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MINING

SOUTHERN AFRICAN DEVELOPMENT COMMUNITY



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PROJECT NUMBERING SYSTEM

Projects are identified using an alphanumeric numbering system:

1. The first three letters indicate the member State.

AAA	-	Regional	NAM	-	Namibia
ANG	-	Angola	SWA	-	Swaziland
BOT	-	Botswana	TAN	-	Tanzania
LES	-	Lesotho	ZAM	-	Zambia
MAL	-	Malawi	ZIM	-	Zimbabwe
MOZ	-	Mozambique			

2. 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

3. The second digit is a serial number

A B B R E V I A T I O N S

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
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
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
SADC	=	Southern African Development Community

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
SPA	=	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
USA	=	United States of America
WB	=	World Bank
ZAM	=	Zambia
ZIM	=	Zimbabwe

1. EXECUTIVE SUMMARY

- 1.1 There are at present a total of thirty five (35) Projects, under the SADC Mining Sector Programme. The cost of these projects is estimated at US\$31 million, of which US\$13 million, representing 42 per cent, is secured. This shows an improvement in the funding status compared to the previous year when the total cost of the programme was estimated at US\$20.34 million, of which only US\$7.24 million representing 36 per cent was secured. Although some projects have not, as yet, secured funding, there has been progress on others. The European Union has committed funds to the tune of US\$6.6 million for Project MOZ. 0.1 Geophysical and Geochemical map Compilation Facility and Phase 1 of Project AAA.0.11 Inventory of Mineral Resources in the SADC Region. In addition, the European Union has committed US\$2.0 million for the Mining Investment Forum to be held in December, 1994.
- 1.2 The technical assistance from SwedeCorp to the MCU environment sub-sector came to an end in April, 1994. The work achieved under this sub-sector is presented as new environmental project proposals. The proposals are aimed at reducing pollution from past, present and future mining activities in the SADC region.
- 1.3 German technical assistance in the field of small-scale mining came to an end in May, 1994. Through this technical assistance several feasibility studies were undertaken. In consequence, two technology workshops were organised and they resulted in the publication of two Handbooks on small-scale mining.
- 1.4 The Main thrust of the Mining Sector Strategy is to increase investment in the mining sector. Thus, a number of activities aimed at increasing information on the geology of the region are being undertaken. Furthermore, in order to promote the mining sector of the region and attract both local and foreign investment, an Investment Forum is planned for December, 1994 in Lusaka, Zambia. The Forum will afford member States an opportunity to market their business environment and projects to both regional and international entrepreneurs. A number of countries in the region have in recent years convened investment fora to promote their mining industries, for example, Namibia and Tanzania.
- 1.5 The SADC Mining Sector Coordinating Unit is collaborating with the East and Southern African Mineral Resources Development Centre on Project MOZ.0.1 Geophysical/Geochemical Map Compilation Facility. In this regard, the EU agreed to fund this project to be coordinated by the Centre and the SADC Mining Sector Coordinating Unit.

- 1 6 In an effort to avoid overlap and duplication of activities, two meetings were held with the SADC Environmental and Land Management Sector (ELMS), in Lusaka, in December, 1993 when the ELMS staff visited the MCU to discuss the Zambezi River Water Quality Monitoring Project. The MCU visited the ELMS in Lesotho in April, 1994 to discuss the Mining and Environment project proposals. It was agreed that the MCU could carry out a water quality project on the Zambezi River Basin to complement the work by the ELMS on the Zambezi River Action Plan
- 1.7 Following preliminary assessment, it has been indicated that Mining operations do have a deleterious impact on the environment. In an effort to reduce the adverse impact of Mining operations on the environment, five projects relating to the environment have been added to the programme. This is one of the priority areas and it is hoped that resources will be mobilised to facilitate detailed work
- 1 8 Apart from attendance at the various regular meetings of SADC, the Coordinating Unit organised and participated in a number of conferences, seminars and workshops. The Coordinating Unit participated at an international seminar on mining and environment organised by the United Nations Technical Cooperation for Development and the Carl Duisberg Foundation (CDG) held in Windhoek, in September, 1993. The training seminar was aimed at enabling participants and interested bodies to conduct their own training courses. The training courses focused on the negative impacts of mining operations on the natural environment
- 1 9 In addition, the MCU funded and organised the Third International Gemstone and Precious Metals Workshop in conjunction with the Association of Geoscientists for International Development (AGID). The workshop was held during 22nd - 26th November, 1993 in Lusaka and was well attended by participants from Lesotho, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe. Topics covered at the workshop included gemstone and gold prospecting, mineral processing, lapidary and jewellery industry and marketing. Practical demonstrations were carried out on gemstone identification, sorting, heat treatment, cutting and polishing. MCU has printed a Handbook on the gemstone/gold mining, lapidary and jewellery industry, from the presentations at the workshop.
- 1 10 The Coordinating Unit also participated at an environment workshop sponsored by the United Nations and the Zambian Government. The workshop offered participants the opportunity to take part in an on site case study of the enormous impact of mining operations on the local and regional environments. The workshop covered such topics as pollution control technologies, waste disposal and air quality monitoring, site reclamation, environmental

legislation, environmental management planning and environmental auditing.

2.0 REVIEW OF THE REGIONAL SITUATION

2.1 Mining is a global business and the level of growth in the world economy will continue to affect the performance of the SADC mineral sector.

2.2 The year 1993 marked the fourth year in a row of sluggish world economic performance. By comparison, however, the world output registered a slight improvement from 1.7 per cent in 1992 to 2.2 per cent in 1993. Overall, there was more growth in developing countries compared to developed countries. While developed countries grew by 1.1 per cent, developing countries grew by 5 per cent.

2.3 Growth in Sub Saharan Africa improved from 0.5 per cent in 1992 to 2.0 per cent in 1993. The table below illustrates growth of World Economy for the period 1990-1993

Table 1. Growth of the Global Economy 1990 - 1993, Annual percentage change.

	1990	1991	1992	1993
World	1.6	0.2	1.7	2.2
Developed Market Economies	2.3	0.7	1.7	1.1
Economies in Transition	-6.3	-9.0	-16.8	-10.0
Developing Countries	3.4	3.4	4.9	5.0
Latin America and Caribbean	0.1	2.9	2.2	3.0
Africa	1.9	2.0	0.7	1.4
West Asia	1.9	-0.1	6.6	6.0
South East Asia	6.4	5.7	4.9	5.5
China	5.2	7.7	13	11.0
Mediterranean	1.1	-7.9	-5.2	3.0
World Trade	5.1	3.6	4.6	3
Growth of World per capita income	0	-1.5	-1.1	-0.2

Sources: United Nations - 1993, UNECA 1993, End of Year statement, 1994 National Economic Reports (Malawi and Zambia).

- 2 4 The price index of minerals and base metals declined by 3 per cent but zinc and tin prices rose by 11 and 9 per cent, respectively. The major contributing factors to the decline in prices included the weak demand for minerals and metals in the developed market economies, and excess supply mainly from the Commonwealth of Independent States (C I.S)
- 2.5 Although prices for most base metals on the international market were low, there is increasing confidence that there will be a reversal of the trend in the coming years. The current economic boom taking place in China, which registered growth rates of 13 and 11 per cent in 1992 and 1993, respectively, gives some hope for an increase in demand and expectation for the better. As the table above indicates, the trend towards higher growth rates of the global economy is bound to increase demand for minerals and metals
- 2 6 Despite its mineral wealth, Africa in 1992 (excluding South Africa) attracted only about 4 per cent of world expenditure on exploration. SADC's share in this is even smaller. Compare this to individual countries, such as Australia and Canada, which attract 19 and 17 per cent, respectively. However, activities taking place in the member States are likely to reverse this trend. In order to remain in business therefore, SADC has to develop and implement policies and strategies that are aimed at improving its competitiveness in the international market place

Table 2. 1993 Worldwide Planned Mineral Exploration Expenditure by Location

Location	Amount (US\$ million)	% of Total
USA	344.6	20.0
Australia	332.6	19.3
Latin America	331.1	19.2
Canada	295.0	17.1
Pacific	123.6	7.2
Europe	108.6	6.3
Africa (outside South Africa)	93.0	5.4
South Africa	77.5	4.5
CIS, China & Asia	17.2	1.0
Totals	1723.2*	100.0

Source: 1993 Survey by the Canadian Metals Economics Group

- 2.7 During the beginning of the 1990's there were some signs of interest in the former eastern block countries by western countries. However, the uncertainty over these countries arising from political instability may deter most companies from risking their investments there.
- 2.8 In order to attract investment, countries in the SADC region should go further than just revise their investment policies. There is need to carry out an aggressive public awareness campaign globally, so as to sell the mineral resources and conducive investment climate being created in the region. This campaign should be undertaken at both regional and national levels. The holding of the Investment Forum in Namibia in 1993 and the planned SADC Mining Investment Forum to be held in December, 1994, in Lusaka, are a good step in the right direction. With the coming into being of a new democratic South Africa and the peace initiatives in Angola and Mozambique, political and social instability in the Southern African region may soon be a thing of the past. The region should take advantage of this changing situation to attract investment.

3. DEVELOPMENTS IN SADC MEMBER STATES

The year under review witnessed a number of developments in the mining industry of the region. Notwithstanding the low prices of metals in the international market, there is an ever increasing interest in mineral exploration and mining development in the region by both local and foreign companies. This interest could be a result of several factors, but one obvious reason is the changing environment for investment in most of the countries in the region.

Angola

Mining activities in Angola continued to be depressed due to the security situation. For instance, although applications had been received for exploration licences in diamonds, base metals, ornamental stones, iron, gypsum and manganese there was hardly any exploration undertaken. However, there was some progress achieved in regional mapping. Three thousand (3000) square kilometres had been mapped during the year under review covering Luanda and Bengo Provinces

Mining activities continued to be concentrated in areas where there was peace. A mining development project, ANGOROCHA ornamental stones, was initiated by SPE, a portuguese company. Concessions for limestone in the cement and glass industries were given.

