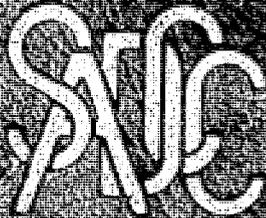


MINING

SOUTHERN AMERICA  
DEVELOPMENT CORPORATION



Windhoek, Republic of Namibia  
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## PROJECT NUMBERING SYSTEM

Projects are numbered in a 3 digit system:

The first digit defines the Sector:

0	-	General
1	-	Precious Metals and Minerals
2	-	Energy Minerals
3	-	Metallic Minerals
4	-	Non-Metallic Minerals
5	-	Water
6	-	Manpower
7	-	Mining Equipment and Consumables

The second digit indicates the member States:

0	-	Regional
1	-	Angola
2	-	Botswana
3	-	Lesotho
4	-	Malawi
5	-	Mozambique
6	-	Namibia
7	-	Swaziland
8	-	Tanzania
9	-	Zambia
10	-	Zimbabwe

The third digit is a serial number.

## ABBREVIATIONS

ADB	=	African Development Bank
AGIP Spa	=	AGIP Spa
AIDAB	=	Australian International Development Aid Bureau
ANG	=	Angola
AUS	=	Australia
BADEA	=	Arab Bank for Economic Development in Africa
BEL	=	Belgium
BOT	=	Botswana
BRA	=	Brazil
CAN	=	Canada
CBI	=	Confederation of British Industries
CFTC	=	Commonwealth Fund for Technical Cooperation
CHI	=	Peoples Republic of China (China)
CITES	=	Convention on International Trade in Endangered Species
DEN	=	Denmark
EEC	=	Commission of the European Communities
FAO	=	Food and Agriculture Organisation of the United Nations
FIN	=	Finland
FRA	=	France
FRG	=	Federal Republic of Germany
GDR	=	German Democratic Republic
IBRD	=	International Bank for Reconstruction and Development
ICAO	=	International Civil Aviation Organisation
ICE	=	Iceland
IDA	=	International Development Agency
IDRC	=	International Development Research Centre
IDU	=	Industrial Development Unit of the Commonwealth Secretariat
IFAD	=	International Fund for Agricultural Development
ILO	=	International Labour Organisation
IMPOD	=	Import Promotion Office for Products from Developing Countries
IRE	=	Ireland
ISNAR	=	International Service for National Agricultural Research
ITA	=	Italy
ITB	=	International Tourism Board
ITU	=	International Telecommunications Union
JAP	=	Japan
KUW	=	Kuwait Fund
LES	=	Lesotho
MAL	=	Malawi
MOZ	=	Mozambique
NAM	=	Namibia
NET	=	Netherlands
NOR	=	Norway
NORDICS	=	Nordic Countries
OPEC	=	Organisation of Petroleum Exporting Countries
POR	=	Portugal
SADCC	=	Southern African Development Coordination Conference
SAFTTA	=	Southern African Federation of Travel and Tour Associations
SAREC	=	Swedish Agency for Research Cooperation with Developing Countries
SATEP	=	ILO Southern African Team for Employment Promotion
SAP	=	Spain
SWA	=	Swaziland
SWE	=	Sweden
SWI	=	Switzerland
TAN	=	Tanzania
TAZARA	=	Tanzania Zambia Railway Authority
UAPTA	=	Unit of Account of the Preferential Trade Area
UK	=	United Kingdom
UNDP	=	United Nations Development Programme
UNIDO	=	United Nations Industrial Development Organisation
USSPEC'd	=	Unspecified
USA	=	United States of America
USSR	=	Union of the Soviet Socialist Republic
WB	=	World Bank
ZAM	=	Zambia
ZIM	=	Zimbabwe

## 1. EXECUTIVE SUMMARY

- 1.1 A minerals sector development strategy covering the period 1986 to 1990, was adopted in 1985. This has been the main policy guideline for the subsequent development of the minerals sector in the SADCC region. The strategy identified constraints to beneficial mineral development, and formulated a Programme of Action to remove these constraints.
- 1.2 As the period covered by this strategy comes to an end, the Mining Sector Programme is now moving from project identification and formulation phase to actual investment implementation phase. Mining projects require long gestation periods.
- 1.3 The Sector programme has grown to a total of 52 projects estimated to cost US\$77.63 million, out of which US\$34.13 million has been secured. Out of these projects, 17 projects are funded. A number of projects have been completed and follow-up action is being carried out through other projects. Some projects have been transferred to Industry and Trade, Energy and Human Resources Development Sectors. The cost and funding status of the Sectoral Programme is contained in the Annex Table.
- 1.4 Cooperation with the Eastern and Southern African Mineral Resources Development Centre (ESAMRDC) focused on the implementation of the joint SADCC Mining Sector/ESAMRDC Project (0.5.1): Establishment of a Regional Geophysical and Geochemical Map Compilation Facility. Consultations were also undertaken with the Sectors of Industry and Trade, Energy, and Soil and Water Conservation and Land Utilisation to define common strategies in the mobilisation and implementation of related projects.
- 1.5 The Mining Sector Coordinating Unit organised a workshop attended by Sectoral Contact Points to map out a plan of operation for Project 0.0.6 "Development of Small-Scale Mining and Minerals Beneficiation". All activities to be performed during the period 1989 - 1992 were defined.
- 1.6 A SADCC Mining Sector delegation visited Namibia in May, 1990 to consult the Government of Namibia on the integration of the country's mining development into SADCC's Mining Sector activities. Consultations with the Namibian Government have resulted in a number of project proposals that were approved by Ministers.

## **2. REVIEW OF THE REGIONAL SITUATION**

2.1 Mining plays a major role in the economies of most member states. The mineral resources of SADCC include base metals, namely; copper, lead, zinc and tin; ferrous and ferro-alloy metals, i.e. iron, manganese, nickel, chromium, molybdenum, cobalt; precious metals, i.e. gold, silver, platinum; energy minerals, i.e. coal, petroleum, gas, uranium; and industrial minerals, i.e. fertilizer and chemical minerals, and gemstones.

2.2 During 1989, the value of SADCC's mineral production was estimated at US\$3 597 million. This was up from 1988, mainly due to the contribution by Namibia. A Summary of some major mineral production in the region is given below:

### **2.2.1 Diamonds**

Diamond production increased by 7.5% over 1988 figures to 17.2 million carats in 1989. This increase is mainly attributed to output from Namibia.

### **2.2.2 Copper**

Copper production increased from 463 000 tonnes in 1988 to 526 677 tonnes in 1989. This increase is due to contribution from Namibia, and increased output from Zambia.

### **2.2.3 Gold**

There was an 11% increase in output to 16.7 tonnes in 1989 from the 1988 production figure, due to an increase in output from Zimbabwe, the largest producer (96%), and additional output from Namibia.

### **2.2.4 Nickel**

There was a decline in nickel production from 34,000 tonnes in 1988 to 31,389 tonnes in 1989. This drop was mainly due to operational problems, and declining ore grades in Botswana.

### **2.2.5 Coal**

Coal production declined by 6.7%, to 6.0 million tonnes in 1989. This was due to operational problems mainly in Zambia.

### **2.2.6 Asbestos**

Asbestos production increased by 2.1% to reach 234,391 tonnes in 1989, compared to 210,000 tonnes in 1988. Asbestos production is from Swaziland (13%) and Zimbabwe (87%).

#### 2.2.7 Cobalt

There was a 1.7% decline in cobalt production mainly due to operational problems in Zambia, which accounts for 92% of total production in the region. Botswana and Zimbabwe also produce some cobalt.

#### 2.2.8 Gemstones

Emerald production declined further to 1559 kilogrammes in 1989, as compared to 1,600 and 2,200 kilogrammes in 1988 and 1987, respectively. These figures may, however, not be realistic as there is substantial trade on the black market. Zambia and Zimbabwe are the main producers of emeralds in the region.

There is also production of other gemstones (amethyst, aquamarine, tourmaline, etc) in the region although production figures are not readily available.

#### 2.2.9 Chromite

Zimbabwe is the only producer of chromite in the region. Production increased by 12% from 560,000 tonnes in 1988 to 627,000 tonnes in 1989.

- 2.3 The development of these mineral resources in the region has historically been dictated by the demands of the industrialised countries. This phenomenon, has resulted in a mining industry geared towards producing raw materials for export. Due to the concentration on large-scale development of export-oriented minerals, very little attention has been given either to the smaller deposits or to the equally important low value minerals that provide a base for the industrial and manufacturing sectors of a national economy. In this regard, a new strategy is being developed to guide the Mining Sector in the development of the Mining Sector Programme of Action for the 1990s and beyond.
- 2.4 However, according to statistical figures supplied by the member States, dependence on minerals varies from one member state to another. In this regard, four countries, namely, Lesotho, Malawi, Mozambique and Tanzania get less than 5% of total revenues from minerals, whereas three countries, namely, Angola (oil); Botswana (diamonds); and Zambia (copper) obtain 80% or more of their revenues from only one mineral. In the case of Swaziland the revenue contribution of the mineral sector is 6%, Namibia is 20% and that of Zimbabwe is estimated at 44%.
- 2.5 For sometime now the national economies of most SADCC member states have experienced stagnation or negative growth rates. Among the factors contributing to this state of affairs are the following:

- (a) over-dependence on the export of a few mineral raw materials and agricultural commodities and importation of capital, intermediate and consumer goods;
- (b) depressed prices for the main SADCC export commodities, particularly minerals. However, mineral prices during the year were favourable and this increased revenue;
- (c) deteriorating terms of trade and worsening balance of payments, which is aggravated by the increasing debt burden in the region;
- (d) lack of foreign exchange, leading to reduced import capacity for essential inputs and spare parts, and this results in capacity under-utilisation of various essential industries, including mines; and
- (e) lack of appropriate indigenous technology and skilled manpower.

2.6 Operating in such a background, the Mining Sector in the region has not contributed as much as it could. However, despite efforts aimed at industrial diversification and agricultural expansion, it is evident that the Mining Sector's predominant position as the major foreign exchange earner in the member states, is likely to continue for some time.

### 3. REVIEW OF THE PROGRAMME

3.1 To address the problems of the Mining Sector, the SADCC strategy was formulated to meet the following objectives:

- (a) improvement of knowledge of mineral resources, through the establishment of adequate inventories of existing and potential resources;
- (b) exchange of scientific, technical and economic data on geology, mining and mineral among SADCC countries;
- (c) creation of better systems of forecasting consumption patterns with a view to optimising the utilisation of mineral resources, and the development of mechanisms for intra-regional trade;
- (d) maximum diversification of mining industries, particularly through the development of industrial minerals, and small-scale mining, bearing in mind the principle of equitable regional development;
- (e) reduction of external dependence of the regional mining industry, by the development of local manufacturing capacity for mining equipment, spares and consumables;

- (f) establishment of appropriate scientific, technical and industrial environment required for the development of mineral industries;
- (g) training of high-level professional, managerial and technical personnel in all aspects of mineral resources development; and
- (h) cooperation among SADCC countries in the development, mining, processing and marketing of mineral resources.

3.2 The SADCC Mining Sector programme is subdivided into the following categories:

3.2.1 Projects of General Concern

This category includes projects of general support to the mining industry (small-scale mining, data bank and minerals, remote sensing exploration, exploration facilities, map compilation, geochronology laboratory).

