenance shop, fitting shop and a training school at artisans level. The company trains 360 persons per year, average duration 2 months. It also sends 14 student to polytechnics. The workshop has no foundry complex. The company will be interested to procure cast parts from the proposed foundry.

(t) Botswana Polytechnic, Gaborone, (19.1.82)

Botswana Polytechnic is the only institution which produces mechanical, electrical and civil engineers at diploma level. In 1979 the Craft Training Centre was changed to Polytechnic with the help of SIDA, ILO and the British Government. The Polytechnic has a total capacity of 450 students out of which mechanical intake is 228 (planned) and 206 (actual). The total staff of the polytechnic is 53 lecturers and 20 administrative staffs. In order to expand the workshop the British Government has donated Pula 3 million for machinery and equipment as Workshop Assistance Programme. The 60% of the students are sponsored by the industry and government and 40% by the Government of Botswana.

The ECA/UNIDO mission on Engineering Industry Development in Botswana suggested to the principal of the Polytechnic to introduce the following courses:

- foundry technology and practice (ferrous and non-ferrous),
- forging and heat treatment technology and practice;

- industrial engineering; and
- tool room practice.

Apparently the polytechnic workshop does not have these facilities. The mission also recommended to the Principal the types of machinery and equipment with specifications which will be required for such courses. It was indicated that the polytechnic will include these equipment and machinery from the British Government's grant.

It is suggested that the polytechnic should work closely with the industry and government departments. At present there is very little linkage between polytechnic and the Ministry of Finance and Development Planning, Ministry of Commerce and Industry, Ministry of Agriculture. The mission suggested that the government should undertake the following proposals:

- to form a consultative committee with employers, government and polytechnic,
- to train small-scale industries owners through ad-hoc courses in close co-operation with BEDU.
- the Ministry of Finance and Development Planning should liase closely with the polytechnic for the development of technical manpower.

(u) Brigade Development Centre (BDC), Gaborone (19.1.82 )

The BDC provide alternative production, education, training and employment opportunities, especially for primary school leavers. There are 16 brigade centres scattered throughout the country which provide vocational training in ten different discipline During the discussion it was pointed out that the activities in Centres are reducing at an accekerated rate. This is due to the fact that after the completion of training the students do not obtain appropriate employment in line with their skills. In addition to this, there is drastic reduction of students in Farming Production. The mission suggests that the Botswana Brigade movement should be dissolved and the Government should convert each of the existing Centre in provincial towns to small-scale and rural industries development centres under BEDU (refer to recommendation No. 8.).

(v) Ministry of Finance and Development Planning, Gaborone (19.1.82)

The Ministry indicated that the government is engaged in the formulation of a strategy for the development of productive employment together with a financial assistance policy. The ECA/UNIDO mission elaborated its findings and recommendations to the Ministry. This Ministry acts as a co-ordinating Ministry for all industrial development. The Ministry requested the mission to submit its report at an early date.

(w) Inter-ministrial Meeting, held at the Ministry of Commerce and Industry, Gaborone, (19.1.82 )

The meeting was chaired by an official of the Ministry of Commerce and Industry and was attended by representatives of the Ministry of Mineral Resources and Water Affairs, The Ministry of Agriculture, Botswana Enterprises Development Unit, The Ministry of Finance and Development Planning, Botswana Development Corporation, The Ministry of Works and Communication and The National Development Bank as well as by the Railway Adviser.

The following recommendations were adopted:

- Botswana should establish an integrated commercial farm implements manufacturing unit in the private sector;
- it is necessary to establish a foundry complex in Botswana,
- a mission should be sent to sub-regional countries in order to procure prototype agricultural implements already developed in Zimbabwe, Zambia, Kenya etc.;
- theoretical research in agricultural machinery should be reduced and greater adaptation should be encouraged;
- BEDU should be re-organized and a commission for Small-Scale Industries should be established. BEDU should be given more power and autonomy in order to intensify small-scale industries as stated in the recommendation no. 3.
- greater incentives should be given to small-scale industries and UNCDF report for rural industries development should be implemented. The NDB, RDCL, BEDU should be urged to install more industrial estate in the rural sector;
- it is suggested to form an interministerial co-ordinating committee in order to accelerate the industrial development in Botswana;
- it is recommended to merge all the scattered activities of R&D and converte them into a National Centre for Engineering Design and Manufacturing as indicated in the Recommendation No. 8).

(x) Resident Representative, UNDP, Gaborone,( 19.1.82 )

The mission summarized the findings and the recommendation to be submitted in the mission report. The future UNDP/UNIDO technical assistance projects for engineering industries in Botswana were discussed. During the discussion on foundry project it was pointed out by the mission that Botswana has no local experience in selecting appropriate technology and metallurgical know-how for the setting up of a foundry project which may require outside collaboration.

The mission was told that UNDP/IPF is fully committed upto end of 1983. However, UNDP indicated that it was possible for UNDP to accommodate the following projects in 1984 provided the Government of Botswana requests for such proposal:

(a) Assistance in setting up of a metallurgical laboratory within the foundry project complex amounting to US$ 120,000 in 1984;

(b) Inclusion of US$250,000 UNCDF for the machinery and equipment which will include selected machinery for engineering workshop and foundry complex.

The UNDP also requested the mission to comeout with an integrated proposal for the setting up of a policy and strategy guidelines for the small-scale industries development. The UNCDF report on Rural Industries Development needs to be considered including the BEDU's future role. It was told that UNDP will be willing to provide 4mm for this project.

D. EXISTING STATUS OF ENGINEERING AND ALLIED METALWORKING INDUSTRIES IN BOTSWANA

The activities in the field of engineering and metalworking industries reveal the following important aspects e.g.

- the country has no basic engineering metal transformation facilities like foundry (ferrous and non-ferrous), forging and heat treatment;
- there is no inter-linked development approach in engineering industries!
- the engineering industries are oriented towards constructional fabrication activities,(steel doors, windows, furniture manufacture,)as well as mixed maintenance and repair activities;
- the industries are more geared towards the manufacture of consumer products with high imported value added content in beverage land development hotels and catering etc.
- the higher and middle management levels in the engineering industries are dominated by the expatriate personnel including high ranking officers in the Government departments:
- the country is heavily dependent on South Africa for its import and trade;and a member of the Southern African Customs Union Agreement which favours South African engineering products to be marketed easily in Botswana.

Instituiional Facilities for Engineering and Allied Metalworking Industries Development

There are five institutions primarily responsible for the engineering and allied metalworking industries development in Botswana e.g.

- Botswana Enterprises Development Unit, Metal Estate Workshop of BEDU;
- Botswana Technology Centre;
- Rural Industries Innovation Centre (RIIC)·
- Evaluation of Farming Systems and Agricultural Implements Project, Content Farm Sebele of Agricultural Research Station;
- Selected Centres of Brigade Development Centres.

The engineering industries development activities are widely scattered in the above institutions and virtually no inter-linkage exists among these institution for the engineering industries development. This has c eated permanent confusion in the field of integrated development of engineering industries in Botswana.

Engineering Repair and Maintenance in Botswana

Botswana has very limited facilities for repair and maintenance activities e.g.

- no railway repair and maintenance workshop;
- 9 repair and maintenance workshops under Central Transport Organizations (CTO) for vehicle repair. Most of these workshops require replacement of machinery and equipment. At present the

government has undertaken to upgrade the CTO workshop in Gaborone with foreign assistance;

- The BCL workshop in Selebi-Phikwe is the largest repair and maintenance workshop in Botswana;
- there are small central repair and maintenance units in the Industrial Estates and Agricultural Research Station.

Existing Metalworking Industries in Botswana

Most of the metalworking industries in Botswana are engaged in the manufacture of metal doors, windows and constructional fabrication products. A list of these industries are attached here under.

Institutions Responsible for the Agricultural Machinery and Implement Development

At present there is no commercial enterprise manufacturing agricultural implements in Botswana on a mass or batch production. Most of the implements are imported from abroad specially from South Africa and Zimbabwe.

The following is the statistics 10/ of farming activity in Botswana.

| | Total farms | Farms with land | Crop farm | Cattle farms | Sheep farms | Goat farms | Other live stock farm |
|---|---|---|---|---|---|---|---|
| Total Traditional | 80,000 | 70,100 | 65,600 | 57,700 | 13,700 | 45,800 | 70,000 |
| Total Commercial | 360 | 140 | 135 | 340 | 140 | 155 | 300 |
| Total | 80,360 | 70,240 | 65,735 | 58,040 | 13,840 | 45,955 | 70,300 |

Average traditional land area per farm is 4.6 hectares.

10/ 1980 Botswana Agricultural Statistics, Ministry of Agriculture, page 10.

## EXISTING METALWORKING & ENGINEERING INDUSTRIES IN BOTSWANA

## COMPILATION OF LICENSED MANUFACTURING INDUSTRIES: DECEMBER 1981

| FILE NO. | NAME AND ADDRESS OF COMPANY | LICENSED SINCE | LOCATION | RANGE OF PRODUCTS | EMPLOYEES | TOTAL INVESTMENT IN PULA.* | OWNERSHIP |
|---|---|---|---|---|---|---|---|
| 1. | Radiators Botswana (Pty)Ltd. P.O. Box 303, Francistown | 1968 | Francis-town | Radiators Non-ferrous Metals | 8 | 55,510 | Foreign |
| 2. | Botswana Steel Furniture MFRS. (Pty) Ltd. P O. Box 275, Gaborone | 1969 | Caborone | Steel Furniture | 26 | 99,990 | Foreign |
| 3. | Cliff Engineering Botswana(Pty)Ltd. P.O. Box 262 Gaborone | 1969 | Gaborone | Trailers, Tanks, Steel Structures | 45 | 188,396 | Foreign |
| 4. | Terry Cooney (Pty) Ltd. Box 43 Gaborone | 1971 | Gaborone | Gates, Poles Steel Structures | 96 | 212,300 | Foreign |
| 5. | Fridgeco Botswan (Pty) Ltd. Box 602 Caborone | 1970 | Gaborone | Refrige-rators, Air conditioners | 16 | 99,304 | Foreign & Local |
| 6. | Iron & Steel Cons. (Pty) Ltd. Box 1528, Caborone | 1975 | Gaborone | Corrugated Roofing Sheeting | 16 | 393,708 | Foreign |
| 7. | Ifestos Engineering (Pty) Ltd. Box 230, Selibe-Phikwe | 1975 | Selibe-Phikwe | Corrugated Pipes Steel | 64 | 153,758 | Foreign |
| 8. | Taurus Batteries (Pty) Ltd. Box 149, Caborone | 1978 | Gaborone | Lead Acid Batteries | 11 | 6,971 | Foreign & Local |
| 9. | Wind-Dorf (Pty)Ltd. Box 214, Caborone | 1973 | Gaborone | Windows Doorframes | 24 | 111,511 | Foreign |

* 1 Pula = 1.30 US$

| FILE NO. | NAME AND ADDRESS OF COMPANY | LICENSED SINCE | LOCATION |
|---|---|---|---|
| 10. | P.W.S. (Pty) Ltd. Box 249, Gaborone | 1978 | Gaborone |
| 11. | Ital Furniture & General Contractors (Pty) Ltd. Box 331, Lobatse | 1973 | Lobatse |
| 12. | Kgalagadi Resources Development (Pty) Ltd. Box 1287, Gaborone | 1976 | Gaborone |
| 13. | Metal Founders (Pty) Ltd. Box 262, S/Phikwe. | 1979 | S/Phikwe |
| 14. | Francistown Printers (Pty) Ltd. P.O. Box 601 Francistown | 1981 | Francistown |
| 15. | Lobatse Engineering (Pty) Ltd. Box 336, Lobatse | 1979 | Lobatse |
| 16. | Leco Botswana (Pty) Ltd. Box 291, S/Phikwe | 1974 | S/Phikwe |
| 17. | St. Clair Sheet Metal & Steel Structures (Pty) Ltd. Box 236 Gaborone | 1979 | Gaborone |
| 18. | Ranoya [illegible] icultural Engine [illegible] (Pty) Ltd. Box 11[illegible] Gaborone | 1974 | Gaborone |

| RANGE OF PRODUCTS | EMPLOYEES | TOTAL INVESTMENT | OWNERSHIP |
|---|---|---|---|
| Building & Fencing Materials | 82 | 267,291 | Foreign |
| Steel Furniture | 50 | 119,578 | Foreign |
| Solar Energy | 11 | 129,987 | Foreign |
| Sheet Metal Products | 25 | 1,273 | Foreign |
| School and Commercial Stationery | 12 | 66,100 | Foreign |
| Steel Furniture Wheel Barrows | 25 | 4,968 | Foreign |
| Mining Equipment | 40 | 249,241 | Foreign |
| Pre-fabricated Housing | 11 | 130,934 | Foreign & Local |
| Troughs, Hoses, Cattle Rails Trailers | 160 | 391,500 | Foreign & Local |

| FILE NO. | NAME AND ADDRESS OF COMPANY | LICENSE | LOCATION |
|---|---|---|---|
| 19. | K.B. Construction (Pty) Ltd. Box 414 Selibe-Phikwe | | Selibe-Phikwe |
| 20. | B.B. Engineering(Pty) Ltd. Box 262 Selibe-Phikwe | 1975 | Selibe-Phikwe |
| 21. | ALFA Engineering Co. (Pty)Ltd. Box 95 Selibe-Phikwe | 1977 | Selibe-Phikwe |
| 22. | Batawana Metal Work Box 25, Maun | 1980 | Maun |
| 23. | Sharp's Electrical Plumbing(Pty)Ltd. Box 603,Gaborone | 1974 | Gaborone |
| 24. | S&J (Pty)Ltd. Box 843,Gaborone | 1975 | Gaborone |
| 25. | Gantron Prints.(Pty) Ltd. Box 219 Gaborone | 1980 | Gaborone |
| 26. | Mosupatsela Engineering (Pty)Ltd. Box 1268 Gaborone | 1976 | Gaborone |
| 27. | Crown Industries (Pty)Ltd. P.O. Box 801 Francistown | 1981 | Francistown |
| 28. | Wire Products(Pty)Ltd. Box 214, Gaborone | 1974 | Gaborone |
| 29. | Limpopo Autorotive Ind. (Pty)Ltd. Box 24 Lobatse | 1977 | Lobatse |

| RANGE OF PRODUCTS | EMPLOYEES | TOTAL INVESTMENT | OWNERSHIP |
|---|---|---|---|
| Flush Doors, Roof Trusses | 150 | 102,705 | Foreign |
| Fencing & Building Materials | 75 | 140,000 | Foreign |
| Structural Steel Work | 50 | 111,134 | Foreign |
| Furniture Donkey Carts | 13 | 42,300 | Local |
| Burglar Bars Columns, Uniports | 220 | 284,309 | Foreign |
| Tanks, Baths, Chairs, Toilets | 20 | 85,000 | Foreign |
| Door & Window Frames, Prefab. Houses | 120 | 1,113,000 | Foreign |
| School and Office Furniture | 12 | 71,692 | Local |
| Steel & Wooden Furniture | 20 | 90,000 | Foreign |
| Fencing Materials | 28 | 116,473 | Foreign |
| Steel Trailers | 35 | 108,500 | Foreign |

The following table indicate the total production of crops in 1980:

In Metric Tons

| | Sorghum | Maize | Millet | Beans/ Pulses | Sun Flowers | Ground Nuts |
|---|---|---|---|---|---|---|
| Total Traditional | 27,170 | 6,885 | 2,270 | 1,780 | 74 | 163 |
| Total Commercial | 1,930 | 4,715 | - | 50 | 660 | 1,237 |
| Total | 29,100 | 11,600 | 2,270 | 1,830 | 1,400 | 1,400 |

These figures clearly indicates that the traditional sector is responsible for maximum crop production in Botswana. Traditional farmings are carried out by hand tools, ox driven implements and donkey driven implements. The report prepared by Mr. D.N. Kherdekan, UNCDF Adviser, BOT/80/003 titled Rural Artisional Development Programme (Rural Mechanics/Blacksmiths Workshpps) has identified a host of important agricultural implements which can be manufactured in small-scale and rural industries in Botswana.

In addition to this the following institutions have developed prototype models for the traditional sector e.g.

(i) EFSAIP, Agricultural Research Station, Content Farm Sebele.
- Mechanical ox-drawn plough planter;
- Planter/fertilizer single row ox or donkey driven;
  two row ox drawn planter/fertilizer
- weeder conversions/top dresser

(ii) RIIC(Rural Industries Innovation Centre)
- Sorghum decorticator and sorghum milling complex;
- Biogas generator,
- Solar energy generator for pumping;
- Windmill

(iii) Brigade Development Centre, Kgatleng
- Manufacture of ox-drawn multipurpose farm implements

Looking at the traditional farming in Botswana the estimated requirement of animal drawn implements will be in the region of 20,000 to 30,000 units per annum. Most of these are being imported from abroad. It is highly recommended that Botswana should manufacture local farm implements with prototypes already developed in Botswana. UNIDO/UNDP assistance can be requested for an integrated and inter-linked manufacture of agricultural machinery in Botswana. Zimbabwe's and Zambia's experience in this venture will be an asset.

Existing Instititions for Small-Scale and Rural Industries Development

At present the following institutions are responsible for small-scale and rural industries development in Botswana e.g.

- Botswana Enterprised Development Unit
  BEDU under Ministry of Commerce and Industry;
- National Development Bank;
- Rural Industries Innovation Centre;
- Botswana Development Corporation Ltd.
- Brigade Development Centre for Manpower Training.

The BEDU is the focal point for the development of small-scale industries in Botswana. The mission observed tht at present BEDU's activities are weak due to certain policy measures adopted by the government. In fact BEDU is the only institution which is primarily responsible for the achievement in the small-scale sector. In order to bolster BEDU's future performance it is necessary that BEDU should be given statutory powers to implement the following aspects of small-scale industries development e.g.

- Institutional reorganization of BEDU and transforming BEDU into Small-Scale Industries Development Organization (SIDO);
- Registration of all small-scale and rural industries in Botswana;
- Creation of financial assistance through BEDU for loans by the Government credit guarantee scheme by National Development Bank, opening of banks for small-scale industries in rural sector;
- Providing scarce raw material to small-scale industries through bulk purchase schemes;
- supply of machinery and equipment to small-scale industries on a hire-purchase system;
- Creation of a National Centre for Engineering Design and Manufacturing under BEDU in order to provide technical facilities to small-scale industries (prototype development and training centre);
- Industrial management and Technical Training facilities e.g.

  (i) Appreciation courses
  (ii) Specialized courses
  (iii) Ad-hoc courses
  (iv) Technical training programme
  (v) Mobile workshops
  (vi) Study cum observation visits

- Management consultancy services;
- Government stores purchase programme where government will give priority to procure products from small-scale industries;

- Creation of marketing facilities for small-scale industries;
- Special incentive schemes for backward areas;
- Creation of Industrial Estates in rural sector and market towns;
- Creation of export house
- Ancillary industries development.

As suggested in Recommendation 3 and 7 it is necessary for the Government of Botswana to request UNIDO/UNDP to assist BEDU in formulation of an integrated small-scale and rural industries development programme in Botswana.

Existing Facilities for Engineering Manpower Development in Botswana

The following institutions are responsible for the development of engineering and technological manpower in Botswana

- Botswana polytechnic;
- Metal Estate workshops, BEDU
- SCL Training Unit
- Brigade Development Centres
- Botswana Technology Centre
- Rural Industries Innovation Centre.

There is an acute shortage of engineering skills in Botswaa. It is necessary to upgrade the existing institutions responsible for the engineering manpower in Botswana. The proposed creation of the National Centre for Engineering Design and Manufacturing will help considerable in the field of manpower development.

E. MAJOR CONSTRAINTS

The engineering and allied metalworking industries in Botswana are in the private sector. Major engineering and industrial activities are located in Gaborone, Selebi-Phikwe, Francistown.

(a) Constraints at the Institutional Level

- The Ministry of Commerce and Industry, Development Corporation, BEDU, etc. lack experienced technical manpower e.g. industrial engineers, engineering project analysts, mechanical project officers etc. This is the reason why the industrial problems particularly engineering industries are not being adequately diagnosed.
- lack of interlinked co-ordination among the Governmental and Non-governmental organizatior
- too many institutions are involved in the prototype development of agricultural implements and related engineering products
- the role of National Development Bank is not clear as far as the small-scale industries development is concerned;

- the national policy measures are inadequate for the development of small-scale and rural industries.
- inter-ministrial linkages are inadequate and the role of Ministry of Finance and Economic Development does not inter-link the various development aspects at project levels.
- Botswana Development Corporation Ltd. performs its activities in isolation from the national development for engineering industries sector. BDCL mainly promotes industries in consumer and service sectors with high foreign value added inputs.

(b) Constraints at Engineering and Technological Level

- non- of foundry, forging heat treatment facilities which are primarily responsible for the engineering industry development.
- lack of facilities for the engineering design capability development at industry level.
- lack of facilities in the field of tool room activities
- lack of facilities to obtain engineering and technological advisory services in the following fields e.g.

(i) product identification and market sizes;
(ii) preparation of techno-economic engineering studies;
(iii) appropriate choice and selection of machinery, equipment and processes;
(iv) appropriate management technique for engineering industries.
(v) product improvement and marketing.
(vi) informations of sub-regional markets andproducts being manufactured in the subregion.

(c) Constraints at the Manpower Level

- lack of technical managers and higher supervisors.
- lack of engineers particularly in the field of industrial engineering!
- lack of engineering designers in product and tool design
- lack of process planners;
- lack of skilled operatives
- lack of qualified marketing personnel.
- lack of comprehensive engineering training programme at industry level.

F. PROJECTS IDENTIFIED

The following projects were identified by the mission:

At National Level

I. Projects for long-term assistance

Project Proposal No. 1 11/

Assistance to Integrated Foundry and Mechanical Workshop Complex in Private Industry-

The Ministry of Commerce and Industry has already prepared a feasibility study for the setting-up of a foundry in Botswana by joint group BC-Berlin - Consult GmbH/Dr. Rudolf Stotz Engineers in May 1980 for the production of 1070 M.Tons of grey cast iron by means of cupola technology and coal as primary energy material.

The project feasibility study does not include an integrated machine shop which is not available in Gaborone and in provincial towns. It is suggested that the Government of Botswana may approach UNIDO/UNDP to assist part of this project as mentioned below:

(a) Assistance in setting up of a metallurgical laboratory with expert and equipment assistance.

| | | |
|---|---|---|
| - One metallurgist - 12 mm | - | US$ 72,000 |
| - Laboratory equipment | - | US$ 48,000 |
| Total | | US$120,000 |

The budget can be included in IPF 1984 with UNIDO as executing agency

(b) Assessment and procurement of selected foundry equipment and conventional machine tools and equipment for the integrated foundry complex.

| | | |
|---|---|---|
| - One mechnaical engineer - 6 mm | - | US$ 36,000 |
| - Machinery and equipment | - | US$214,000 |
| Total | | US$250,000 |

The project finance can be obtained from UNCDF and UNIDO will be the executing agency. Government may request UNDP to finance this project.