The emphasis of mining policy is placed on private investment. To this end, the government continued to do away with state monopolies.

Botswana

The mineral sector in Botswana continued to play a significant role in the economy. During the year under review, the sector registered an unexpected increase of 11 per cent, contributing 40 per cent to total revenue.

In the past few years, diamond cutting and polishing factories have been established in an effort to diversify within the diamond industry and create additional employment opportunities. Currently, there are three factories operating in the country.

The Jwaneng Fourth Stream Project is on schedule and is due for commissioning in the last quarter of 1994. The Project aims at increasing diamond production in Botswana.

Dimension stone quarrying operations in Manyana area were suspended pending a review of the archaeology and geology of the area.

The Selebi-Phikwe - 810 project was completed during the year and commissioning of the No. 1 Ice Plant started in 1993 with a successful continuous test run.

New Investors acquired interests in Thakadu Mining Pty (Ltd), which holds mining leases in copper deposits. Development of these prospects awaits consideration of a mitigation report by the relevant authorities.

Prospects for growth in the mining sector in Botswana are brightened by the improving diamond markets.

In 1993, one of the shareholders in BCL Limited, AMAX Inc. withdrew from the company. AMAX interests in copper/nickel have been taken up by the remaining two shareholders, the Government of Botswana and Anglo American Corporation (AAC).

The decline in manganese prices, financial problems and poor quality of production forced Jacomar Manganese (Pty) Ltd to suspend its operations at Jacomar mine during the year. Funds are being sought by the company to resume production.

Production of soda ash continues to be constrained by a weak regional demand resulting from the poor regional economic conditions and the impact of the current global recession. Indications however, are that the regional demand is likely to improve in the short term.

New mapping conducted in 1993 covered 23,000 km² and includes revisions to existing maps. Owing to the extensive cover of the country by Kalahari sands, altogether about 25% of Botswana has been mapped. Basic "grassroots" exploration by the Geological Survey Department in 1993 included the continuation of Project GS17 which aims at establishing appropriate geochemical techniques for base metal exploration in the arid terrains of western Botswana. Detailed evaluations were done on two industrial mineral deposits namely a limestone deposit at Tsetsebjwe and a fine-sand deposit near Palapye. Both evaluations are still in progress. Drilling and associated geochemical surveys in Maitengwe Greenstone Belt were completed in July. Logging and sampling of the cores is in progress. In the Vumba Schist belt, work aimed at establishing lithostratigraphic relationships is in progress and the objective of the current mapping is to widen the delineation of the zones with a potential for gold.

Exploration by the private sector continues to be sustained at high levels. In 1993, one hundred and seventy six (176) new prospecting licences were issued. A new development is the appearance of North American junior prospecting companies. Provisional expenditure for the year 1993 was P55 000 000. This indicates a slight drop from the 1992 figure. However the drop is due to the winding up of a major prospecting programme in Northwestern Botswana.

Efforts at improving storage and management of exploration, geophysical, hydrogeological and bibliographic data are being progressed. Shortages of manpower and the lack of appropriate training opportunities have frequently caused problems with the verification of data entry and the testing of the reliability of the databases. The databases are however a beneficial improvisation that offers reasonably good value for the purposes that they were developed.

Lesotho

Phogoane clay project under the Lesotho National Development Corporation (LNDC) is about to come on stream. The deposit is to be exploited for the international market.

Activity in the ornamental stone sector has concentrated on the assessment of quality and quantity and a first draft report was expected to be considered in April, 1994. This activity is being undertaken with the assistance of UNDP.

Mining laws and regulations are being reviewed in Lesotho and it is expected that this exercise will be completed by the end of 1994. With regard to Geoscience Data Management, an IBM computer has been acquired in the Department of Mines and DBase IV software installed. Staff is being trained to effectively utilise this facility.

Malawi

Exploration work was undertaken on graphite deposits in Salima by Graphite Mining Company. A feasibility study is underway on the deposit. It is envisaged that the mine will produce 3,000 tonnes of coarse graphite flakes. The production is expected to double after two years of operation. The Ilomba sodalite hill is under development with a view to opening up a mine soon.

Although some efforts continued to be made to encourage small scale mining, operations in the gemstone sector were not satisfactory. Illegal mining and dealing continued.

Coal mining regulation for inclusion in the Mining Act is expected to be finalised in 1994.

Mozambique

Several exploration programmes were undertaken during 1993 in Mozambique. The minerals covered included, rare earth metals, Gemstones (Zambezia Province) Gold (Manica) and Heavy mineral sands along the coast.

New gold alluvial deposits were discovered in the Northern Province of Niassa on the boarder with Tanzania. More than 10,000 illegal miners are involved in mining such deposits.

Construction of a processing plant for graphite continued in Anacuabe, with Mozambique, where production is expected to start in July, 1994.

New mines which came on stream include the marble production targeted for the export market in Italy and Portugal, and a gemstone mine opened up by Hagura/GPL.

A National Commission for Environment has been created. The commission is chaired by the Minister of Mineral Resources. In addition, the current mining legislation is undergoing review with the assistance of the Commonwealth Secretariat, including a special fiscal regime for the mining sectors.

Namibia

The new Mining Act was implemented in April, 1994. Exploration activities were undertaken covering base metals and industrial minerals. Offshore exploration for diamonds and hydrocarbons continued during the year. There was also exploration for fluorspar at Okorusu with a view to increasing reserves.

A German company is prospecting and mining sodalite for dimension and ornamental stone and will soon establish local processing facilities.

In order to attract investments, the Namibian government has taken an aggressive stance towards promotion of the mining sector. This is demonstrated by the holding of the investment conference on Namibia in 1993 and the planned geological conference in 1994. Follow-up campaigns on the investment conference were undertaken in Canada and Japan.

Data bases on mineral deposits and mineral rights held by various companies have been established at the Geological Survey Department

A second draft Environmental Policy was completed in March, 1993.

Swaziland

There was a general increase in mineral production in Swaziland except for coal which experienced a significant decline due to the closure of Emaswati coal. A new coal mine came on stream.

Tanzania

There was a significant surge of interest in seeking mineral rights mainly due to the favourable investment climate being put in place in Tanzania. This interest is concentrated on gemstones and gold.

The Tanzanian mining policy and strategy aims at among other things, strengthening of small scale mining by improving availability of machines and other inputs, institutional strengthening, promotion of mineral trade and general improvement of the investment climate.

Three mines came on stream in 1993. These are the two gemstone mines in Arusha and the one for ball clay in Southern Iringa.

A data bank on geology and minerals has been established at the Ministry of Water, Energy and Minerals

An environmental law is being formulated and the department of mineral resources is compiling information on mining related activities for inclusion in the policy.

Zambia

Government is carrying out measures to encourage private sector participation in the mining industry. A new incentive scheme is under consideration as part of the revised Mines and Minerals Act.

There are also proposals to privatise the giant Copper Mining Company, ZCCM, although the mode of this privatisation has not yet been decided. ZCCM continued to register declining production due to depletion of reserves, financial and other operational problems. Copper production in 1993 declined from 441, 554 tonnes in 1992 to 403,451 tonnes in 1993. Cobalt production on the other hand, declined from 4,634 tonnes in 1992 to 4,212 tonnes. The company instituted measures aimed at boosting production and reducing costs

Apart from proposals to restructure the Ministry of Mines and Minerals Development, in order to make it more responsive to the new mining investment climate, the Mines and Minerals Act is being reviewed to incorporate, a new fiscal regime aimed at attracting investment. A number of companies such as Phelps Dodge, Anglo American Corporation and Rio Tinto Zinc acquired exploration licences for various minerals.

Zimbabwe

Zimbabwe experienced a record level of exploration activities with 153 Exclusive Prospecting Order (EPO) active covering 14.8 million hectares or 33 per cent of the country. 107 applications were under consideration. There was a shift in interest from precious metals to diamonds. About 60 per cent of EPOs were for diamonds. A number of local and foreign companies, including De Beers and Re union mining are involved in prospecting for diamonds.

Diamond production which started in 1992 at the River Ranch deposit near Beitbridge is going on and production increased from 40,654 carats in 1992 to 43,850 carats in 1993.

There is also interest in exploration for hydrocarbons under special grants with emphasis on Coal Bed Methane (CBM) in recent years. Arising from previous studies for coal in Hwangwe and Sengwa coal fields, there is a lot of data on CBM. Test wells sunk at greater depth yielded samples whose analysis came out positive. However, there is need to raise more capital for additional sample analysis

A summary of activities in the member States for the period 1992-1993 is given below:

TABLE 3. 1992-1993 MINING ACTIVITIES IN SADC: A SUMMARY

COUNTRY	EXPLORATION		MINING		PROCESSING FACILITY		POLICY CHANGE	
	1992	1993	1992	1993	1992	1993	1992	1993
ANGOLA	underground water	underground water	diamonds	ornamental stones limestone diamonds	diamonds	Diamonds	Mining Law enacted Liberalise diamond market	Mining Law Review
BOTSWANA	diamonds base metals precious metals	diamonds base metals precious metals						Mining Law under review
LESOTHO	diamonds base metal	ornamental stones						Review of Mining Law
MALAWI							Ministry of Mines created	Coal Mining Regulation
MOZAMBIQUE	gold gemstones heavy mineral sand	dimension stones gold heavy mineral sands graphite		marble gemstone			Privatise Mining companies Review mining/ regulation law	

NAMIBIA		basemetals industrial minerals fluorspur		sodalite			Minerals Act	2nd Environmental Policy
SWAZILAND				coal mine				
TANZANIA	diamonds gold graphite	gesmtones gold		gemstones clay				
ZAMBIA	ornamental basemetals gemstones	gemstones basemetals	gemstones	gemstones			liberalise gemstone industry	review of mines and minerals Act
ZIMBABWE	gold diamonds basemetals PGMs	diamonds gold basemetals hydrocarbons	diamond					

4 PERFORMANCE OF MAJOR MINERALS

An account of the performance of some major minerals produced in the SADC region is given in the following paragraphs.