3.2.2 Precious Metals and Marketing

Support for small-scale mining, and the development of processing facilities and marketing structures in the region.

3.2.3 Energy Minerals

The Sector intends to define a strategy for improving the coal development in the region. In this regard, a general study on the coal resources in the region has been undertaken, while emphasis has been given to support member States to increase coal production (Malawi, Mozambique, Swaziland). Steps have also been taken to increase the use of indigenous coal resources by modifying the burning installations (Swaziland).

3.2.4 Metallic Minerals

Emphasis has been given to the development and optimisation of processing and utilisation capacities of base metals industries (steel, copper, aluminium, titanium) and related downstream operations. In addition, support is being given to exploration projects in order to discover new deposits.

3.2.5 Non-Metallic Minerals

Emphasis is being given to the development of fertilizer raw materials (phosphate, potash and lime), and of mineral inputs necessary to the local industry (refractory minerals, gypsum, bentonite, ceramic raw materials and kaolin).

The importance of non-metallic industrial minerals is clearly demonstrated by the large number of projects in this sub-sector.

#### 3.2.6 Water

The Mining Sector is mainly concerned with the harnessing of underground water resources. Any development in this field will only be decided after the conclusion of the assessment of the water resources of the region, currently being jointly undertaken with the Soil and Water Conservation and Land Utilisation Sector.

#### 3.2.7 Mining Equipment and Consumables

The Sector has recognised the need to develop the local production of inputs to the mining industry. Emphasis has been given to the collection of data on mining equipment and spares, and mining chemicals and explosives. Regular contacts are being maintained with the regional industry to overcome the constraints in the development of the production of mining inputs.

#### 3.2.8 Manpower

Recognising the need to develop indigenous manpower, the Mining Sector identified and formulated projects aimed at making the region self-sufficient in the manpower needs. In this regard, emphasis has been placed on the coordination of the existing industrial and educational units, standardisation of courses and strengthening of training facilities.

3.3 Most of the projects undertaken during the first five-year strategy period 1986/90, have focused on collection and analysis of data. This has been invaluable in identifying viable or bankable projects. The next phase will focus on implementation of investment projects. In this regard, a new strategy is being developed to guide the development of the sector during the 1990s and beyond.

#### 3.4 New Projects

Seven new projects have been added to the programme. These are:

- (a) 0.0.9 Exploration of the Kalahari Sands;
- (b) 1.0.2 Diamond Exploration in the SADCC Region;
- (c) 2.6.1 Evaluation and Development of Namibian Coal Deposits;
- (d) 2.9.1 Maamba Rehabilitation Phase II;

- (e) 3.9.2      Exploitation of Munali Nickel Deposit;
- (f) 3.10.1     Increased Production at Kamativi Tin Mines Feasibility Study;
- (g) 4.0.10     Metallurgy of Ores from Alkaline Complexes (Carbonalites, etc.)

4.    **CURRENT STATUS OF PROJECTS**

**Project 0.0.0: Support to the Mining Sector Coordinating Unit**

This is an on-going project and involves provision of personnel and technical support to strengthen the capacity and capability of the Sector Coordinating Unit.

The project entails secondment of five experts in the fields of Mining, Geology, Mineral Processing, Economics and Manpower Planning. To each of these experts, a Zambian counterpart is provided, who will eventually take over the responsibilities performed by the experts. The project is estimated to cost US\$3.08 million. Out of this figure, US\$0.533 million has been secured from France and US\$1.400 million from the Nordic countries, US\$0.78 from the EEC and US\$0.367 from Zambia.

**Project 0.0.3: Sharing of Mineral Processing Facilities**

The aim of this project is to review the existing and planned mineral processing facilities in the region, and to assess how best these facilities might be utilised to benefit all the member States. The consultant is required to make recommendations on how best to rationalise the utilisation of existing plants; and recommend, if necessary, the establishment of new metallurgical plants. The project is estimated to cost US\$0.13 million.

A Nordic technical advisor has been seconded to the Coordinating Unit, and the project is under implementation.

**Project 0.0.4: Remote Sensing Survey Using the Spot Satellite**

The objective of this project is to assess and evaluate the present national programmes of the SADCC member States on the use of spot satellite remote sensing techniques for recording stereoscopic pairs of images to prepare a photo-geological interpretation of selected mineral provinces in SADCC member States, with a view to enhancing mineral resources exploration. The survey will also examine the feasibility of establishing a SADCC tracking station and interpretation centre. The project is estimated to cost US\$0.49 million. Funding is being sought.

**Project 0.0.5: Regional Seismic Network and Data Centre Feasibility Study**

The objective of this project is to study the feasibility of establishing, at the national and the regional levels, a SADCC Seismological Network to detect earth movements.

Phase 1 of the project is under implementation with funding (US\$0.081 million) from the Nordic countries.

**Project 0.0.6: Small-Scale Mining and Minerals Beneficiation**

The project is divided into two phases. The objectives of the first phase are:

- (a) selecting potentially high-value mineral deposits in the region, which are amenable to small-scale mining and processing;
- (b) identifying appropriate methods for production and marketing of products and financing arrangements;
- (c) determining appropriate mining and processing equipment to be used; and
- (d) selecting, within the region, areas for pilot projects for small-scale mineral operations.

Phase II will be the actual implementation of a pilot programme, to test the suitability of the small-scale mining and processing approach. Phase I is estimated to cost US\$0.24 million. The programme was mapped out through a workshop in September 1989, attended by Sectoral Contact Points.

A technical advisor has been appointed to the Coordinating Unit, who is executing Phase I of the project and is supported by a counterpart officer.

**Project 0.0.7: Regional/National Geological Minerals and Mining Bibliographic Data Banks**

The objectives of the project are to:

- (a) select a number of institutions in the region which have facilities to constitute regional and national data banks;
- (b) define the work programmes and needs of the data banks;
- (c) secure and install additional needs of data banks;
- (d) establish standard format for data and information compilation;
- (e) to prepare a regional bibliography; and

(f) to train local staff to operate the data banks.

The project is estimated to cost US\$ 1.2 million. Funding is being sought.

**Project 0.0.8: Analysis of the Investment Climate in the SADCC Mining Sector**

The objective of the study is to review the regulatory and incentive framework for mining development in each of the SADCC member States, and make specific recommendations on action to improve this framework. The project is under implementation with the support of the World Bank, at an estimated cost of US\$0.29 million. A prototype study was done for Zimbabwe last year. Studies in the rest of the member States are currently underway.

**Project 0.0.9: Exploration of the Kalahari Sands**

The objective of this new project is to explore for new ore deposits under the Kalahari Sands. This project will be implemented in two Phases. Funding is sought for Phase I method selection, development and testings (US\$0.10 million). Implementation of Phase II will depend on the results of Phase I.

**Project 0.5.1: Regional Geophysical and Geochemical Map Compilation Facility**

The objective of the project is to establish, within the region, a geophysical and geochemical map compilation facility. This facility is expected to serve as the focal point for the development and production of new maps and the exchange of mineral information.

The project proposes that the existing Mozambique facility in Empresa Nacional de Hidrocarbonetos be expanded to serve as a regional centre.

This work will be performed with the participation of the Eastern and Southern African Mineral Resources Development Centre (ESAMRDC) in the collection of geochemical and geophysical data. The project cost is US\$0.89. Funding is being sought.

**Project 0.10.1: Central Isotope Geochronology Laboratory**

This is an on-going project whose facilities are located in Zimbabwe. The facilities are being used by member States. US\$0.23 million has been secured from EEC to meet regional obligations of the centre (analysis to be done for member States and training of regional staff) for three years. For the moment the use of the Facility by other member States is free. However, when the support of the EEC is exhausted in two-and-a-half years time, member States using

the Facility (Botswana, Malawi, Tanzania and Zambia) will pay basic fees to cover the cost of services rendered. The Project estimated cost is US\$0.23 million.

**Project 1.0.1: SADCC Gemstone Buying, Processing and Marketing**

During Phase I of the project, work will focus on the examination of the international demand/supply market for gemstones. The feasibility of establishing a regional marketing mechanism for rough and processed gemstones, as well as a regional jewellery industry based on gemstones, will be assessed.

Phase II of the project will be the actual implementation of the project arising from Phase I. Phase I is estimated to cost US\$0.14 million. Funding is being sought for Phase I. Phase II costs will depend on results of Phase I.

**Project 1.0.2: Diamond Exploration in SADCC Region**

The main purpose of this new project is to define the diamond provinces of the SADCC region. The objectives of the project are:

- (a) to undertake a broad-based search for diamonds, and establish the concept of a diamond belt extending from Namibia in the Southwest, through Botswana into Western Zambia and to Tanzania in the North East as well as into Angola to the North West; and,
- (b) to study, in some depth, the satellite imagery of known occurrences of diamond, and seek similar signatures within Namibia, Zambia, Tanzania and Angola since some of the occurrences are tectonic controlled and the regional tectonisms can be traced covering all these countries.

This project will be executed in conjunction with Geological Survey Departments of member States. This project is a follow-up to Project 0.0.1 "Small-Scale Mining, Processing and Marketing". The project is estimated to cost US\$0.10 million. Funding is sought.

**Project 2.0.1: Exploitation of Coal Resources in the SADCC Region**

The objective of this project is to review the known coal resources of the region; in order to make an assessment of the possibilities of development, in terms of potential local consumption and export markets.

The project was implemented with the support of the Commonwealth Fund for Technical Cooperation through the Industrial Development Unit (IDU), at a cost US\$0.15 million. The recommendations of the study regarding a study

on the improvement of productivity in coal mines, and the promotion of the use of coal as well as coal explorations, are being followed up by the Coordinating Unit.

**Project 2.4.1: Coal Exploration and Evaluation in Malawi**

The objective of this project, which is underway, is to investigate and assess the economic potential of known coal occurrences in Malawi, and to train Malawi nationals in coal exploration, evaluation and production, as well as inventory report writing.

This project is being funded by France (US\$0.83 million) and Malawi (US\$0.58 million). Negotiations to secure the balance of US\$1.2 million are underway with France.

**Project 2.4.2: Mining Development Trial at Livingstonia, Malawi**

The objective of the project is to develop commercial coal mining in Malawi, thus furthering the objective of national self-sufficiency. Funds (US\$0.39 million) were secured from France and a small-scale coal mine is successfully being operated by the Mining Investment and Development Corporation (MIDCOR). Total cost of the project is US\$0.39 million.

**Project 2.4.3: Coal Analysis Laboratory in Malawi**

The objective of the project is to establish a coal analysis laboratory in Malawi, as support to the present coal exploration projects to avoid sending samples abroad for testing. The laboratory is fully operational and is at the disposal of SADC member States. The cost of services will be met by the users. Samples of coal from Lesotho have been analysed.

**Project 2.5.1: Manufacture of Coke at Moatize Colliery (Mozambique)**

The objective of this project is to establish coking facilities at Moatize Colliery in order to increase the value of the Moatize product, and reduce regional dependence on outside coke suppliers. The feasibility study (Phase I) is expected to take three months to complete. Phase II, the establishment of coking facilities, will depend on Phase I. Phase I is estimated to cost US\$0.08 million. Funding has been secured from France and work is expected to start soon.

**Project 2.5.2: Management Assistance for Coal Development in Mozambique**

The purpose of this project is to support a management assistance programme for the National Coal Board of Mozambique.