The mission has already communicated this proposal to UNIDO with a copy to UNDP on 12 March 1982.

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11/ The mission has discussed this with Government/UNDP on 19.1.82.

Project Proposal No. 2 12/

Integrated and Inter-linked Development of Small-Scale and Rural Industries

The project will be under the umbrella of BEDU and will be divided into two phases:

Phase I - Rationalization of existing institutional arrangement for the inter-linked development of small-scale industries with special reference to policy, strategy and planning of this sector. Small-scale and rural industries development (UNCDF BOT/80/003 report on rural industries development programme will be based of this project).

Phase II - Long-term assistance for the small-scale and rural industries development.

The project budget should be as follows:

| | | | | |
|---|---|---|---|---|
| Phase I | - | Expert assistance | - 6 mm | - US$ 36,000 |
| Phase II | - | Expert assistance | - 48 mm | - US$ 288,000 |
| | | Equipment & Training | - | - US$ 712,000 |
| | | Total Phase II | | US$1,000,000 |

Phase I - should start immediately and UNIDO should be the executing agency.

Phase II - may start 1984 for two years and UNIDO will be the executing agency.

Project Proposal No. 3

Integrated and Inter-linked Manufacture of Agricultural Machinery and Implements

There is no agricultural machinery and implements manufacturing industry in Botswana. Government of Botswana may request UNDP/UNIDO assistance for setting up of an agricultural machinery and implements manufacturing industry. The demand for animal drawn implements in Botswana is estimated to be 20,000 to 30,000 units per year. A wide variety of prototype and farm tested implements and equipments are arleady available within the country. The project can be divided into two phases.

Phase I Market survey, detailed design preparation, workshop drawings including techno-economic assessment

12/ Mission has already discussed this with BEDU and UNDP on 19.1.81

| | | | | |
|---|---|---|---|---|
| | Expert assistance | 24 mm | - US$ | 150,000 |
| Phase II | Production planning, selection of machine and equipment, installation and running of the factory | 48 mm | - US$ | 300,000 |
| | Machinery, equipment and training | | US$ | 700,000 |
| | Total | 72 mm | - US$1 | ,150,000 |

The duration of the project will be 3 years and UNIDO will be the executing agency.

Project Proposal No. 4

Establishment of an Engineering Industry Advisory Team in the Ministry of Commerce and Industry

The engineering advisory back-up facilities within the Ministry is limited. Therefore Government of Botswana may request UNDP/UNIDO to set up a long-term project within the Ministry to assist and promote engineering industries in Botswana.

Project budget:

| | | | | |
|---|---|---|---|---|
| Expert assistance | | | | |
| - one industrial engineer | - | 24 mm | - | US$150,000 |
| - one mechanical engineer | - | 24 mm | - | US$150,000 |
| - one project analysist | - | 24 mm | - | US$150,000 |
| Total | | 72 mm | - | US$450,000 |

Project may start on 1984 and UNIDO will be the executing agency.

Project Proposal No.5

Establishment of a National Centre for Engineering Design and Manufacturing

The purpose of the project will be to integrate all the fragmented activities at national level for the prototype development, design, improvement of national capabilities, product development, training, information collection and dissemination and advisory assistance to local industries for engineering industries development including preparation of techno-economic studies etc.

Project budget:

| | | | |
|---|---|---|---|
| Expert assistance for the formulation policy and integration of existing R&D activities | - 72 mm | - US$ | 450,000 |
| Establishment of the Centre similar to ARCEDEM in Ibadan, Nigeria with machinery and equipment | | - US$1,050,000 | |
| Total | | US$2,000,000 | |

The project may start 1984 and UNIDO will be the executing agency.

II. Project for short-term assistance

Project Proposal No. 6 13/

Assistance to BEDU Metal Estate's Maintneance hop to Upgrade into Tool-room

Assistance will be directed towards uparading of the existing maintenance shop into a tool room for local industries. The project will also assist in improving the design capabilities for jigs, tools, fixtures.

Expert (tool room and tool design) 6 mm - US$ 36,000

UNIDO will be the executing agency.

Project Proposal No. 7

Assistance to Central Transport Organization(CTO) to Standardize the Nine Workshops in Provincial towns 14/

This short-term project will assist CTO to design a module of workshop identical to each other for the maintenance of vehicle including planning and programming of repair and preventive maintenance schemes.

Expert (automobile maintenance and plant design) 6 mm - US$36,000

UNIDO will be the executing agency.

Project Proposal No. 8

Assistance to Botswana Polytechnic in Planning Physical Facilities for the Pilot Foundry, Forging and Heat Treatment with Training Syllabus 15/

These pilot plants will accelerate the specific training programme at diploma level and crafts level for the industry.

Expert in foundry, forging, heat treatment - 6 mm - US$36,000

Machinery and equipment component will be procured from bilateral assistance.

UNIDO will be the executing agency.

At Subregional Level

The following activities should be undertaken at the subregional level for the development of engineering industries e.g.

---

13/ Mission has discussed this with BEDU and UNDP

14/ Mission has discussed this with CTO and UNTP

15/ Mission has already discussed this with Polytechnic and UNDP on 19.1.82

- exchange of informations on agricultural machinery development with Zimbabwe, Zambia, Kenya, Mozambique and Angola;
- organize study tours for the local industrialists to visit neighbouring countries to examine the engineering industries adaptation;
- expand greater sub-contracting arrangement within PTA countries for spare-parts and engineering product manufacture;
- exchange of apprentices among the Southern and Eastern African countries.

## G. FUTURE FOLLOW-UP

The following are the future follow-ups to be undertaken by the Government of Botswana:

- to approach UNIDO/UNDP to include the projects in (IPF) 1984;
- to submit the project proposal for bilateral or multilateral assistance;
- to establish immediately the Engineering Advisory Team to Ministry of Commerce and Industry;
- to visit selected foundry and agricultural machinery and manufacturing establishments in Zimbabwe in order to acquire joint venture projects;
- to request UNIDO/UNDP to prepare detailed project documents for the IPF submission.

SECTION IV

# COUNTRY REPORT *

# OF

# THE REPUBLIC OF ZIMBABWE

## ECA/UNIDO ENGINEERING INDUSTRY DEVELOPMENT

## FOLLOW-UP MISSION

## 20 January 1982 - 7 February 1982

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* A draft ad-hoc report has already been submitted to the Government, UNIDO and [illegible] Salisbury on 5 Feburary 1982. The report was discussed in the Inter-Ministrial meeting held in the Ministry of Industry and Energy Development on 5 February 1982. The present report includes the ad-hoc report prepared by the Regional Adviser.

## SECTION IV

## THE REPUBLIC OF ZIMBABWE

### A. RECOMMENDATIONS

The following are the major recommendations to be followed-up by the Government of Zimbabwe for the development of engineering industries sub-sector:

(a) At Institutional Level

1. It is recommended to establish a National Centre for Engineering Design and Manufacturing" similar to the African Regional Centre for Engineering Design and Manufacturing (ARCEDEM) in Ibadan, Nigeria. It is requested that the Government of Zimbabwe should become an active member of ARCEDEM in order to promote and utilize the Centre's activities at national level for engineering industry development.

2. It is recommended to set-up a Commission for the promotion of Small-Scale and Rural Industries Development and to establish at an early date a Small-Scale Industries Development Centre (SIDO) within the Ministry of Industry and Energy Development. The Indian, Tanzanian, Zambian and Kenyan experiences in this field will be of help.

3. It is recommended to establish an Inter-Ministerial Joint Advisory Body to ensure the availability of engineers, highly skilled operatives, designers, general machinists, etc. for the engineering industries.

4. It is recommended to study the institutional arrangements in countries like India, Mexico, Nigeria, Kenya, etc. in order to assess how the institutional frame-work was developed in these countries, particularly during their period of de-colonization.

It is further recommended that a high level interministerial team with private sector representations visit these countries for 6 to 8 weeks. The fund can be obtained from TCDC.

5. It is essential that the Ministry of Industry and Energy recruit Industrial Engineers and Technical Officers in the Ministry to supervise the engineering and Metal Working Sector. This will be initially in the form of a Technical Advisory Team which will be composed of international staffs and local technical counterparts.

6. There is an urgent need for a Foreign Investment Regulation Act. (Similar acts of other developing countries could serve as a model).

7. It is suggested that the import licences for the consumable tools, raw material, machinery, etc. should be given directly to the actual users instead of the importers and stockists.

8. It is recommended that the Ministry of Commerce and Trade should prepare and publish Import Trade Control Regulations(similar to Indian publication called "Red Book") which will illustrate product and specification-wise, engineering items which are being restricted from importation.

9. It is essential that all import licences be accompanied by a clearance letter from the local industries unable to manufacture such products prior to the approval of import licences. These should be obtained by the importers.

10. The importation of second-hand reconditioned machinery should be curtailed as such importation will create future maintenance and replacement problems. The information for the machinery and equipment procurement should also be obtained from the advanced Third World countries producing such machinery and equipment.

(b) At Engineering and Technological Level

11. It is recommended to implement the seven long-term projects and eight short-term projects through UNIDO/UNDP assistance. The Government counterpart agency would be the Ministry of Industry and Energy. The projects are described in Item (F) titled Identification of projects in section IV of this report.

12. It is further recommended to consider the ad-hoc report prepared in Salisbury on 5 February 1982 particularly the projects identified in the mission report.

13. It is recommended that the Government of Zimbabwe encourage the local private sector industries to establish joint venture projects in Botswana and in Lesotho particularly agricultural machinery and implements, spare-parts for transport equipment manufacture, and development of foundry, forging, etc. It would seek UNECA's assistance in this field.

14. It is recommended that RESCCO, Bulawayo be proposed as well as the focal industry for the repair and rebuilding of steam locomotives and ultimately diesel locomotives, for all Central and Southern African countries.

15. It is recommended to organize a National Workshop on foundry, forging and heat treatment in Zimbabwe.

(c) At Manpower Development Level

16. It is highly recommended to over programme the technical manpower development activities in Zimbabwe.

17. It is highly recommended to introduce Industrial Engineering courses at the University and Polytechnic level.

18. It is recommended that the Railway Training School in Bulawayo should be expanded to cater to the needs of railways as well as the industries due to the fact that railways subcontract substantial manufacturing items to local industries. The capacity of the railway training school should be at least for 500 students.

19. It is recommended to organize Industrial Management and Technical Training courses in the following fields:

- Appreciation courses
- Specialized courses
- Ad-hoc courses;
- Technical in-plant training courses
- Study-cum-observation visits;
- Introduction of mobile vans as extension services;
- Job training in prototype production units; and
- Post-graduate apprentice schemes for graduate and diploma holders in engineering field for 2 to 3 years.

B. ORGANIZATION OF MISSION/COUNTERPART

The mission was composed of:

Mr. Aloke Kumar Mitra
UNIDO Regional Adviser Engineering Industries
Joint ECA/UNIDO Industry Division
Addis Ababa

and was assisted by the following Government Officials:

(a) Government Counterpart

Mr. E.D. Mabhena
Under Secretary
Ministry of Industry & Energy Development
Earl Grey Building
Cnr. Livingstone Ave/4th Str.
Salisbury
Zimbabwe

(b) Government Representatives in mission

- Mr. C.T. [illegible]
  Sr. Administrative Officer
  Salisbury
- Mr. P. Copan
  Assistant Secretary,
  Bulawayo
- Mr. P.M. Mkwananizi
  Sr. Administration Officer
  Bulawayo
- Mrs. A. Thomas
  Sr. Clerk
  Bulawayo

C. REPORTS ON VISITS AND MEETINGS

| | | |
|---|---|---|
| Wednesday, 20.1.82 | 16.00 hrs. | JPO UNDP<br>Salisbury |
| Thursday, 21.1.82 | 11:00 hrs. | Under Secretary<br>Ministry of Industry & Energy Development<br>Salisbury |
| Thursday, 21.1.82 | 14:45 hrs. | Tassburo Fastners Ltd.<br>Salisbury |
| Thursday, 21.1.82 | 16.00 hrs. | Crawn Brass Ltd.<br>Salisbury |
| Friday, 22.1.82 | 08:45 hrs. | Metal Box (CA) Ltd.<br>Salisbury |
| Friday, 22.1.82 | 11·40 hrs. | Precision Grinders Ltd.<br>Salisbury |

| | | |
|---|---|---|
| Friday,22.1.82 | 12:30 hrs. | J. McKeekan<br>Salisbury |
| Friday, 22.1.82 | 13:30 hrs. | Head Office<br>Metal Box (CA) Ltd.<br>Salisbury |
| Friday, 22.1.82 | 15:30 hrs. | Tube and Pipe Ltd.<br>Salisbury |
| Friday, 22.1.82 | 17:45 hrs. | Berik Plasbond Plastic Division<br>Metal Box (CA) Ltd.<br>Salisbury |
| Monday, 25.1.82 | 09:30 hrs. | Ministry of Trade & Commerce<br>Bulawayo |
| Monday, 25.1.82 | 10:30 hrs. | Bulawayo Technical College<br>Bulawayo |
| Monday, 25.1.82 | 12:00 hrs. | Temper Tools<br>Bulawayo |
| Monday, 25.1.82 | 14:30 hrs. | Radiator and Tinning(Pvt)Ltd.<br>Bulawayo |
| Tuesday, 26.1.82 | 08:15 hrs. | RESCCO<br>Bulawayo |
| Tuesday, 26.1.82 | 10:15 hrs. | Bulawayo Steel Products<br>Bulawayo |
| Tuesday, 26.1.82 | 12:25 hrs. | RHOBOLTS<br>Bulawayo |
| Tuesday, 26.1.82 )<br>29.1.82 ) | 14:30 hrs.<br>16:55 hrs. | All Metal Foundry<br>Bulawayo and<br>Salisbury |
| Tuesday, 26.1.82 | 15:30 hrs. | O. Conolly & Co.(Pvt)Ltd.<br>Bulawayo |
| Wednesday, 27.1.82 | 08:30 hrs. | National Railway Workshop<br>Bulawayo |
| Wednesday, 27.1.82 | 10:40 hrs. | United Spring &<br>Forging Co.<br>Bulawayo |
| Wednesday, 27.1.82 | 14:10 hrs. | Toolmaking & Engineering Co.<br>Bulawayo |
| Wednesday, 27.1.82 | 15:30 hrs. | Metal Box (CA)Ltd.<br>Bulawayo |
| Wednesday, 27.1.82 | 17:40 hrs. | ZIMPLOW<br>Bulawayo |

| | | |
|---|---|---|
| Wednesday, 27.1.82 | - | No visits due to lack of time. |
| Thursday, 28.1.82 | 09:30 hrs. | BERBAT(Pvt)Ltd. Marandellas |
| Thursday, 28.1.82 | 13:30 hrs. | Marandellas Foundry & Manfuacturing(Pvt)Ltd. Marandellas |
| Thursday, 28.1.82 | 15:30 hrs. | Capital Tea and Coffee Co. (CA) (Pvt) Ltd. Marandellas |
| Friday, 29.1.82 | 09:45 hrs. | Non-ferrous Die-casting(Pvt)Ltd. Norton |
| Friday, 29.1.82 | 11:20 hrs. | ZR Pumps (Pvt) Ltd. Norton |
| Friday, 29.1.82 | 12:00 hrs. | C.A. Forge Co. Ltd. Norton |
| Friday, 29.1.82 | 13:30 hrs. | Wire Weavers(Pvt)Ltd. Norton |
| Monday, 1.2.82 | 14:30 hrs. | Inter-Company Meeting with Industrial Development Corproation and Metal Box, Salisbury for tool room development. |
| Tuesday, 2.2.82 | 15:00 hrs. | UNDP, Resident Representative Salisbury |
| Tuesday, 2.2.82 | 16:30 hrs. | Ministry of Transport Salisbury |
| Wednesday, 3.2.82 | 11:00 hrs. | Ministry of Economic Planning and Development Salisbury |
| Wednesday, 3.2.82 | 18:00 hrs. | Institute of Foundryman meeting Salisbury |
| Wednesday, 3.2.82 | 14:00 hrs. | Matecliffe Agricultural Institute Domboshawa |
| Wednesday, 3.2.82 | 16:00 hrs. | Ministry of Agriculture Salisbury |
| Thursday, 4.2.82 | 11:00 hrs. | Tinto Industries Ltd. Salisbury |
| Thursday, 4.2.82 | 15:00 hrs. | UNDP, Resident Representative Salisbury |
| Friday, 5.2.82 | 12:00 hrs. | Inter-ministrial meeting Ministry of Industry & Energy Development Salisbury |
| Friday, 5.2.82 | 16:00 hrs. | UNDP, Resident Representative Salisbury |

Discussion with Various Institutions, Industries and Establishment in Zimbabwe

1. UNDP, Salisbury, (20.1.82)

The programme officer of UNDP hand over the programme of various visits to factories in Salisbury, Bulawayo, Norton and Marendellas. The mission explained its objectives and highlighted the follow-up actions as laid down in the Lagos Plan of Action. UNDP handed over a number of important documents for the mission to study relating to the industrial performance of Zimbabwe. UNIDO's six project proposal/ documents were also handed over to the mission. It was told that the Government did not support those project documents.

2. Ministry of Industry and Energy Development, Sailsbury, (21.1.82)

As a counterpart Ministry to the ECA/UNIDO mission, the Under Secretary of the Ministry welcomed the mission requested it to submit an early report to the Government for immediate follow-up action. The ECA/UNIDO mission explained its objectives and it was decided with the Ministry that the mission would devote itself to the following aspects of engineering industry development in Zimbabwe

- examine critically the existing gaps in engineering industries and allied metalworking industries in Zimbabwe
- propose very specific project ideas in order to bridge these gaps for the integrated development of the engineering sector
- advise on the future measures to be taken by the Government to upgrade and utilize the existing engineering industries
- to look into the aspects of technical manpower development programme.

3. Tassburg Fastners Ltd., Salisbury, (21.1.82)

This is a light metalworking industry manufacturing bolts, nuts, screws, etc. Production is 25 to 30 tonnes of steel wire per week, employing 44 persons which includes 9 skilled and 5 unskilled. The company exports products to Malawi and South Africa. The company complained about the wire products supplied by Lancashire steel which are not annealed adequately and create problems in further machining. There are major problems in getting the supply of chemicals for electro-plating due to cut in import quota which may reduce their normal export. The company is expanding its workshop and introducing semi-automatic machinery to increase employment.

4. Crown Brass, Salisbury, (21.1.82)

This company manufactures brass products e.g. water fittings, fire extinguishers, etc. It has two induction furnaces and a general purpose machine shop with a tool room. The company complained that the extruded brass rods supplied by the Radiator and Tinning Bulawayo are not straight and create problems during machining. The following suggestions were made by the mission to improve the quality of the products with reduced manufacturing costs:

- to change composition of brass to 53% Cu and 47% Zn which will reduce the the main copper cost,
- to manufacture gland bodies and the seatings from plastic material (injection moulding) as per BS. 1010. Metal Box could be contacted for the supply of parts;
- to introduce plastic (acralic) heads for taps which will reduce metal cost;
- to assess possible manufacture of small consumable tools e.g. drills, reamers, taps etc.

5. Metal Box (CA) Ltd., Salisbury,( 22.1.82 )

The company has 20% South African and 80% UK Shares. The manufacturing range includes metal cans,containers,plastic containers etc. Out of the 460 employers in general packing division 20 are skilled operatives. At present the division has 16 apprantices. Among other metal container machineries and equipment, the company has a tool room which includes some precision machineries and equipment. The company manufactures its own moulds dies,press tools etc.The ECA/UNIDO mission proposed to the management of the company to expand the tool room activities for internal as well as external requirements. The mission inspected the recent space for the new training Centre for apprentices. The concept of a Central Tool Room was discussed the company was interested enough to show the mission an excellent covered space with all the facilities in the new premises acquired by the company adjacent to their existing one. The layout of the shop was given to the mission for further examination. It was decided that Metal Box will call meeting at their head office with the representative of the Industrial Development Corporation to discuss the matter further.

6. Precision Grinders Ltd., Salisbury,( 22.1.82)

This is a general purpose light engineering workshop engaged in the following activities:

- overhauling of single cylinder vertical stationary diesel engines;
- manufacture of parts of diesel engines;
- manufacture and fabrication of parts for the mining industry;
- manufacture of 4.5 kw(6HP), 11.3 kw(15HP) and 17 kw (22.5 HP) hammer mills.
- manufacturs parts and components according to customer's order.

The company receives its casting from its own group(J. McKeekan) in Salisbury. The management of the company indicated to the mission that they are very interested to start up Single Cylinder Vertical Stationary Diesel Engines(about 20-30 units per month. The mission inspected the workshops and suggested that most of the machinery and equipment are available within the factory except three machines i.e. one duplex portal frame bed type milling machine multispindle bolster plate type drilling and tapping machine)and upright drilling and tapping machine with pentagone turret head.

The sister company has already started manufacturing the crank-shafts for the engines in S.G. iron.

7. J. McMeekan Foundry, Salisbury,( 22.1.82 )

This is an integrated foundry and machine shop complex. There are two cupola furnaces of 3-4 tons per hour capacity. The foundry has facilities for $CO_2$ moulds S.G Iron, heavy duty grey cast iron castings and can cast single product of upto 200kg. The company produces:

- automobile finished parts e.g. brake drums etc.;
- centrifugal pump bodies;
- mining equipment parts etc.;
- manhole covers etc.;
- parts for hammer mills.

Out put of the foundry is 10 to 20 tonnes of cast parts per week. It has an excellent pattern making shop for metal moulds.

8. Head Office, Metal Box (CA)Ltd., Salisbury,( 22.1.82)

The meeting was chaired by the Managing Director of the group. The mission discussed about the possibility of setting up of a Central Tool Room with possible assistance either from bi-lateral sources or from the UNIDO/UNDP technical assistance programme.

It was suggested that such a tool room should be established with the participation of two/three local industries and should operate as a commercial enterprize. It was estimated that the cost of the tool room will be in the region of US$ 5 million. The following ideas were suggested for the establishment of a Central Tool Room in Zimbabwe

- Land to be provided by the participating companies if possible existing building to be used;
- Existing machineries and equipment for tools manufacture should be utilised;
- List of existing machineries and equipment to be prepared (list has already been prepared by the Metal Box Group and handed over to the ECA/UNIDO mission refer to item 'D' of Section IV),
- UNIDO/UNDP should be approached to prepared a feasibility study for the consideration of participating companies and the Industrial Development Corporation
- Cost of the additional precision machinery and equipment can be obtained from IDC, bilateral grants/aids, UNIDO/UNDP technical assistance for experts and moderate supply of machinery and equipment;
- Private sector participating companies together with Government representatives will form a Board of Directors to run the tool room.

It was decided that an inter-company meeting be organized with IDC and MIED on 2 February 1982 at 14:30 hours at Metal Box (CA), Head Office.