4 1 Asbestos

Production increased by 6 per cent from 182,459 tonnes produced in 1992 to 192,672 tonnes in 1993. However, the increase was lower than that experienced during the 1991/92 period when production shot up from 155,585 tonnes to 182,459 tonnes. The two producers of Asbestos in the region, Swaziland and Zimbabwe, both increased their production during the year under review.

The international market for Asbestos continued to be depressed due to the increasing environmental concerns especially in the developed economies. However, both the Swazi and Zimbabwean Asbestos does not experience any marketing problems because of environmental concerns. This is because the fibres produced by these countries are comparatively less hazardous.

4 2 Coal

Except in Malawi, Tanzania and Zimbabwe, coal production declined in all the remaining four producers in the region (Botswana, Mozambique, Swaziland and Zambia). However, despite the problems faced by the producing countries such as capital and equipment, there was a positive growth in production of about 6 per cent.

4 3 Cobalt

Due to a number of financial problems faced by ZCCM, the major producer (about 90 per cent) of cobalt in the region, the total regional output of cobalt declined from 5,007 tonnes in 1992 to 4,526 tonnes in 1993. Zambia's production reduced from 4,634 in 1992 to 4,212, Botswana also experienced a slight decline from 208 tonnes to 205 tonnes. Zimbabwe on the other hand, increased its production by 13 per cent from 100 tonnes in 1992 to 113 in 1993. ZCCM continued to institute measures to improve production and cut down on costs.

Demand for cobalt remained stable during the year and is expected to improve even further in the coming year as the world economy improves. At the international supply scene, Zaire and Zambia are still the major suppliers. The price fluctuated between US\$11 and US\$28/lb.

4.4 Copper

There was an overall decline in copper production in the region. The region produced 468,426 tonnes in 1993 compared to 509,296 produced in the previous year representing a decline of about 8 per cent. Apart from Botswana which registered a slight increase in production all the three other producers, Namibia, Zambia and Zimbabwe experienced a decline. Some of the factors contributing to the decline in production include lack of capital to service equipment and depleting of good grade ore reserves resulting in high mining costs.

Copper prices which started the year at £1534 per tonne followed a downward trend and averaged at £1276 per tonne. There was an upturn in the price during the middle and towards the end of the year mainly due to the speculative investment associated with the tight concentrate market. Copper stocks at the end of 1993 stood at 3 weeks of consumption.

The LME stocks rose during the year to reach 610,350 tonnes at end of December compared to 342,625 tonnes reached in 1992. Further declines in copper prices are therefore, expected as stock levels surge.

4.5 Chromite

Chromite production again fell in 1993 representing a continuous fall in production by Zimbabwe the sole producer in the region. The slow growth in the world economy and excess supply depressed the market. Although Zimbabwe has the capacity to increase production to 1,000,000 tonnes, this can only be achieved during favourable market conditions for chrome.

4.6 Diamonds

Diamond production reduced by 14 per cent from 18.9 million carats in 1992 to 16.1 million carats in 1993. Whereas Tanzania and Zimbabwe increased production, there was a decline in Angola, Botswana, Lesotho, Namibia and Swaziland. The reduction in production was mainly due to the depressed market.

De Beers Central Selling Organisation (CSO), which markets about 80 per cent of world production increased sales in 1993 to US\$4,366 million. This represented an increase of 28 per cent on 1992 figures.

Some of the short term factors affecting increase in sales included, the uncontrolled Angolan rough supply due to the war situation in the country, the imposition of a temporary 20 per cent duty on all commodities which resulted in the reduction of Russian polished diamonds being traded on the outside market and the increased purchase of rough diamonds by India

There are, however, signs of over supply in the lower and cheaper quality category of rough diamonds. The market balance has also been tipped by the rough diamonds from Russian and US stock piles, previously meant for industrial and technical use.

4.7 Gold

There was a slight increase in gold production in most producing countries in SADC with Zimbabwe contributing the most to the total production of 24,497 kg in 1993. The increase represented a two per cent change from the production of 2438 kg in 1992.

After the six year falling prices in gold the 1993 prices averaged at US\$360 per ounce. The market saw a high of US\$407 during the year under review.

4.8 Nickel

Both Botswana and Zimbabwe increased their production of nickel giving a total regional production of 30,797 tonnes compared to 29,223 tonnes produced in 1992. However, world nickel production and consumption declined during the year under review.

The world primary nickel production during the first 10 months of 1993 totalled 639,000 tonnes down by 12.5 per cent from 724,000 tonnes produced during the same period in 1992. At the same time the world consumption stood at 652,400 tonnes in 1993 compared to 663,600 tonnes in the previous year.

The average price for nickel in 1993 stood at \$5,293 per tonne, the lowest in current prices since 1987.

The slight improvement in price in the fourth quarter of 1993 was due to seasonal factors, a tight world nickel scrap market and the threat of a strike at the Russian mine of Norilsk nickel company and intensified speculation in the market. The LME stocks in 1993 stood at 128,000 tonnes. However, the information that Russian and other producers' output decline is expected to bring hope for the nickel market. Canada has indicated that it will cut back on production during 1994 to assist the market to recover.

4 9 Lead

The region experienced a decline in production from a total 34,122 tonnes in 1992 to 33,092 tonnes in 1993. While Namibia's production remained around 31,000 tonnes, Zambia's production reduced by about 32 per cent from the 1992 figures. The fall in production from Zambia's ZCCM is due to depletion of the ore reserves at the lead/zinc mine in Kabwe, which led to the subsequent closure of the mine in June, 1994.

During 1993, there was a continued decline in mine production in the international market mainly due to low prices. During the first three quarters of 1993, mine production in the developed economies declined by 10 per cent. However, despite the sluggish growth in Western Europe, Japan and other market economies, lead consumption remained steady during the first eight months of 1993.

The average price of lead during 1993 was £270 per tonne compared to the 1992 average of £307 per tonne. The stocks at LME at the end of 1993 represented 3.3 weeks of consumption.

The expected supply cutbacks and recovery of the global economy is likely to give impetus to the lead market.

4 10 Zinc

The region's Zinc production fell from 75,849 tonnes in 1992 to 39,263 tonnes in 1993. This was a significant decline experienced by both Namibia and Zambia the regional producers of the metal. Apart from the global problem of low prices and decline in demand, Zambia was faced with depletion of the ore reserves for the mineral.

Zinc market experienced a very difficult year in 1993. At the beginning of 1993 the price for zinc at LME stood at US\$1060 per tonne. The price eventually fell to the low of US\$859 during September, 1993. The average LME price during the year was US\$960 per tonne compared to US\$1239 per tonne in 1992.

Stocks increased from 457,000 tonnes to 906,700 tonnes at the end of 1993. This is equivalent to 16 weeks consumption.

In 1994, it is expected that the situation will improve for zinc, as there will be an acute shortage of zinc concentrate which will lead to a reduction in metal production. However, the huge stocks at LME is likely to suppress zinc prices.

5 **PROGRAMME REVIEW**

5 1 The SADC Mining Sector programme is composed of thirty (35) Projects at an estimated cost of US\$31 million, of which US\$13 million, representing 42 per cent, has been secured.

5.2 **Consultations with South Africa**

At a meeting held on 20th May, 1994 in Maseru, Lesotho, Mining Ministers took a decision to review the programme in view of the coming into being of a democratic South Africa. This review was aimed at rationalising the Programme of Action and reducing overlap and duplication of efforts

Following this decision a Joint Committee of Experts comprising Botswana, Namibia, Mozambique, South Africa, the SADC Secretariat and the Coordinating Unit was constituted and met from 30th June to 1st July, 1994 in Pretoria. The report of the Joint Committee was submitted to Ministers on 17th August, 1994 in Gaborone, Botswana

Arising from the report of the Joint Committee, Ministers emphasised the need to carefully study projects on the programme by Specialist Sub-committees in order to increase efficiency in the utilisation of resources. These specialist Sub-Committees will facilitate implementation of projects in various Sub-Sectors and assist the Coordinating Unit in the management of the programme.

Ministers approved Sub-Committees comprising of experts in various mining activities to implement projects indicated under each Sub-committee. Specifically, Honourable Ministers considered and approved the establishment of the following Sub-committees.-

(1) **Geology Sub-Committee**

This Sub-Committee will comprise of Directors of Geological Surveys or equivalent officers supported as appropriate by their professional staff. The Sub-Committees will assist in implementation of projects indicated below;

- | | |
|--------------------------|---|
| * Project AAA 0 10 | Establishment of Regional Seismic Network and Data Centre |
| * Project AAA.0.7 | Regional/ National Geological Minerals and Mining Bibliographic and Databanks |
| * Project AAA 0.11 | Inventory of Mineral Resources in the SADC Region |

- * Project MOZ.0 1 Geophysical/ Geochemical Map Compilation Facility
- * Project AAA.0.9 Exploration of the Kalahari Sedimentary Basin
- * Project ZIM.0 1 Central Isotope Geochronology Laboratory in SADC Region
- * Project AAA 3 7 Assessment of Iron Ore Deposits in Angola, Namibia and Swaziland
- * Project AAA.4.8 Promotion of Ornamental Stones in the SADC Region

(11) Mineral Processing Sub-Committee

The composition of this Sub-Committee will comprise Directors of Metallurgy and supported by their staff This Sub-Committee will be responsible for the projects below:

- * Project AAA.3 6 Assessment of Heavy Mineral Sand Deposits and Feasibility of Establishing a Titanium Dioxide Plant
- * Project AAA 3 4 Study of the Bauxite Resources in the SADC Region
- * Project AAA 0 3 Inventory and Optimisation of Mineral Processing Facilities in the SADC Region
- * Project AAA 4 3 Study and Establishment of a Refractory Industry in the SADC Region
- * Project AAA 4 10 Metallurgy of Ores from Alkaline Complexes
- * Project AAA 7 3 Feasibility Study on the Manufacture of Electrodes in the SADC Region

111) Environmental Sub-Committee

This Sub-Committee will comprise Directors of Mining Inspectorate or equivalent officers and will be responsible for the following projects

- * Project AAA.8.1 - Environmental Impact of Mining and Related Industries on the Water Quality of the Rivers of the Zambezi Basin
- * Project AAA 8.2 - Air Pollution from Mine Emissions
- * Project AAA 8 3 - Mitigation and Alternative Technologies for the use of Mercury and Cyanide for Gold Recovery, River Bank Degradation and River Siltation in Small Scale Mining
- * Project AAA 8 4 - Effects of Spontaneous Combustion of Coal
- * ProjectAAA.8 5 - SADC Environmental Regulatory Framework for Mining

(1v) Mining and Marketing Sub-Committee

This Sub-Committee will comprise Chief Mining Engineers or equivalent officers supported by their staff. The following projects will fall under this Sub-Committee,

- * Project AAA 0 6 - Small Scale Mining and Minerals beneficiation
- * Project AAA.4.5 - Market Surveys of Industrial Minerals
- * Project AAA.4.6 - Assessment of Vermiculite Production in the SADC Region
- * Project AAA 4 9 - Study and Development of Gypsum Production in the SADC Region
- * Project LES.7.1 - Manufacturing of Diamond Tools in the SADC region

- * Project AAA.7.4 - Central Data Bank for Mining Equipment and Spares Manufactured in the SADC Region
- * Project AAA.7.5 - Investigation of the Rationalization of Rock Drills and Rock Drill Steels Manufacturing Industries in the SADC Region
- * Project AAA.7.6 - Investigation of the Rationalization of the Manufacture of Wear Resistant Liners and Rail Track and Fittings in the SADC Region

v) **Human Resources Development Sub-Committee**

This Sub-Committee will constitute Deans of the Faculties of Mining/Geology or equivalent supported by their staff. The following projects will fall under this Sub-Committee;

- * Project TAN.0 1 - Establishment of a Gemmological Institute
- * Project AAA.6.2 - SADC Mining Sector Human Resources Development
- * Project AAA 6 3 - Setting up of a Mining Sector Industrial Training and Development Advisory Unit
- * Project AAA.6.4 - Redesign and Development of SADC Mining Technical Courses facilities
- * Project AAA.6.5 - Requirements of Strengthening of Regional Mining Sector Education Unit

In creating these Sub-Committees, Ministers took note of the following issues:

- Regional experts will be engaged to the fullest extent possible in the execution of regional projects.

- The Sub-Committees of experts will convene meetings on a regular basis to review the implementation and operation of regional projects

5 3 New Areas of Cooperation

It has been recognised that mining operations have a deleterious effect on the environment. The adverse effects are usually in form of physical destruction of the morphology of the earth's surface, gaseous emission, noise and chemical effluents arising usually from the processing of minerals. In an effort to reduce the adverse environmental effects of mining operations, five environmental projects have been added to the programme. Profile of these Projects appear in the section on Project briefs.

6 0 STATUS OF PROJECTS

Projects under the programme are at various stages of implementation. Following is the current status of projects.

6 1 Overall Coordination

Project AAA.0.0 - Support to the Mining Sector Coordination Unit

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

South Africa is to provide an expert whose terms of reference are to be determined by the Coordinating Unit. As a principle it has been decided that all member States should consider the secondment of their experts for strengthening the capacity of the Coordinating Unit and that such secondment should be on a need driven basis as indicated by the Unit.

With regard to the question of strengthening the SADC Mining Sector Coordinating Unit the Government of Zambia indicated that it is to appoint a full time Coordinator and his/her Deputy as soon as possible.

The Coordinating Unit has received Technical Assistance from various organisations, including the following

- * Austria is providing support in (Mineral Processing), whereas France and Sweden are assisting in Geology and Environmental Protection and Pollution Control, respectively

- * The Swedish support, after an extension of four months came to an end in April, 1994. German Technical Assistance in small scale mining came to an end in May, 1994.

Environment Sub-sector

The Environment Sub-sector was set up in March, 1992 as part of the Nordic technical Assistance (FINNIDA & SIDA) to the SADC Mining Sector Coordinating Unit (MCU) which lasted until July, 1993. From then onwards the technical assistance was funded by the Swedish International Enterprise Development Cooperation (SwedeCorp) and this came to an end in April, 1994.

A summary of work done in relation to the environment sub-sector is as follows:

During the first half of 1992 a critical evaluation study was undertaken. A final draft report "Environmental Effects of Mining in the SADC Region" was prepared based on the findings of the evaluation study which was disseminated in October, 1992. The report gives an overview of the effects of mining operations on the environment in the SADC region, based on visits to eight countries and 35 mines and mining organisations. Both deleterious effects and instances where the problems have been successfully tackled have been noted.

Building on the results of the evaluation study and the report, as well as other available relevant information, a "Mining and Environment" workshop was held in December, 1992, in Lusaka, Zambia.

The recommendations from this workshop outlined a number of programmes and project proposals for SADC. Building on these recommendations, and through the technical assistance of SwedeCorp, the MCU conducted two studies, i.e. 'Environmental Audit of the Kabwe Mining Operations' and 'Strengthening Environmental Policy and Law for Mining in the SADC'. The recommendations from these studies have been incorporated into project proposals and the MCU took the initiative to visit, in April, 1994, the SADC Environmental and Land Management Sector (ELMS) in Lesotho, to discuss the proposals. The ELMS expressed no objection to the Sector's proposals and made a number of comments that have now been incorporated into the final project proposals.

Hence, the objective of creating the environment sub-sector has been fulfilled and the resulting project proposals once approved by Council will form the basis for continued work under the sub-sector.

Project AAA.0.3 - Inventory and Optimization of Mineral Processing Facilities

An inventory of the major mineral processing facilities in the SADC member countries has been undertaken in the following mineral categories and these has been recorded in a catalogue as follows

- Precious Metals (gold 17)
- Base metals (copper, lead and zinc 18)
- Alloy metals (cobalt, nickel, chrome, tin, tantalum 14)
- Industrial Mineral (diamonds, asbestos, graphite, manganese, kaolin, bentonite, phosphate, fluorite, pyrite, soda ash, gypsum, wollastonite, G & W Minerals and Mindeco Central Processing Plants for various minerals 26)
- Energy Minerals (uranium, coal 7)
- Iron and steel (2)

These plants represent most of the processing techniques applied in the SADC mineral processing facilities

The necessary data and information was collected by visiting mines and plants in eight SADC member countries, Botswana, Lesotho, Malawi, Namibia, Swaziland, Tanzania, Zambia and Zimbabwe. About 80 per cent of the work has been carried out

It is planned that work in Mozambique will be carried out in July, 1994. The rest of the work in Angola and Zimbabwe will be carried out between June and August, 1994

The final catalogue of about 100 mineral processing plants will represent the current status and most of the processing techniques applied in the SADC region

Recommendations will be given on the application of new processing techniques, improvements in modernisation, maintenance and optimisation of existing plants. The possibilities of sharing various plants on a regional basis will be highlighted

This project will be completed by the end of 1994 and the report will be distributed to all the SADC member States

The Coordinating Unit is liaising with South Africa in order to include information on South Africa in the catalogue

Project AAA.0.10 - Establishment of a Regional Seismic Network and Data Centre

The main objective is to set up a SADC Regional Seismographic Network and a Regional Seismic Data Centre.

Most member States are in the process of setting up National Seismic Stations. The Mining Coordinating Unit is supporting and monitoring implementation of this project at the national level. Some of the activities being undertaken by member States include the following:

- Zambia Geological Survey in collaboration with the United States Geological Survey is upgrading Kapopo Seismic Station where a Broad Band and Sunsparc seismometers will be installed. Three remote stations will also be upgraded into Digital Recording Stations. The Kapopo Station will be incorporated into IRIS and digital data will automatically be shared with other IRIS stations. Aerial coverage of the Kapopo Station will include Central and Southern Africa.
- Tanzania, being within the East African Rift Valley System, is susceptible to earth tremors and earthquakes. Three stations built in Arusha, Mbeya and Dodoma are now operational. More stations will be set up in Mwanza, Kigoma, Sumbawanga, Songea, Tabora, and Mtwara. The success of the project however, will depend on donations or loaning of equipment from outside institutions and donor countries. The University of Pennsylvania of the United States of America has agreed to set up 20 temporary seismological stations to operate for one year.
- Malawi and Mozambique are cooperating with South Africa in rehabilitating their seismic infrastructure with a view to eventually establishing seismic stations.
- In Botswana, a seismic centre has been established at the Geological Survey Department in Lobatse in cooperation with the United States Geological Survey.
- In Lesotho, two seismic stations are planned to be implemented by the Lesotho Highland Water Project to monitor induced seismicity from the dams.
- Swaziland is cooperating with a British Geological Survey (BGS) to establish five stations. The experts from BGS inspected sites for location of these stations in December, 1993.
- The Geological Survey of Namibia is operating a seismic station at Tsumeb in collaboration with the United States Geological Survey.

Progress in setting up National Seismic Network will facilitate the establishment of the regional seismic network and data centre. However, a review of what is being undertaken in member States needs to be called out in order to establish the compatibility of the various seismic systems in use.

The Geological Sub-Committee (GSC) reviewed this project and decided to form a Geophysical Working Group which will be responsible for the following -

- editing a catalogue of the seismic stations operating in the region
- producing and circulating seismological bulletins
- designing and maintaining a databank of all seismic events
- placing new stations when funds are available

Establishing of a regional Network and data Centre would be difficult and expensive due to poor telecommunication facilities in the region. This issue will be raised with the SADC Telecommunication and Transport Sector.