The main objective of the programme is to build an efficient technical structure within the Coal Board to enable it to implement, coordinate and direct the coal development programmes at all stages from the preliminary, feasibility to the launching of the projects, their supervision and management, as well as the environment aspects. A technical assistance programme, consisting of the secondment of 5 experts to the National Coal Board is under implementation with the support of Brazil and France (US\$1.8 million).

**Project 2.6.1: Evaluation and Development of Namibian Coal Deposits**

This new project seeks to achieve the following objectives:

- (a) to develop a coal mine to meet the local demand in energy and in mineral smelting;
- (b) to replace imported coal and save the much needed foreign exchange; and
- (c) to create employment.

The project will be implemented in 4 phases starting from the review of data through the prospecting of target areas, pre-feasibility study to the development phase.

Funding (US\$0.02 million) is sought for Phase 1 (review of data and target selection).

**Project 2.7.1: Assessment of Increasing Uses of Indigenous Coal in Swaziland**

The objective of the project is to assess the technical problems related to Swaziland using its low-grade coal in industry, instead of importing industrial coal from South Africa. The study will evaluate both economic and financial problems involved in the switch to the local coal at the producer and consumer levels. US\$0.041 million has been secured from France, and the project is under implementation.

**Project 2.9.1: Maamba Rehabilitation Phase II**

This project aims at maintaining the production capacity of around 750 000t per annum of washed coal by rehabilitating major mining and plant equipment at Maamba Collieries (Zambia). This is a new project, and is estimated to cost US\$9.5 million. Funding is being sought.

**Project 3.0.4: Integrated Alumina/Aluminium/Calcination Industry in the SADC Region**

This project is a feasibility and market study aimed at determining the viability of establishing an integrated alumina/aluminum/calcination industry in the region, based

on the known bauxite deposits, (Malawi, Mozambique and Tanzania). The project, which was completed with UNDP funding of US\$0.25 million, concluded that a detailed feasibility study be carried out to produce a bankable document for establishment of an aluminium smelter based on exploitation of the Mulanje bauxite. Funding (US\$0.25 million) is being sought for this follow-up action.

#### **Project 3.0.5: Bauxite Exploration in the SADCC Region**

Phase I of this project will look into basic geological mapping, scout sampling and detailed sampling (1:5 000). The main aim of the project in Phase II is to establish concretely, the size of the bauxite reserves that exist in Mozambique and Zimbabwe, and in Phase III to assess whether that reserve can form the raw material base for a regional aluminum industry. Project cost is US\$1.53 million. Funding is being sought for Phase I.

#### **Project 3.0.6: Assessment of Heavy Mineral Sand Deposits and Feasibility of a Titanium Oxide Plant**

The project is conceived in two phases. Phase I comprises the assessment of current reserves of heavy mineral sand deposits in Malawi, Mozambique and Tanzania. During this phase, an assessment of the regional and international market for heavy sands and titanium dioxide will be carried out. The cost estimate for Phase I is US\$0.132 million. Funding is sought for Phase I.

#### **Project 3.0.7: Assessment of Iron Ore Deposits**

The project aims to carry out a study in Angola and Swaziland, to establish the iron ore reserves in these two countries. In addition, the study will assess the possibilities of establishing both regional and international markets for iron ore products. The study will take into account the findings of Project 3.0.2.

The project is costed at US\$0.06 million. Funding is being sought.

#### **Project 3.9.1: Exploration for Lead/Zinc Prospects -Zambia**

The objective of the project is to reassess all existing data on the lead/zinc deposits in the Kabwe area, with a view to establishing the quantities of ore contained in the reserves. It will also be necessary to augment the data gaps by carrying out geophysical surveys throughout the area, and drilling trials as part of the effort to estimate the strength of the reserves. The cost of the project is US\$2.64 million.

Phase I of the project (reassessment of the existing geochemical data) was implemented with French support at a cost of US\$0.06 million. Phase II (drilling programme) has

been completed with funding (US\$2.64 million) from Japan. Analysis of drill cores is underway.

**Project 3.9.2: Exploitation of Munali Nickel Deposit (Zambia)**

The objective of this new project is to ensure an optimum and coordinated development of the nickel resources of the SADCC Region by:

- (a) evaluating, through a detailed feasibility study, the viability of the Munali Nickel in the production of a nickel concentrate; and
- (b) optimising the excess capacity of nickel smelting facility in Zimbabwe, by processing the Munali Nickel.

Funding (US\$1.2 million) is being sought for the Phase I (detailed feasibility study). Phase II (investment) will be determined by Phase I.

**Project 3.10.1: Increased Production of Kamativi Tin Mines - Feasibility Study**

This new project seeks to achieve the following objectives:

- (a) To mine the very large resources of low grade tantalite ores with increased output of 150 000 to 200 000 tpm, equal to about 1 500 tons of tin metal per annum, in order to ensure the survival of Kamativi Tin Mine and its smelter, as a viable economic entity for an extended period. The Kamativi Tin Smelter is required to convert tin produced by numerous existing and future small scale tin mines in SADCC region (Namibia, Zambia, Zimbabwe) into metal concentrates;
- (b) To avoid loss of tin production in the SADCC region; and,
- (c) To avoid the redundancy of several hundred employees and negative influences on the economic well-being of the remote Zambezi Valley area.

This project will be executed in 2 phases:

Phase I - Pre-feasibility study

Phase II - Feasibility Study.

Funding (US\$0.13 million) is being sought for Phase I.

**Project 4.0.2: Sua Pan (Botswana) and Lake Natron (Tanzania) Project - Market Study**

The objective of this study is to assess the demand of common salt, soda ash, potash among the SADCC member States;

and to determine the possibility of the region providing a secure market, which would allow the exploitation of the salt deposits at Sua Pan in Botswana and Lake Natron in Tanzania. The project has been completed. The study has shown that a market exists in the region for products from Sua Pan, and that small-scale operations at Lake Natron would be profitable. Botswana and Tanzania are studying the reports.

#### **Project 4.0.3: Establishment of a Refractory Industry**

The objective of this project is to determine the viability of establishing a refractory industry in the region; and, if found viable, to make recommendations on how this might best be achieved. The project has been completed with UNDP funding (US\$0.17 million). The Coordinating Unit, in consultation with Zimbabwe is assessing the scale of investment required for the installation of refractory production facilities in the region.

#### **Project 4.0.4: Processing of Lime**

The purpose of this project is to undertake a region-wide demand study for lime and lime based products, in the various industries; in order to determine the viability of establishing processing plants. The project has been completed with funding from UNDP. A number of recommendations were made for each member State. The Mining Coordinating Unit is following up with each member State in order to ensure that implementation takes place.

#### **Project 4.0.5: Non-Metallic/Industrial Mineral**

The aim of this project is to make an assessment of known potential of non-metallic minerals in the region and to propose concrete projects for their development. A preliminary study was completed and was reviewed by the Sector Coordinating Unit. The final report of the First Phase was approved in May, 1988. Phase II, the market survey, is underway (cost US\$0.175 million).

#### **Project 4.0.6: Assessment of Vermiculite Production in the SADCC Region**

The project is divided into two phases. Phase I aims at evaluating the strength of present reserves of vermiculite resources in the region through surveys in Malawi and Zimbabwe. This study will also establish the regional and international demand for vermiculite products.

Phase II, which comprises exploration, will depend on the results of Phase I. US\$0.077 million has been secured from France for Phase I, which is under implementation.

**Project 4.0.7: Assessment of the SADCC Hotel and Household Whiteware Industry**

The objective of the project is first to determine, through a study, the constraints to the development of a SADCC Hotel and Household Whiteware Industry, and to assess available prospects for the industry. The study will then recommend measures that need to be taken to promote the development of these industries, as well as the projects that can be coordinated regionally. Funding (US\$0.076 million) is being sought.

**Project 4.0.8: Market Survey for SADCC Ornamental Stone**

The project aims at assessing the strength of the existing regional and international market for ornamental stones produced from the SADCC region; and to propose new projects in this area. Financing (US\$0.075 million) is being sought.

**Project 4.0.9: Gypsum Production in the SADCC Region**

The objective of the project is to assess the current market for gypsum in the SADCC region and to propose strategies for developing the regional production of gypsum. In addition the project will assess the size of gypsum reserves in Angola and Tanzania; assess the availability of artificial gypsum in Zambia; and map out a strategy for their development.

Funding (US\$0.10 million) is being sought.

**Project 4.0.10: Metallurgy of Ores from Alkaline Complexes**

The objectives of this new project are to:

- (a) produce the agro-mineral phosphates and agricultural lime, which are essential to improve agriculture but not available;
- (b) produce saleable concentrates of niobium, rare earths, thorium-uranium, zircon, strontium, fluorite, etc, for sale on world markets; and
- (c) create employment opportunities for the local population.

Funding (US\$0.47 million) is being sought.

To achieve the objectives, a study will be carried out on existing data on geology and resources of the region. A comprehensive review, and the selection of more promising areas will be undertaken to assess metallurgical ore properties for possible processing technologies. A programme of research will be designed, followed by

laboratory tests in order to make a preliminary plant design and produce a pre-feasibility report.

**Project 4.1.1: Production of Fertilizers from Phosphates - Angola**

The objective of this project is to exploit the extensive deposits of phosphates in the Zaire Province of Angola in order to help meet the agricultural needs of the region for phosphate-based fertilizer; and, thereby, contribute to SADCC self-sufficiency in fertilizer production. US\$0.143 million being sought for Phase I (feasibility study).

**Project 4.5.1: Development of Boane Bentonite Mine - Mozambique**

Phase I of the project will focus on the rehabilitation of the Boane Mine, Maputo. Phases II and III will initiate the upgrading of the mine, and on the basis of the success of this exercise, proceed to produce bentonite.

Availability of markets will be a crucial factor in determining whether the mine should go into extra investment for increased production.

Phase I of this project (Assessment of Rehabilitation and Market Survey) has been completed with support from the Commonwealth Fund for Technical Cooperation, CFTC (US\$ 0.54 million). Funding (US\$0.24 million) for Phase II has been secured from CFTC for the implementation of the Rehabilitation Programme, and work is to start soon.

**Project 4.7.1: Exploration for Ceramic and Chemical Industry Raw Materials - Swaziland**

The project aims at carrying out an exploration of the talc, pyrophyllite silica and kaolin deposits of South-West Swaziland. A feasibility study will be carried out to determine how these deposits can be developed for the domestic market, as well as for the region's ceramic and chemical industries. Funding (US\$0.54 million) is being sought.

**Project 4.8.1: Pugu Kaolin Project (Tanzania)**

The objective of this project is to establish an open-cast mine, and treatment plant, to exploit Tanzania's kaolin resources, in order to meet the demand of the SADCC region; and to export to other countries. This project requires an equity partner and investment financing of up to US\$12.0 million. A pilot plant has been installed with the support (US\$7.5 million) of Austria and the African Development Bank (ADB), and is in operation.

A market survey was carried out by the State Mining Corporation of Tanzania (STAMICO). However, the market was

not adequately identified. A complete appraisal of this project, including a further market survey, is being undertaken with support from Canada.

**Project 4.9.1: Mining of Fluorspar (Zambia)**

The objective of this project is to open a new fluorspar mine in the Sianyoola area, in Zambia, in order to supply the SADCC market; and to export the product on the international market, and thus generate foreign exchange. Agip SpA is willing to proceed with this investment, once funding for the necessary infrastructure has been secured. About US\$ 13 million is, therefore, being sought for the general infrastructure development. Consultations between the Government of Zambia and the ADB on the funding of the project are underway.