9. Tube and Pipe Ltd., Salisbury (22.1.82)

The company manufacturers tubes and pipes of 4", 8" and 13" diameters and has a capacity of 1,500 tonnes/month. The main constraints the company is facing are lack of market and lack of foreign exchange to procure plates. The company is willing to participate with SISCO in order to procure plates if such a project is undertaken by SISCO for the local manufacture of products

10. Berik Plasbond Plastic Division, Metal Box (CA) Ltd., Salisbury, (22.1.81)

The company is a part of Metal Box Group and is engaged in manufacturing plastic cans and containers. The production shop consists of heavy duty injection moulding machines and a tool room for the local manufacture of dies, moulds etc. The company agreed to prepare a list of existing machinery of their tool room which can be mobilized for the future installation of a Central Tool room in Zimbabwe. (Refer to item "D' of Section IV of this report for the list of existing machinery and equipment of this company).

11. Ministry of Trade and Commerce, Bulawayo, (25.1.82)

The Assistant Secretary of the Ministry welcomed the mission and handed over the programme of visits in Bulawayo. The Ministry provided the local counterpart to the mission. The ECA/UNIDO mission explained the objectives and terms of reference of the activities of the mission.

12. Bulawayo Technical College Bulawayo, (25.1.82)

There are three technical colleges in Zimbabwe e.g. a polytechnic in Salisbury, a technical college in Bulawayo and a craft training college in Que-Que. The Bulawayo Technical College has training facilities in the following divisions/departments:

- division of commerce,
- division of civil engineering, mining and building
- division of electrical engineering;
- division of mechanical engineering;
- department of mathematics and science,
- department of hotel keeping and catering.

The total intake of the polytechnic is as follows:

| | | |
|---|---|---|
| Planned | 5000 (in all disciplines) | - 2500 (in engineering) |
| Actual | 4289 (in all disciplines) | - 2044 (in engineering) |

The students are taken in three levels i.e

- craft level - 1400
- technical level - 400
- higher technician level - 244

The main constraints are:

- inadequate teaching staff (in mechanical engineering alone there are 52 posts with 30 vacancies)
- staff salaries are low compared to the University level.

It is suggested that the polytechnic should organize courses for the small-scale industries owners on ad-hoc basis.

13. Temper Tools, Bulawayo, (25.1.82)

The company manufacturers agricultural hand tools, files and rasps. The material consumption is 50 tons/year.

During the discussion it was observed that the company is using expensive steel (EN43 spring steel) for the agricultural hand tools. The mission was told that ZISCO does not produce appropriate metals for the agricultural hand tools. The mission suggested that the company should diversify its product line e.g. manufacture of small consumeable tools like drills, reamers, taps etc.

14. Radiator & Tinning (Pvt)Ltd., Bulawayo (25.1.82)

The company manufactures a wide range of products and specialises in the manufacture of radiators and extruded brass sections in round, square and hexagone. The company wishes to expand and rationalize its activities. The mission suggested that technical assistance can be requested for the preparation of a feasibility study and a rationalization programme from UNDP/UNIDO on a short-term basis, say upto 4 mm. The company should request the Ministry of Industry for such assistance.

15. RESCCO, Bulawayo, (26.1.82)

This is a heavy engineering industry manufacturing constructional and structural engineering products, railway rolling stocks and repairing and overhauling railway steam locomotives. It is suggested that this company should point of all railway steam locomotive repairing and overhauling activities in Southern and Central African countries.

A number of delegations from the railway workshops from Zimbia, Tanzania, Kenya came to discuss regarding the repair and overhauling of the steam locomotives but so far no concrete proposals have been made by these countries. At present Mozambique has shown interest in overhaul of their steam locomotives.

16. Bulawayo Steel Products, Bulawayo, (26.1.82)

The company manufactures the following animal drawn agricultural implements

- single - furraw ploughs - 18,000 per year
- harrows
- cultivators
- planters
- drawbars
- ground nut shellers
- bolts, nuts, trek chains, hoes and deroes.

Present production is about 35,000 units/year. Most of the machinery and equipment is obsolete and requires immediate replacement. It is suggested that the company should manufacture power operated implements and if possible set up manufacturing plants with joint collaboration in Botswana and in Lesotho.

17. RHOBOLTS Ltd., Bulawayo,(26.1.82)

The company manufactures precision bolts, mild steel bolts, split pins, studs, bright and high tensile nuts, HS Nuts, rivets, screws, nails, set screws, washers, and high carbon socket heat bolts, electrical transmission fittings etc. The mission suggested that the company should endeavour to introduce hot stamping process in order to:

- cut down machining time;
- reduce the metal consumption without waste
- increase of production and productivity.

The mission suggested a 4 mm UNIDO/UNDP technical assistance to study the hot stamping technology for this company.

18. All Metal Foundry, Bulawayo,(26.1.82 and Salisbury 29.1.82)

This is an integrate foundry and mechanical workshop. The company manufactures

- wide range of cast parts (ferrous and non-ferrous)
- complete 50 tonnes and 20 tonnes eccentric presses - 100 units/year;
- 10 tonnes - fly presses 200 units/year
- power hacksaws

The company 135 persons with a turnover of 1000 tons/year. The foundry capacity is 3 tons/hour. The main constraint the company faces is lack of machine operatives in the machine shop. The mission suggested that the company should expand its activity and introduce the following product lines:

- up right drilling machine
- double ended grinding machine
- press brake.

19. O. Conolly & Co.(Pvt)Ltd., Bulawayo,(26.1.82)

The company consists of a large modern foundry complex with integrated mechanical and structural workshop. The main lines of activities are:

- Production of castings in all grades of spheroidal graphite, grey and malleable irons, brass and aluminium, to BSS and SABS standards;

- Structural Engineering. Design, fabrications and erection of structural steel work. Manufacture of heavy plate fabrications,in light gauges mild and stainless steel and aluminium

- Mechanical engineering, manufacture of mining equipment,milling, industrial and contractors' plant and machinery

The foundry and machine shop complex consists of:

- foundry complex (induction furnace cupola, oil fired furnace) laboratory, pattern shop and store, sand plant, stores, moulding area,compressive house, fettling, furnace area, heat treatment plant.including mass production moulding facilities for upto 30kg

in malleable, S.G. and grey iron. Castings upto 15 tonnes are produced by floor moulding in the heavy jobbing shop.

- fabrication and machine shop complex
- structural fabricating shop, heavy plate shop, light plate and sheet metal shop, machine shop, assembly shop, electrical shop, stores, engineering estimating and planning office, drawing office, main administration office.

The mission suggested that the company is in a position to manufacture machine tools in Zimbabwe. The following range of machine tools can be manufactured:

- Lathes - upto 10HP
- Drilling machines upto 5HP
- Milling machines upto 3HP
- Shaping machines upto 5HP
- Grinding machines upto 5HP

The company needs a collaboration with reputable establishment from developed or developing countries. The mission hgihlighted that Kenya and Nigeria are already going ahead to manufacture machine tools with the collaboration and participation of Hindustrian Machine Tools, Bangalore, India. The mission further recommended that conolley may contact HMT in Bangalore to discuss the matter futher.

20. National Railways Workshop, Bulawayo,(27.1.82)

This is one of the largest railway repair and maintenance shop in Southern African Region. The National Railways of Zimbabwe is under the Ministry of Transport.

The Railway mechanical workshop situated in Bulawayo not only repairs and maintains the locomotives and rolling stock, it also manufactures spare-parts and ancillary components.

The major constraint of the railway is lack of skilled operatives and management personnel. At present under the bilateral agreement between the Government of Zimbabwe and the Government of India, 216 Indian operatives, instructors and related staff are stationed in Bulawayo. The mission suggested that it is necessary for Zimbabwe to over-programme the training activities. It is suggested by the mission that the proposed new training school should accomodate about 500 trainees indifferent disciplines. The mission also suggested that Government of Zimbabwe should explore the possiblity of sending apprentices to Kenya Railway Training School in Nairobi which has a capacity to train 1000 apprentices.

21. United Spring and Forging Co., Bulawayo,(27.1.82)

This is a large mechanical workshop which produces:

- agricultural hand tools;
- leaf and coiled springs;
- heavy forged parts;
- parts for mining industry;
- fabricated structural parts;
- heavy dies, moulds etc.
- heavy duty pressed parts.

The mission explained the objectives of the factory visit to the meeting chaired by the Chairman of the company, with the Directors. The company has a wide experience in forging, and heat treatment technologies. The mission suggested to the Board whether the company will be willing to manufacture standard consumeable metal cutting tools e.g. drills, reamers, taps, chasers, milling cutter, etc. This requires a market and feasibility study with 4 mm UNDP/UNIDO inputs and a long-term project for expert assistance through UNIDO/UNDP. The company is willing to invest on plant and machinery It was pointed out by the mission that at present there is no manufacturing facilities for small tools manufacture throughout the Eastern, Central and Southern African subregion. Moreover, imported tools are expensive and procurement takes a long delivery time.

The mission also suggested that it will recommend to the Government of Zimbabwe to set up a small manufacturing line with 3-5 tons Induction Furnace within ZISCO complex to manufacture High Speed Steel and die and tool steel metals. The projects are already recommended in titem (F) of the Section IV of this report.

22. Toolmaking and Engineering Co., Bulawayo,(27.1.82)

This is one of the active and progressive toolmakers in Zimbabwe. The company manufactures the following products e.g.

- jigs, fixtures, dies and moulds;
- kitchenware products;
- children toys e.g. cycles etc.;
- parts for ZISCO;
- agricultural implements (hand tools);
- wide variety of precision tool room work.

The mission discussed about the proposed Central Toolroom and whether the company will be interested to participate in this project. The company endorses the mission views and agreed to participate in the proposed project. The mission recommended that the company will be a permanent working adviser to the proposed project.

23. Metal Box (CA)Ltd., Bulawayo,(27.1.82)

This is another factory of the Metal Box group in Zimbabwe manufacturing metal containers. The company has a small toolroom.

24. ZIMPLOW, Bulawayo,(27.1.82)

This is another large agricultural implements manufacturing factory in Zimbabwe. The company manufactures wide range of agricultural animal drawn implement and hand tools. The product range includes:

- wide range of holes;
- mould board ploughs (single and two furrow ploughs)
- high wing ridger,
- pitman drive
- cultivators;
- ground nut
- triangular, diamond, and zig -zag harrows.

The present production is about 40,000 units per annum.

It is suggested by the mission that the company should set up a joint venture project in Botswana. It is further suggested that the company may embark on the manufacture of power operated implements.

25. BERBAT (Pvt) Ltd., Marandellas,(28.1.82 )

This is a small fabricating shop manufacturing:

- live stock handing equipment.
- fabricated products
- metal boats.

It was suggested that the company may diversity its product e.g.

- manufacture of small poultry equipment for small farmers.
- manufacture of metal silos upto 1 ton capacity (kit type) for small farmers.
- manufacture of bio-gas generater (model can be obtained from India)

The mission also suggested that the company employ a local marketing officer to improve export of their products. The mission has recommended a short term UNIDO/UNDP assistance to upgrade this company.

26. Marandellas Foundry and Manufacturers (Pvt)Ltd., Marandellas,(28.1.82 )

This a medium size foundry manufacturing:

- charcoal fired iron
- traditional cast iron cooking pots,pans,etc.)
- cast iron scissors
- sewing machine table.
- various other cast parts

The company complained that due to the cut in import license it is difficult for the company to procure grinding and polishing wheels thereby its normal production has been reduced. The company pointed out that South Africa products of cast pans and bowls have a black mac finished coating. Due to the abcence of this metal coating the company cannot export its products to South Africa. The mission recommended that it is a phosphate coat and can easily be processed by the company and requested it to contact Imperial Chemical Industries (ICI) to obtain informations on Park-O-Lublize Process. The process is as follows:

- Phosphate, stain and oil process: Any conventional phosphating process, provided it conforms with particular weight, dyed by any approved water stain and sealed by an approved oil to give corrosion protection specified by the manufacturers;
- Parkolubrize process: Phsosphate with parkolubrize and seal with an approved lubrication oil to give a good corrosion protection surface.

Equipment should consist of:

1. Degreaser vat with Trichloroethylene
   3 ftx2ftx2ft
2. Phosphating vat
   3ftx2ftx2ft.

The company told the mission that it was waiting for 5 years to obtain this information. The mission was contacted by ICI Office in Salisbury to explain the exact requirement of the company.

27. Capital Tea & Coffee Company (CA) (Pty)Ltd.,Marandellas,(28.1.82)

The company processes coffee, tea and curry powder. Recently the company has started a foundry with a 1½ ton cupola furnace and wished to purchase 2nd hand machinery. Another product company manufactures is Robertson's Building System of pre-fabricated house.

28. Non-ferrous Die Casting(Pvt)Ltd., Norton,(29.1.82)

The company basically manufactures brass cast products e.g.

- brass water fittings, taps, valves etc.,
- car parts:
- electrical Aluminium fusing clads etc.
- fire extinguishers sprincklers

It has a 250kg/hour induction furnace for brass melting. The production is 150 tons/year and 20 tons of Aluminium per year. Technology used is gravity die casting system and there is a small tool room in the factory. It was suggested that the company should develop the following parts in order to economise the expensive cross input to reduce cost:

- manufacture of plastic gland body ½ inch and $\frac{3}{4}$ inch size (to contact Metal Box in Salisbury)
- manufacture of acrylic head instead of brass head of the taps
- composition of the brass to be 53% Cu and 47% Zn instead of 60% Cu and 40% Zn
- magnesium alloy die cast knob for taps;
- electroplating should be Nickle 12 micron and Chromium 3-4 micron.

The company requires design assistance. It is possible that the company could introduce hot stamping technology for gland, jumpter, sprinkers etc.

29. ZR Pumps (Pvt)Ltd., Norton,(29.1.82)

The company is specialized in manufacture of sub-mersible pumps of three varieties i.e

- 1.5 to 4.5 cubic meters/hour
- 3.5 to 9.0 cubic meters/hour
- 7.5 to 16.0 cubic meters/hour
  upto 250 HP motor.

The pumps are mainly used for irrigation and water supply purposes. There are other four companies manufacturing pumps in Zimbabwe i.e

- Bestobell(Z)Ltd. Centrifugal pumps upto 50HP (100 cu.meter/hour)
- Monopump - Spiralpumps 2-25HP
- Craster - Centrifugalpumps 1½HP
- Tinto Industries - Centrifugal pumps 50HP.

The company at present manufacture (by sub-contracting) Tufnol plastic impeller. The mission suggested that the outside housing can also be made from plastic material. The company accepted the idea. The company has complained that importers were given license to import same range of pumps from South Africa.

30. Central African Forge Co(Pvt)Ltd., Norton,(29.1.82)

The company is a general purpose forge shop and manufactures a wide range of vices, axles, forge parts, forge balls for mines. The mission was told that the company has already contacted railway authorities to manufacture railway axles. It is suggested by the mission that the wheel, rim and axle project should be an integrated plant. The demand for local axles are 1000 per year and the sub-regional demand can be as high as 4000 to 4000 per annum. The mission suggested a short-term UNIDO/UNDP assistance to prepare a market study and feasibility study for the wheel and axle manufacture in Zimbabwe. The company complained that there is acute shortage of consumeable metal cutting tools in Zimbabwe.

31. Wire Weavers (Pvt)Ltd., Norton,(29.1.82)

The company manufacture woven wire mesh from 2 mm to 9 mm wire andoproposed to manufacture wire mesh upto 12 mm wire. The company supplies screens for mining industry. It was suggested by the mission that case hardening of the wire after being woven will reduce cost of high carbon steel with higher wear resistance property for mining use. The company is willing to consider the proposal.

32. Inter-company Meeting with Industrial Development Corporation(IDC) and Metal Box(CA)Ltd. at their Head Office in Salisbury for Proposed Establishment of a Central Tool Room, Salisbury,(1.2.82)

The meeting was attended by Metal Box IDC, ECA/UNIDO mission, Non-ferrous Die Casting Ltd. and the Ministry of Industry and Energy Development.

The mission explained the reactions it had received from the various industries and was convinced that the Zimbabwean industries require a Central Tool Room due to the fact that the industries requirements are becoming complex and directed towards high precision activities within the engineering and allied metalworking sectors. The purpose of the Central Tool Room will be to design and manufacture the following:

- precision jigs, tools and fixtures;
- tool maintenance which cannot be done in small industries
- manufacture dies and moulds and gauges
- manufacture of precision spare-parts
- training of highly skilled operatives;
- manufacture of standard jigs and fixture parts and component;
- batch manufacture of inspection tools e.g. vice, v-blocks, callipers, gauges, rulers etc.

It was suggested by the mission that the proposed tool room should be operated by two/three private sector industries with the representatives of IDC and Ministry of Industry. The Central Tool Room should run as a commercial profit making enterprise.

IDC pointed out that it will be interested to invest upto Zimbabwe dollars 2 million provided there will be a feasibility study.

The mission has already recommended the project with UNIDO/UNDP technical assistance programme (Item 'F' of Section IV of this report).

It was also suggested that the existing precision machine tools of industries participating in the tool room project should be moblized and the proposed tool room should cater to the needs of all industries in Zimbabwe.

33. Ministry of Transport, Salisbury,(2.2.82)

The mission met the Under-Secretary of the Ministry and explained the mission objectives for engineering industry development in Zimbabwe. The mission discussed the expansion of the Railway Training School and suggested to the Ministry that the training programme for Zimbabwe needs over programming as there is an acute shortage of trained manpower in local industries. The mission also highlighted the need for low cost rural transport equipment.

34. Ministry of Economic Planning and Development, Salisbury(3.2.82)

The meeting was chaired by the Under-Secretary of the Ministry. A representative of the UNDP was also present. The mission explained its objectives and discussed in detail the project proposals identified in the ad-hoc report for the engineering industries development. The Ministry explained that the UNDP IPF is fully committed for 1983 and the only way left for the Ministry is to utilize the bilateral funds available to the country for industrial development. Following conclusions were drawn:

- The short-term projects identified in the ad-hoc report under (SIS) UNIDO/UNDP technical assistance can be executed at an early date;
- The long-term project proposals can be financed from bilateral assistance. The mission suggested that the Government may request the donor countries to pledge the amount indicated in each project proposal to UNIDO trust fund (UNIDF) in order for UNIDO to execute the projects. The Ministries reaction was positive on this matter.

35. Meeting with the Institute of Foundryman, Salisbury(3.2.82)

The ECA/UNIDO engineering industries development mission addressed the members of the Institute of Foundryman in Salisbury. The following companies were present

- Metal Sales Ltd., Salisbury;
- Fuld Technical Sales, Salisbury;
- Standard Association Central Africa;
- Concorde Investment, Salisbury;
- Tinto Industries, Salisbury;
- Metcast (Pvt) Ltd., Marlborough;
- Neves Foundry, Salisbury
- Stainless Steel Casting, Salisbury;
- All Metal Foundry, Bulawayo;
- Non-Ferrous Die Casting(P)Ltd., Norton, (chairman of the association);and
- Clarson (Pvt)Ltd., Salisbury.

The chairman of the associated introduced the mission to the members. The mission pointed out the importance and role of foundry industries in engineering industries development. The following suggestions were made

- The companies engaged in the foundry activities in Zimbabwe should make a foundry development programme, which will include technology

reassessment, future plans of development, and manpower development programme.

- Due to the acute shortage of skilled foundry operatives, it was suggested that an inter-company manpower development programme be established to train people within the existing foundries of Zimbabwe;
- The companies should co-operate with each other in order to develop technology, improve productivity and joint ventures in export of foundry products;
- Hot stamping and die-casting technologies should be given top priority for the increased production of foundry products;
- To organize a National Workshop for the foundry, forging and heat treatment development in Zimbabwe.

36. Hatecliffe Agricultural Institute, Domboshawa, (3.2.82)

The R&D research station is under the Ministry of Agriculture and is the focal point for the development and testing of agricultural machinery and implement in Zimbabwe. The research station has a large experimental farm. The institute has developed the following:

- wide range of implements
- solar-energy equipment
- testing and measuring equipment for power-operated machinery
- applied agricultural research

The institute works closely with the agricultural machinery industries in Zimbabwe and has prepared a small-scale farm machinery directory for the farmers.

37. Ministry of Agriculture, Salisbury, (32.2.82)

The mission visited the Permanent Secretary of the Ministry of Agriculture The main theme of discussion was the participation of Zimbabwe in the following meetings e.g.

(a) African Regional Consultation on Agricultural Machinery Industry, Addis Ababa, 5-9 April 1982 organized by UNIDO/ECA/OAU.

(b) Third Informal Expert Group Meeting for the Second Global Consultation on Agricultural Machinery Industry, UNIDO, Vienna 7-17 June 1982;

(c) Workshop for Agricultural Machinery Design in Cairo, September 22,1982 to October 8, 1982 by UNIDO.

It was agreed that Zimbabwe will be present in these meetings with understanding that UNIDO will endeavour to provide fund for item (c) whilst the Ministry will provide fund for item (b) in order to send the candidates from Zimbabwe.

38. Tinto Industries Ltd., Salisbury, (4.2.82)

This is a large industrial complex manufacturing wide range of agricultural machinery and implements and other engineering products e.g.

- foundry cast parts
- pumps
- standard trailers and tippers
- heavy duty rotary mower
- 3 meter fertilizer distributor
- spinner distributor
- hand planting station marker/fertilizer
- trailed heavy duty ripper
- mounted heavy duty ripper
- ripper/pot holer
- re-ridger
- inter-row harrow
- heavy duty off-set disc harrow;
- mounted off-set disc harrow;
- mounted chisel plough
- standard sic plough
- high clearance trash plough
- extra heavy duty dise plough
- precision planter:
- strip
- reversible disc plough
- utility planter
- tine cultivators
- high speed gangtiller
- grader.

The company has a large foundry with a 3 ton electric arc furnace for S.G. Iron and a one ton cupola furnace for grey iron. It produces a wide variety of cast parts. The mission discussed with Directors of the company regarding the proposed Central Tool Room. The mission to the company company's officials that Tinto Industry is capable to manufacture low cost transport equipment e.g. 3 wheeled moped rikshaws, 3 wheeled pick-up range etc. for the rural sector. The mission has already recommended UNDP/UNIDO assistance for such project (item 'F' section IV of this report).

39. Resident Representative, UNDP, Salisbury, (4.2.82)

The mission explained its objectives to UNDP and particularly the project proposals identified by the mission for the engineering industries development. It was told that the UNDP will take every measure to include the projects in the IPF. At present the IPF for Zimbabwe is fully committed. It was indicated that one/two improtant project may be considered. The short-term projects can be executed from SIS fund and UNIDO should be informed.

40. Inter-Ministrial Meeting held in the Ministry of Industry & Energy Development, Salisbury, (5.2.82)

The meeting was attended by the following institutions:

- Ministry of Industry and Energy Development;
- ECA/UNIDO Engineering Industry Development Mission;
- Industrial Development Corporation;
- Ministry of Trade and Commerce;
- United Nations Development Programme.

The meeting was chaired by the Under Secretary of the Ministry of Industry and Energy Development. The mission highlighted the important features of the identified projects and its far-reaching impact on the economic sectors of Zimbabwe. The main theme of discussions were confined to the identified projects, import regulations and ban on second hand machinery import. IDC pointed out that the mission did not visit all large industries in Zimbabwe, therefore, the mission should return to Zimbabwe again in order to study the major engineering industries. It was pointed out that the mission's programme of visits was preapred by the Ministry. IDC wanted to study the ad-hoc report before any conclusions could be made by IDC. The Ministry recommended the delegates to submit at an early date the individual comments of each Ministry in order to follow-up the ad-hoc report prepared by the mission.