Project AAA.0.6 - Small Scale Mining and Minerals Beneficiation

The original objectives of the project were

- a) selecting potential 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 operations

At the beginning of the German Technical Assistance to this project, the objectives of the project were redefined through a ZOPP Workshop (Goal Oriented Project Planning Workshop), which was held in September, 1989 and attended by all sectoral contact points. The Workshop defined the specific objectives and activities to achieve them. The redefined objectives appear in the table below:

Table 4. Small-Scale Mining and Mineral Beneficiation, Objectives and Outputs

Objectives	Output
1 Establishment of Small-Scale Mining Section in MCU	The Small Scale Section was established in 1989 Through the Section, MCU is providing gemological services as a result of specialised training
2 Propose viable and environmentally acceptable technologies for Small Scale Mining, by carrying out Feasibility studies on typical mineral deposits.	Feasibility studies completed for member States <u>Lesotho</u> - Kolo diamond deposit - Majapereng coal deposit - Kao and Lighobong diamond deposits <u>Namibia</u> - Namibia Lithium Mines - Small Scale Mining of tin <u>Zambia</u> - Chongwe copper/gold deposits - Mufumbwe copper deposit - Choma tin deposit <u>Zimbabwe</u> - Tin deposits near Kamativi (Cooperatives) - Sandawana emerald deposit - Filabusi gold deposits
Propose appropriate and beneficiation technologies through workshops and seminars	Two technology workshops were organised and resulted in the publication of two Handbooks on Small-Scale Mining.
3. Establishment of a database on SSM	Database available
4 Make recommendations for financial facilities for SSM.	Study on financing of small scale mining completed and recommendations submitted to member States.
5. Improve legislation of SSM	Mining Legislation reviewed for Angola, Swaziland and Zambia

6 Propose regular availability of equipment to SSM.	Survey done through the study on plant hire scheme in Zimbabwe and the study on financing of Small Scale Mining in the SADC countries
7 Assessment of training requirements	Assessment done and details contained in the final report of the project
8 Assessment of marketing schemes and proposals for improvement.	Study of gemstone marketing in Malawi completed, International Gemstone Marketing covered in the gemstone workshop and appearing as Chapter 15 in the Handbook on gemstone/ gold mining, lapidary and jewellery industry
9 Rehabilitate laboratory facilities of Geological	A SADC mineral dressing laboratory has been established at the Geological Survey Department in Lusaka

Although the technical assistance from the German Government (May 1989-May 1994) came to an end, the Small Scale Mining Section of the Mining Sector Coordinating Unit will continue to operate and promote the small scale mining industry in the SADC region using internal capacity and resources

The Coordinating Unit is to make available information on small scale mining to South Africa, including the United Nations Guidelines arising from the small scale mining workshop which was held in Harare in February, 1993

6 1.1 Geoscience Data Management Programmes

There are three projects currently being implemented under this project These are Regional/National Geological, Minerals and Mining Bibliographic and Databanks, Inventory of Mineral Resources in the SADC Region and Geophysical/Geochemical Map Compilation Facility All these projects are to be reviewed by the Geology Sub-committee, taking into account facilities existing in South Africa

Project AAA.0.7 - Regional/National Geological Minerals and Mining Bibliographic and Databanks

The project aims at establishing National/Regional Bibliographic Databanks on Geology, Minerals and Mining based on regionally standardized data forms, software and hardware, in each SADC member state.

The geology section with the assistance of the French Government is evaluating the various systems being used by member States and their manpower implications. A workshop is being planned where common bibliographic database structures, codes, software and hardware will be discussed, agreed upon and adopted.

Project AAA.0.11 - Inventory of Mineral Resources in the SADC Region

This is a follow-up project to Project No. AAA 0 7 (Inventory on Geology, Mining and Minerals) and aims at the creation of a computerised database on Geology and Mineral Resources, development of GIS system and Production of various thematic maps.

Phase I (Creation of Computerised Mineral Occurrence Data Bases) of the project will be implemented at East and Southern African Mineral Resources Development Centre (ESAMRDC) with technical assistance from the European Union (EU) Activities in the member States are as follows:

- In Tanzania, technical and financial assistance from UNDP to the Mineral Data Bank Project was extended for another year in November, 1993. The project continued training local staff and computerising geological information available at MADINI Archives
- The Government of Zimbabwe has concluded an agreement with the Canadian International Development Authority (CIDA) for a 3 year data management programme. However, at present the Ministry has the following data base
 - 1 Data Bank on EPO's and SG's initiated in 1992.
 - 2 Mineral deposit data bases covering gold, base metals and industrial minerals
 - 3 Annual Total Mineral Production data bases from 1906 for 39 minerals

- In Zambia the World bank project is assisting in the development of mining and geoscience data bases.

Additional funds to implement Phase II of Project AAA 0 11 (Inventory of Minerals Resources in the SADC Region) and Project AAA.0.7 (Regional/national Geological, Minerals and Mining Bibliographic Data Banks) have been sought from the African Development Bank (ADB) and the Canadian International Development Authority (CIDA). A total of US\$2.8 million has been pledged

The above two projects were reviewed by the Geology Subcommittee and it was recommended that software to be used for these projects should be compatible with that used in South Africa This is because South Africa has already a regional bibliographic databank which can be downloaded to other Geological surveys

It was also recommended that a Database Working Group be formed to oversee implementation of these projects.

**Project MOZ.0.1 - Geophysical/Geochemical Map
Compilation Facility**

The project aims at establishing National Geochemical and Geophysical Data Processing Facilities in each SADC member State, and a Regional Geoscience Data Centre (RGDC) to provide facilities and training for the processing and interpretation of geophysical and geochemical data for all SADC member States.

Types of data to be used are as follows.

a) Geophysical

- . Magnetic
- . Gravity
- . Radiometric
- . Seismic Survey results
- . Electromagnetic data
- . Resistivity data

b) Geochemical

- Stream Sediment Geochemistry
- Soil Geochemistry
- Drainage Channels

c) Others

- . Mineral Occurrences Data
- . Surface Geology
- Structural data
- Political/administrative boundaries
- Topography/Digital Terrain Models

The financial agreement on this project was signed in November, 1993 between EU and the Government of Tanzania on behalf of Southern and Eastern African countries. A tripartite meeting between EU, ESAMRDC and MCU has been planned where the modalities of implementing the projects will be worked out. The outcome of this meeting will be submitted for consideration by the Geology Sub-committee.

In reviewing this project it was observed that:

- aeromagnetic and gravimetric data is available in digital format in some international institutions (ITC, Leeds University) SADC MCU should contact these institutions so that data be made available to member States
- geochemical data is scarce and incompatible throughout the region.

It was therefore decided that a Geophysical Working Group and a Geochemical Working Group be created. These working groups will comprise geophysicists and geochemists respectively. The groups should compile an inventory of the data available in each country, assess the computer needs with regard to data interpretation, assess the geophysical and geochemical expertise available, design a standard output for the maps

The meeting suggested that the Geophysical Working Group convene within three weeks after the current GSC meeting with a view to improving the TORs of the Geoscience Data Component of the EDF Assistance Project number 7 ACP RPR 147 and 7 ACP TA 037 (REG/70447), taking into account the data and expertise available in the region.

Project AAA.0.9 - Exploration of the Kalahari Sedimentary Basin

The objective of this project is to devise methods for exploring in areas covered by the Kalahari Sands, as well as produce a sub-Kalahari geological map. An assessment of the mineral resources potential within and beneath the Kalahari sands will also be undertaken.

Financial (US\$0.80m) and technical assistance to implement the project is being sought from a number of cooperating partners (Perez Guerro Trust Fund, Commonwealth Secretariat and Norad), who are still considering the request.

The Geology sub-committee has recommended that the project be split in two phases as follows:-

Phase 1 - production of sub-Kalahari Geological map, Basin contour map and Isopach map

Phase 2 - Characterization of the Kalahari sands.

Phase 1 of the project will be implemented by a group of regional experts while phase 2 require a major research by highly skilled manpower.

The project title has been recommended to change to "The Geology of the Kalahari basin"

Project TAN.0.1 - Establishment of a Gemological Institute

The project aims at establishing an Institute of Gemology in the SADC region. The Institute will train gemologists from SADC countries. The project will be implemented in two Phases:

Phase I - Undertake feasibility study on the curriculum, staff development and institutional framework

Phase II - Actual establishment of the Institute

Phase I of the project has been initiated with the assistance of the French Government. Two countries (Zambia and Tanzania) have been covered; other countries will be covered as funds become available.

Project ZIM.0.1 - Central Isotope Geochronology Laboratory

Refurbishment and upgrading of the laboratory has been completed with the assistance of EU funding amounting to ECU298,140.00.

Previously, the laboratory used 87 Strontium/186 Strontium (86 Sr/86 Sr) age determination method only, but after refurbishing and upgrading the following additional rock age dating methods have been added:

- Uranium/Lead (U/pb) dating of zircons using the KOBi method;

- $^{143}\text{Nd}/^{144}\text{Nd}$ Neodymium (143 Nd/144 Nd) ratio measurement on mineral and whole rock samples for model age calculations; and
- Measurement of common (natural) Pb ratios and age determinations

Some member States have submitted research projects to be carried out at the laboratory These are:

- Tanzania has submitted the following projects.