**Project 5.0.1: Hydro-Geological Investigation**

This project seeks to determine how best to organise the collection of hydro-geological data, and identify areas within the region where availability of water is most likely to benefit future development in the agricultural, industrial and mining sectors.

The project was implemented, jointly with the Regional Hydrological Assessment (7.0.2) of the Soil and Water Conservation and Land Utilisation Sector and was supported by the World Bank. The project is completed. The recommendations from this project will be considered at the next meeting of Ministers of Mining in 1991.

**Project 7.0.2: Production of Mining Chemicals and Explosives**

The objective of this project is to provide data on existing facilities for the production of mining chemicals and explosives; and make proposals for further expansion taking into consideration supply, demand and availability of raw materials. The study financed by the CFTC at a cost of US\$0.08 million, has been completed and the report has been reviewed by member States, and the recommendations are being followed by Kafironda Explosives Ltd. and Nitro Nobel of Zimbabwe. Regular contacts between these industries and the Coordinator are being maintained.

**Project 7.0.3: Study on the Manufacture of Electrodes**

The objective of this project is to determine the viability of establishing a regional industry for the production of electrodes. Funds (US\$0.07 million) are being sought.

**Project 7.0.4: Central Data Bank for Mining Equipment and Spares Manufactured**

The objective of the project is to establish a Central Data Bank of mining equipment and spares manufactured in the

SADCC region, used by relevant mining industries. US\$0.59 million has been secured from the Nordic countries, and 2 experts seconded to the Coordinating Unit are implementing this project.

**Project 7.0.5: Rationalisation of Rock Drill Steel Manufacturing Industries**

The objective of the project is to investigate ways of improving the industries which manufacture hand-held rock drills, rock drills steel and spares, in the SADCC region. US\$0.08 million has been secured from the Nordic countries, and the project is under implementation.

**Project 7.0.6: Rationalisation of the Manufacture of Wear Resistant Liners and Rail Track and Fittings**

The objective of the project is to investigate ways of improving the operations of the industries producing wear resistant liners, rail track and fittings within SADCC region. US\$0.08 million has been secured from the Nordic countries and the project is under implementation.

**Project 7.0.7: Manufacture of Activated Carbon from Coconut Shells**

The objective of Phase I of the project is to assess, through a survey, the existence of a regional market for activated carbon, and to survey the coconut charring and activating methods in the region. The project will also assess the availability of coconut resources, and the feasibility of installing an activating plant in the region. Phase II of the project is the actual installation of the plant. US\$0.07 million has been secured for Phase I from Commonwealth Fund for Technical Cooperation. Implementation is expected to start during the second half of 1990.

**Project 7.3.1: Manufacture of Diamond Tools in Lesotho**

The objective of this project is to launch a market study on the demand for diamond tools in the SADCC region with a view to making recommendations on the possibilities of establishing a diamond tools manufacturing facility in Lesotho. The terms of reference for this study and a revised project description, including new costings, have been approved. Lesotho is carrying out a preliminary study which has not been completed. The subsequent phase of the project (Manufacture of Diamond Tools) is estimated to cost US\$0.08 million.

0.0.4 REMOTE SENSING SURVEY USING SPOT SATELLITE

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Estimated Costs

Total: US\$ 0.49m  
Foreign: US\$ 0.49m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$ 0.49m

Executing Agency:

Sector Coordinating Unit

Duration: 4 months

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**Objectives:** The objectives of this project are:

- \* to introduce and to enable the large scale application of advanced earth observation satellite imagery in the SADCC region, for purposes of resource management and resource inventory and data collection and interpretation;
- \* to ensure a coordinated introduction of satellite remote sensing techniques in the SADCC region, giving a maximum benefit to each SADCC member State;
- \* to define if any specialised installation (interpretation centre, etc...) might be worth established at a regional level;
- \* to assess and evaluate the present national programmes for selected minerals; and,
- \* to examine the feasibility of establishing a SADCC tracking station and interpretation centre.

**Description:** The launches of the American LANDSAT/THEMATIC MAPPER satellite in 1984 and the French SPOT satellite in 1986 mark a break-through in quality of satellite data with ground resolutions in the range of 10m to 20m (SPOT), up to 30m (TM), and a much wider scanning spectrum with up to 7 channels (TM), designed for specific geological and other applications. The combined information derived from both satellite systems improves greatly the present earth observation techniques and these satellites are opening up new fields of application.

The following are among the principal applications for images produced from SPOT and TM data:

- \* aid to geologic mapping and exploration of minerals and oil/gas resources;
- \* topographic surveys at medium scales such as 1: 100.000 (TM) up to 1: 50.000 (SPOT). Development of new types of thematic maps with frequent updating;
- \* land use studies; and,
- \* agriculture, forestry, water resources evaluations.

The tasks to be undertaken in the frame of this project are to:

- \* identify the fields of application, where the use of satellite remote sensing will have substantial impact in the SADCC countries: geology, mineral/hydrocarbon exploration, cartography, agriculture, forestry, land use; and,
- \* propose plan of action for realisation of long-term remote sensing projects for SADCC countries, taking into account the possibility of the establishment of regional facilities, supporting the national development strategies in this field, and the other SADCC projects using satellite imagery, specifically for agriculture.

**Status:** Funding being sought.

**0.0.7 REGIONAL/NATIONAL GEOLOGICAL, MINERALS AND MINING  
BIBLIOGRAPHIC DATA BANKS**

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Estimated Costs

Total: US\$1.20m  
Foreign: US\$1.20m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$1.20m

Executing Agency:

Sector Coordinating Unit

Start:

Duration: 5 years

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**Objectives:** The objectives of the project are firstly to set up a regional bibliographic Data bank on Geology and Mining, and secondly to set up national geological, minerals and mining Data banks, based on Regionally standardised data forms, software and hardware, in each SADCC member country.

The existence of these compatible national Data banks will permit, when necessary to easily compile regional data on a particular subject.

**Description:** The main tasks to be undertaken are:

- \* to select Institutions/Departments in member countries which have facilities to handle the data bases, and to define the exact scope of the work of these units, and allocate personnel;
- \* to purchase and install the equipment;
- \* to finalise Minerals and Mining Industry standardised forms, control the filling of these forms, and compile them;
- \* to compile a regional bibliography, and incorporate it into a global bibliographic data system;
- \* to install a minerals and mining inventory software, and the corresponding security procedures respecting the confidentiality of some data; and,
- \* to train local staff in the operation of the data banks to ensure continuity.

**Status:** Funding is being sought.

**0.0.9: EXPLORATION OF THE KALAHARI SANDS**

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Estimated Costs

Total: Phase I: US\$0.10  
Phase II:

Foreign: US\$0.10m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$0.10m

Executing Agency:

Sector Coordinating Unit

Start: 1990

Duration:

Phase I: 24 months  
Phase II: to be determined  
by Phase I

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**Objectives:** The objective of the project is to discover new ore deposits under the Kalahari Sands.

**Description:** The project involves the exploration for potential mineral deposits in the Kalahari Sands.

The Kalahari Sands covers large parts of Southern Africa, and in Namibia, the sand is estimated to be up to 250 metres thick in places. Because of this sand cover, and the relative aridity of the area, the Kalahari basin is not well explored for the mineral potential in the solid rock underneath the sand.

The Namibian rock formations, which disappear eastwards under the sand cover are known to carry minerable ore deposits of coal, copper, lead, zinc, manganese and vanadium. In addition diamonds could be found in the north-eastern part of Namibia where kimberlites were already identified in an earlier exploration programme.

**Status:** Funding is being sought.

**0.5.1 REGIONAL GEOPHYSICAL AND GEOCHEMICAL MAP  
COMPILATION FACILITY**

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Estimated Costs

Total: US\$0.89m  
Foreign: US\$0.89m  
Local: -

Financing Gap: US\$0.89m

Executing Agency:

Sector Coordinating Unit  
ESAMRDC; and Government  
of Mozambique

Funding Secured

Foreign: -  
Local: -

Start: -

Duration: Five years

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**Objectives:** The objective of the project is to establish, within the region a geophysical and geochemical map compilation facility. This facility is expected to serve as the focal point for the development and production of new maps and the exchange of mineral information.

**Description:** The project aims at expending an existing facility, designed for the production of seismic sections (oil exploration) at the Empresa Nacional de Hidrocarbonetos (ENH) (State oil company) in Maputo, so as to transform it into a regional geoscience data centre able to process and interpret geophysical, geochemical, and other geoscientific data.

The creation of the facility will proceed jointly with the collection of regional geophysical and geochemical data, so as to produce initial regional thematic maps. The collection of data will be done in cooperation with the Eastern and Southern African Mineral Resource Development Centre (ESAMRDC).

The main tasks to be undertaken are:

- \* identification, procurement and installation of the equipment necessary for the expansion of existing facilities;
- \* survey of all existing geophysical data available in each member State, and conversion of such data to a format compatible with ENH equipment;

- \* compilation of relevant regional maps and regional interpretation of the data, and identification of gaps and areas that need to be resurveyed;
- \* creation of a regional geoscience archive; and,
- \* development of local expertise in the centre, to provide further services to subregional institutions in the same field.

**Status:** Funding is being sought.

**1.0.1 SADCC GEMSTONE BUYING, PROCESSING AND MARKETING - PHASE I**

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<u>Estimated Costs</u>	<u>Financing Gap:</u> US\$0.14m
Total: US\$0.14m	<u>Executing Agency:</u>
Foreign: US\$0.14m	Sector Coordinating Unit
Local: -	
<u>Funding Secured</u>	<u>Start:</u> -
Foreign: -	<u>Duration:</u> 6 months
Local: -	

---

**Objectives:** The objectives of the project are: to evolve a SADCC strategy for buying, cutting, polishing and selling of gemstones, to eliminate illegal mining and illicit trading in gemstones; and to enhance employment generation in the gemstone industry and foreign exchange earnings from the export of rough and cut gemstones, within the SADCC region.

**Descriptions:** The countries of SADCC are endowed with many precious and semi-precious minerals such as emeralds, tanzanite, rubies, amethyst, aquamarine, agates, several semi-precious stones, etc. The present situation is such that each SADCC country operates its gemstone industry independent of other SADCC countries. This practice has resulted in illicit trading of rough gemstones. Accordingly, several SADCC countries are losing millions of dollars every year in potential foreign exchange earnings from rough gemstones and semi-precious stones smuggled out of their borders. On the other hand, improvements and the expansion of cutting and polishing

facilities could enhance employment opportunities and the value of gemstones produced in the countries.

During Phase I of the project, work will focus on the examination of the international demand/supply market for gemstones. The feasibility of establishing a regional marketing mechanism for rough and processed gemstones, as well as a regional jewellery industry based on gemstones, will be assessed. Phase II of the project will be the actual implementation of project arising from the first phase.

**Status:** Funding is being sought.

### 1.0.2 DIAMOND EXPLORATION IN SADCC REGION

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Estimated Costs

Total: US\$0.10m  
Foreign: US\$0.10m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$0.10m

Executing Agency:

Sector Coordinating Unit

Start: as soon as possible

Duration: 2 years

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**Objectives:** The main objective of the project is to define the diamond prevalence in the SADCC region through a systematic geological exploration of all favourable diamond bearing areas.