41. Resident Representative, UNDP, Salsibury, 5.2.82

The mission informed the outcome of the inter-ministrial meeting to the UNDP. It was agreed that the short-term project assistance proposal should be considered by UNIDO/UNDP at an early date and UNDP will follow-up the ad-hoc report with the Government of Zimbabwe.

## D. EXISTING STATUS OF ENGINERING AND ALLIED METALWORKING INDUSTRIES IN ZIMBABWE

The activities in the field of engineering and metalworking industries in Zimbabwe reveal the following important aspects e.g.

- the basic metal, engineering and allied metalworking industries sub-sectors play a dominent role in the manufacturing sector of Zimbabwean industries. The contribution of fabricated metal products, machinery and equipment branch of the manufacturing sector contributed (since early 1970's) to the GNP is the largest which is no doubt a significant indicator of the economic progress and self-reliance of Zimbabwe,
- although the remarkable progress of engineering industries throughout the sanction period managed to put the engineering industries in the forefront of all economic activities, still there are some engineering and technological gaps within the engineering industries, e.g. lack of availablity of alloy steel and ,tool steel, tool room facilities, acute shortages of consumable metal cutting tools etc.;
- the existing engineering industries are using obsolete machinery and equipment as there has been no rationalization programme at the national level;
- unbalanced growth of engineering industries mostly geared towards the production of constructional products, secondary capital goods e.g. pumps, agricultural machinery etc., consumer products, and selected spare parts. There was no policy of the previous government to manufacture engineering primary capital goods, e.g. machine tools, metal cutting tools, prime movers, electrical generators, and indigenous manufacture of commercial transport equipment;

- basic foundry and forging industries have developed in the industrial sector without any institutional facilities which may be required for their future upgrading interms of modern technology development etc.
- at present there is no national design and development institutions which could have rendered valuable service to engineering industries;
- most of the engineering industries are with the private sector and the previous government did very little to upgrade their activities;
- the engineering industries are still heavily dependent on South Africa for the procurement of essential raw materials, consumeable tools, and other primary ingridients at factory level.
- although in the country Ferro chrome is produced by Anglo American Group and Ferro Manganese by Nimer and Chapman, the ZISCO does not produce the full range of alloy steel for engineering industries;
- small-scale and rural metalworking industries had been totally neglected by the previous government. The present Government has given top priority to the small-scale and rural industries development;
- at present there are hardly any engineering and technical personnel in the Ministries of Industry, Agriculture, Transport and Economic Planning. This is the reason why the engineering industries development has been extremely unbalanced, and the development of primary capital goods were totally neglected.

## Institutions Responsible for the Engineering Industries Development

The Ministry of Industry and Energy Development is primarily responsible for the development of engineering industries in Zimbabwe. The following are the Governmental and Non-governmental institutions responsible for the promotion of engineering industries:

- Industrial Development Corporation
- Industrial Finance Corporations Ltd.
- Confederation of Zimbabwe Industries
- Association of Chamber of Commerce of Zimbabwe
- Institute of Personnel Management
- Institute of Foundryman
- Small Industries Advisory Service
- Institute of Agricultural Engineering

## Engineering Repair and Maintenance Facilities

Most of the engineering industries have their own repair and maintenance facilities. The repair and maintenance facilities of large industries in many occasions are sub-contracted to smaller units. Mining, Railway and Transport have their own repair and maintenance facilities. In fact the repair and maintenance facilities are excellent in Zimbabwe.. The private company like RESCCO Bulawayo completely overhauls and repairs the scrapped steam locomotives at reasonable cost. The Railways Workshop in Bulawayo not only maintains its rolling stock but also manufactures wide range of railway parts and components. There is a heavy sub-contracting arrangements with the smaller engineering workshops at all levels of engineering activities in Zimbabwe.

Institutions for Small-Scale Industries

There is a Small-Scale Advisory Service instituted by the Government. Recently the Government has requested UNDP for the promotion of small-scale and rural industries through a project which will be executed by UNIDO.

Zimbabwe has ample scope for small-scale industries development. In fact the majority of the metalworking industries are in the small-scale sector. The ECA/UNIDO mission has recommended government to set up a Commission for small-scale industries. The small-scale industries development in Zimbabwe needs the following institutional arrangement:

- Institutional arrangement to form a Small-Scale Industries Development Centres SIDO in each districts(it is necessary to study the experiences of Kenya, Tanzania, Zambia and India). The primary function of SIDO will be:
  - (i) Advising prospective entrepreneurs on setting up new small-scale enterprises, choice of machinery, design, fabrication, layout installation and operation of machines;
  - (ii) Conducting economic surveys
  - (iii) Advising small units on improved technical processes and demonstrating modern technical processes through Extension Services Centres;
  - (iv) Establishing contacts with important whole sale and retail dealers;
  - (v) Acting as an Information Centre for engineering, technological and commercial information
  - (vi) Training of small industrialists and artisans for effective running of small-scale industries
- Under the Ministry of Industry and Energy Development, it is necessary to form a National Small-Scale Industries Corporation . Such a corporation will be the real focal point of all small-scale and rural industries development in Zimbabwe. The SIDO's will be under the National Small-Scale Industries Corporation
- Registration of all small-scale and rural industries in Zimbabwe
- Creation of financial assistance through all the financial institutions for loans by the Government credit guarantee scheme etc. Every private and public bank must have a section for small-scale industries promotion;
- Providing scarce raw materials to small-scale industries through bulk purchase scheme;
- Supply of machinery and equipment to small-scale industries on hire-purchase schemes;
- creation of a National Centre for Engineering Design and Manufacturing under the Ministry of Industry and Energy Development, in order to provide technical facilities to small scale industries (prototype development training centre)

- Industrial Management & Technical Training facilities which would offer
  - (i) Appreciation courses
  - (ii) Specialized courses;
  - (iii) Ad-hoc courses;
  - (iv) Technical Training Programme
  - (v) Mobile Workshops;
  - (vi) Study cum observation visits.
- Management consultancy services;
- Government stores purchase programme where government will give priority to procure products from small-scale industries.
- Creation of marketing facilities for small-scale industries
- Special incentive schemes for backward areas;
- Creation of Industrial Estates in the rural sector and market towns;
- Creation of an export house;
- Ancillary industries development.

Institutions Responsible for the Development of Agricultural Machinery and Implements in Zimbabwe

The Institute of Agricultural Engineering under the Ministry of Agriculture is primarily responsible for the development of agricultural machinery and implements in Zimbabwe.

The Hatecliffe Agricultural Institute at Domboshawa has engineering workshops, farm machinery training and testing centre and a large experimental farm. The Institute works in close co-ordination with large agricultural machinery industries in Salisbury and Bulawayo. The Institute has produced wide range of agricultural implement prototype and farm tested. The local industries has also participated in the development of agricultural machinery in Zimbabwe.

Foundry(ferrous and non-ferrous) Industries in Zimbabwe

Zimbabwe among all ECA/OAU member States has the largest number of foundries. The following are the ferrous and non-ferrous foundry industries in Zimbabwe:

| | |
|---|---|
| - Clemision Plaskeet Bulawayo | -Electric arc furnace 5 ton/hour<br>-Electric arc furnace 2 ton/hour for steel castings. |
| - Rhodisian Metal Products Bulawayo | -Cupola 1½ ton/hour grey cast iron. |
| - ABJ Engineering Bulawayo | -Cupola 1½ ton/hour<br>-Cupola 2 ton/hour grey cast iron |
| - Bulawayo Castings Bulawayo | -Cupola 1½ ton/hour grey cast iron |

| | |
|---|---|
| - F. Issels & Sons<br>Bulawayo | -Cupola 3 tons/hour<br>-Induction ½ ton/hour<br>-Arc furnace 3-5 tons/hour<br>grey cast iron and steel |
| - Connellys<br>Bulawayo | -Induction furnace 15 tons/hour<br>-4 number cupola 16 tons/hour<br>grey cast iron<br>S.G. iron<br>malleable castings |
| - Nimar & Chappan<br>Bulawayo | -Cupola 5-6 tons/hour<br>-Electric arc furnace 5 tons/hour<br>grey cast iron and steel casting<br>also produces ferro manganese |
| - Busmetals Ltd.<br>Bulawayo | -Cupola 1½ ton/hour<br>grey cast iron |
| - All Metal Foundry<br>Bulawayo | -Cupola 2 number 3 tons/hour<br>grey cast iron |
| - Railway Workshop<br>Bulawayo | -Cupola 3 tons/hour<br>grey cast iron |
| - FIELD<br>Salisbury | -Cupola 3 tons/hour<br>grey cast iron |
| - Non-ferrous Metal Wroks,<br>Salisbury | Figures not available |
| - Industrial Platers<br>Salisbury | Figures not available |
| - Craster Engineering(Pvt)Ltd.<br>Salisbury | Figures not available |
| - Toolmaking and Die Casting(Pvt)Ltd.<br>Salisbury | Figures not available |
| - Pioneer Engineering(Pvt)Ltd.<br>Salisbury | Figures not avaliabl |
| - Mashonaland Mall Iron(Pvt)Ltd.<br>Salisbury | Figures not available |
| - 4-J's Engineering(Pvt)Ltd.<br>Salisbury | Figures not available |
| - Clarson(Pvt)Ltd.<br>Salisbury | Figures not available |
| - Dorr and Pitt(Pvt)Ltd.<br>Salisbury | Figures not available |
| - Metal Sales<br>Salisbury | -Cupola 3 tons/hour<br>167 tons/month<br>grey cast iron |
| - Fluid<br>Salisbury | Figures not available |

| | |
|---|---|
| - Standard Association<br>C.A. Ltd.<br>Salisbury | Figures not available |
| - Concorde Investment<br>Salisbury | -Foundry equipment manufacturer |
| - Tinto Industries<br>Salisbury | -Electric arc furnace 3 tons/hour<br>-Cupola 1 ton/hour<br>steel casting<br>grey cast iron |
| - Die and Pressure Die Castings<br>Salisbury | Figures not available |
| - METCAST<br>Salisbury | -Cupola 2 tons/hour<br>140 tons/month<br>grey cast iron |
| - Stainless Steel Casting<br>Salisbury | 5 tons/month<br>Stainless steel |
| - Non-ferrous Die Castings<br>Morton | 8 tons/month<br>brass |
| - Clarson & Co.<br>Salisbury | Figures not available |
| - Aut. Elect. Production Co.<br>Salisbury | Figures not available |
| - NEVES Foundry<br>Salisbury | Figures not available |
| - J. Mcmeekan<br>Salisbury | 2 number cupola 1½ ton/hour<br>grey cast iron<br>S.G. iron |
| - Marandeellas Foundry &<br>Manufacturing Ltd.<br>Marandeellas | 2 number cupola 1½ and 2 tons/hour<br>grey cast iron |
| - Capital Tea & Coffe Co.<br>(C.A) (Pvt) Ltd.<br>Marandeellas | -Cupola 1½ tons/hour<br>grey cast iron |

N.B.(i) About 50% of these foundries have facilities for brass and aluminium castings.

(ii) There are about 10 or 15 other small foundries.

## Major Tool Rooms in Zimbabwe

In Zimbabwe the majority of large and medium size industries have certain tool room facilities at the factory level. However, the country is heavily dependent on import of special tools and large tools from abroad in general and from South Africa in particular. The country has no jig boring or jig grinding machine although the industrial activities particularly the engineering industries activities have developed enormously. As regards tool room facilities, Zimbabwe faces the following problems:

- non-availability of standard parts for jigs, tools and fixtures.
- jigs, tools and fixtures are manufactured with non-standard parts which increases the cost of tools.
- mould and die manufacturers do not have adequate facilities; for instance there is no duplex die-sinking machine which can simultaneously develop male and female dies in one loading;
- precision thread grinding and threal milling facilities are not available.
- there are no facilities for standard and non standard gauge and gauge tool manufacture.

In view of these facts, the ECA/UNIDO mission requested the Government of Zimbabwe to establish a large Central Tool Room in order to cater to the growing needs of local industries. The mission exhaustively discussed the establishment of such a tool room with Government Officials and the Directors of selected industries in Zimbabwe. The response from the industries is excellent. In fact the Metal Box(CA)Ltd., has shown considerable interest with Industrial Development Corporation to establish such participate in this venture. Metal Box has already supplied a detailed list of machinery which are in existance in their factories and which can be utilised if the Central Tool Room is established in the near future with their participation. The machinery and equipment available from the Metal Box(CA)Ltd. are as follows: erosion machine.die sinking machine precision lathe,precision milling machine;pentagraph machine,Colchester 1600 lathe,Voest lathe.Harrison lathe,precision milling machine universal milling machine.precision shaper universal grinder,Jones & Shipman grinder clarkson tool and cutter grinder.automatic band saw 3A pedestal drilling machine, heat treatment furnace. The mission has also identified the special precision machines which are required and not available in Zimbabwe. (Refer Project Proposal No.1 item 'F' of Section V of this report).

## Existing facilities for Engineering Manpower Development in Zimbabwe

There is acute shortage of engineering skills due to the exodus of the minority population in Zimbabwe. The main shortages in the engineering skills are as follows:

- lack of middle management engineers e.g. production engineers, methods engineers, industrial engineers, quality control engineers, design engineers etc.
- lack of engineering manpower at the supervisory level;
- lack of skilled manpower at the operative level e.g. turners, borers, millers, welders, maintenance operatives, fitters etc.
- lack of skilled manpower at the commercial level e.g. technical sales and marketing engineers, valuers, etc.

The Zimbabwe training programme for technical manpower development is based on following methods:

- artisans and technician training programme in industry and in technical colleges;
- railways and central mechanical equipment department training programme at technician level;
- apprenticeship scheme for the diploma and graduate degree holders in industry;
- training programme abroad.

It is estimated that about 5,000 to 10,000 engineering skilled operatives are required in Zimbabwe for immediate absorption in industries.

The ECA/UNIDO mission suggested to the Government of Zimbabwe to over-programme the training activities within the educational and industrial institutions and establishments. The best effort will be to give directive to all engineering establishments to over-programme their intake of apprentices for at least five years to come.

## E. MAJOR CONSTRAINTS IN ENGINEERING INDUSTRIES IN ZIMBABWE

The engineering and allied metal working industries are in the private sector in Zimbabwe. Major industrial and engineering activities are located in Bulawayo, the second largest city after the capital, Salisbury. The metal and engineering industries are contributing maximum to the GNP. The following are the major constraints:

### (a) Constraints at the Institutional Level:

- The Ministry of Industry and Energy, Ministry of Economic Planning and Development and the Ministry of Commerce and Trade and Industrial Development Corporation lack technical manpower e.g. engineers industrial engineers, engineering project analysts, etc. This is the reason why the industrial problems particularly engineering industries problems are not being appropriately diagnosed by these organizations;
- The development guidelines for the engineering industries never existed during the regime of the previous Government. In reality what has happened is that the engineering industries during the sanctions period started producing goods and services within the private sector with obsolescent machinery and equipment. It is astonishing that many complicated types of machinery and equipment were produced by the private sector industries. The role of small scale and medium size private sector industries has never been identified. This has created major constraints in technology selections at the factory level.

- There is no small-scale institutional development aspects in Zimbabwe. The present Government has given top priority for the development of small-scale and rural industries. Previous Government has totally neglected the small-scale sector;

- Although metalworking industries have developed considerably in Zimbabwe, there is no institutional support for the industrial design and development aspects;

- There is a lack of interministerial co-ordination among the ministries. This has created considerable gaps in the policy implementation and promotion of engineering industry sector;

- Licencing policy for the import of equipment facilities for the engineering industries is totally inadequate. In fact, during the previous regime, the importers and stockists were given more privileges than the actual manufacturers. This is the reason why the importers are endeavouring to monopolise the markets and charging high prices wherever they can;

- Against export of engineering products the local manufacturing companies enjoyed negligible incentive which was not proportionate to their exports. In fact, the net gainer of foreign exchange earnings were the local importers and stockists who have contributed very little to export of national products and obtained maximum import licences during the time of previous regime. There is no positive export and import strategies so far as the balancing of foreign exchange distributing is concerned. The Government will have to look into this problem more critically (see recommendations);

- It is observed that during the previous regime there was no inter-ministrial co-operation and co-ordination within the framewrok of a positive industrial policy and strategy including policy concerning foreign investment. The present Government has inherited this

(b) <u>Constraints at Engineering and Technological Level</u>:

- Non availability of consumable tools e.g. drills, reamers, taps, etc.; the country heavily depends on South Africa and European countries to procure these essential engineering commodities. The delivery time in many cases is 6 to 8 months. South African prices of these tools through local importers are exorbitantly high. In many cases the importers are importing items which are not essentially required for the engineering industries. Although the country is earning foreign exchange by the sweat of the engineering industries exports, many engineering industries do not have even essential tools to carry out their day to day productions;

- The local importers are charging Z$5,000 per tonne of die and tool steel. This is a prohibitive price. It is worthwhile to mention that the mild steel price is only about Z$350 per tonne. In majority of cases the companies cannot get their appropriate tool material. (Z$0.70 = US$1.00)

Shortage of appropriate raw materials. Many industries particularly the agricultural hand tools manufacture are using EN 43 grade from TISCO whereas they should have used hardening and tempering quality carbon steel. BS 1970 part 2 1970 GR 3;

- Lack of appropriate technologies in engineering processes particularly in the non-ferrous industries.

- Lack of adequate tool room facilities for the manufacture of precision dies, moulds jigs and fixtures. etc a few selected industries do have limited facilities in this important engineering back up support. For instance this country with such a high level of engineering activities does not have even a precision jig-boring machine or a duplex die sinking machine. The country is heavily depending on South Africa for special tools and dies

- Lack of hot stamping and die casting facilities in many industries the products which could be produced by hot stamping and die cast method at a cheaper price are being produced by ordinary casting and conventional machining process

- Lack of design facilities limiting appropriate adaptation of foreign products the appropriate facilities for the jig, tools and fixture design exist only in very few companies.

- Lack of facilities for obtaining engineering and technological advisory services in the following fields.

  1. product identification and evaluation of market sizes
  2. preparation of techno-economic engineering studies
  3. industrial and manufacturing processes in engineering industries
  4. appropriate choice and selection of machinery and equipment.
  5. appropriate management techniques for engineering industries
  6. marketing of products.
  7. information on subregional markets and products being manufactured in the subregion.

(c) Constraints at the Manpower Level

In addition to what has been described in page 27 the following are the major constraints:

- Lack of technical managers and higher supervisors
- Lack of engineers particularly in the field of industrial engineering (workstudy, work measurement, method study)
- Lack of engineering designers in product design and tool design
- Lack of process planners.
- Lack of skilled operatives e.g. turners, millers, shapers fitters (precision), tool room operators, etc. (general machinists);

- Lack of qualified marketing personnel

- Lack of comprehensive training programmes at engineering industry level. (The existing technical colleges are understaffed).

## F. IDENTIFICATION OF IMMEDIATE PROJECTS FOR THE ENGINEERING INDUSTRIES

### At National Level

The following are the major engineering projects and proposals for implementation.

### I. PROJECT FOR LONG-TERM ASSISTANCE

### Project Proposal No. 1

### Establishment of large central tool room with existing private industries

(UNIDO has already submitted a project document under the title "Establishment of Tool, Die, Jigs, Fixture Production Centre with a specialised engineering service unit". Duration 4 years 9 months, UNDP inputs US$2,973 million.)

Proposal is excellent and the present mission recommends the following deviation for consideration:

Inter-linked Project: Government should request UNIDO/UNDP to assist in setting up of an alloy steel unit with ZISCO (3 to 5 TM induction furnace to produce tool steel, HSS, die steel, etc.

The following company and institution wart to mobilise their resources, e.g.

- Metal Box Central Africa Limited *
- Industrial Development Corporation*

Industrial Development Corporation wishes to participate with an investment of Z$2 million. Metal Box Central Africa Limited wishes to participate with their existing tool room machinery and equipment and additional investment. 52 m x 20 m = 1040 sq.m. with extension facilities available within Metal Box in Salisbury. The factory is empty and ready with electricity and water.

Reaction from Industries: More or less all the industries visited by the mission wanted such a tool room.

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* Both establishments require a feasibility study.

Viability: It is suggested that the tool room be established and run by the private industries. As the operation of a tool room is highly capital intensive, it would be better that the management of the tool room should be in the hands of a few private industries with a Government nominee/representative on its Board. The tool room will have to run as a commercial enterprise.

Products to be manufactured and training:

- Jigs and fixtures up to 500 kg weight single piece;
- Moulds and dies of up to 200 kg weight per piece;
- Gauges 10,000 piece/uear;
- Manufacture of small measuring equipment - 10,000 per year.
- Tools and special tools - 20,000 pieces/year;
- Press tools - 100 kg per single piece;
- Precision spare-parts
- Existing tool grinding and maintenance for all industries.
- Training of highly skilled operatives as tool makers - 50 per year (Duration of training 4/5 years)

Maximum Accuracy of the Tool room: The tool room will be geared for precision work up to 0.0002 inch and surface finish up to 0.2 micro inches (equivalent mm standard).

Proposed UNIDO/UNDP Contribution of Machinery and Equipment. The following precision machinery and equipment can be included in the project document:

- Jig boring machine, accuracy up to 0.0002 inch.,
- Precision universal grinding machine;
- Tool room duplex die sinking machine with electro hydraulic tracer control;
- Precision universal milling machine with optical dividing head.
- High precision gauge grinding machine;
- Precision universal broach sharpening machine;
- Universal tool and grinding machine.
- Numerically controlled turret type drilling and tapping machine;
- Large spark erosion machine.
- Horizontal high precisional optical comparator;
- Tool maker's microscope.
- Slip gauges and precision measuring instruments,
- Induction Furnace
- Gas Carburizing Furnace
- Gear hobber and gear shaver

Mobilisation of existing precision tool room machinery: List has been supplied by the Metal Box Company, Salisbury.

Investment Requirement:

- Factory site and cost of factory - private industry (cost to be estimated);
- Existing machinery and equipment - private industries (value to be estimated).
- Machinery not available as listed above - UNDP/UNIDO (US$ 1.5 million) + the contribution from Industrial Development Corporation
- Expert assistance including training (international staff) - UNDP/UNIDO (US$ 1.0 million);
- Industrial Development Corproation - (Z$ 2 million)
- Proposed UNIDO/UNDP contribution - (US$ 2.5 million). UNIDO to be the executing agency.

Special Considerations:

(a) If the cost of machinery as listed above exceeds US$ 1.5 million, the participating companies as well as I.D.C. will have to share the difference, apart from pledging their existing machinery.

(b) The tool room should undertake jobs from all industries in Zimbabwe;

(c) Inter-company Board of Directors to be established with a permanent adviser from Tool making and Engineering Company (Pvt.)Ltd., Bulawayo.