Crustal Evolution of the Mozambique Belt of Tanzania, whose objectives is to time orogenic events in the Mozambique belt of Tanzania, especially the lower crustal processes (e.g. granulite-facies metamorphism)
- The Mozambique and related belts-crustal evolution and mineralisation, which aims at establishing the evolution (birth, growth and stability) and mineralisation of the Mozambique (MB) and related belts (e.g. the Usagaran-Ubendian, Irumide and Zambezi Belts) through integrated geological studies.
- Malawi is preparing proposals on the detailed mapping programmes which require the use of CIGLAB and these will be submitted directly to the laboratory.
- Botswana, Mozambique and Zimbabwe have submitted their proposals directly to the laboratory

Member States are being urged to make full use of this facility and the MCU will advise the national Universities to conduct their projects at the laboratory

Funds for travel, subsistence and costs for analysing samples are available from the project funds. This is limited to three months per country for the duration of the EU support programme

After reviewing this project the GSC decided that geochronology should be addressed within the broader scheme of cooperation regarding stratigraphy, which should be handled by the Geology Sub-Committee It was underlined that most of the dating work is uncoordinated Therefore, the Council of Geosciences of South Africa, jointly with SADC MCU would establish close links with the regional laboratory in Harare with a view of comparing the facilities and sharing expertise

Precious Metals and Minerals**Project AAA.1.2 - Diamond Exploration in SADC Region**

At the Mining Ministers' meeting held in Lusaka in June, 1993 the project's terms of reference were reviewed, discussed and accepted as follows

Phase I (8 months)

A desk study will be carried out which will cover the following

- appraisal of diamond exploration activities in each SADC member State
- compilation of data on geology, structure, paleomorphology, drainage pattern and other features in areas of known diamond bearing zones
- classifying and grouping of the prospective zones into characteristic types based on geology, mineralogy, geochemistry, age, structural setting, morphology, diamond characteristics, genetic concepts etc
- interpretation of existing remote sensing data (satellite imageries and geophysical data) in selected zones

Data for Phase I has to be provided by National Institutions, while Phase II will be executed by a consultancy. Member States have been asked to provide basic data needed under Phase I

Member States were requested to supply data for the first Phase of this project. Most member States are compiling the required information. Due to the enormity of the data in some member States, support is required in terms of computer facilities

Phase II (4 months)

Interpretation of data obtained from Phase I will constitute the major scientific appraisal of this study. This will culminate in the publication of monograph and its distribution to various interested parties. Follow-up promotional activities are envisaged. The details of this are to be worked out. The estimated cost of the project is US\$0 39 million

Meanwhile, the Sector Coordinating Unit has approached Perez-Guerrero Trust Fund of the Group of 77, the International Development Research Centre and United Nations Revolving fund for Natural Resources Exploration for financial assistance.

The project was reviewed by the Geology Sub-committee and recommended that its implementation be done in a similar manner to the Kalahari sands project. It has been recommended to change the project's title to "The Geology of diamond occurrences in the SADC region".

6 1 3

Metallic Minerals

Project AAA.3.4 - Study of Bauxite Resources in the SADC Region

This project is a feasibility and market study aimed at determining the viability of establishing an integrated alumina/aluminium industry in the region, based on the known bauxite deposits in Malawi, Mozambique and Tanzania.

A pre-feasibility study, 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 the establishment of an aluminium smelter based on exploitation of the Mulanje bauxite

Regarding the manica bauxite deposit the study recommended that this deposit be continued to be exploited for the manufacture of aluminium sulphate, as it could not support the establishment of an aluminium industry

Regarding the bauxite deposit in Tanzania, the study recommended that more exploration was required. In this regard further exploration is being undertaken by the private sector.

Funding for the detailed feasibility study on the Mulanje bauxite deposit has been secured from ADB (US\$1 million) and work has been completed. The report of the detailed feasibility study was submitted to Malawi in June, 1994. The results of the feasibility study are positive and the private sector has indicated interest

The Geology Sub-Committee reviewed this project and, in recognition of the expanding usage of bauxite, it was recommended that a detailed assessment of known deposits be carried out and the data published as a SADC memoir.

Project AAA.3.6 - Assessment of Heavy Mineral Sand Deposits and Feasibility of Establishing a Titanium Dioxide Plant

The Project is conceived in two Phases Phases I comprises the assessment of current reserves of heavy mineral sand deposits in Malawi, Mozambique, Namibia and Tanzania. The cost estimate for Phase I is US\$0.132 million.

Phase I is already being implemented on a bilateral basis. Resource assessment of Lake Chirwa has been completed with the assistance of the Germany Geological Survey In Mozambique, three areas along the coast are being explored by the Italian Geological Company.

The concern of member States should be in the area of promoting establishment of Titanium Dioxide Plant South Africa has the technology to process Heavy Mineral Sands and member States may wish to work with South Africa on bilateral basis to develop their deposits.

The geology Sub-Committee reviewed the project and recommended the following to be done -

- establishing nature and distribution of the heavy mineral sand deposits
- available data from Malawi, Mozambique, Tanzania, South Africa and Namibia should be compiled for publications as a SADC memoir
- aspects of establishing a titanium dioxide plant should be removed from the project's terms of reference as this is a private sector affair

Project AAA.3.7 - Assessment of Iron Ore Deposits in Angola, Namibia and Swaziland

In the joint PTA/SADC study of the region's steel industry, Angola and Swaziland were omitted. In addition, Namibia has to be considered in the same framework of the SADC/PTA assessment, as it was not a member when the study was undertaken However, data on Angola and Swaziland has been included in the joint PTA/SADC report

A complementary study will be carried out to cover these three countries

The Geology Sub-Committee recommended that the project be implemented by the Mining and Marketing Sub-committee. The final decision will however, be made after member States have studied the SADC/PTA report.

6 1 4

Non-Metallic Minerals

Project AAA.4.3 - Study of Refractory Mineral Resources and the Establishment of a Refractory Industry in the SADC Region

The objective of this project is to determine the viability of establishing a refractory industry in the region. A completed study was considered by the Mining Ministers' meeting in Arusha in May, 1990. Following the consideration of the recommendations of the study, the Ministers decided that the investment required to establish such a plant be determined first, before the implementation of the recommendations could be undertaken.

Consultations have taken place between the Government of Zimbabwe and the SADC Mining Sector Coordinating Unit. In this respect, Zimbabwe has been actively pursuing a joint project with MECON of India, funded by the Government of India under the Africa Fund. The aim is to conduct laboratory studies and a feasibility study for the manufacture of refractory bricks using magnesite, Kyanite and other locally available raw materials. Test work has been undertaken in furnace refractory linings on a number of furnaces and smelters in ZISCO STEEL in Zimbabwe, on the Zambian Copperbelt, and in India.

The feasibility report has been completed. Indications of prospects so far are positive and encouraging. The report is currently being scrutinised by the Zimbabwe Government, after which it will be made available to member States.

This project has been broadened to include other refractories apart from magnesite.

The project was reviewed by the Geology Sub-Committee and it was recommended that it be implemented by a group of regional experts under the title of "The Geology of Non-Metallic Minerals". Other projects to be implemented under this title are project AAA.4.5 - Market survey of Industrial Minerals and project AAA.4.9 - Study of Gypsum Resources in the SADC region.

Project AAA.4.5 - Market Surveys of Industrial Minerals

The market survey of industrial minerals has been done on specific minerals. Market surveys on lime and refractory products were done under UNDP-funded studies. Market survey of vermiculite was done for the Malawi deposits, together with the resource assessment on bilateral arrangements with BGRM of France. In Zimbabwe, the market survey of black granite is being finalised with support of the Commonwealth Secretariat. The MCU is currently undertaking a desk study on the ceramic industry (production and market survey).

As the industrial minerals are very sensitive to transport costs, the MCU has undertaken a study on the transport-cost implications for the development of industrial mineral deposits. The report has been distributed to member States and potential investors in the field of industrial minerals to enable them make investment decisions.

South Africa has also completed market surveys on various industrial minerals. This information will be shared and distributed to the private sector.

The recommendations made by the geology Sub-Committee on this project are similar to those on project No AAA.4.3.

Project AAA.4.6 - Assessment of Vermiculite Production in the SADC Region

The project aims at evaluating the present reserves of vermiculite resources through surveys in Malawi and Zimbabwe, and establishing the regional and international market for vermiculite.

Malawi has already evaluated its vermiculite resources (1991) through a bilateral agreement with the French Government. The resources in Zimbabwe and the establishment of markets have not yet been undertaken. The sector will support the market survey only.

Information arising from the studies should be distributed to the private sector.

Project AAA.4.8 - Promotion of Ornamental Stones in the SADC Region

The project aims at producing a brochure on SADC ornamental stones and a map showing distribution of the same in the SADC Region.

Member States were requested to make available information on ornamental stones available in the respective member countries to be used by the Unit in making an in-house promotion strategy of the project. So far, only Zambia and Namibia have provided the required information

South Africa was initiating work on preparation of a brochure on Ornamental Stones with support from UNESCO. The Coordinating Unit is to examine the possibility of extending this work to cover the SADC Region

The geology Sub-Committee noted that this was a simple and straight forward but important project which regional experts should start implementing immediately

Project AAA.4.9 - Study of Gypsum Resources in the SADC Region

The objective of this project is to assess the current market for gypsum in the SADC 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, Tanzania and Zambia (including the availability of gypsum as a by-product of the metallurgical process) and map out a strategy for their development

CFTC has funded this project and the study report is being finalised by the Consultants.