**Description:** The project will undertake a broad-based search for diamond and establish the concept of a diamond belt extending from Namibia in the south west, through Botswana into Western Zambia and to Tanzania in the north east as well as into Angola to the north west.

The project will also study the satellite imagery of known occurrences in Botswana and Lesotho and seek similar indications within Angola, Namibia, Tanzania and Zambia, since some of the occurrences are tectonic-controlled and the regional tectonism can be traced covering all these countries.

The main tasks to be undertaken are:

- i) satellite imagery study of all known productive and unproductive kimberlites in the SADCC region;
- ii) a study of the diamond yielding alluvials of the region; and,
- iii) a careful analysis of the drainage of the productive pipe complex in respect of known placer deposits, also a search for paleo rivers draining the pipe areas using satellite imagery of good resolution.

**Status:** Funding is being sought.

**2.6.1 EVALUATION AND DEVELOPMENT OF NAMIBIAN COAL DEPOSITS  
Phase I**

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<u>Estimated Costs</u>	<u>Financing Gap:US\$0.02m</u>
Total: US\$0.02m	<u>Executing Agency:</u>
Foreign: US\$0.02m	Government of Namibia
Local: -	
<u>Funding Secured</u>	<u>Start:</u>
Foreign: -	<u>Duration: 6 years</u>
Local: -	

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**Objectives:** The objectives of this project are to:

- develop a coal mine to meet the local demand in energy and mineral smelting;
- replace imported coal and save the much needed foreign exchange; and,
- create employment.

**Description:** Coal is known to exist in the Aranos basin in the South east; Toscanini on the west coast approximately 300 km north of Walvis bay; and in the extreme north in Ovamboland in the Etosha basin. Rocks similar to the coal bearing sequence are also expected to occur in the general Kavango-Caprivi region in the Zambezi basin. In the latter basin the rocks are covered by Kalahari sands which would require geophysical or other remote sensing inputs.

The project will involve the evaluation and development of Namibian coal deposits.

**Status:** Funding is being sought.

**2.9.1 MAAMBA REHABILITATION PHASE II**

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<u>Estimated Costs</u>	<u>Financing Gap:</u> US\$9.5m
Total : US\$9.5m	<u>Executing Agency:</u>
Foreign: US\$9.5m	Maamba Colliery Co.
Local: -	
<u>Funding Secured</u>	<u>Start:</u> As soon as possible
Foreign: -	
Local: -	<u>Duration:</u> 8 months

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**Objectives:** The project aims to maintain production capacity of around 7 500 000 t per annum of washed coal at Maamba Collieries, through rehabilitation of major mining equipment such as the dragline and related plant equipment.

**Description:** Project activities are to:

1. to overhaul major components of the 20 year old 1260W BE Dragline in order to elongate its economic working life from the stipulated 25 years to 35 - 40 years. This will obviate the necessity of procuring a replacement dragline at a cost of not less than US\$ 20 million.
2. rehabilitate other mining plant and equipment in order to maintain a production capacity of around 750 000 t/annum of washed coal.
3. to maintain constant supplies of washed coal to other SADCC Member States.

**Status:** Funding is being sought.

**3.0.4 INTEGRATED ALUMINA/ALUMINIUM/CALCINATION INDUSTRY IN THE SADCC REGION**

Estimated Costs

Total: US\$0.25m  
Foreign: US\$0.25m  
Local: -

Financing Gap: US\$0.25m

Executing Agency:

Sector Coordinating Unit

Funding Secured

Foreign: -  
Local: -

Start: Immediate

Duration: 1 to 2 years

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**Objectives:** This project is a feasibility and market study aimed at determining the viability of establishing an integrated alumina/aluminium/calcination industry in the region, based on the Mulanje and Manica bauxite deposits, in Malawi and Mozambique, respectively.

**Description:** The SADCC region imports most of its requirements of aluminum products, although substantial bauxite resources are known to exist in the Mulanje and Manica areas of Malawi and Mozambique respectively:

- \* Mulanje, Malawi - Although a bauxite deposit of economic interest - with a calculated reserve of 60 million tonnes and a proven reserve of 30 million tonnes - has been identified, a feasibility study to produce 125,000 tonnes per annum was abandoned because of lack of adequate infrastructure;
- \* Manica, Mozambique - These deposits, which straddle the Zimbabwe and Mozambique borders, have been worked since 1935, producing an average of some 4,000 tonnes per annum. Mining in the Zimbabwe side of the boarder is coming to an end, since the deposits are nearly exhausted: and local industries are in need of the raw material.

These deposits, in addition to the region's plentiful supply of cheap hydro-electric power, which is important to guarantee the economic viability of aluminium processing, should provide the basis for the development of an aluminium industry.

The consultants selected to execute this study will be required to undertake a market assessment of the regional demand for various aluminium products, and a re-evaluation of the total resource potential of the

bauxite deposits. In addition, terms of reference include:

- \* to propose the plant capacity, and other details, necessary to produce calcined bauxite, for processing into alumina and smelting into aluminium and other products;
- \* to analyse plant capacity, costs, etc, related to the production of aluminium sulphate, alumina, calcined bauxite and aluminium;
- \* to review the availability and cost of all other inputs required for the project, including caustic soda, fluorspar, graphite and refractories; and,
- \* to recommend the best location for plant(s), and to assess the environmental impact of the project.

**Status:** Funds being sought.

### 3.0.5 BAUXITE EXPLORATION IN THE SADCC REGION

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Estimated Costs

Total: US\$1.53m  
Foreign: US\$1.53m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Cap: US\$1.53m

Executing Agency:

Sector Coordinating Unit

Start:

Duration: 1 year

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**Objectives:** The objectives of the project are to establish bauxite resources along the Mozambique - Zimbabwe boarder, likely to serve as a basis for the establishment of an aluminum industry in the SADCC region. Such an industry, using the abundant energy resources of the region, would reduce or eliminate the dependence of the SADCC countries on imported aluminum metal; enhance regional self-reliance on aluminum products, and promote and sustain regional economic integration.

**Description:** There is no primary aluminum production in the entire SADCC region and all aluminum currently consumed is imported. Bauxite resources from which aluminum are produced are known to exist in a number of countries including Malawi, Mozambique, Tanzania and Zimbabwe. Some previous work has been done in some of the

bauxite localities to establish reserves but more work is needed in the remaining areas to delineate sufficient reserves for the establishment of a SADCC aluminum production industry. Accordingly the present project intends to evaluate and establish bauxite reserves along the Mozambique - Zimbabwe border.

It will be developed in two exploration stages with a third phase feasibility study of selected deposits:

- \* Phase I will look into basic geological mapping (1 500 000), scout sampling, and detailed mapping (15 000) (US\$519 000);
- \* Phase 2 involves detailed survey of selected deposits (12 000); detailed and systematic sampling by pitting and auguring; comprehensive chemical and mineralogical analyses (US\$616 000), both in Mozambique and Zimbabwe; and,
- \* Phase 3 involves a representative bulk sampling programme; economic evaluation of the deposit, and feasibility study (US\$394 000) to determine whether existing reserves can form the raw material base for a regional aluminium industry.

Decision on proceeding from I to other phases will depend on technical results of phase I (existence of valuable occurrences), and on results of study 3.0.4.

**Status:** Funding is being sought.

**3.0.6 ASSESSMENT OF HEAVY MINERAL SAND DEPOSITS AND FEASIBILITY OF A TITANIUM OXIDE PLANT**

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Estimated Costs

Total: US\$0.13m  
Foreign: US\$0.13m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$0.13m

Executing Agency:

Sector Coordinating Unit

Start:

Duration: 4 months

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**Objectives:** The objective of this project is to promote the orderly development of the SADCC heavy mineral sand deposits (Malawi, Mozambique, Tanzania), and to contribute to SADCC self sufficiency by substituting imports of titanium oxide for paints etc, with local production. Excess production will be exported.

**Description:** The heavy minerals sands in Malawi, Mozambique and Tanzania have been investigated, first for thorium minerals and later for titanium and other minerals, since the early '50s. Following various periodic investigations which failed to result in any mining investment, interest in these deposits, particularly those of Mozambique, has re-awakened in recent years. There is reason to believe that these deposits can now be exploited profitably.

Despite the existence of very large titanium mineral resources, the SADCC countries continue to import large quantities of titanium oxide for paints etc. No attempt has been made to assess the viability of a titanium oxide plant to supply the SADCC market, with excess production being exported.

The project will be developed in 2 phases:

The main tasks to be undertaken during phase I will be to:

1. study current knowledge of the heavy mineral sand deposits of Malawi, Mozambique and Tanzania, the proved reserves, indicated reserves and grades of the economic minerals;
2. determine the international and regional markets for the heavy minerals in the sands and their prices the international market for titanium oxide;
3. determine the titanium oxide consumption in SADCC and advise whether a detailed feasibility study on a titanium oxide plant is justified.
4. Assess the viability of the deposits and specify the work required prior to a feasibility study for each deposit and the sequence in which the deposits should be investigated.

Phase two of the project will be to prove sufficient reserves to justify exploitation according to recommendations of phase I, and to make corresponding feasibility studies.

**Status:** Financing is being sought.

**3.0.7 ASSESSMENT OF IRON ORE DEPOSITS IN ANGOLA  
AND SWAZILAND**

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<u>Estimated Costs</u>	<u>Financing Gap:</u> US\$0.06m
Total: US\$0.06m	<u>Executing Agency:</u>
Foreign: US\$0.06m	Sector Coordinating Unit
Local: -	
<u>Funding Secured</u>	<u>Start:</u> -
Foreign: -	
Local: -	<u>Duration:</u> Five months

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**Objectives:** The objective of this study is to appraise and assess the iron ore resources in Angola and Swaziland with the objective of establishing a viable iron and steel industry.

**Description:** The study will:

- review and assess in the frame of the PTA/SADCC Iron and Steel development strategy, the potentialities of the development of iron ore deposits in Angola and Swaziland;
- identify the markets that would be available, possibly within the SADCC/PTA regions for the iron ore, and to establish the most suitable transport routes to such markets;
- determine the metallurgical processes that would be suitable for producing products (e.g pellets, sponge iron or other upgraded material) and to identify the input resources required for such processes; and,
- determine the potential profitability of the venture using alternative assumptions concerning capital investment, operating costs, prices and output levels.

**Status:** Funding is being sought.

**3.10.1 INCREASED PRODUCTION OF KAMATIVI TIN MINES (ZIMBABWE)  
- FEASIBILITY STUDY**

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Estimated Costs

Total: US\$0.13m  
Foreign: US\$0.13m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$0.13m

Executing Agency:

Sector Coordinating Unit

Start: As soon as possible

Duration: 8 months

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**Objectives:** The project seeks to determine the feasibility of an increased and extended production of tin at Kamativi (Zimbabwe).

**Description:** Mining at the Kamativi Tin Fields started in a small scale about 70 years ago. The present Kamativi Mines commenced production in the mid-fifties, mining and milling about 360 000 tonnes of ore per annum, and producing 600 tonnes of tin per annum, in the adjacent smelter.