(d) If premises are available in Bulawayo, priority of estalbishing the unit should be given to Bulawayo;

(e) A Government representative should be on the Board of Directors;

(f) Tool room should also be devoted to training local tool makers for industries;

(g) Preparation of a feasibility study.

Special NOte: The tool room should be established with Indian experience, e.g. Madras Tool room, Bangalore Tool room. A delegation should be sent to India prior to the installation of the project. These tool rooms were established by UNIDO assistance.

Project Proposal No. 2

Integrated and Inter-linked Project for the Design and Manufacture of Agricultural Animal Drawn Implements in existing two companies in Bulawayo

UNIDO has already submitted a project document titled "Centre for Development and Manufacture of Agricultural Tools, Implements and Machinery", US$ 3.120 million, duration 5 years.

The proposal needs to be modified and the project should be directed towards upgrading the two existing private industries in Bulawayo devoted to the manufacture of animal drawn implements. Final Act of Lagos has given top priority to agricultural implements manufacture in African region. Food Import Bill in African region has touched US$ 20 billion in 1980/81. Today Zimbabwe is the largest manufacturer of animal drawn implements amongst the ECA Member States.

Existing Activities in the two companies in Bulawayo:

- British Metal Corporation
- Zimplow Ltd. (both located in Bulawayo)

The companies are manufacturing animal drawn ploughs, harrows, cultivaters, planters etc. including hand tools. The two companies together produce about 80,000 to 90,000 of all types of animal drawn implements. This includes sizeable export to neighbouring countries.

Sub-regional Demand for Animal Drawn Implements: In addition to the growing demand by the farmers at the national level, there exists a sizeable market in Eastern and Southern African countries for the animal drawn implements. If the technical assistance is extended to these two companies, it is expected that the production of animal drawn implements can be increased to 150,000 to 160,000 units per year with increased export for foreign exchange earning.

Existing Prices: The manufacturing costs and selling prices of the existing implements manufactured in Bulawayo are half and even one-third of the prices marketed by South Africa in Botswana, Malawi and neighbouring countries. With the proposed technical assistance from UNIDO/UNDP, the product prices can even be lowered for the farmers to buy low cost implements.

Inter-linked Projects: Project Proposal 1,3

Reaction from Existing Industries: The two local industries are very keen to expand their activities. In fact, most of the machinery and equipment are fully utilised and majority of the machinery are 20 to 40 years old. Apart from expert assistance, it is highly recommended that the UNIDO/UNDP project should include funds for the replacemnt of some of the existing machinery. There is an urgent requirement of dies and tools.

Objective of the Projects:

(a) To rationalise and upgrade the existing facilities within the two companies;

(b) Increased production of animal drawn implements;

(c) Development and manufacture prototype implements with improved local design through greater R&D facilities;

(d) Future manufacture of selected power operated implements;

(e) Comprehensive in-plant training programmes for higher, and middle management and skilled operatives within the factories.

Special Note: Lagos Plan of Action has urged the African Governments to increase the agricultural inputs for greater food production. Agricultural implements are important inputs to farm mechanisation. So this project will have to be a priority project for the Government of Zimbabwe.

Project Proposal No. 3

Auxiliary Industry Support

Local Manufacture of Tool Steel, Die Steel, High Speed Steel, High Carbon Steel for Existing Industries

UNIDO has already submitted the project proposal for a Model Foundry/Forge Unit for Rural Regional Development, duration 3 years, cost US$ 2,434,700.

There are about 20-25 large and medium size foundries in Zimbabwe and the foundry production of Zimbabwe is highest throughout Eastern and Southern African region. What is required immediately is to install a small plant with ZISCO to manufacture the following quality of special steels which are urgently required by the industries.

Special Steels Required

(a) Hardening and tempering quality carbon steel sections B.S. 970 Part 2, 1970 Gcr 8

(b) Carbon Tool Steel B.S. 970 Part 1 1972 Gcr 3

(c) Case hardening quality carbon sulphur steel B.S. 970 Part 3, 1971 Gcr 8

(d) High speed steel, HSS - 18-4-1-0.6

(e) Other grades of alloy steels needed by the industry.

Capacity: Initial capacity of the plant should be 3-5 tonnes/charge with high frequency induction furnace.

Material: Fe Cr and Fe Mn are manufactured within the country by Anglo American Group and are mostly exported. Zisco manufacture EN 43 spring steel and EN 8 as far as high carbon steels are concerned.

Demand: The initial demand for the alloy steel will be about 2,000 tonnes per annum.

Location: The plant must be located within the existing ZISCO complex and existing infrastructure should be fully utilised, including the roller mill facilities.

UNIDO/UNDP Assistance

(a) Expert Assistance - (US$ 300,000)

(b) Machinery and equipment - (US$ 1,000,000)

(c) Training - (US$ 200,000)

Total cost of the project - US$ 1.5 million (UNIDO will be the Executing Agency)

Special Note: The project must be with ZISCO's activity
The location of the plant should be inside ZISCO
The present metallurgical facilities should be extended to this unit
The present roller mill facilities will be utilised
The sections required will be in square and round up to 100 mm
A project document is required to be prepared by UNIDO.

Project Proposal No. 4

Local Small Tools Manufacturing Plant for Drills, Reamers, Taps, Dies etc.

At present the Eastern, Southern and Central African sub-region, consisting of over 24 countries, does not manufacture any consumable small tools like high speed steel (HSS), drills, reamers, taps, single point cutting tools, dies, etc.

In Zimbabwe the contribution of metal and engineering industries to GDP is the highest. Therefore, considering the high level of engineering activities within the industries, it is essential that the Government encourage the existing industries to expand their activities for the manufacture of small tools within the country.

Prerequisite

- It is essential that the existing industries should undertake such project with a foreign collaborator on a joint venture basis. Such collaboration can be obtained from countries e.g. India, Korea, Brazil etc.
- The production initially should be on minimum volume basis as was the case in India during the 1950's. The company which used to produce these types of products was Addision Tools Ltd., Mount Road, Madras, India with technical collaboration from U.K.

Present Situation: There is an acute shortage of twist drills, milling cutters, taps, dies, reamers, etc. in all the industries visited by the mission. Some of the industries are waiting for tools even up to 6 to 8 months. There is considerable dependancy on South Africa. South African prices for tools are very high. Delivery of imported tools from Europe take a long time. This is one of the major constraints of the industries in Zimbabwe today.

Products to be manufactured

(a) HSS - twist drills for standard and tap sizes (BS 328 and 328(A) Part 1, 1959 M + I Gr 8, Part 2, 1972 Gr 4) - 300,000 per year.

(b) HSS core drills - 10,000 per year.

(c) HSS - Reamers. BS 122, Part 2. 1964, M + I Gr 7 - 50, per year.

(d) Single point cutting tools - BS 1296, Part 1, 1970, M Gr 2, Part 2, 1972, M Gr 3, Part 3, 1972, M Gr 4.

(e) HSS - End mills, BS 122, Part 1, 1953, Gr 8 - 10,000 per year.

(f) HSS - Slot drills, BS 328, Part 2, 1972, Gr 4 - 10,000 per year.

(g) HSS 'T' slot cutters, BS 1974, M Gr 7 - 10,000 per year.

(h) HSS - Plain mills, BS 1974, M Gr 7 - 2,000 per year

(i) HSS - Side and face cutters, BS 1974, M Gr 7 - 2,000 per year

(j) HSS - Shell end cutters, BS 1974, M Gr 7 - 2,000 per year.

(k) HSS - Face mills, BS 1974, M Gr 7 - 2,000 per year.

(l) Assorted gear cutters, BS 436. BS 978, Part 5, 1965. Gr 7 - 1,000 per year.

(m) HSS - Slitting from 200 mm to 500 mm - 2,000 per year.

(n) HSS Hand taps and machine taps, BS 949, Part 1, 1976, M Cr 8, Part 4, 1969 M + I Gr 8 - 5,000 sets.

(o) Woodworking tools - 40,000 per year.

(p) HSS Veneer knives - 20,000 per year.

(q) HSS Circular saws, BS 411, 1969, M Gr 5 - 10,000 per year

(r) HSS Die sets - 5,000 per year.

Technology Requirement

- Material tool steels and high speed steel rounds and squares
- Turning, milling, shaping and threading
- Heat treatment and tempering
- Grinding, lapping, etc.
- High level quality control

Companies interested to manufacture in Zimbabwe

1. Temper Tools Ltd., O P.O. Box 8280, Bulawayo (already manufacturing files and rasps).
2. United Soring and Forging (Pvt.)Ltd., P.O. Box 8024, Bulawayo (already involved in heat treatment of alloy steel).

Interacting Project: Proposal 3 - manufacture of local tool steels and 1 - Central Tool Room.

Proposed UNIDO/UNDP Assistance

First Phase: Market survey, techno-economic analysis, selection of appropriate technology, selection of joint venture partner (based on Indian type), feasibility study, etc.
6 m/m - US$ 40,000.

Second Phase: Expert assistance for 4 years with 4 top experts
Total 192 m/m - US$ 1.0 million
UNIDO will be the Executing Agency
Experts assistance will be to train operatives and commissioning of the project including the manufacturing of products.

Commitments of the Company and the Collaborator

1. Investment of plant and machinery
2. Investment of factory and building including infrastructure
3. Provision of working capital.

It is strongly recommended that the Government of Zimbabwe may seriously consider such project within the private sector.

Project Proposal No.5

Assistance in setting up of Railway Training Centre in Bulawayo

Currently the Railway intends to setting up of a training centre in Bulawayo. The mission was told that the British Government will assist in setting up this project.

It is recommended that UNIDO/UNDP provide technical expert assistance in order to increase the number of intake per year. It is also suggested that the Government of Zimbabwe may approach countries like Government of India for additional machinery and equipment and expert assistance required for such a project. The Indian Railways in currently assisting a number of African countries.

The mission suggests that the Railway Training Programme should be over-programmed to train local skilled operatives in the region of 500 per year to cater for the needs of existing industries, particularly turners. fitters, millers, borers, shapers, etc.

Estimated contribution of UNIDO/UNDP for expert assistance - US$ 500,000.

Project Proposal No. 6

Establishment of a "National Centre for Engineering Design and Manufacturing"

The project will be designed like the African Regional Centre for the Engineering Design and Manufacturing (ARCEDEM) in Ibadan, Nigeria. The objective of the project will be:

- to liase closely with ARCEDEM in Nigeria;
- to improve the design capabilities for local industries;
- to assist in manufacturing product design and prototype manufacture;
- to set up an R&D activities for engineering and allied metal working industries product development;
- to introduce a data bank for collection and dissemination of engineering process, planning, products, manufacturing technology, choice of appropriate plant and machinery, introduction of production and process standards, supply of project of profiles, assessment of feasibility studies etc.
- to train high management and middle managment engineers including the specialize operatives;
- to promote inter-linkages within the industries.

Total Project cost: US$ 2,000,000
Executing Agency : United Nations Industrial Development Organization
Government Counterpart Agency: Ministry of Industry and Energy Development

**Project Proposal No. 7**

**Assistance to set up a technical advisory team in Ministry of Industry and Energy Development**

Due to lack of technical and engineering personnel within the Ministry of Industry and Energy, it is difficult for the Ministry to diagnose the industrial problems, particularly from the engineering and metalworking sector.

The proposed project will be to assist the Ministry in the following fields:

- monitoring of the engineering industries;
- render engineering guidance to the industries in order to achieve greater sub-contracting arrangement;
- advise the Ministry in terms of import substitution projects;
- advise the Ministry on the replacement machinery and equipment;
- assisting the industries in the preparation of engineering buyer guide for export promotion;
- advise the Ministry on import licences;
- advise the interacting Ministries for the development of the engineering sector;
- advise on the assessment of projects and feasibility study;
- rationalize the import licensing of capital goods and consumable tools for the industries;
- advise on the manpower development programme for the engineering industries;
- design the policy guidelines and implementation systems for the Ministry of Industry and Energy.

The Engineering Industries Advisory Team (EIAT) should be composed of following disciplines:

- Industrial Engineer Adviser - 48 m/m (Mechanical & Electrical)
- Mechanical Engineer Adviser - 60 m/m specialized in foundry, forging, heat treatment, tool room, etc.
- Industrial Planning Implementation Adviser - 36 mm (considerable experience in industrial planning and policy implementation).

Total Project cost: US$ 750,000
Executing Agency: United Nations Industrial Development Organisation (UNIDO)
Government Counterpart Agency: Ministry of Industry & Energy Development.

Special Considerations and Pre-requisites:

- Government of Zimbabwe through the Public Service Commission should recruit at least 6 engineering and technical officers as counterparts of the international staffs.
- To retain the expert ZIM/80/006 Post Industrial Planning adviser presently attached to the Ministry of Economic Planning and Development. This Adviser has already contributed to formulate the Development Plan, therefore it will be easier in future to implement the development plan, if the same adviser is retained by the Government in the above proposed project.

II. SHORT-TERM ASSISTANCE

Project Proposal No. 8

Technical Assistance and the Preparation of Feasibility Study for the Manufacture of Vertical Diesel Engine

Company: Precision Grinders Limited, Salisbury

The company has excellent foundry and machinery and equipment. It has already started to manufacture S.G. Iron Crankshaft.

Duration - 4 mm - US$ 25,000 (UNIDO)

Project Proposal No. 9

Technical Assistance for Improved Hot Stamping of Non-ferrous Products

Company: RHOBOLTS, Bulawayo

The company is, at present, producing various brass/aluminium parts by general machining. Through this assistance the company will be able to produce parts at cheaper price. Feasibility study will be required.

Duration - 4 mm - US$ 25,000 (UNIDO)

Project Proposal No. 10

Technical Assistance for the Manufacture of Wheel and Axles (Railway and Mines)

Company: Central African Forge Limited, Norton

The company wants to manufacture forged axles and is already in touch with National Railway Workshop, Bulawayo and O. Conolly & Co. Bulawayo on this project. It is suggested that the wheels and axles should be manufactured by one company. Feasibility study required, including the upgrading of the existing company in Norton.

Duration - 6 mm - US$ 35,000

Project Proposal No.11

Technical Assistance for the Upgrading and Rationalisation of Existing Brass Casting Factories including Product Development

The following companies, e.g.

(a) Non-Ferrous Die Casting, Norton
(b) Crown Brass, Salisbury

require the upgrading and diversification of their existing product lines, including product development, design and manufacture.

Duration - 4 mm - US$ 25,000 (UNIDO)

Project Proposal No. 12

Technical Assistance for Development and Manufacture of Livestock Handling Equipment, including Product Diversification

BERPET (Private) Limited, Marandellas, is at present manufacturing livestock handling equipment. It is suggested that this company manufactures the following product lines:

- Small poultry feeding equipment for farmers
- One tonne grain silos for farmers
- Bio-gas generators (Indian type)

The company requires product design, market survey and physical manufacturing development. Very little additional machinery and equipment required.

Duration - 4 mm - US$ 25,000 (UNIDO)

Project Proposal No. 13

Assistance to prepare Feasibility Study and Promotion of Joint Venture Project for O. Conolly & Co. Limited, Bulawayo, for the Manufacture of Selected Machine Tools

O. Conolly & Co. has the largest foundry in Bulawayo, with a capacity of 14 tonnes steel casting and 10 tonne cast iron, including S.G. Iron and Malleable Castings. The company has also a large machine shop. It is suggested that with existing 40% unutilized capacity in foundry the company may consider the manufacture of selected machine tools, e.g. lathes, drilling machine etc.

The company needs assistance to prepare feasibility study and to secure a joint venture project.

Duration - 6 mm - US$ 35,000 (UNIDO)

Project Proposal No. 14

Assistance to Local Development of Automotive Parts in Zimbabwe

It is essential that the existing companies in Zimbabwe manufacture local auto-parts in order to create employment and save foreign exchange for the country.

It is essential that a short-term project be established to identify the appropriate local manufacture of automotive and transport parts within the existing engineering activities. The present mission observed that a number of engineering industries want to manufacture such products.

The project should be within Ministry of Industry and Energy.

Duration - 6 mm - US$ 35,000

Project Proposal No. 15

Assistance for the Development of Low Cost Transport Equipment on Sub-contracting Arrangement

The low cost transport equipment is essentially required for the rural population. The model of such transport can be adapted from India, Philippines, Thailand, etc. The project requires the promotion of a joint venture arrangement with existing industries in Zimbabwe and a foreign collaborator from the countries mentioned above. The products are moneds, three-wheeled rikshas, mopted pick-up vans, etc. The company in India like BAJAJ Ltd., Bombay, manufactures similar products.

An analysis of existing enginering carabilities can be surveyed by the Ministry.

Duration - 6 mm - US$ 35,000 (UNIDO)

At Subregional Level

The following subregional projects may be promoted in Zimbabwe e.g.

- co-operation to establish a permanent set up to overhaul steam and diesel locomotives in RESCCO, Bulawayo for all the subregional countries;
- co-operation in manufacturing of railway wagons and ancillary parts with RESCCO as a focal industry.
- exchange of design and manufacturing informations for agricultural machinery and implement with Matecliffe Agricultural Institute, Domboshawa
- organizing a subregional workshop for the development of joint venture projects on foundry, forging and heat treatment with the experience of Zimbabwe.
- expansion of ZISCO for the manufacture of plates and sheets for all subregional countries;
- expansion of ZISCO for the manufacture of tool steel, die steel and special purpose steel for all subregional countries.

G. FUTURE FOLLOW UP

The following are the future follow-up to be undertaken by the Government of Zimbabwe:

- to approach UNIDO/UNDP to include the selected priority project in IPF 1983-1984;
- to submit the project proposals for bilateral or multilateral assistance from the friendly countries; the fund allocated for such assistance can be pledged to UNIDO in order to execute the projects on behalf of donor countries;
- to establish immediately the Engineering Advisory Team as indicated in the project proposal No. 7 (according to ad-hoc report No. 6).
- to request UNIDO/UNDP to prepare detailed project documents for IPF or for the submission to the bilateral assistance.

SECTION V

# COUNTRY REPORT

# OF

# THE KINGDOM OF LESOTHO

## ECA/UNIDO ENGINEERING INDUSTRY DEVELOPMENT

## FOLLOW-UP MISSION

## 8 February 1982 - 14 February 1982

## SECTION IV

## THE KINGDOM OF LESOTHO

### A. RECOMMENDATIONS

The following are the major recommendations to be followed-up by the Government of Lesotho for the development of engineering industries sub-sector:

1. It is highly recommended to establish an Engineering Industry Advisory Team within the Ministry of Trade and Industry. This Advisory Team will finally establish a Metal and Engineering Industries Development Unit within the Ministry. The present project LES/77/013 can be merged with this proposal.

2. It is recommended to establish an Inter-ministrial National Co-ordinating Committee for Metal and Engineering Industry Development in Lesotho.

3. It is recommended to organize a national workshop in the field of technological and manpower development aspects for metal and engineering industries in Lesotho.

4. It is strongly recommended to develop and implement the project proposals No.1 to No.6 identified by the ECA/UNIDO Mission in Lesotho. It is further recommended that the Central Planning and Development Office in co-operation with the Ministry of Trade and Industry, LNDC, BEDCO and NTDS may approach UNDP and UNIDO to include the priority projects in country IPF for Lesotho.

5. It is recommended that the country IPF needs to be revised for greater inclusion of engineering development projects upto 1985.

6. It is recommended that the National Manpower Development Secretariat in future should send more students for engineering industries courses (Diploma and Degree) offered through bilateral and multilateral arrangements. The students already studying in Australia, England, Ireland, West Germany, USSR, Canada, USA, Cuba and Kenya should be requested to undergo training in foundry, forging, heat treatment, machine shop, tool room etc. during 1982 to 1985.

7. It is recommended to upgrade the Lesotho polytechnic into Lesotho Technical College and to introduce specialized courses in foundry, forging, heat treatment, machine shop, tool room, industrial engineering, preventive maintenance engineering etc.

8. It is recommended to establish a National Centre for Engineering Design and Manufacturing and the Project Proposal No. 2 will be a complementary activity. Such Centre should be based on the African Regional Centre for Engineering Design and Manufacturing (ARCEDEM), Ibadan, Nigeria. It is proposed that the ARCEDEM should be contacted immediately for the planning of scuh a project in Lesotho. In future this National Centre should liase closely with ARCEDEM.

9. It is highly recommended to promote joint venture engineering projects with companies in Zimbabwe, Kenya, Zambia, for agricultural machinery industry, spare-parts manufacture and selected engineering products.

10. It is highly recommended to implement the integrated foundry complex in Lesotho as indicated in Project Proposal No. 2.

B. ORGANIZATION OF MISSION/COUNTERPART

The mission was composed of

Mr. Aloke Kumar Mitra
UNIDO REgional Adviser
ECA/UNIDO Joint Industry Divison
ECA
Addis Ababa

and was assisted by the following Government Officials:

(a) Government Counterpart

Mr. Kevin Mosololi Manyeli
Permanent Secretary
Ministry of Trade and Industry
Maseru

(b) Government Representative in Mission

Miss Mapiti Motsatse
Industrial Planning Officer
Department of Trade and Industry
Maseru

C. REPORTS ON VISITS AND MEETINGS

| | | |
|---|---|---|
| Monday, 8.2.82 | 09:00 hrs. | UNDP, Maseru |
| Monday, 8.2.82 | 15:30 hrs. | Ministry of Industry & Trade, Maseru |
| Tuesday, 9.2.82 | 08:30 hrs. | Central Planning & Development Office, Maseru |
| Tuesday, 9.2.82 | 09:40 hrs. | Lesotho National Development Corporation (LNDC), Maseru |
| Tuesday, 9.2.82 | 11:40 hrs. | Lesotho Steel Products Ltd. Maseru |
| Tuesday, 9.2.82 | 14:50 hrs. | Basotho Enterprises Development Corporation(Pty)Ltd. (BEDCO), Maseru |
| Tuesday, 9.2.82 | 16:10 hrs. | Anglo American Group Maseru |
| Wednesday, 10.2.82 | 08:30 hrs. | Lesotho Polytechnic Maseru |
| Wednesday, 10.2.82 | 11:30 hrs. | Lesotho Steel Products Maseru |
| Wednesday, 10.2.82 | 14:45 hrs. | Central Planning & Development Office, Maseru |
| Thursday, 11.2.82 | 10:00 hrs. | Tranalquip Ltd. Maputsoe |
| Thursday, 11.2.82 | 12:00 hrs. | Lesotho National Development Corporation,(LNDC),Maseru. |

| | | |
|---|---|---|
| Thursday, 11.2.82 | 14:40 hrs. | Ministry of Education, Sport & Culture. Maseru |
| Friday, 12.2.82 | 08:30 hrs. | Ministry of Agriculture Maseru |
| Friday, 12.2.82 | 10:00 hrs. | Ministry of Industry and Trade Maseru |
| Friday, 12.2.82 | 11:25 hrs. | National Manpower Development Secretariat, Maseru |
| Friday, 12.2.82 | 12:30 hrs. | UNIDO, Senior Adviser Maseru |
| Friday, 12.2.82 | 14:30 hrs. | Inter-Ministrial Meeting at Central Planning & Development Office, Maseru |
| Friday, 12.2.82 | 16:30 hrs. | Resident Representative UNDP, Maseru |

Discusstion with various Institutions Industries and Establishments in Lesotho

(a) UNDP, Maseru,(8.2.82 )

The mission visited the UNDP Office and met the Senior Programme Officer. It was told that the Government has prepared a workprogramme for the mission and the government counterpart will be the Ministry of Industry and Trade. The official mission will commence at 15:30 hours.