Recommendations made by the Geology Sub-Committee on this project are similar to those made under project AAA 4 3

Project AAA.4.10 - Metallurgy of Ores from Alkaline Complexes

The objectives of this project are to

- a) produce the agro-minerals phosphate and agricultural lime, which are essential to improve agriculture,
- b) produce saleable concentrates of niobium, rare earths, thorium-uranium, zircon, strontium, fluorite, etc, for sale on world market; and
- c) create employment opportunities for the local population

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. Funding (US\$0 47 million) is being sought

This project will be implemented under the direction of the Mineral Processing Sub-Committee, in conjunction with Universities and other research institutions in the SADC region

The Geology Sub-Committee recommended the following:-

- that cabornatite complexes should first be properly characterised before instituting studies to determine processing routes. Most of the complexes in the region have not been adequately characterised.
- that the project is big and requires highly experienced manpower which the region lacks
- that metallurgical research on better known cabornatites can be carried by the Mineral Processing Sub-Committee

It was therefore recommended that implementation of the project should be deferred until after completion of the much easier project on the SADC Mining Sector programme

6 1 5

Manpower

Project AAA.6.2 - SADC Mining Sector Human Resources Development

A nucleus of three Universities in the region i e University of Zambia, University of Zimbabwe and Witswatersrand University had already initiated programmes of cooperation. Further work to incorporate other institutions could be built around this nucleus. The Coordinating Unit is taking strong initiative to form a Human Resources Development Sub-committee to assist in implementing this project.

Project AAA.6.3 - Setting up of a Mining Sector Industrial Training and Development Advisory Unit

The purpose of this project is to set up a Mining Sector Training and Development Advisory Unit, responsible for helping the industry improve in-company training systems, methods, and materials in managerial, technical and administrative fields, and to generalise their use throughout the Sector.

Project AAA.6.4 - Redesign and Development of SADC Mining Technical Courses Facilities

The purpose of the project is to design technical courses in mining subjects, and to strengthen facilities at the Bulawayo School of Mines and the Zambian Institute of Technology (now part of the Copperbelt University), in order to meet the forecast requirements of skilled personnel in mining operations, such as Section and Shift Bosses, Mining and Ventilation Technicians and Junior Engineers, Mine Captains and Underground Managers

Project AAA.6.5 - Requirements for Strengthening of Regional Mining Sector Education Unit

The purpose of the project is to identify, advise on and assist in procurement of additional requirements of specific regional Mining Sector education institutions, in terms of equipment and teaching staff, in order to expand the intake of students to meet the future needs of the Mining Sector

6 1 6 Mining Equipment and Consumables

Project AAA.7.3 - Feasibility Study on the Manufacture of Electrodes in the SADC Region

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

Work on the project has been completed. A report has been circulated to member States for comments.

Project AAA.7.4 - Central Data Bank for Mining Equipment and Spares Manufactured in the SADC region

A Directory of SADC mining equipment manufacturers, representatives and services offered, has been produced and copies distributed to mining companies and related industries in the member States

Since then, apart from the Coordinating Units' endeavours to source and update the data bank, it is hoped that SADC mining equipment manufacturers, representatives and service organisations will take the initiative to submit information in relation to new products and services coming on stream, as well as these being phased out. However, no updated information for entry to the data bank, has been received to date. Efforts to urge the mining supplies industry to avail such information to the MCU will continue to be made through the SADC Mining Quarterly, a publication of the SADC Mining Sector Coordinating Unit

Efforts to extend the data bank to include quantitative information on the demand for mining equipment in the region are under way. Member States were requested to submit information on operating mines as a baseline for the project. Some member States have already submitted the information required

The quantitative information will be synthesised to ascertain specifically which equipment, spares or accessories are economically viable for manufacture. Those identified will be promoted as special projects to potential investors.

Project LES.7.1 - Manufacturing of Diamond Tools in the SADC Region

The objective of this project is to launch a market study on the demand for diamond tools in the SADC region, with a view to making recommendations on the possibilities of establishing a diamond tools manufacturing facility in Lesotho.

During the Consultative Conference held in Maputo in February, 1992, the Commonwealth Fund for Technical Assistance (CFTA) undertook to finance (US\$0.08 million) the project. However, the re-programming of activities at the Commonwealth Secretariat resulted in the suspension of most of the project activities of CFTA including this project

The re-programming exercise has since been completed and CFTC is now undertaking in-house work relating to the project.

With the acceding of South Africa to SADC, there was need to review the project and determine whether the project was still economically viable. Consultations will take place between Lesotho and South Africa on the future course of the project

Project AAA.7.5 - Investigation of the Rationalisation of Rock Drills and Rock Drill Steels Manufacturing Industries in the SADC Region

This project had by necessity to be separated in two, as it represents different manufacturing capacities. With some support from the Nordic countries, work was carried out whose output was as follows

- Hand Held Rock Drills

The present and future requirements for hand held rock drills was established.

Two manufacturers were identified, who showed an interest in starting up or expanding rock drills production. However, casting facilities of rock drills do not exist in the region and these will have to be acquired

- Rock Drill Steels

The present requirement for rock drill steels and the main production obstacles associated with their production were established. Modifications to the rock drill steel meant to enable industries to supply the total requirements of the SADC region were recommended and the saving on imported steel determined

This project has been completed and the report will be circulated to the private sector

Project AAA.7.6 - Investigation of the Rationalisation of the Manufacture of Wear Resistant Liners and Rail Track and Fittings in the SADC Region

This project was implemented together with Project AAA.7.5 under the Nordic technical assistance programme. The main results of the work are

- **Rationalisation of Manufacturing of Rail Tracks**

Zimbabwe Iron and Steel Company (ZISCO), being the sole manufacturer of rail tracks was looked into. Investigations revealed that the steel mill requires upgrading and modernising, as it is running at a loss and far below its rated capacity.

The rolling mill for rail tracks is old and labour intensive, and a source for production losses, which is significant for the whole ZISCO.

It is, however, envisaged that the consumption of rail track for mining operations will decrease as there is a trend, as in Europe, to go for trackless transport system.

- **Rationalisation of Manufacturing of Wear Resistant Liners**

Investigations indicated that sufficient manufacturing capacity is available to satisfy market demand. However, due to intra-SADC trade barriers there are reasons to believe that liners are imported from non-SADC areas.

This project has been completed and the report will be circulated to the private sector.

Project AAA.7.7 - Manufacture of Activated Carbon from Coconut Shells in the SADC Region

The study was undertaken with the assistance of the Commonwealth Secretariat in 1992, and was discussed at the Mining Ministers' meeting in 1993 in Lusaka, Zambia. The report has been distributed to member States.

The report indicates that there is a regional market in SADC/PTA and South Africa for about 8,000 tonnes of activated carbon of which the SADC region's share is approximately 2,000 tonnes per annum. Information arising from this report will be disseminated to potential investors. A number of investors have shown interest in manufacturing activated carbon in Mozambique, Kenya, Zanzibar and South Africa.

Project AAA.8.1 - Environmental Impact of Mining and Related Industries on the Water Quality of the Rivers of the Zambezi Basin

This project would investigate the sources and fate of heavy metals and other pollutants arising from mining activity (operational and closed mines including ore deposits) in the Zambezi river basin region and quantify the effects on the flora and fauna of the rivers. Major, minor and trace elements other than heavy metals as well as some chemical compounds and other parameters will be included

The project would also investigate the effect of mining activity in areas where such activity is intensive in order to quantify its effect on the ground water quality and quantity. The contribution to water quality and quantity (amount) from mine dumps will also be investigated. In the light of these findings it would recommend ways to ensure that ground water contamination and abstraction did not incur severe environmental effects in the region.

The study will pay specific attention to the areas influenced by present and past mining activities as well as areas with known mineral deposits and mineral potential. Biological sampling of heavy metals in indicator species will be included to form a basis of biological investigation.

This is a new project for which funding is sought.

Project AAA.8.2 - Air Pollution from Mine Emissions in SADC Region

This project would investigate the sources and fate of sulphur dioxide emissions in the SADC region and quantify its effects on the flora and fauna in the region. In the light of the findings it would propose standards for emissions, set an emission inventory and monitoring stations.

This project would also investigate the technical options open for the direct reduction of SO₂ to sulphur, the markets for sulphur in the region and the economics of the routes considered. In particular it would take into account local reductant sources (coal fines, coalbed methane, coke oven gas and electrolytic hydrogen) that have not been evaluated up to now.

This is a new project for which funding is sought.

Project AAA.8.3 - Mitigation and Alternative Technologies to the use of Mercury and Cyanide for Gold Recovery, River Bank Degradation and River Siltation in Small Scale Mining

This project would investigate the fate of mercury and cyanide compounds used in mining in the SADC region and quantify their effects on the flora and fauna. An essential component is to explore all possible avenues to find competitive alternative solutions, particularly for the use of mercury, or alternate technologies in the recovery of gold

The project should go on to explore avenues pertaining to siltation of rivers due to river bank mining and washing of the mined mineral. The project will also train small scale miners in the use of methods that will minimise the negative effects on the environment

This is a new project for which funding is sought

Project AAA.8.4 - Effects of Spontaneous Combustion of Coal

This project would investigate the causes and control of spontaneous combustion at open cast coal mines and in coal dumps in the SADC region

It would lay out and implement a test programme at selected mines and in the light of the results recommend standards and techniques to control the problem. These techniques aim to improve present ones or preferably replace the existing ones with new and more cost effective alternatives.

This is a new project for which funding is sought

Project AAA.8.5 - SADC Environmental Regulatory Framework for Mining

This project aims at coming up with a regional framework of mining environmental legislation for the purpose of assisting member States to adopt harmonised SADC standards.

The project will also assist in providing guidelines to Government Mining Engineers and other officials for laying conditions pertaining to environmental requirements for new and existing mines. A clear environmental policy guideline is required to promote new investment in mining as this will contribute to better planning and environmental management of new and existing mines.

This is a new project for which funding is sought.

AAA.0.10 ESTABLISHMENT OF A REGIONAL SEISMIC NETWORK AND DATA CENTRE

Estimated Costs

Total US\$8.3m
Foreign US\$8.3m
Local US\$8.3m

Financing Gap: US\$8.3m

Executing Agency:

Institutions nominated by national Governments.

Funding Secured

Foreign. -
Local -

Start: As soon as funding is secured.

Duration: 5 Years

Objectives: The main objective is to set-up a SADC Regional Seismographic Network and a Regional Seismic Data Centre.