Production was increased to 600 000 tpa of ore, and 1 200 tpa of tin, in the seventies and 960 000 -10 800 tonnes and 1000 tpa of tin, at present; arising from improvements of and additions to the original plant, to counter falling ore grade. Richer ores are exhausted, and the medium grade Chingahari Section is soon coming to an end. About half of the ore comes from underground, and the other half from open cast workings in very low grade ore. After the drop of tin prices, production was not profitable and substantial state subsidies had to be granted.

Because much of the mining equipment is almost obsolete, and the milling plant which is the core unit is almost 40 years old and hopelessly overloaded, there is not much chance of improving the situation.

During the last decade, low grade, easily minable resources were demonstrated and additional potential indicated. A mining and milling rate of 1 800 - 2 400 tonnes of tin per annum could be maintained for - at least 50 years.

However, this would require a modern, low cost-high capacity mine, and an efficient concentrator plant. This would return Kamativi Mine to profitability.

Furthermore, the project seeks to investigate how the smelter could be adapted to accept the tin concentrate from the tin mine in Namibia and of many existing and future small scale tin mines in Namibia, Zambia and Zimbabwe.

**Status:** Funding is being sought.

**4.0.7 ASSESSMENT OF SADCC HOTEL AND HOUSEHOLD WHITEWARE INDUSTRY**

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Estimated Costs

Total: US\$0.08m  
Foreign: US\$0.08m  
Local: -

Financing Gap: US\$0.08m

Executing Agency:

Sector Coordinating Unit

Funding Secured

Foreign: -  
Local: -

Start:

Duration: 7 months

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**Objectives:** The objectives of this project are to reduce dependence of SADCC region on imports of hotel and household whiteware; promote intra-SADCC trade and overseas exports of these products; and promote the development of regional industrial minerals.

**Description:** Many of the SADCC countries are importing a large share of their requirements of hotel and household whiteware and sanitaryware. The project will first determine, through a study, the constraints to the development of a SADCC Hotel and Household Whiteware Industry, and to assess available prospects for the industry. The study will then recommend measures that need to be taken to promote the development of these industries, as well as the projects that can be coordinated regionally.

The main tasks to be undertaken are to:

- \* visit existing SADCC hotel and household whiteware industries, so as to determine constraints and perspectives of development, and present production level;

- \* assess on going and planned projects;
- \* Assess existing and potential regional and export market, together with present imports; and,
- \* recommend measures to promote development of hotel and household whiteware industry, and the use of local raw material as input to this industry.

**Status** : Funding is being sought.

### 3.9.2 EXPLOITATION OF MUNALI NICKEL DEPOSIT (ZAMBIA)

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Estimated Costs

Total: US\$1.2m  
 Foreign: US\$1.2m  
 Local: -

Financing Gap: US\$1.2m

Executing Agency:

Sector Coordinating Unit  
 /Government of Zambia

Funding Secured

Foreign: -  
 Local: -

Start: As soon as possible

Duration:

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**Objectives:** The main objectives of the project are to ensure an optimum and coordinated development of the nickel resources of the SADCC Region; to evaluate through a detailed feasibility study the viability of the Munali Nickel deposits; and Optimise the use of the excess capacity of nickel smelting facility in Zimbabwe by processing the Munali nickel.

**Description:** The project aims at exploiting the Munali nickel deposit by undertaking a full detailed feasibility study. The work will entail an additional exploration programme as well as preparation of mine plans and flow sheet for concentrating the ore.

The nickel matte (concentrate) will be transported to Zimbabwe where additional mineral processing capacities do exist for final processing into nickel metal.

The specific activities to be undertaken in the context of this project are to:

- (i) undertake a detailed feasibility study and support the work programme of the current licence holder - Messrs Apollo. This entails the drilling of additional holes and full analysis of material;
- (ii) prepare a mine plan and flow sheet for concentrating the ore; and,
- (iii) promote investment in the project.

**Status:** Financing is being sought.

#### 4.0.8 MARKET SURVEY FOR SADCC ORNAMENTAL STONE PROJECTS

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Estimated Costs

Total: US\$0.08m  
Foreign: US\$0.08m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$0.08m

Executing Agency:

Sector Coordinating Unit

Start:

Duration: 7 months

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**Objectives:** The objective of this project is to permit a coordinated development of ornamental stone industry in the SADCC region.

**Description:** Developments are being considered in the ornamental stone industry in Zambia and Mozambique, where marble projects are being implemented.

However Angola has got operational facilities for black granite and marble, and Zimbabwe is operating a black granite quarry.

All these projects, apart from furnishing small local markets, can deal with overseas export markets.

The project will review the type and quantity of products expected from the regional ornamental stone projects, and analyze the regional and

overseas market for these products. A strategy of development will be recommended.

**Status:** Financing is being sought.

#### 4.0.9 DEVELOPMENT OF GYPSUM PRODUCTION IN THE SADCC REGION

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<u>Estimated Costs</u>	<u>Financing Gap:</u> US\$0.10m
Total: US\$0.10m	<u>Executing Agency:</u>
Foreign: US\$0.10m	Sector Coordinating Unit
Local: -	
<u>Funding Secured</u>	<u>Start:</u> -
Foreign: -	
Local: -	<u>Duration:</u> 7 months

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**Objectives:** The main objective of this project is to satisfy the requirements of gypsum and gypsum based products in the SADCC region through a coordinated development of existing deposits and thereby reduce dependence on imported products particularly in construction materials.

**Description:** There is a requirement in many of the SADCC countries for different gypsum based products for the cement industry, agriculture and construction.

Present production is low and cannot furnish the demand, thus requiring imports of raw materials or semi-finished products based on gypsum.

However prospects exist for regional production:

- \* in Angola, where potential reserves have been identified in the area of Sumbe between Porto Amboim and Sombe.
- \* in Tanzania where gypsum resources are known since the beginning of the century in Kilwa district.
- \* in Zambia where gypsum is produced as a by product of copper.

The study will assess the current market for gypsum products in the SADCC region and to propose strategies for developing the existing known resources in Angola, Tanzania and Zambia.

Reserves and probable cost of mining, processing and transportation of the gypsum from the deposits will also be assessed.

**Status:** Funding is being sought.

**4.0.10 METALLURGY OF ORES FROM ALKALINE COMPLEXES  
(CARBONITITES, ETC)**

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Estimated Costs

Total: US\$0.47m  
Foreign: US\$0.47m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$0.47m

Executing Agency:

Sector Coordinating Unit

Start: As soon as possible

Duration: 18 months

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**Objectives:** The objectives of the project are:

- \* to produce the agro-mineral phosphates and agricultural lime, which are either not available, but essential to improve local agriculture;
- \* to produce saleable concentrates of niobium, rare earths, thorium-uranium, zircon, strontium, fluorite etc. for sale on world market; and,
- \* to create employment opportunities for the local population.

**Description:** The project aims at optimising the use of existing metallurgical technology for the treatment of ores of alkaline complexes/carbonatites.

Malawi, Namibia, Tanzania, Zambia and Zimbabwe have many magnetic alkali complexes, which often contain carbonatite. About 20 of these complexes are well known and partially explored.

These alkali complexes carry many economic minerals such as - phosphates, like apatite and isokite; niobium, in pyrochlore and niobite; rare earths and thorium, in monazite, bastnaesite and many other rare minerals; zirconium; fluorite, barite, strontianite; vermiculite; calcite - dolomite; and iron ore.

The percentage and relative abundance of these minerals is varying from complex to complex, and also within a complex. Some are predominantly phosphate deposits, and others are niobium or rare earth minerals or vermiculite.

There are also residual weathering deposits at the surface where the carbonates were dissolved and replaced by a clay - iron oxide matrix.

At present, only one carbonatite, Dorowa in Zimbabwe, is being mined, for the recovery of phosphate minerals.

The mineralogy and petrographic structure of the various alkaline complex ores has been investigated and is well known, for some of the deposits. Reserves and grades of the economic minerals have been assessed at least sufficiently to allow preliminary planning to pre-feasibility study level.

However, the recovery of all valuable minerals in saleable concentrates has been found to be rather difficult in most of the cases. Fine inter-growth with iron ores, negative response to froth flotation of some phosphates etc. have been encountered. As these problems are common to many of the alkaline complex ores, the project will investigate all known complexes, and select a few in each member state for indepth studies with the aim to develop metallurgical technologies which allow an efficient extraction of all saleable minerals. The possibilities of making agricultural lime from the calcite-dolomite component will also be investigated.

**Status:** Funding is being sought.

**4.1.1 PRODUCTION OF FERTILIZERS FROM THE ZAIRE PROVINCE (ANGOLA)**

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Estimated Costs

Total: US\$0.14m  
Foreign: US\$0.14m  
Local: -

Funding Secured

Foreign: -  
Local : -

Financing Gap: US\$0.14m

Executing Agency:

Sector Coordinating Unit

Start: -

Duration: 4 months

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**Objectives:** The objective of this project is to exploit the extensive deposits of phosphates in the Zaire province of Angola in order:

- \* to help meet the agricultural needs of the region for phosphate-based fertiliser; and,
- \* contribute to SADCC self-sufficiency in fertilizer production.

**Description:** Pilot exploitation of these phosphate resources was carried out in the early 1980's. The project involves a feasibility study to assess the investments required followed by the design of an implementation programme.

First phase involves a review and assessment of the current knowledge of the phosphate deposits in the Zaire province; and an analysis of the work previously undertaken - including the establishment of the pilot plant. Samples will be collected and analysed, and an assessment of the proven reserves undertaken. A market study, for the domestic and export markets will be launched. The second phase of the project will cover the mobilisation of resources for the implementation of the enterprise.

**Status:** Funding is being sought.

**4.7.1 EXPLORATION FOR CERAMIC AND CHEMICAL INDUSTRY  
RAW MATERIALS IN SWAZILAND**

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<u>Estimated Costs</u>	<u>Financing Gap:</u> US\$0.54m
Total: US\$0.54m	<u>Executing Agency:</u>
Foreign: US\$0.54m	Sector Coordinating Unit
Local: -	
<u>Funding Secured</u>	<u>Start:</u> -
Foreign: -	
Local: -	<u>Duration:</u> 14 months

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**Objectives:** The objectives of the project are to evaluate four industrial mineral occurrences (kaolin, silica, pyrophyllite and talc) which are located at close proximity to each other in the South West of Swaziland, to determine their viability for development in order to substitute for currently imported table ware, paint, pesticide, cosmetics and other related products.

**Description:** Swaziland imports about 1.75 million US\$ Dollar worth of various ceramic ware. Projects for developing ceramic industry in the country were seriously discussed but left pending subject to proven availability of cheap and easily accessible raw materials. The most promising deposits are all located in one geographic area. With limited additional work, it will be possible to determine the reserves and minerability of the deposits.

The industrial minerals deposits under consideration (kaolin at Mahlangatsha; silica at Madinda; talc at Handkop and pyrophyllite at Magubheleni) have either been previously surveyed or briefly mined in the past. However, additional investigations are needed to prove the reserves and quality of material at a confidence level necessary to plan further industrial development. Accordingly, detailed geological surveys evaluation and the determination of the feasibility of mining the deposits to supply raw materials for ceramic, paint, chemical and cosmetic industries in the region are necessary.