(b) Ministry of Industry and Trade, Maseru,(8.2.82)

The meeting was chaired by the Deputy Permanent Secretary; and was also attended by Industrial Planning and Promotion Officers(three), and UNIDO Industrial Adviser, ECA/UNIDO mission. Welcoming the mission the Chairman requested the officers of the Ministry to prepare a work programme for the mission. The mission explained the objectives of the engineering industries development programme and that particularly the objectives were directed towards the development of foundry, forging, heat treatment, machine shop, tool rooms etc. at the national and subregional levels. The Ministry assigned an Industrial Planning Officer as the Government Representative to visit the establishments and to assist the mission during its stay in Lesotho.

(c) Central Planning and Development Office, Maseru,(9.2.82)

The objective of ECA/UNDO mission was exolained to the planning officers of the Ministry. The mission was told that UNIDO has already proposed two projects e.g.

(i) UNIDO mission for the development on agricultural machinery and implements from UNIDP 1979. Project cost US$ 130,000. A feasibility study for the manufacture of agricultural implements has already been prepared by UNIDO and will be followed up by LNDC.

(ii) UNIDO has submitted a project proposal titled "techno-economic appraisal for the Establishment of a mechanical workshop and steel fabrication plant"(13.10.81) Programme 31.8.D. Under SIS.

So far Ministry has not taken any positive measures to implement these project.

(d) Lesotho National Development Corporation,(LNDC),Maseru(9.2.82)

The mission was received by the project officer of LNDC. The mission explained its objectives and rquested meeting the LNDC Director at a later stage to discuss the findings of the mission.

(e) Lesotho Steel Products (Pty)Ltd., Maseru,( 9.2.82 & 10.2.82 )

This is a structural steel plant mostly devoted to constructional activity and manufacture of doors and windows. The company has 25% LNDC share. The output of the company is 80 tons/month. The factory is equiped with fabrication machinery and equipment. The mission suggested that the company can diversify its products in the following fields with a few addition of general purpose machinery and equipment. The proposed products are:

- manufacture of wheel barrows 5,000 units/year
- manufacture of small poultry feeding equipment for small farmers (1,000 units/year)
- manufacture of grain silos (1,000 units/year) upto 1 ton capacity for small farmers;
- manufacture of animal drawn implements 5,000 units/year (It was suggested that company can negotiate with two Balawayo, Zimbabwe units for joint venture projects. The addresses of the Zimbabw company was given to this establishment).

(f) Basotho Enterprises Development Corproation(Pty)Ltd, (BEDCO), Maseru,( 9.2.82 )

The mission met the managing Director of BEDCO and explained the objective of the mission for engineering industries development in Lesotho. The BEDCO came into existance in 1975 and to date has promoted 100 small-scale manufacturing unit which includes 2 metal working industries. The main problems the institution is facing today are:

- lack of training facilities within BEDCO complex;
- product identification and techno-economic project profiles to promote small-scale industries.

The mission suggested that BEDCO should approach the National Small-Scale Industries Corporation in New Delhi, India to obtain three volumes of small-scale industries profiles prepared by the Government of India. It was also suggested that the BEDCO should establish a Small-Scale Industries Development Centre (SIDO) for the overall technical and training assistance to small-scale owner.

(g) Anglo American Group, Maseru.( 9.2.82 )

The purpose of the visit was whether the group will be interested to set up an agricultural implements manufacturing plant. The mission pointed out that UNIDO has already prepared a feasibility study. It was suggested that the LNDC should follow-up this proposal.

(h) Lesotho Polytechnic, Maseru,(10.2.82)

This is the only technical institution in Lesotho to train mechanical, electrical and civil engineers. The capacity of the polytechnic for the three disciplines are 90 studients for mechnaical engineering, 10 students for electrical engineering and 10 students for civil engineering. The present number of students are 511. During the discussion with the Director, the mission observed that very little linkage exists between central planning office and secretariat of Manpower Development with the polytechnic. The polytechnic does not have facilities to train students in foundry, forging, heat treatment technolgies. This problem was indicated by the mission during its meeting with the Ministry of Education on 11 February 1982.

(i) Central Planning and Development Office, Maseru,( 10.2.82 )

The mission was received by the Director of the office. The mission explained its objective for the engineering industry development in Lesotho. The Central Planning requested the mission to prepare three terms of references for three projects e.g.

- Establishment of an integrated foundry and machine shop/fabricating shop project;
- Establishment of an agricultural implement manufacturing plant;
- Assistance to set up engineering industry advisory team in Ministry of Industry and Trade.

The mission highlighted the fact that the Government of Lesotho may contact the Zimbabw companies for joint venture projects. The foundry industry has developed considerably in Zimbabwe and it may be possible if a delegation from Lesotho to visit Zimbabwe for future establishment of foundry project. The mission agreed to prepare the terms of references for the above mentioned projects.

(j) Tranalquip (Lesotho)(Pty)Ltd. Maputsoe,(11.2.82)

The company manufactures electrical transmission line fittings, eye bolts, shot welders made out of malleable cartings. Most of the primary castings are imported from abroad. The turnover of the company is 25 tons/week. The General Manager of the company is a metallurgist and has 25 years experience in foundry practice. The mission was told by the General Manager that the foundry project in Lesotho is a feasibile project and the requirement for cast parts will be about 1,000 tons/year.

(k) Lesotho National Development Corporation (LNDC),Maseru,(11.2.82)

The Director of LNDC welcome the mission and explained the corporation's activities. There are only five metalworking industries in Lesotho where LNDC has participated in equity shares. e.g.

- Tranalquip (Lesotho)(Pty)Ltd. - Dutch
- Domolux - RSA
- Lesotho Steel oducts(Pty)Ltd. Local
- Solevgy Systems Lesotho(Pty)Ltd. -
- T.N.E. Steel works(Pty)Ltd. - local

The mission reviewed the past projects which were promoted by LNDC. LNDC agreed that it would support the three projects identified by the mission and would sent its representative in the final inter-ministrial discussion to be held 12 February 1982.

(l) Ministry of Education, Sports and Culture, Maseru(11.2.82 )

The mission was received by the Chief Education Officer of the Ministry. The mission explained that there is an urgent need to train local citizen in the field of engineering industries manpower development. Moreover an inter-linked approach could be designed to integrate the manpower development aspects among the Polytechnic, Manpower Development Secretariate and the Ministry of Education. The Ministry requested the mission to come out with a positive proposal for future consideration.

(m) Ministry of Agriculture, Maseru,(12.2.82)

The ECA/UNIDO mission discussed with Director of the Technical Services regarding the forthcoming Regional Consultation on Agricultural Machinery Industry in Addis Ababa, 5-9 April 1982. The Ministry promised that it would send representative to this Consultation. The mission indicated that Lesotho may visit Zimbabwe and Botswana where number of prototype agricultural machinery and implements are developed by the P&D units. These implements can easily be adapted in Lesotho with minimum investment. The Ministry indicated that Lesotho has small farms, ox-drawn implements are extensively used by the farmers, and a planter modification has been carried out for improved performance.

(n) Ministry of Industry and Trade Maseru Lesotho,(12.2.82 )

Welcoming the mission the Permanent Secretary of Ministry of Industry and Trade pointed out the importance of the foundry project and manufacture of agricultural implements in Lesotho. The mission highlighted its objectives with particular reference to the Lagos Plan of Action. Being a LDC the mission pointed out that it is imperative for Lesotho Government to establish at least one integrated foundry during the Industrial Development Decade for Africa. The Permanent Secretary referred the fourthcoming Solidarity Meeting for Lesotho to be organized by UNIDO and requested whether it would be possible for the Regional Adviser to visit Lesotho again to finalize the programme of the Solidarity Meeting. The Adviser suggested that the Government should approach ECA/UNIDO Joint Industry Division for the participation of theAdviser. A list of projects was given to the mission those will be presented to the Solidarity Meeting. The mission was told that the Lesotho Government is keen to establish an integrated foundry complex.

(o) National Manpower Development Secretariat welcomed the mission and explained the activities of NMDS. The Secretariat activities are·

- to train local students abroad·
- to develop basic education
- to co-ordinate with all ministries and parastatals for manpower development·
- to conduct manpower survey.

The secretariat has recently completed its manpower survey. The mission was given a list of students who are being trained abroad. The mission examined the list and observed that the programme is rather unbalanced due to the fact that less number of students was sent abroad for engineering and technical disciplines. The mission requested the Secretariat to train more students in foundry, forging, heat treatment, machine shop and tool room practicies. This will help the Lesotho Government to utilize local capabilities in the event of establishing engineering industries project.

(p) Inter-Ministrial Meeting at Central Planning and Development Office, Maseru,(12.2.82)

The meeting was chaired by the Director of the Office and was represented by, UNDP, ECA/UNIDO mission, Ministry of Trade and Industry, Central Planning Office, LNDC, Ministry of Agriculture, MFDS and Tranalquip (Lesotho)(Pty)Ltd.,

The mission explained that there is no foundry activities in Lesotho. The term of reference drawn up by the mission was examined and it was decided that the Government of Lesotho will request UNDP/UNIDO to send a diagnostic mission for the preparation of a techno-economic study for an integrated foundry complex and machine shop.

During the examination of the terms of reference for the local manufacture of agricultural implements, the mission pointed out that UNIDO had laready prepared a feasibility study. What is required is that Government of Lesotho should promote investment opportunity and if possible to embark on a joint venture project with one of the industries in Zimbabwe. It was proposed that theGovernment of Lesotho should send a delegation to Zimbabwe to discuss the matter further with the feasibility study already prepared.

With regard to thw setting-up of the proposed Engineering Advisory Team within the Ministry of Trade and Industry, it was suggested by the ECA/UNIDO mission that the existing UNIDO Project LES/77/013 should be converted into an umbrella project which will include the proposed terms of reference prepared by the mission.

Central Planning has agreed with these proposals and promised the mission that it will follow-up all the recommendations.

(q) Resident Representative, UNDP.(12.2.32)

The mission highlighted its findings to UNDP and suggested that the three projects identified by the mission should be given top priority. The UNDP pointed out that IPF is fully committed upto 1983 end. The mission proposed that some of the country programme needs to be modified due to the fact that the Lagos Plan of Action urged the ECA/OAU member States to establish basic industries in African countries. Out of the three projects, the project titled "Establishment of Integrated Foundry and Machineshop" and Assistance to set-up Engineering Advisory Team in the Ministry of Industry are of paramount importance to the Lesotho Government. The project on Engineering Advisory Team can be brought under the existing on going project LES/77/013 as an umbrella project on a long-term basis.

The third project titled "Local Manufacture of Agricultural Machinery and Implements"requires investment promotion and implementation by the Lesotho Government and further UNIDO assistance may not be required. It is suggested that the Government may wish to submit the project proposal for bilateral implemented through UNIDO by pledging the donor's fund to UNIDO for effective implementation

The mission reitarated that UNDP may approach the Government of Lesotho in in order to promote the project proposal titled " Establishment of Integrated Foundry and Machine shop Complexes". UNDP promised that as soon as it receives the Government reaction it will inform UNIDO.

The mission thanked UNDP for its continued co-operation and extended assistance without which the mission could not have fulfilled its objective in Lesotho.

## D. EXISTING STATUS OF ENGINEERING AND ALLIED METALWORKING INDUSTRIES IN LESOTHO

The development of engineering industries is in an embryonic stage in Lesotho. The present activities in the field of engineering and allied metalworking industries highlights the following important aspects.

- There is no foundry in Lesotho. Although the company e.g. Tranalquip Lesotho (Pty)Ltd. imports 1300 tons/year cast malleable iron power-line fittings and De Beer Lesotho Mining Co. Ltd. estimated to import over 1000 tons/year cast parts still todate Lesotho does not have a foundry complex of its own
- There is also virtually no forging, heat treatment and tool room activities in Lesotho. Most of the consumeable tools required for local industries are imported from abroad
- Due to the lack of above facilities Lesotho could not establish any agricultural machinery industry, although the country has a maximum number of traditional farmers with small farm land using animal drawn implements
- There are only 10 to 12 organized metalworking industries in Lesotho, mostly engaged in fabrication and constructional work, door and window manufacture etc. The basic import of commercial steel sections are plates, sheets, pipes, rods, and pipe products. The engineering products for maintenance purposes are imported from abroad. The imports of commercial steel products are as follows:

(in metric tonnes)

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Steel bars, angles | 279 | 8 995 | 1,954 | 2,551 | 3,373 |
| Steel plates and sheets | 714 | 5.322 | 4,623 | 7.800 | 7,825 |
| Iron/steel pipes and tubes | 3,247 | 3,443 | 4 472 | 6,203 | 8,901 |
| Total | 4,240 | 17.760 | 11,049 | 16,554 | 20,099 |

In fact the Building and Construction sector has trippled its GDP in the last five years.

- the higher and middle management levels in the engineering industries are dominated by expatriate personnel including high ranking officers in the Government and parastatal organizations;
- the country is heavily dependent on South Africa for its import and trade; and a member of the Southern African Customs Union Agreement which favours South African engineering products to be marketed easily in Lesotho.

Existing Institutional Facilities for Engineering and Allied Metalworking Industries Development

There are three institutions primarily responsible for the engineering and allied metalworking industries development in Lesotho e.g.

- Ministry of Trade and Industry
- Lesotho National Development Corporation (LNDC)
- Basotho Enterprises Development Corporation (Pvt)Ltd. (BEDCO)

LNDC is primarily responsible for medium and large-scale industries development whereas BEDCO is entrusted with the promotion of small-scale and rural industries.

Engineering Repair and Maintenance in Lesotho

Lesotho has very limited facilities for engineering repair and maintenance activities e.g.

- large mechanical maintenance workshop located in the diamond mines of De Beers Lesotho Mining Co. Ltd.
- vehicle workshop of plant and vehicle pool services, Ministry of Works
- maintenance workshops of the commercial enterprises importing engineering products;
- maintenance shop of BEDCO industrial estate.

There is no manufacturing facilities for spare parts of capital maintenance.

Existing Metalworking Industries in Lesotho

The following are the major metalworking industries in Lesotho e.g.

| | |
|---|---|
| - Tranalquip(Lesotho)(Pty)Ltd. | products are: power line fittings, steel eye bolts shotwelders |
| - Dorolux | products are light fittings |
| - Lesotho Steel Products (Pty)Ltd. | products are:steel windows and doors |
| - Solergy Systems Lesotho (Pty)Ltd. | products are solar Energy Systems |

| | |
|---|---|
| - T.N.B. Steel-Workers (Pty)Ltd. | products are steel window frames |
| - De Beer Lesotho Mining Co. Ltd. | product is diamond |
| - BEDCO (Small-Scale Industries) | 2 units manufacturing steel products |
| - Lesotho Farming Services and Engineering (Pty)Ltd. | products are trailers |
| - Patha Services | Job shops for welding and auto repair |
| - Malarnie Motors | mechanical repair |

Institutions Responsible for the Agricultural Machinery and Implement Development

As mentioned before Lesotho has no agricultural machinery and implemtns manufacturing plant.

The Soil Conservation Workshop under the Ministry of agriculture and Marketing is responsible for the R&D activities of agricultural implements development. The crop development section of this workshop has already carried out plamter modification to improve the performence of the planter.

The demand for animal drawn implements is estimated to be 5000 to 7500 units per annum. Most of the hand tools and animal drawn implements are imported from South Africa.

Existing Institition for Small-Scale and Rural Industries Development

Basto Enterprises Development Corporation (Pty)Ltd.(BEDCO) is primarily responsible for the development of small-scale industries in Lesotho. BEDCO has an industrial estate complex in Maseru. BEDCO assisted about 100 small-scale industries which includes 2 metalworking enterprise. In order to upgrade BEDCO's activities it is necessary for BEDCO to promote the following development aspects e.g.

- Institutional reorganization of BEDCO and transformation of BEDCO into a National Small-Scale Industries Development Organization (SIDO).
- Registration of all small-scale and rural industries in Lesotho.
- Creation of financial assistance in the form of loans, government credit guarantee scheme, opening of banks for small-scale industries in rural sector
- Providing scarce raw material to small-scale industries through bulk purchase scheme;
- Supply of machinery and equipment to small-scale industries on hire purchase scheme.
- Creation of a design and development centre to provide technical facilities to the small-scale industries;
  (prototype development and training centre)

- Industrial management and technical training facilities e.g.
  - (i) Appreciation courses
  - (ii) Specialized courses
  - (iii) Ad-hoc courses
  - (iv) Technical training programme
  - (v) Mobile workshops
  - (vi) Study-cum observation visits.
- Government stores pruchase programme where government will give priority to procure products from small-scale industries.
- Creation of marketing facilities for small-scale industries.
- Special incentive schemes for rural areas.
- Creation of Industrial Estates in rural areas.
- Creation of export house for small -scale industries.
- Ancillary industries development.

It is necessary for BEDCO to undertake an Integrated Small-Scale and Rural Industries Development Programme.

Existing Facilities for Engineering Manpower Development Programme in Lesotho

The following institutions are responsible for the engineering manpower development in Lesotho e.g.

- National Manpower Development Secretariat (NMDS).
- Lesotho Polytechnic.

The National Manpower Development Secretariat(NMDS) is responsible for:

- manpower training programme (within and outside the country)
- training of professional and managerial levels
- priority training to alleviate manpower shortage specially in areas of middle management level, technical skills etc.
- manpower survey both in private and public sector.

The NMDS has just competed the manpower survey in Lesotho.

The technical manpower development programme in Lesotho is directed towards the training of local citizens in the following manner:

- sending students to obtain degree and diploma in specific discipline through bilateral or multilateral assistance;
- local academic technical training programme in Lesotho polytechnic in diploma courses;
- local technician and craft training courses in Lesotho polytechnic.

Total intake in Lesotho polytechnic for technical education is as follows:

- 90 students for mechanical engineering;
- 10 students for electrical engineering;
- 10 students for mechanical engineering.

The period of specific course is for 3 years duration. The total number of students in polytechnic is 511.

With regard to the training of students abroad, the analysis of this programme shows that the technical manpower development programme is rather unbalanced. It is noticed that out of 405 students studying aborad only 107 are studying mechanical, electrical, civil, industrial and constructional engineering. The percentage is as follows:

Training in engineering field - 26.43%
Training in non-engineering field - 73.57%.

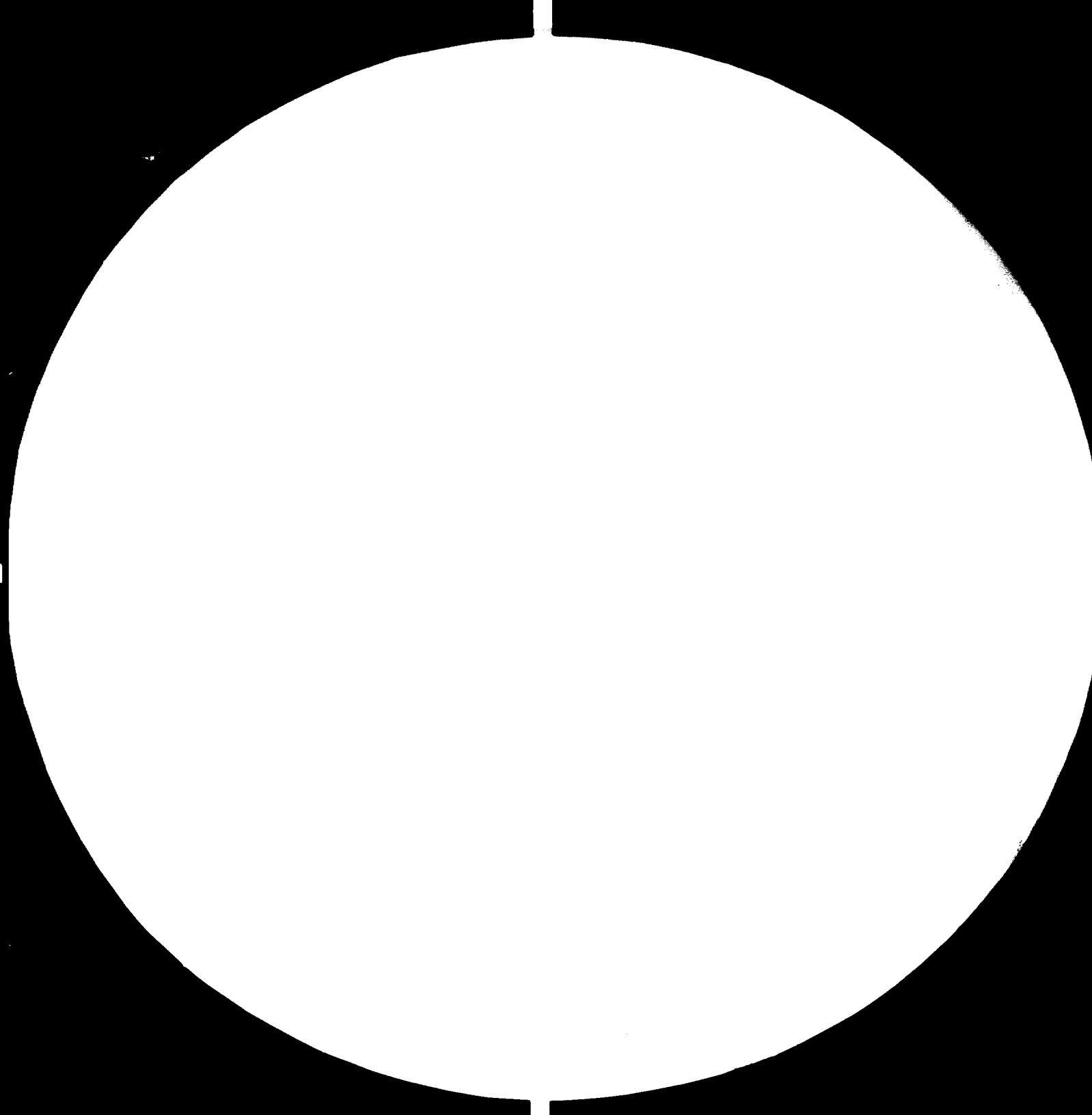
It is to be noted here that most of the engineering and related industries are manned by expatriate engineers. Therefore, it is highly recommended that the NMDS should restructure the manpower development programme abroad with a positive plan to send more students for technical studies in future. This will reduce the expatriate bill and conserve the foreign exchange which can be utilized for industrial development of the country. The complete analysis is shown in the attached table as of December 1981.

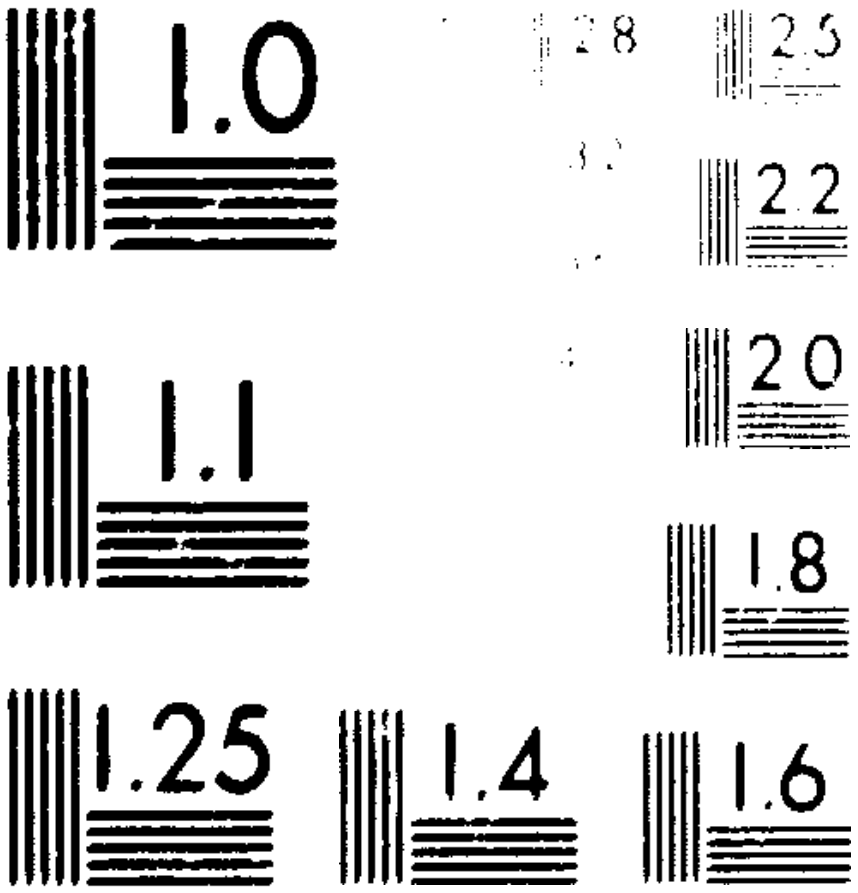
The mission further suggests the Government that the students studying mechanical engineering in Australia, England, Ireland, West Germany, USSR, Kenya should be requested to be trained in foundry, forging, heat treatment, machine shop, tool room activities before they return home. The reason is that the Lesotho Government may promote foundry and related industries in near future. If these students are trained in specific mechanical engineering dicipline it will create indigenous capability to undertake and implement the industrial projects. Moreover, about 30 industrial projects will be submitted to the Forthcoming Minitrial Solidarity meeting. This has got a great significance to the implication of the availability of indigenous trained manpower to implement the future approved projects.

Therefore, the ECA/UNIDO mission suggests the following measures to be undertaken by the Government:

- to request NMDS to restructure the foreign training programme where at least 60% of the total intake should be sent for engineering training;
- to request Ministry of Education to upgrade the polytechnic into a Higher Technical College

The technical manpower shortage has become an acute problem in Lesotho. The above suggestions can lead to a better supply of engineering skills for local industries in future.

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LESOTHO MANPOWER DEVELOPMENT PROGRAMME ABROAD
STUDENT STUDYING IN ABROAD FOR DEGREE AND
DIPLOMA COURSES AS ON DECEMBER 1981

ANALYSIS BY FCA/UNIDO ENGINEERING INDUSTRY DEVELOPMENT MISSIONS

| Countries by Region | No. of Students | Mechanical Engineering | Electrical/ Electronics/ Communication Engineering | Civil & Architectural Engineering | Industrial Engineering | Construction Engineering | Others |
|---|---|---|---|---|---|---|---|
| ASIA | | | | | | | |
| ASIA | | | | | | | |
| INDIA | 15 | - | - | 13 | - | - | 2 |
| Sub-total | 15 | - | - | 13 | - | - | 2 |
| AFRICA | | | | | | | |
| BOTSWANA | 9 | - | - | - | - | - | 9 |
| EGYPT | 1 | - | - | - | - | - | 1 |
| GHANA | 1 | - | - | - | - | - | 1 |
| KENYA | 44 | 1 | 4 | 1 | - | - | 38 |
| LIBERIA | 1 | - | - | - | - | - | 1 |
| MALAWI | 2 | - | - | - | - | - | 2 |
| NIGERIA | 2 | - | - | | - | - | 2 |
| TANZANIA | 6 | - | | 3 | - | - | 3 |
| SWAZILAND | 12 | - | - | | - | - | 12 |
| ZAMBIA | 2 | | - | - | - | - | 2 |
| ZIMBABWE | 4 | - | 1 | - | - | - | 3 |
| ZAIRE | 1 | | - | - | - | | 1 |
| Sub-total | 85 | 1 | 5 | 4 | - | | 75 |
| FAREAST | | | | | | | |
| AUSTRALIA | 16 | 1 | 2 | - | - | - | 13 |
| NEW ZEALAND | 1 | - | - | 1 | - | - | - |
| Sub-total | 17 | 1 | 2 | 1 | - | - | 13 |
| NEAREAST | | | | | | | |
| ISRAEL | 1 | - | - | - | - | - | 1 |
| Sub-total | 1 | - | - | - | - | - | 1 |

| Countries by Region | No.of Students | Mechanical Engineering | Electrical/ Electronics/ Communication Engineering | Civil & Archtectural Engineering | Industrial Engineering | Construction Engineering | Others |
|---|---|---|---|---|---|---|---|
| WESTERN EUROPE | | | | | | | |
| AUSTRIA | 1 | - | - | - | - | - | 1 |
| ENGLAND | 73 | 4 | 13 | - | - | - | 56 |
| FRANCE | 1 | - | - | - | - | - | 1 |
| IRELAND | 29 | 11 | 3 | - | 1 | - | 14 |
| NETHERLAND | 2 | - | - | - | | - | 2 |
| SWITZERLAND | 1 | - | - | - | - | - | 1 |
| WEST GERMANY | 26 | 10 | 3 | - | - | 3 | 10 |
| Sub-total | 133 | 25 | 19 | - | 1 | 3 | 85 |
| EASTERN EUROPE | | | | | | | |
| USSR | 23 | 1 | 1 | 1 | - | | 20 |
| CSSR | 2 | - | - | - | - | | 2 |
| GDR | 5 | - | 1 | - | - | - | 4 |
| BULGARIA | 1 | - | - | - | - | - | 1 |
| YUGOSLAVIA | 3 | 1 | - | - | - | | 2 |
| Sub-total | 34 | 2 | 2 | 1 | - | | 29 |
| NORTH AMERICA | | | | | | | |
| USA | 76 | 2 | - | 12 | - | - | 62 |
| CANADA | 32 | 1 | 1 | 8 | - | | 22 |
| CUBA | 12 | - | 2 | 1 | - | - | 9 |
| Sub-total | 120 | 3 | 3 | 21 | - | - | 93 |
| GRAND TOTAL | 405 | 32 | 31 | 40 | 1 | 3 | 298 |
| In % | | 7.90% | 7.70% | 9.90% | 0.03% | 0.90% | 73.57% |

Summary Total Student being trained abroad - 405
Total Student being trained in Mechanical Engineering - 32(7.90%)
Total Student being trained in Electrical Engineering - 31(7.70%)
Total Student being trained in Civil Engineering - 40(9.90%)
Total Student being trained i- Industrial Engineering - 1(0.03%)
Total Student being trained in Construction Engineering 3(0.90%)
Total Student being trained in Non-Engineering -298(73.57%)
Training Engineering Field - 26.43%
Training in Non-Engineering Field 73.57%

Mechanical Engineering includes Aircraft maintenance mining and drafting engineering.

E. MAJOR CONSTRAINTS

As mentioned before the engineering industries development is still in embryonic stage in Lesotho. The major country constraints are confined towards the lack of development and implementation aspects of engineering industries. Continued dependency on imports of engineering goods and services has guided the country into an atmosphere that nothing can be manufactured locally at economic level. These constraints will have to be overcome. The identified constraints for engineering industries development are as follows.

(a) Constraints at Institutional Level

- The Central Planning and Development Office, Ministry of Trade and Industry, Lesotho, National Development Corporation, Basotho Enterprises Development Corporation do not have adequate technical and engineering staffs to diagnose the existing problems of engineering industries, follow-up of the implementation of engineering projects where feasibility studies are already prepared. To overcome these problems the above institutions require, industrial planning engineer, industrial engineers, mechanical engineers, technical analysists, and a project implementation team. The institutions are heavily loaded with non-technical personnel who endeavour their best to promote the engineering industries without much success.
- Lack of institutional co-operation and co-ordination among the Governmental and Non-governmental organizations.
- Lack of institutional facilities to promote inter-linked development aspects.
- Lack of institutional facilities for prototype development and technological adaptation aspects of engineering products.
- The role of LNDC and BEDCO is not clear as far as the engineering industries development aspects are concerned. So far they have promoted more industries producing non-engineering projects.
- The national policy and strategy for the inter-linked development aspects needs greater study for engineering industries development.
- UNDP, IPF programme upto 1985 does not cover major projects related to the engineering industries development. It is to be noted here that greater industrialization require maximum development of engineering industries to meet the basic needs of the citizens. Therefore, it is highly recommended to restructure the UNDP IPF and include maximum assistance for engineering industries development in Lesotho.

(b) Constraints at Engineering and Technological Level

- Non-existance of foundry, forging, heat treatment, tool room facilities which are primarily responsible for the integrated development of engineering industries.
- Lack of facilities for the engineering design capability development at industry level.

- Non-existance of agricultural machinery industry particularly the manufacture of hand tools and animal drawn implements which are greatly needed by the farmers;
- Lack of repair and maintenance facilities for agricultural implements, transport equipment and general preventive maintenance of industrial plants and machinery;
- No facilities for local spare-parts manufacture;
- Lack of facilities for the procurement and dissemination of engineering and technological informations at industry level;
- Lack of engineering and technological advisory services which should provide the following important activities:

  (i) product identification and market sizes for import substituted projects;

  (ii) preparation and appraisal of techno-economic engineering studies at project level;

  (iii) appropriate choice and selection of machinery, equipment and processes;

  (iv) appropriate management techniques for engineering industries;

  (v) product improvement and marketing;

  (vi) supply of informations of subregional markets and products being manufactured at subregional level,

  (vii) promotion of joint venture projects with advanced African developing countries e.g. Zimbabwe, Kenya, Zambia, etc.

(c) Constraints at the Manpower Level

- Unbalanced technical manpower development programme;
- Lack of availability of engineers, designeers, industrial engineers etc. the NMDS programme on foreign training includes only one Industrial Engineer receiving training in Ireland;
- Lack of product and tool designers;
- Lack of process planners at industry level;
- Lack of skilled operatives, the large labour force works in South African mines on unskilled jobs;
- Lack of qualified marketing personnel;
- Lack of comprehensive engineering training programme at industry level.

F. PROJECTS IDENTIFIED

The following projects are identified by the ECA/UNIDO mission:

At National Level

I. Projects for Long-term Assistance

Project Proposal No.1 1/

Assistance to Set-up-Engineering Advisory Team in the Ministry of Trade and Industry

This will be an umbrella project and should be combined with the project LES/77/013 - Advisor in Industrial Planning. The Ministry's activities cannot be strengthened unless the project component includes technical and engineering experts. The backwardness of the engineering industry in Lesotho further justify this project. There is an urgent need to introduce international experts with local counterparts to improve the local capabilities to diagnose, upgrade and establish engineering industries.

(a) Duties:

The proposed combined project will be to assist the Ministry of Trade and Industry, LMDC, BEDCO in the following aspects of industrial development e.g.

- participate and to formulate industrial planning with inter-linked development of industrial sector;
- monitoring of the performance of industries;
- advise the Ministry, LNDC, BEDCO to promote import substitution project and joint venture projects with neighbouring African countries.
- to render technical assistance and engineering guidence to achieve greater sub-contracting arrangement
- assist the industries particularly wood working, metal working and other industries to help in improving their processes, productivity, identification of new product lines and technological assistance.
- advise the Ministry, LNDC, BDECO, MMDS of the development of technical and engineering manpower development programme;
- assist in the formulation of policy, guidelines and modalities for implementation of priority projects fro Ministry, LNDC, BEDC, MMDS;
- assist the industries in the promotion of joint venture project and investment promotion.
- assist in training the Government counterparts in order to continue the activities on a permanent basis within the Ministry.

(b) Duration of the Project : 2½ year with extension

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1/ The terms of reference was prepared and submitted to the Government/UNDP/UNIDO on 11 February 1982.

(c) Composition of the International Staffs

The team should be composed of

| | | |
|---|---|---|
| - One Adviser in Industrial Planning | - | 30 mm |
| - One Industrial Engineer | - | 30 mm |
| - Two Mechanical Engineer specialized in foundry, forging, heat treatment, tool room etc. | - | 48 mm |
| Total m/m | | 108 mm |

(d) Project Budget

| | | | |
|---|---|---|---|
| Expert assistance | 108 mm | - | US$650,000 |
| Transport | | - | US$ 30.000 |
| Fellowship/training | | - | US$ 50,000 |
| | Total cost | | US$730,000 |

(e) Composition of the Local Staff:

- Three Industrial Project Officer in planning, industrial engineering and basic industry development(Engineer or equivalent Degree Holder).

(f) Executing Agency: UNIDO

(g) Government Agency: Ministry of Trade & Industry in close co-operation with LMDC, BEDCO, Ministry of Planning, MIDS.

(h) Starting Date: 1st July 1982

Project Proposal No. 2 2/

Establishment of an Integrated Foundry, Fabrication and Machine shops Complex

(UNIDO has already submitted a project proposal - Techno-Economic Appraisal for the Establishment of a Mechanical Workshop and Steel Fabrication Plant(13.10.81) Programme 31.8.D Under SIS).

It is recommended that the proposal submitted by UNIDO should be considered by the Government and the proposal to be modified to include foundry.

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2/ The terms of reference was prepared and submitted to the Government/UNDP/UNIDO on 11 February 1982. The Government has already requested UNIDO through UNDP Telex MISC 464 dated 11 March 1982 for a techno-economic appraisal for this project from UNIDO Regular Programme.

(a) Background

Lesotho has no foundry establishment and at present import shape castings in grey iron and malleable. There is no forging, heat treatment, machine shop and tool room activities exist in normal sense. Most of the foundry product are being imported from South Africa, Japan and other countries. Non-ferrous foundry activities are non-existance in Lesotho. The demand for shape casting in grey iron and malleable is estimated to over 2,000 tons per annum. Basic support industries like foundry, forging, heat treatment machine shop, etc. are the real backbone of the engineering industries development. These infrastructure needs to be developed in Lesotho which is land locked country in persuance with the New Delhi Declaration and Plan of Action.

The mission discussed this integrated project at length with LNDC on 9 February 1982, Anglo American Group 9, February 1982, the Ministry of Trade and Industry 12 February 1982 and Central Planning and Development Office 12 February 1982. The general consideration has been to undertake a techno-economic feasibility study prior to the establishment of such a project.

Lesotho National Development Corporation (LNDC)

During the discussion with LNDC, it was told that the LNDC will be fully responsible for the supply of machinery and equipment cost of the project this will include capital development cost e.g. land, building, water and electricity supply, machinery and equipment, common service facilities including local training costs. Therefore, Government requires UNIDO/UNDP technical assistance for experts, training and special non-capital expenses.

(b) Project Identified by the Mission

(i) Foundry products

The following are the grey cast iron products of:

| | Estimated |
|---|---|
| - manufactufacture of manhole covers(Gr.14) | - 250 tonnes/annum |
| - manufacture of gratings (Gr.14) | - 100 tonnes/annum |
| - manufacture of assorted flange implement wheels mining wheel etc. (Gr.17) | - 50 tonnes/annum |
| - manufacture of electrical transmission parts malleable or S.G | -1300 tonnes/annum - (actual) |
| - manufacture of brakedrums, hubcorevs,barrow wheels etc. (Gr.17) | 50 tonnes/annum |
| - manufacture of spare-parts casting for diamond mines (Gr.17) including grinding balls (chilled) | 400 tonnes/annum |
| - manufacture of selected parts for building meterials in malleable | 100 tonnes/annum |
| - manufacture of (i) charcoal fired iron; (ii) traditional cooking bowl dome shaped; (iii) traditional cooking pan fired with charcoal (Gr.17) | 150 tonnes/annum |
| - manufacture of brass casting bearings for mines, water fittings etc. | 100 tonnes/annum |
| Total | 2500 tonnes/annum |

(ii) Machining and fabrication products

- Machining of the foundry products as mentioned in item b(i)
- fabrication of constructional parts e.g. structual products, mining parts
- manufacture of automotive spare-parts and mining spare-parts;
- manufacture of road maintenance spare-parts.
- manufacture of prototype equipment e.g. ploughs, planters etc.
- fabrication of truck body, trailers etc.,
- repair and maintenance of tools
- job orders according to customers requirements
- future product lines of agricultural implements locast transport equipment and other fabricating products
- manufacture of brass bearings for mines, brass water fittings, values etc.

(c) Proposed Capacity of the Foundry Complex

It is anticipated that the capacity of the foundry will be in the range of 2500 tonnes of liquid metal per annum and will be divided into three categories

- 1000 tonnes/annum grey cast iron castings by cupola process 1½ tonnes/hour cupola
- 1400 tonnes/annum malleable/S.G. iron castings by electric arc/induction furnace 2 tonnes/hour capacity
- 100 tonnes of non-ferrous (brass/alurinium) castings by induction furnace 50kg/hour capacity.

It is to be noted here that the local company Messers. Tranalquip Lesotho(Pty)Ltd. at Maputsoe at present importing 25 tonnes/week (1300 tonnes/year) malleable castings from abroad. The company's General Manager who is a metallurgist and has 25 years experience infoundry activities in UK indicated to the mission that the grey iron castings requirement in Lesotho will be in the region of 1000 tonnes/annum.

(d) Proposed Capacity of the Fabrication and Machine shop Complex

The proposed capacity of the Fabrication and Machine shop will be to cater:

- cutting bending, folding and welding of fabricated parts upto 12.5 mm
- hot forging upto maximum weight 5 kg piece of billet
- heat treatment will include case hardening, through hardening, normalizing graded high carbon and alloy steel,
- mechanical handling equipment upto 10 tonnes capacity
- general purpose machine shop for off cutting, turning, shaping, boring milling, grinding, threading, drilling, taping, braching etc.
- metal coating will cinclude phosphating, dip painting and spray painting
- storing upto a capacity of 40 tonnes of steel sections and plates.

(e) Floor Area and Administrative Building

| | | |
|---|---|---|
| (i) | Foundry area | 1,200 sq.meter |
| (ii) | Machine shop | 1,900 sq. meter |
| (iii) | Fabricating shop | 1,650 sq. meter |
| (iv) | Administrative block including design office etc. | 250 sq.meter |
| | Total covered area | 5 000 sq.meter |
| (v) | Open area | 5,000 sq. meter |

(f) Plan of Action of the Project

The following is the plan of action of the project-

| | |
|---|---|
| - preparation of techno-economic feasibility study | - UNIDO/UNDP |
| - preparation of factory lay out selection of machinery and equipment etc. | - UNIDO/UNDP |
| - selection of site, building construction etc. | - Government/LNDC, rivate sector |
| - procurement of machinery equipment and physical facilities | - Government/LNDC/Private sector |
| - installation of machinery equipment and commissioning of plant | - UNIDO/UNDP |
| - recruitment of personnel, training and related activities | - Government/UNIDO/UNDP |
| - physical running of the plant | - UNIDO experts and factory administration |

(g) Manufacturing Technology

(i) Foundry

For grey cast iron - the technology should be based on conventional cupola process melting with:

- coal as energy
- green sand moulding
- floor moulding/conreyorized moulding
- core-sand and mould sand preparation equipment
- mould making machines
- feltling and cleaning equipment
- sand blast equipment
- mechanical handling equipment;
- metallurgical laboratory equipment e.g. pyrometer, sand tester etc.
- pattern making shop
- common service facilities etc.

For malleable iron -

- electric arc furnace/induction furnace
- heat treatment chamber

For non-ferrous (brass and aluminium)

- induction furnace

(ii) Fabrication

Bending machines, folding machines, press brakes, welding equipment, sheaving machine, grinding machine, roll bending machine, blading machine, gas cutting machines, eccentric press and tools, fixtures etc.

(iii) Machining

- general machining will include: turning machines, boring machines, drilling machines, milling machines, tapping machines, grinding machines, broaching machines, gear cutting machines, part off machines, shaping machines, planing machines, tools jigs and fixtures.
- tool room will include: universal cutter grinders, precision lathe, drilling, tapping machines, precision milling, boring machine and inspection tools, gauges cutting tools etc.

(iv) Forging

hammer forging, billet cutting, and heat treatment furnaces, quenching tanks, hardness testing equipments, forging tools.

(v) Common services will include air supply compressor set, water supply electrical system with transformer etc. transport services.

(vi) Management will include production services, design services, inspection and quality control services, procurement and marketing services, service for training and manpower development.

(h) Duration of the Project - 4 years

(i) Composition of the International Staffs

(i) For foundry:

| | | |
|---|---|---|
| - one foundry expert/metallurgist | - | 48 mm |
| - one mould maker | - | 36 mm |
| - one pattern maker | - | 36 mm |

(ii) For fabrication and machine shop

| | | |
|---|---|---|
| - one industrial engineer (electrical/mechanical) | - | 36 mm |
| - one product and tool designer | - | 36 mm |
| - one process planner | - | 12 mm |
| - one mechanical forge expert | - | 24 mm |
| - one fabrication expert | - | 24 mm |
| Total | | 252 mm |

(j) Pre-project Cost

| | | |
|---|---|---|
| Prepratory mission UNIDO/UNDP for techno-economic assessment (3 member 3 weeks each already submitted by UNIDO under SIS) | - | US$ 25,000 |
| Pre investment study/feasibility study(if required) | - | US$100,000 |
| Total pre-project cost | | US$125.000 |

(k) Estimated project Cost(UNIDO/UNDP)

| | | |
|---|---|---|
| - experts | - | US$ 1,600,000 |
| - project cars | - | US$ 40,000 |
| - training/fellowship | - | US$ 360,000 |
| Total project cost | | US$ 2,000,000 |

(l) Government Contribition (Estimated Investment)

As discussed with LNDC the mission estimates the following cost as Government contribution through LNDC and private sector participating industries.

| | Estimated in US$ |
|---|---|
| - Land and land clearance (10,000 sq.meters ) | 100,000 |
| - Building and factory construction (5,000 sq. meter covered) | 1,500,000 |
| - Machinery and equipment | 4,000,000 |
| - Ancillary Facilities | 500,000 |
| - Working capital | 500,000 |
| Total Investment | US$ 6,600,000 |

(m) Composition of Local Staff

| | |
|---|---|
| - General Manager | 1 |
| - Divisional Manager | 4 |
| - Industrial Engineer | 3 |
| - Quality Control Engineer | 2 |
| - Process Planner | 3 |
| - Product designer/draughtsman | 5 |
| - Tool designer/draughtsman | 3 |
| - Production engineer | 4 |
| - Supervisors | 4 |
| - Inspectors | 4 |
| - Foremen | 8 |
| - Operatives(skilled/unskilled) | 60 |
| - Maintenance engineer | 2 |
| - Maintenance operative | 6 |
| - Unskilled | 40 |
| - Others(marketing sales etc.) | 10 |
| Total | 167 |

Note : It is suggested that the National Manpower Development Secretariat should instruct the students studying in Australia, England, Ireland, West Germany, USSR Yugoslavia, USA, Canda, Cuba to be trained in foundry, forging, heat treatment, machine shop, tool room etc. before they return to Lesotho between 1983 to 1985.