**Status:** Funding is being sought.

**4.8.1 PUGU KAOLIN PROJECT (TANZANIA)**

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Estimated Costs

Total: US\$15.00m  
Foreign: US\$12.00m  
Local: US\$ 3.00m

Funding Secured

Foreign: -  
Local : US\$3.000m (Tan)

Financing Gap: US\$12.00m

Executing Agency:

Government of Tanzania

Start:

Duration: 30 months

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**Objectives:** The objective of this project is to establish an open-cast mine, and treatment plant, to exploit Tanzania's kaolin resources, in order to meet the demand from the SADCC region; and to export to PTA and other countries.

**Description:** Kaolin is used as a raw material in many minerals based manufacturing industries, such as paper, rubber, ceramics, paints, pesticides, etc. The Pugu Hills, in Tanzania, contains huge and high quality proven deposits of kaolin; which are suitably located in relation to railway, road and

port facilities. The exploitation of these resources for the use of local industries, and for export, will have a national and regional impact.

The purpose of the project is to mobilise equity investment funds for the development of these deposits in order to supply kaolin to SADCC member States. A preliminary feasibility and engineering study has already been completed. The study proposes the development of an open cast mine and the construction of a treatment plant to produce 36 000 tonnes per year of refined kaolin both of filler and coating grades.

The specific activities to be undertaken in the context of this project are:

- \* to identify and confirm potential sources of financing;
- \* to identify and contract a consulting Engineer to carry out a detailed design and engineering work plan; and,
- \* to contract a firm to supply machinery and equipment in order to construct and commission the mine and plant; and undertake management and training for a five year period.

**Status:**

The existing pilot plant is being rehabilitated with Austrian and ADB aid. Present installed capacity is 8000 t/y.

A market survey will be commissioned soon so as to determine the feasibility of expanding capacity up to 36 000 t/y of kaolin for the local and regional market. Results of the market survey will determine follow-up action on the project.

**4.9.1 MINING OF FLUORSPAR IN THE SIANYOOLU AREA  
(MAZABUKA) - ZAMBIA**

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Estimated Costs

Total: US\$35.00m  
Foreign: US\$35.00m  
Local: -

Funding Secured

Foreign: US\$22.00m (AGIP)  
Local : -

Financing Gap: US\$13.00m

Executing Agency:

Government of Zambia

Start:

Duration:

Investment Phase: 2  
Years  
Mining Phase: 40 years

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**Objectives:** The objective of this project is to open a new fluorspar mine in Zambia in order to supply the SADCC market; and to export the product on the international market, and thus generate foreign exchange.

**Description:** Fluorspar is a fluxing agent used in the metallurgical industry, and also in the photographic and glass industries. At present small quantities of fluorspar are mined in Zimbabwe, and the project will supplement this supply; and will supplement this supply; and will allow Zambia to export internationally.

Agip SpA holds a prospecting licence in the Gwembe Valley, in Zambia, for base and industrial minerals. During exploration Agip discovered and delineated, in the basement formation, a series of veins of fluorspar of very good quality and thickness. The grade is generally above 70% and the minerable reserves are estimated at 2 000 000 tonnes, which could easily be increased to 4 000 000 tonnes, for the production of acid grade fluorspar. The annual forecast production is 120 000 tonnes. After supplying the SADCC member States the excess can easily be exported providing foreign exchange to Zambia (US\$20 million annually), as well as increase traffic to the railways, create employment and development of a rural area in the very depressed Gwembe Valley, 80 km east of Mazabuka.

The project, therefore, entails the provision of infrastructure, which includes roads, power supply, housing, water supply, school and health facilities.

**Status:** A prefeasibility study was completed in January 1988. Agip SpA is willing to proceed with investment, once funding for the necessary infrastructure has been secured. Funding is, therefore, being sought for this general infrastructure.

### 7.0.3 STUDY ON THE MANUFACTURE ELECTRODES

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<u>Estimated Costs</u>	<u>Financing Gap:</u> US\$0.07m
Total: US\$0.07m	<u>Executing Agency:</u>
Foreign: US\$0.07m	Sector Coordinating Unit
Local: -	
<u>Funding Secured</u>	<u>Start:</u> To be determined
Foreign: -	
Local : -	<u>Duration:</u> 6 months

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**Objectives:** The objective of this project is to determine the viability of establishing a regional industry for the production of electrodes.

**Description:** Roughly 7 500 tonnes of electrodes paste is consumed annually in the region, in the process of electric smelting of chromite, copper and nickel. All of this is at present imported, mainly from South Africa. This paste is normally made from anthracite coal as the binder and a principal objective of the study is to identify a suitable anthracite deposit, or a suitable alternative.

The project is divided into two phases. During the first phase a compressive market survey will be undertaken of the current and future demand for electrodes of the region. The study will assess the requirements for both graphite electrodes and Soderberg electrode paste, and seek to identify the principal current suppliers and advise on the reliability of future supply. Alternative suppliers and their cost will also be assessed.

An appraisal will be undertaken of the various methods of electrode manufacturing within the region, together with a survey of the availability of the necessary raw materials within the region.

On the basis of this information, and an assessment of the economic viability of the project, the consultants will be requested to recommend the most appropriate method of electrode manufacture and the possible location of the prospective plant.

The second phase of the project involves the extensive testing of the manufacturing method recommended in phase one, as part of a definitive feasibility study of the production of electrodes in the region.

**Status:** Funding is being sought.

### 7.3.1 MANUFACTURING OF DIAMOND TOOLS IN LESOTHO

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Estimated Costs

Total: US\$0.08m  
Foreign: US\$0.08m  
Local: -

Funding Secured

Foreign: -  
Local: -

Financing Gap: US\$ 0.08m

Executing Agency:

Sector Coordinating Unit

Start:

Duration: 8 months

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**Objectives:** The objective of this project is to launch a market study on the demand for diamond tools in the SADCC region, and to make recommendations on the possibilities of establishing a diamond tools manufacturing facility in Lesotho.

**Description:** The SADCC region is well endowed with diamonds of both jewellery and industrial quality; Botswana, Angola and Tanzania being the most important producers. In other member states small scale miners are involved in diamond mining, of industrial quality.

The Mining Sector in the SADCC region uses a large quantity of diamond tools, drill bits, turning tools, saws, etc, most of which are imported.

Lesotho has, over many years, developed skills in the diamond industry. For instance, the Machace Diamond Cutting Workshop employs some sixty workers who cut and polish stones from 0.1 carat.

The dependence of the SADCC region on imported diamond tools should be reduced by establishing manufacturing facilities for diamond tools. It is proposed to take advantage of Lesotho's diamond production and the presence of skills to develop a manufacturing industry which is not capital intensive.

**Status:**

Funding is being sought. The terms of reference and a revised project description, including new costings, have been approved. Lesotho is carrying out a preliminary study to be completed by May, 1990.

**CRITERIA AND PROCEDURES FOR PROJECT SELECTION**

These criteria are intended to maintain the coherence of the SADCC Mining Sector programme, within the general framework of the objectives of SADCC. They shall serve as guidelines for the member states, Sector Coordinators and cooperating partners, in the selection and presentation of new project proposals for inclusion in, as well as in the review of projects already in the programme.

1. CRITERIA

The basic criterion to be used is whether or not the project in question contributes significantly to the achievement of SADCC's four primary development objectives:

- \* the reduction of economic dependence, particularly, but not only, on South Africa;
- \* the forgoing of links to create a genuine and equitable regional integration;
- \* the mobilisation of resources to promote the implementation of national, interstate and regional policies; and
- \* concerted action to secure international cooperation within the framework of SADCC's strategy for economic liberation.

The overall SADCC objectives are in themselves, however, too general to provide adequate guidance for the selection of discrete projects. It is, therefore, necessary that each project be positively evaluated against the following checklist:

- \* how does the project relate to SADCC's overall regional objective - specially, does the project contribute to the reduction of dependence, or does it enhance regional self reliance in a specific area?
- \* is the project rooted in the perceived needs of the people of the region, or is it simply a 'good idea' generated by some outsider; has it been discussed with the member states directly concerned prior to presentation at a regional meeting; is there sufficient background documentation to make an objective judgement about the project?
- \* does the project benefit/involve more than one country; if not, what is its relevance to the region as a whole?

- \* what is the relationship between the regional project/programme and related national programmes, i.e. are the national and regional programmes mutually supportive and what priority is accorded to them?
- \* is the project part of a coherent regional programme or is it simply and ad hoc initiative?
- \* to what extent is it envisaged that regional resources - human and material - will be used in the implementation of the project and what priority and efforts have been given to the mobilisation of national / regional resources?
- \* is there a local executing agency / enterprise to implement the project?
- \* does the project contain adequate provision to cover its recurrent costs?
- \* are there adequate arrangements to ensure effective operational coordination after the capital investment phase has been completed?
- \* have the long term manpower implications of the project been provided for?
- \* could the project be broadened to enhance its regional impact?

## 2. PROCEDURE FOR PROPOSAL EVALUATION AND APPROVAL OF PROJECTS

### (i) Formulation of New Project

For a project to be considered, it should be formulated in a standardised manner covering the following aspects:

Objectives

Description

- \* reference to how the project relates to SADCC objectives;
- \* why it has relevance as a regional project;
- \* relation to national programmes;
- \* socio-economic justification;
- \* full technical description of how the work is to be carried out;
- \* cost estimates and sources of financing.

## Implementation

- \* Executing Agency
- \* work programme and time schedule

Projects can be proposed by member Governments and/or the Sector Coordinator.

The formulation can be done by:

- \* a member State, or member States in cooperation;
- \* Sector Coordinating Unit;
- \* the Sector Coordinating Unit and a member States (s) in cooperation.

## Approval Procedure

A new project shall go through the following steps:

(a) Project Formulation and Documentation

This should be done by the entity proposing the project.

(b) Presentation to the Sector Coordinating Unit.

The project document should be submitted to the Sector Coordinating Unit at least three months prior to a meeting of the Sector Ministers, in order to allow for due consideration and analysis.

(c) Evaluation by Sector Coordinating Unit.

The Sector Coordinating Unit shall carry out an evaluation to ascertain that the project proposal is consistent with the objectives, strategy and criteria of the SADCC Mining Sector, before being submitted to the relevant sectoral authority for approval.

(d) Distribution of project proposals

The documentation for new projects should, preferably, be distributed to all member States well in advance of the meeting in which they will be considered.

(e) Presentation to Sector Officials

The member States(s) concerned, supported by the Sector Coordinating Unit present (s) the project for consideration at a meeting of relevant sectoral authority.

(f) Approval

Project proposals must be considered by the Sectoral Committee of Ministers for recommendation for approval by the Council of Ministers, before they are formally placed onto the Sectoral Programme of Action.

(g) Urgent Proposals

Only in exceptional circumstances, as in the case of emergency projects, should consideration be given to project proposals which have not been processed as above.

3. PROCEDURE FOR CONTACTS WITH THE COOPERATING PARTNERS

Sectoral programmes and projects are, generally communicated through the sectoral programme document produced for the Annual Consultative Conference. However, in between Annual Consultative Conference, specific projects may be communicated to interested cooperating partners directly.

In the case of a project located in one country, the member State which is host for the project, assisted by the Sector Coordinating Unit, will coordinate contact with interested cooperating partners. Both the Sector Coordinating Unit and other interested member States must be kept fully informed of progress in consultations on the implementation of projects, either by direct contact or usually through progress reports submitted to Sectoral meetings.

In the case of projects involving more than one country, and general coordination activities or projects involving all member States, the Sector Coordinating Unit, assisted as appropriate, by the member States, will coordinate contacts.