(n) Executing Agency — UNIDO

(o) Government Counterpart Agency: — LNDC in close co-operation with the Ministry of Industry, BEDCO, and MCDS.

(p) Starting date

- preparatory mission — May 1982
- preparation of feasibility study — November 1982
- commencement of the project — June 1983

(q) Special Note:

The mission observed that a foundry expert is already available in the country who is now working with Tranalquip Lesotho(Pty)Ltd. P.O. Box MU 182, Maputsoe, Lesotho. The name of the expert is Mr. D.J. Smart (UK) qualification one in metallurgy, diploma in safety management, member of the Institute of British Foundrymen (UK) with 25 years experience on top British foundry industries. Mr. Smart is aware of the local situation and negotiated on behalf of his company to set up a foundry in Lesotho. LNDC is aware of the negotiation too. The mission suggests that in the event the project is approved by the Government, Mr. Smart can be appointed as Project Manager as he has considerable experience in Lesotho.

(r) Special Consideration

It is suggested that the UNIDO experts should work and report to the company to be established by LNDC and private sector industries.

Location: the complex can be located either in Maputsoe or in BEDCO complex in Maseru.

(s) Immediate Action by the Government of Lesotho

It is necessary that the Government of Lesotho may request UNDP and UNIDO to prepare the techno-economic feasibility study adequate fund should be allocated from SwS for the purpose of mounting a mission for three weeks to appraise the study by May 1982.

The Government of Lesotho may also request UNDP to allocate US$2,000,000 in the country IPF from June 1983.

The initial term of reference was prepared at the request of the Central Planning and Development Office, Maseru which is superceeded by this proposal.

Project Proposal No.3

Local Manufacture of Animal Drawn Implements - Lesotho

(UNIDO has already prepared a feasibility study and LNDC is examining the prosal and future follow up).

Existing Situation in Eastern and Southern African Region
Animal Drawn Implements

At present the following countries are manufacturing Agricultural animals drawn implements.

| | | |
|---|---|---|
| Zimbabwe | - | Two companies producing about 80,000 to 90,000 units/year |
| Mozambique | - | Figures available in ECA |
| Kenya | - | Six companies (figures not known) |
| South Africa | | Figures not known |

Zimbabwe exports implements to Botswana and S.A. to the tune of about 20,000 units per year.

Lesotho imports animal drawn implements from S.A. The mission was told that in many cases the S.A. prices for a mouldboard plough to the farmers are as high as 200 Rands. (US$216). The same plough in Zimbabwe costs about US$60 and in Zambia costs about US$ 66.

It is anticipated that the consumption of animal drawn implements in Lesotho will be in the region of 7000 to 10 000 units per year.

The mission suggests that the private company e.g. Lesotho Steel Products may visit Zimbabwe with LNDC to explore the possibility on the future manufacture of drawn implements on joint venture basis with anyone of the following company.

Bulawayo Steel Products, Bulawayo
ZIMBABWE

ZIMPLOW Bulawayo Zimbabwe

Special Note

If the Project Poposal No. 2 i.e.integrated foundry, machine shop and fabrication shop is established by the Government, the products indicated in Project Proposal No.3 will be autoratically included in Project Proposal No. 2.

There will be no additional investment for Project Proposal No. 3.

II. Projects for Short-Term Assistance

Project Proposal No. 4

Assistance to BEDCO to upgrade their Maintenance shop into a Tool room and and to Identify New Metal Products for Small-Scale Manufacture

UNDP/UNIDO Assistance will be directed towards the upgrading of the existing maintenance shop in BEDCO complex into a tool room. The project will also assist to improve the design capabilities for jigs, tools, fixturers manufacture. The out put of the project will be:

(i) supply of improved tools etc.

(ii) training of high skilled operatives

(iii) identification of new metal products for small-scale industries

Expert (tool room planning, tool design - 6 mm US$ 136,000 machinery and training)

Government Contribution supply of additional machinery and equipment

UNIDO will be the executing agency.

Project Proposal No. 5

Assistance to National Manpower Development Secretariat to Formulate Engineering Manpower Development Programme

This proposed short-term UNIDO/UNDP assistance to secretariat will help NMDS to restructure its engineering manpower development programme and to forecast the requirement for next ten years with a postive programme.

Expert in engineering manpower development 4 mm US$ 25,000

UNIDO will be the executing agency.

Project Proposal No. 6

Assistance to LMDC for the Establishment of a Metal and Engineering Advisory Unit within LMDC

This UNIDO/UNDP short-term assistance will be aiming at the capability development of LMDC by establishment of a permanent Metal and Engineering Advisory Unit with in LMDC.

Expert (in Metal and Engineering Planning - 4 mm US$ 25,000
and Institutional Development
Mechanical/Industrial Engineer)

UNIDO will be the executing agency

## List of Project Profiles Cleared by the Government of Lesotho for the Solidarity Meeting in June 1982

1. Agricultural farm implements - 3 units one each at Maseru, Butah-Buthe and Mohale's Hoek
2. Maize and Feed Mill
3. Rural Tanneries - Rural Tanning Units - 9
4. Ceramic ware
5. Establishment of Units for Industrial Tools, Machinery and Technical Supply Centres in Lesotho
6. Meat Processing Plant
7. Assistance to Botsabelo Milk Plant
8. Assistance to the on going seed multiplication plant. (FAO & UNIDO) UNIDO's Contribution or from Solidarity Meeting.
9. Mohokare Heavy Clay Products
10. School Uniform Proposal for Mohalalitoe (Aram Lily PTY Ltd.) at Leribe
11. Berea Knitwear (Pty Ltd) expansion
12. Perspective planning unit in BEDCO
13. Training programme in BEDCO
14. Blanket manufacturing
15. Establishment of Industrial Dev. Fund
16. Sand Stone cutting for Building
17. Establishment of Five Industrial Estates at Butha-Buthe, Mafeteng, Khubetsoana, Mohalalitoe and Quthing
18. Sunflower oil extraction plant
19. Wool Scouring

### At subregional Level

The following activities should be undertaken at the subregional level for the development of engineering industries e.g.

- exchange of informations on animal drawn agricultural implements with Zimbabwe, Zambia, Botswana, Mozambique, Kenya.
- organize study tours for the local industrialists to visit neighbouring countries to examine the engineering industries adaptation.

- expand greater sub-contracting arrangement within PTA countries of Eastern and Southern African States for spare-parts and engineering products manufacture
- exchange of apprentices among the Southern and Eastern African countries

G. FUTURE FOLLOW-UP

The followings are the future follow-up to be undertaken by the Government of Lesotho:

- to approach UNIDO/UNDP to include the projects in IPF 1983-1986
- to submit the project proposal for bilateral or multilateral assistance if the donor countries are agreable the fund can be pledged to UNIDO for effective implementation of Project Proposal No.2 and No.3
- to establish immediately the Proposed Engineering Advisory Team to Ministry of Trade and Industry.
- to visit selected foundry and agricultural machinery industries in Bulawayo, Zimbabwe in order to promote joint venture projects.
- to request UNIDO/UNDP to prepare detailed project documents for the IPF submission.

ANNEX

LIST OF PERSONS VISITED

THE REPUBLIC OF BOTSWANA

| | | |
|---|---|---|
| 1. | Mr. M.J. Mbaakanye | Director of Industrial Affairs<br>Ministry of Commerce & Industry<br>Gaborone |
| 2. | Mr. Klaus W. Baer | Industrial Engineer<br>Division of Industrial Affairs<br>Gaborone |
| 3. | Mr. Ahmed Munier | UNV, UNDP, Gaborone |
| 4. | Mr. J. R. Monametsi | Acting Director BIDU.<br>Ministry of Commerce & Industry<br>Gaborone |
| 5. | Mrs. D.S. Caboutloeloe | Retail Estate Manager<br>BEDU, Gaborone |
| 6. | Mr. C.K. Lesolle | Technical Officer, BEDU, Gaborone |
| 7. | Mr. C. Mojalemotho | Field Management Officer<br>BEDU, Gaborone |
| 8. | Mr. P. Zaidi | Resident Representative<br>UNDP, Gaborone |
| 9. | Mr. Duncan | Manager, Iron and Steel<br>Construction (PTY) Ltd.<br>Gaborone |
| 10. | Mr. Victori F. Amann | Chief Agricultural Economist<br>Ministry of Agriculture<br>Gaborone |
| 11. | Mr. A.D. Moor | Director, FAMCVA<br>Agricultural Engineering<br>(PTY)Ltd., Gaborone |
| 12. | Mr. Ted Semple Fisher | General Manager<br>Cliff Engineering (PTY)Ltd.<br>Gaborone |
| 13. | Mr. G.D. Horsepool | Agricultural Engineer<br>Agricultural Research Station<br>Gaborone |

| | |
|---|---|
| 14. Mr. L.L. Mukokemani | General Manager<br>Central Transport Organization<br>Gaborone |
| 15. Mr. Klass Kuiper | General Manager<br>Botswana Development Corporation<br>Gaborone |
| 16. Mr. O.P. Nayar | Railway Adviser<br>Ministry of Works and Communication<br>Gaborone |
| 17. Mr. Geoffrey Ramaribana | Asst. Manager<br>Rural Industries Innovation Centre<br>Kanye |
| 18. Mr. O.D. Dropi | Asst. General Manager<br>National Development Bank<br>Gaborone |
| 19. Mr. M.H. D. Murray-Hudson | AMAX Botswana Ltd.<br>Gaborone |
| 20. Mr. B.S. Mothibe | Asst. Personnel Superintendent<br>BCL Ltd. Selebi-Phikwe |
| 21. Mr. J. Kennedy | Section Engineer Training<br>BCL Ltd., Selebi-Phikwe |
| 22. Mr. A. Diamond | Section Engineer Machineshop<br>BCL Ltd., Selebi-Phikwe |
| 23. Mr. Shyam Kopnikar | Senior Project Officer<br>National Development Bank<br>Gaborone |
| 24. Mr. F.R.A. Morris | Principal, Botswana Polytechnic,<br>Gaborone |
| 25. Mr. K. Astrom | Senior Technical Education Officer<br>Brigade Development Centre<br>Gaborone |
| 26. Mr. M.P. Nadzonga | MFSC Secretary, BRIDEC<br>Gaborone |
| 27. Mr. Affeta Werger | Principal Planning Officer<br>Ministry of Finance and Development<br>Planning, Gaborone |

| | |
|---|---|
| 28. Mr. L. Mothibatsela | Chief Economist<br>Ministry of Finance and Development Planning<br>Gaborone |
| 29. Mr. P.L. Owen | Planning Officer I<br>Ministry of Mineral Resources and Water Affairs<br>Gaborone |
| 30. Mr. Ray Purcell | ALDEP Co-ordinator<br>Ministry of Agriculture<br>Gaborone |
| 31. Mr. M. Disele | Project Officer<br>Botswana Development Corporation<br>Gaborone |
| 32. Mr. J. S. Platt | ALDEP, Ministry of Agriculture<br>Gaborone |
| 33. Mr. Perry Karlsson | Senior Tech. Officer<br>BEDU, Gaborone |
| 34. Mr. C. Lindfors | Ind. Implementation Adviser<br>BEDU, Gaborone |
| 35. General Manager | Botswana Development Corporation<br>Gaborone |

THE REPUBLIC OF ZIMBABWE

| | |
|---|---|
| 36. Mr. Mabhena | Under Secretary<br>Ministry of Industry & Energy Development<br>Salisbury |
| 37. Mr. C.T. Kuvaza | Senior Administrative Officer<br>Ministry of Industry and Energy Development<br>Salisbury |
| 38. Mr. P. Conan | Asst. Secretary<br>Ministry of Trade and Commerce<br>Bulawayo |
| 39. Mr. P.N. Mkwananzi | Senior Administrative Officer<br>Ministry of Trade and Commerce<br>Bulawayo |
| 40. Mr. A. Thomas | Act. Senior Clerk<br>Ministry of Trade and Commerce<br>Bulawayo |

| | | |
|---|---|---|
| 41. | Mr. R.S. Labram | Manager<br>Tassburg Fastners Ltd.<br>Salisbury |
| 42. | Mr. M. Trivella | Foreman Tassburg Fastners Ltd.<br>Salisbury |
| 43. | Mr. P.I. Harrison | Manager<br>Crown Brass Ltd.<br>Salisbury |
| 44. | Mr. M. Brooks | Divisional Manager<br>Metal Box(CA) Ltd.<br>Salisbury |
| 45. | Mr. J. Critchlow | Public Relation Executive<br>Metal Box (CA) Ltd.<br>Salisbury |
| 46. | Mr. Harry Knowles | General Manager<br>Precision Grinders Ltd.<br>Salisbury |
| 47. | Mr. P.Z. Van Dernlereg | General Manager<br>J. McKeekan<br>Salisbury |
| 48. | Mr. A.J. Organ | Managing Director<br>Metal Box (CA) Ltd.<br>Salisbury |
| 49. | Mr. U. Ettlin | Managing Director<br>Tube and Pipe Ltd.<br>Salisbury |
| 50. | Mr. Chris Pearce | Production Manager (Plastic<br>Metal Box (CA) Ltd.<br>Salisbury |
| 51. | Mr. J.H. Bowman | Principal<br>Bulawayo Technical College<br>Bulawayo |
| 52. | Mr. J.J. Cockcroft | Sales Admin. Manager<br>Temper Tools<br>Bulawayo |
| 53 | Mr. J.J. Hodgskin | Managing Director<br>Radiator and Tinning(Pvt) Ltd.<br>Bulawayo |

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| 54. | Mr. Ben Owen | Senior Divisional Manager<br>Radiator and Tinning (Prt) Ltd<br>Bulawayo |
| 55. | Mr. Gilbert Dale | Executive Director<br>RESCCO Bulawayo |
| 56. | Mr. Sandy Morrison | Steam Locomotive Manager<br>RESCCO, Bulawayo |
| 57. | Mr. C. Lincoln Buck | Managing Director<br>Bulawayo Steel Procuts<br>Bulawayo |
| 58. | Mr. A.F. Carrier | General Manager<br>PHOBOLTS<br>Bulawayo |
| 59. | Mr. N.E. Scott | Director, All Metal Foundries<br>Bulawayo |
| 60. | Mr. T.G. Connellys | Director, O. Conolly & Co.(Pvt) Ltd.<br>Bulawayo |
| 61. | Mr. A. Roth | Director, All Metal Foundries<br>Salisbury |
| 62. | Mr. D. Cook | Managing Director<br>National Railway<br>Bulawayo |
| 63. | Mr. R. Blachet | Asst. Mechanical Engineer<br>National Railway<br>Bulawayo |
| 64. | Mr. R.B. Radue | P.R.O. National Railway<br>Bulawayo |
| 65. | Mr. Dodds | Director, United Spring & Forging Co.<br>Bulawayo |
| 66. | Mr. F.E. Halsted | Chairman, United Spring & Forging Co.<br>Bulawayo |
| 67. | Mr. A.N. Kendal | Director, United Spring & Forging Co.Ltd.<br>Bulawayo |
| 68. | Mr. A.F. Holborn | Director, United Spring & Forging Ltd.<br>Bulawayo |

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| 69. Mr. K. Halsted | Director, United Spring & Forging Ltd.<br>Bulawayo |
| 70. Mr. R. Wilson | Works Manager<br>Toolmaking & Engineering Co.<br>Bulawayo |
| 71. Mr. B.F. Maher | Div. Manager<br>Metal Box (CA) Ltd.<br>Bulawayo |
| 72. Mr. R. J. Sampson | Director & General Manager<br>ZIMPLOW Ltd<br>Bulawayo |
| 73. Mr. J. Battershill | Managing Director<br>Berbat (Pvt) Ltd.<br>Bulawayo |
| 74. Mr. W.H. Manicom | Managing Director<br>Marandellas Foundry & Manufacturers (Pvt)Ltd.<br>Marandellas |
| 75. Mr. Loxton | General Manager<br>Marandellas Foundry & Manufacturers (Pvt) Ltd.<br>Marandellas |
| 76. Mr. J. F. W. Felderhof | Managing Director<br>Capital Tea & Coffee Co. (CA)Ltd.<br>Marandellas |
| 77. Mr. Gustav Klement | Managing Director<br>Non-ferrous Die Casting (Pvt) Ltd.<br>Norton |
| 78. Mr. Michel Kramer | Managing Director<br>ZR Pumps (Pvt) Ltd.<br>Norton |
| 79. Mr. E.J. Firau | Managing Director<br>C.A. Forge Co. (Pvt) Ltd.<br>Norton |
| 80. Mr. Ralph L. Stead | General Manager<br>Wire Weavers (Pvt) Ltd.<br>Norton |
| 81. Mr. E.M. Seward | Investigation Controller<br>Industrial Development Corporation<br>Salisbury |

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| 82. | Mr. R.W. Taylor | Works Manager<br>Metal Box (CA) Ltd<br>Salisbury |
| 83. | Mr. C.J. Smith | Marketing Manager<br>Metal Box (CA) Ltd.<br>Salisbury |
| 84. | Mr. Clarke Parr. C.A. | Under Secretary<br>Ministry of Transport<br>Salisbury |
| 85. | Mr. M.C. Chasi | Asst. Secretary<br>Ministry of Transport<br>Salisbury |
| 86. | Mr. C.T. Kuruneri | Under Secretary<br>Ministry of Transport<br>Salisbury |
| 87. | Mr. A. John Spear | Chief Engineer and Head of Institute<br>The Institute of Agricultural Engineering<br>Salisbury |
| 88. | Mr. K. G. Godwin | Technical Director<br>Tinto Industries Ltd.<br>Salisbury |
| 89. | Mr. Aelred Long | Machineshop & Foundry Division<br>Tinto Industries Ltd.<br>Salisbury |
| 90. | Mr. Osborn | Permanent Secretary<br>Ministry of Agriculture<br>Salisbury |
| 91. | Institute of Foundryman Association | 14 Foundry Director<br>Salisbury |
| 92. | Mr. T.W. Samunyai | Asst. Secretary<br>Ministry of Industry & Energy Development<br>Salisbury |
| 93. | Mr. D.A. Fielo | Under Secretary<br>Ministry of Industry & Energy Development<br>Salisbury |

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| 94. | Mr. G.A. Spence | Industrial Development Corporation<br>Salisbury |
| 95. | Mr. M.N. Nyambuya | Ministry of Industry & Energy Development<br>Salisbury |
| 96. | Mr. N.S. Mbanga | Ministry of Trade and Commerce<br>Salisbury |
| 97. | Mr. K.S. Mutenje | Ministry of Industry & Energy Development<br>Salisbury |
| 98. | Mr. T.S. Mercer | Ministry of Industry and Energy<br>Salisbury |
| 99. | Prof. E. Onitiri | Resident Representative<br>UNDP<br>Salisbury |
| 100. | Mr. S. Tejno | Programme Officer<br>UNDP<br>Salisbury |
| 101. | Mr. J.U. Mansukhani | UN Industrial Planner<br>Ministry of Economic Planning & Development<br>Salisbury |

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|---|---|---|
| 102. | Mr. Carl-Erik Wiberg | Resident Representative<br>UNDP<br>Maseru |
| 103. | Mr. Cavalli | Deputy Resident Representative<br>UNDP<br>Maseru |
| 104. | Miss R. Catchalian | Programme Officer<br>UNDP<br>Maseru |
| 105. | Mr. J.P. Barigye | Senior Trade Policy & Planning Adviser<br>UNCTAD<br>Maseru |
| 106. | Mr. M.A. El-Hawary | UNIDO Industrial Adviser<br>Ministry of Commerce & Industry<br>Maseru |

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| 107. | Mr. Kevin Mosololi | Permanent Secretary<br>Ministry of Commerce & Industry<br>Maseru |
| 108. | Mr. T.K. Tsietsi | Deputy Secretary<br>Ministry of Commerce & Industry<br>Maseru |
| 109. | Miss Mapiti Motsatse | Industrial Planning Officer<br>Ministry of Commerce & Industry<br>Maseru |
| 110. | Mrs. L.H. Hlaoli | Industrial Promotion Officer<br>Ministry of Commerce & Industry<br>Maseru |
| 111. | Miss L. Leuta | Industrial Planning Officer<br>Ministry of Commerce & Industry<br>Maseru |
| 112. | Mrs. Q. Moji | Director, Central Planning & Development Office<br>Maseru |
| 113. | Mr. Terry Musiyambiri | Planning Officer<br>Central Planning & Development Office<br>Maseru |
| 114. | Miss M. Kolobe | Planning Officer<br>Central Planning & Development Office<br>Maseru |
| 115. | Mr. M. J. Comar | Project Officer<br>Lesotho National Development Corporation<br>Maseru |
| 116. | Mr. J.R. Bothma | Director, Lesotho Steel Product (Pty) Ltd.<br>Maseru |
| 117. | Mr. Duplessis | Manager Lesotho Steel Product (Pty) Ltd.<br>Maseru |
| 118. | Mr. Ben Sebatane | Managing Director<br>Basotho Enterprises Development Corporation (Pty) Ltd.<br>Maseru |
| 119. | Mr. M.G. Taylor | Managing Director<br>Anglo American Group<br>Maseru |

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| 120. | Mr. Leonard Rantofi | Director<br>Lesotho Polytecknic<br>Maseru |
| 121. | Mr. D. J. Smart | Managing Director<br>TRANSLOUIP Ltd.<br>Maputsoe |
| 122. | Mr. B.S. Moahloli | Director<br>Lesotho National Development Corporation<br>Maseru |
| 123. | Mrs. Salukazi Molapo | Project Development Officer<br>Lesotho National Development Corporation<br>Maseru |
| 124. | Mr. John F. Curtin | Adviser<br>Lesotho National Development Corporation<br>Maseru |
| 125. | Dr. E. Malie | Chief, Education Officer<br>Ministry of Education, Sports & Culture<br>Maseru |
| 126. | Mr. R.T. Mochebelele | Director of Technical Service<br>Ministry of Agriculture<br>Maseru |
| 127. | Mr. L.E. Molise | Chief, Agricultural Officer (Crop)<br>Ministry of Agriculture<br>Maseru |
| 128. | Mr. John Maieane | Director, Manpower Planner<br>National Manpower Devlopment Secretariat<br>Maseru |
| 129. | Dr. K. Appiah | Planner<br>National Manpower Development Secretariat<br>Maseru |