4. AGREEMENT AND CONTRACT PROCEDURES

The Council of Ministers has agreed that as a matter of general principle, SADCC project agreements should be signed by the member States directly involved and cooperating partners, and witnessed by the Sector Coordinator. Such agreements should spell out the rights and obligations of all parties and, in particular, should indicate clearly the reporting and monitoring procedures.

5. PROJECT IMPLEMENTATION, OPERATION AND MONITORING

Implementation refers to the preparation and execution of a project, but does not include subsequent operation and maintenance (e.g of a plant).

Member States involved in each project, with the assistance of the Sector Coordinating Unit, are responsible for its implementation and operation, through their appropriate institutions.

The Sector Coordinating Unit will provide the required assistance to member States in all stages of the project.

Financial responsibility for each project will be of the member State(s) involved, and each member State will be responsible for servicing its financial commitments.

It will, in a number of cases, be necessary to have a project steering committee, which is responsible for overseeing and monitoring the implementation of the project and serves to give policy guidance and control. The steering committee would have the following members:

- representatives of the Member Government (s) responsible and involved;
- a representative of the cooperating partners supporting the project; and
- the Sector Coordinator

The executing agency implementing the project, will not be a member of the committee, but will participate in the meetings for reporting and liaison purposes.

When a project involves simultaneous and inter-dependent implementation in more than one country, the steering committee will ensure the overall coordination of the implementation of the various parts of the project.

The Sector Coordinating country is responsible for reporting on the status and progress of sectoral programme and project implementation and related activities to the Sectoral Committee Officials and the Committee of Ministers; and to the Council of Ministers and Summit of Heads of State and Government, at the scheduled meetings.

Project	Project Title	Estimated Cost US\$ Million		Local	Funding Secured & Source US\$ Million	Funding under Negotiation US\$ Million	Financing Gap US\$ Million	Comments/Status
		Total	Foreign					
MINING								
OVERALL COORDINATION								
0.0.0	Support to the Mining Sector Coordinating Unit	3.08	2.71	0.37	0.53 (FRA) 1.40 (NORDICs) 0.37 (ZAM) 0.78 (EEC)	-	-	Nordic experts have been seconded to the Unit
0.0.3	Sharing of Mineral Processing Facilities	0.13	0.13	-	0.13 (NORDICs)	-	-	Study under implementation by an advisor to the SADCC Mining Coordinating Unit
0.0.4	Remote Sensing Survey Using the Spot Satellite	0.49	0.49	-	-	-	0.49	Funding being sought.
0.0.5	Regional Seismic Network and Data Centre-Feasibility Study	0.08	0.08	-	0.08 (FIN)	-	-	Feasibility study underway.
0.0.6	Small Scale Mining and Minerals Beneficiation	0.24	0.24	-	0.24 (FRG)	-	-	Follow-up of project 0.0.1. FRG has seconded an advisor to the SADCC Coordinating Unit and is executing Phase I of the project.
0.0.7	Regional/National Geological Minerals and Mining Bibliographic Data Banks	1.20	1.20	-	-	-	1.20	Follow-up of project 0.0.2. Funds being sought
0.0.8	Analysis of the Investment Climate in the SADCC Mining Sector	0.29	0.29	-	0.29 (WB)	-	-	Under implementation.
0.0.9	Exploration of the Kalahari Sands	0.10	0.10	-	-	-	0.10	New project. Funding being sought
0.5.1	Regional Geophysical and Geochemical Map Compilation Facility	0.89	0.89	-	-	-	0.89	Funding being sought.
0.10.1	Central Isotope Geochronology Laboratory	0.23	0.23	-	0.23 (EEC)	-	-	Laboratory completed and operational. Funding secured for operational costs
Sub-total		6.73	6.36	0.37	4.05	0.00	2.68	
PRECIOUS METALS AND MINERALS								
1.0.1	SADCC Gemstone Buying, Processing and Marketing	0.14	0.14	-	-	-	0.14	Funds being sought for Phase I.
1.0.2	Diamond Exploration in SADCC region	0.1	0.1	-	-	-	0.1	New project. Funding being sought.
Sub-total		0.24	0.24	0.00	0.00	0.00	0.24	
ENERGY MINERALS								
2.0.1	Exploitation of Coal Resources in the SADCC Region	-	-	-	-	-	-	Project completed January, 1990. Recommendations being followed-up by Sector Coordinating Unit.
2.4.1	Coal Exploration and Evaluation in Malawi	2.61	2.03	0.58	0.83 (FRA) 0.58 (MAL)	1.20 (FRA)	-	Project underway.
2.4.2	Coal Mining Development Trial at	-	-	-	-	-	-	Project funded and operational.

Livingstonia, Malawi									
2.4.3	Development of Coal Analysis Laboratory in Malawi	-	-	-	-	-	-	Project completed and facilities are available for use by member States.	
2.5.1	Manufacture of Coke at Moatize Colliery (Mozambique)	0.08	0.08	-	0.08 (FRA)	-	-	Work is expected to start soon.	
2.5.2	Management Assistance for Coal Development in Mozambique	1.76	1.76	-	1.76 (Various)	-	-	Under implementation.	
2.6.1	Evaluation and Development of Namibian Coal Deposits	0.02	0.02				0.02	New project. Funds sought for for Phase I (Evaluation of Data)	
2.7.1	Assessment of Increasing Uses of Indigenous Coal in Swaziland	0.04	0.04	-	0.04 (FRA)	-	-	Under implementation.	
2.9.1	Maamba Rehabilitation Phase II	9.5	9.5	-			9.5	New project. Funding being sought.	
Sub-total		14.01	13.43	0.58	3.29		1.20	9.52	
METALIC MINERALS									
3.0.1	Foundry Fabrication and Machinery Facilities	-	-	-	-	-	-	Study completed, recommendations being followed up by SADCC Industry Sector	
3.0.2	Development of Iron and Steel Industry	-	-	-	-	-	-	Study completed, recommendations being followed up in coordination with PTA and SADCC Industry Sector	
3.0.3	Market Study for Copper Products	-	-	-	-	-	-	Study completed, recommendations transferred to Industry Sector	
3.0.4	Integrated Alumina/Aluminium/Calcination Industry	0.25	0.25	-	-	-	0.25	Phase I completed. Funding being sought for follow-up action.	
3.0.5	Bauxite Exploration in the SADCC Region	1.53	1.53	-	-	-	1.53	Funding being sought for phase 1	
3.0.6	Assessment of Heavy Mineral Sand Deposits and Feasibility of a Titanium Oxide Plant	0.13	0.13	-	-	-	0.13	Funding being sought for Phase 1	
3.0.7	Assessment of Iron Ore Deposits	0.06	0.06	-	-	-	0.06	Funding being sought	
3.9.1	Exploration of Lead/Zinc Kabwe District (Zambia)	-	-	-	-	-	-	Phase I and II completed in March 1990.	
3.9.2	Exploitation of Munali Nickel Depos t	1.2	1.2	-	-	-	1.2	New project. Funding being sought.	
3.10.1	Study on the feasibility of an increased production of Kamativi Tin Mines (Zimbabwe)	0.13	0.13	-	-	-	0.13	New project. Funding being sought.	
Sub-total		3.30	3.30	0.00	0.00		0.00	3.30	
NON-METALIC MINERALS									
4.0.2	Sua Pan (Botswana) and Lake Natron (Tanzania) Project	-	-	-	-	-	-	Study completed. Report with the two member States.	
4.0.3	Establishment of a Refractory	-	-	-	-	-	-	Study completed. Follow-up action	

XI

Industry								
4.0.4	Processing of Lime	-	-	-	-	-	-	being assessed.
4.0.5	Non-Metallic/Industrial Minerals	0.18	0.18	-	0.18 (FRA)	-	-	Study completed. Follow-up actions being assessed.
4.0.6	Assessment of Vermiculite Production in the SADCC Region	0.08	0.08	-	0.08 (FRA)	-	-	Market Survey underway.
4.0.7	Assessment of SADCC Hotel and Household Whiteware Industry	0.08	0.08	-	-	-	0.08	Project underway.
4.0.8	Market Survey for SADCC Ornamental Stone	0.08	0.08	-	-	-	0.08	Funding being sought.
4.0.9	Development of Gypsum Production in the SADCC Region	0.10	0.10	-	-	-	0.10	Funding being sought.
4.0.10	Metallurgy of Ores from Alkaline Complexes	0.47	0.47	-	-	-	0.47	Funding sought.
4.1.1	Production of Fertilizer from the Zaire Province (Angola)	0.14	0.14	-	-	-	0.14	Funding being sought for phase 1 (feasibility study)
4.5.1	Development of Boane Bentonite Mine - Mozambique	0.24	0.24	-	0.24 (CFTC/IDU)	-	-	Work on Phase II to commence soon.
4.7.1	Exploration for Ceramic and Chemical Industry Raw Materials in Swaziland	0.54	0.54	-	-	-	0.54	Funding being sought.
4.8.1	Pugu Kaolin Project (Tanzania)	15.00	12.00	3.00	3.00 (TAN)	-	12.00	Costing of the project being reviewed.
4.9.1	Mining of Fluorspar in the Sianoyo Area (Zambia)	35.00	35.00	-	22.00 (AGIP/SPa)	-	13.00	Funds are being sought for infrastructure.
Sub-total		51.91	48.91	3.00	25.50	0.00	26.41	
WATER								
5.0.1	Hydro-Geological Investigations	1.00	1.00	-	1.00 (WB)	-	-	Completed. Recommendations being assessed.
Sub-total		1.00	1.00	0.00	1.00	0.00	0.00	
MANPOWER								
6.0.2	Appointment of a SADCC Sector Human Resources Liaison Development Officer and Support Staff							Transferred to Human Resources Sector.
6.0.3	Setting up of a Mining Sector Industrial Training and Development Advisory Unit							Transferred to Human Resources Sector.
6.0.4	Redesign and development of SADCC Mining Technician Courses Facilities							Transferred to Human Resources Sector.
6.0.5	Requirements for strengthening of regional Mining Sector educational Units							Transferred to Human Resources Sector.

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	Sub-total	0.00	0.00	0.00	0.00	0.00	0.00
MINING EQUIPMENT AND CONSUMABLES							
7.0.3	Study on the Manufacture of Electrodes	0.07	0.07	-	-	-	0.07 Funds are being sought.
7.0.4	Central Data Bank for Mining Equipment and Spares Manufactured in the SADCC Region	0.06	0.06	-	0.06 (NORDICs)	-	- Project under implementation
7.0.5	Rationalization of Rock Drill Steel Manufacturing Industries in the SADCC Region	0.08	0.08	-	0.08 (NORDICs)	-	- Project under implementation
7.0.6	Rationalisation of the Manufacture of Wear Resistant Liners and Rail Track and Fittings in the SADCC Region	0.08	0.08	-	0.08 (NORDICs)	-	- Project under implementation
7.0.7	Manufacture of Activated Carbon from Coconut Shells in the SADCC Region	0.07	0.07	-	0.07 (CFTC)	-	- Project implementation to start soon.
7.3.1	Manufacturing of Diamond Tools in Lesotho	0.08	0.08	-	-	-	0.08 This project will be completed after Lesotho has done initial work.
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	Subtotal	0.44	0.44	0.00	0.29	0.00	0.15
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	GRAND TOTAL	77.63	73.68	3.95	34.13	1.20	42.30
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