- 1 Objectives of a SADC Regional Seismographic Network are to
 - increase seismological know-how of maintaining seismic network and analyzing seismological data for national, regional and global purposes,
 - increase seismological know-how of methods for studying the structure of the crust and lithosphere in the SADC region;
 - increase capacity to monitor regional earthquake activity,
 - initiate seismological research and promotion of seismic prospecting methods for location of mineral resources,
 - promote publication of seismic zoning maps and establishment of building codes for civil and mining engineering concerns,
 - develop strategies for earthquake disaster mitigation,
 - contribute data to the seismic surveillance of nuclear tests,

- contributes seismological information to all international programmes such as the group of Scientific Experts Technical Test (GSETT), the International Decade for Natural Disaster Reduction (IDNDR) and International Seismological Observing Period (ISOP).

2 Objectives of a SADC Seismic Data Centre (SADC/SDC) are to:

- act as a seismological data bank for the SADC region,
- carry out final analysis and correcting anomalies and mis locations by NSDCs;
- publish monthly seismological bulletins for the region and disseminate information to the region and the international community,
- maintain a permanent check on the operation of National Seismological Network and NSDCS, and to provide assistance where necessary,
- direct regional seismic risk assessment and hazard mitigation,
- initiate and coordinate crustal studies and seismological research programmes in the region;
- coordinate macro-seismic studies (where possible) in case of felt and damaging earthquakes,
- organise and coordinate on-the-job training, seminars and workshops seismology in the SADC region,
- organise and coordinate postgraduate scholarships in seismology;
- promote international cooperation seismology

Description

This project is a follow-up on the feasibility study report on the "Establishment of a SADC Seismographic Station Network and SADC Seismic Data Centre" - Project No AAA 0 5 The feasibility study was completed and its findings compiled into a report in 1990 The report was tabled and accepted at the SADC Mining Ministers meeting in Luanda, Angola in 1991

The project aims at establishing a SADC Seismographic Station Network in the SADC region and the establishing of a SADC Seismic Data Centre (SADC/SDC) in Lusaka, Zambia. This is to be done by upgrading the existing seismographic stations and establishing new ones in countries that have none This will include short period seismographs, strong motion and broadband

The SADC/SDC will be established in Lusaka where the Meteorological Regional Telecommunications Hub(Under construction) will be taken advantage of in communicating seismological data between the SADC/SDC and the National Seismological Data Centres (NSDCs) The same will be utilized for communications to other international data centres throughout the world

In order to have a unified network it is recommended that same make of seismometers and recording equipment are used This is especially so for the single short period vertical component remote stations and the main stations

The need for unification also applies to the computers and software The recommended seismometers are the S-13 Tele.dyne Geotech short period seismometers

STATUS

This project is a follow-up to the SADC Project No AAA 0 5

Funds to implement the project are being sought

AAA.0.9 EXPLORATION OF THE KALAHARI SEDIMENTARY BASIN

Estimated Costs

Total Phase I US\$0.80m
Phase II -
Foreign US\$0 70m
Local US\$0 10m

Financing Gap: US\$0 80m

Executing Agency:

Sector Coordinating Unit

Funding Secured

Foreign Nil
Local -

Start: As soon as funding is secured

Duration:

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

Objectives The Kalahari Sands covers a large part of Southern Africa, and in Namibia it is estimated to be up to 250 meters 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 of the solid rock underneath the sand.

The objectives of the project is to characterize the Kalahari Sand, increase the knowledge of underlying geology and discover new ore deposits under the Kalahari Sand.

Description: The project will devise suitable methods to "look" through the Kalahari Sand cover and to do exploration for potential mineral deposits.

The project envisages collection of existing data (geological, geophysical, geochemical, borehole, remotely sensed etc) from participating member states, studying and interpreting the data and where necessary collect additional data.

Production of a geological map of underlying rocks using the collected data. Adoption of effective exploration method(s) will necessitate field trials.

Project publication will address all issues required to meet the objectives of the project.

Status: Funding being sought

TAN.0.1 ESTABLISHMENT OF A GEMOLOGICAL INSTITUTE

<u>Estimated Costs</u>			<u>Financing Gap</u> US\$0 20m
Total	Phase I	US\$0 20m	<u>Executing Agency</u>
Foreign	US\$0 20m		Sector Coordinating Unit in conjunction with the Geological Survey of Tanzania.
Local	-		
<u>Funding Secured</u>			<u>Start:</u> As soon as possible
Foreign	Nil		
Local	-		<u>Duration:</u> 18 months

Objectives: The main objectives of the project is to train gemologists from SADCC countries with a view to

- a) stimulating gemstone industry in the region,
- b) promoting lapidary and jewellery activities, and
- c) generating foreign exchange through sales of value added products

Description: The project will be executed in two phases

Phase I - Feasibility Study on curriculum and staff institutional framework and equipment needed to train gemologist

Phase II - Establishment of the institute

The gemstone industry in Tanzania has been developing fast due to involvement of many people in gemstone prospecting and mining

Tanzania is endowed with vast gemstone resources found in proterozoic rocks of Usagaran and Ubendian systems. Similar gem rich rocks form a wide belt which extends from Kenya in the north, to Zimbabwe in the south, through Tanzania, Malawi, Mozambique and Zambia

The recent discovery of Tanzanite (a gem form clinozoisite) which is unique in East, Central and Southern Africa has opened a new chapter for the possibilities of rediscovering more gemstone potential within the SADCC region. Furthermore, Tanzania is one of the countries in the SADCC region which possess a wide variety of gemstones, such as garnets, sapphire, chrisopraxe, amethyst, moonstone, zircon emeralds, aquamarine, tourmaline, etc, all of which have been exploited through small scale mining with inadequate exploration and mining techniques

Gemstone industry in the SADCC region contributes to foreign exchange earnings by exporting rough and processed stones.

Tanzania Gemstones Limited (TGL) has been acting as a nucleus for coordinating all gemstone activities in the country, but without properly trained gemologists. The same problem has been faced by individuals, private companies who are involved in gemstone mining ventures. Hence, there is a need to establish a gemological institute in Tanzania, which will aim at promoting the industry and artisanal mining activities

Status: Funding is being sought.

AAA.1.2 DIAMOND EXPLORATION IN THE SADCC REGION

Estimated Costs

Total US\$0 39m

Foreign US\$----

Local US\$----

Financing Gap US\$0.39m

Executing Agency:

Sector Coordinating Unit
in conjunction with
Geological Survey
Departments of SADCC member
States

Funding Secured

Foreign Nil

Local: -

Start: As soon as possible

Duration: Phase I. 2 Years

Objectives: The main purpose initially is to define the diamond provenance of the SADCC region.

- Define kimberlite provinces in the SADC region, characterize diamondiferous kimberlites and diamonds.
- Stimulate exploration for diamonds in the region through publication of data accrued during implementation of the project
- Establish the concept of a diamond belt extending from Namibia in the southwest, through Botswana into Western Zambia and to Tanzania in the northeast as well as into Angola in the northwest
- Publicize the region's potential for discovering diamonds.

Description: The SADC region is geologically diamond prospective and is one of the worlds major producer. The geological similarities existing in countries of the region require a regional approach to increase exploration and mining.

To acheive this, member States have to share their experiences in the search for diamonds, institute studies that will increase the geological knowledge of diamondiferous zones/kimberlites and publicize their findings

The project will be executed in two phases:-

Phase I (8 months)

A desk study will be carried out which will cover the following:-

- appraisal of diamond exploration activities in each SADC member States.
- compilation of data on geology, structure, paleomorphology, drainage pattern and other features in areas of known diamond bearing zones
- classifying and grouping of the prospective zones into characteristic types based on geology, mineralogy, geochemistry, age, structural setting, morphology, diamond characteristics, genetic concepts etc
- interpretation of existing remote sense data (satellite imageries and geophysical data) in selected zones

Phase II (4 months)

Interpretation of data obtained from Phase I will constitute the major scientific appraisal of this study. This will culminate in the publication of monograph and its distribution to various interested parties. Follow-up promotional activities are envisaged. The details of this are to be worked out. The estimated cost of the project is US\$ 0.39 million

Status: Funding is being sought.

AAA.3.6 ASSESSMENT OF HEAVY MINERAL SAND DEPOSITS AND
FEASIBILITY OF A TITANIUM DIOXIDE PLANT

Estimated Costs

Total US\$0 13m

Foreign US\$0 13m

Local: -

Funding Secured

Foreign: Nil

Local: -

Financing Gap US\$0 13m

Executing Agency:

Sector Coordinating Unit

Start: As soon as funding
is secured.

Duration:

Phase I. 4 months

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 reawakened in recent years. There is every reason to believe that these deposits can now be exploited profitably.

The project will be developed in 2 phases:

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

- 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;
- determine the international and regional market for the heavy minerals in the sands and their price,

- determine the international and regional market for titanium oxide and advise whether a detailed feasibility study on a titanium oxide plant is justified, and,
- 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 II of the project will be to determine whether sufficient reserves exist to justify exploitation.

Status: Financing is being sought.

AAA.4.8 PROMOTION OF ORNAMENTAL STONES IN THE SADC REGION

Estimated Costs

Total US\$0 50m

Foreign US\$0 50m

Local -

Funding Secured

Foreign Nil

Local -

Financing Gap US\$0 50m

Executing Agency:

Sector Coordinating Unit

Start: As soon as funding is secured.

Duration: 7 months

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

Description: The project aims to

- prepare the catalogue of known deposits of ornamental stones, where quality and quantity parameters will be indicated.
- publish an explanatory brochure with illustrations
- publish an accompanying map showing localities of the known deposits
- distribute catalogue, brochure and map to all relevant institutions in the region.
- encourage national centres (e.g. Geological Survey) to undertake promotional activities.

Status: Financing is being sought

AAA.4.10 METALLURGY OF ORES FROM ALKALINE COMPLEXES

Estimated Costs

Total: US\$0 47m

Foreign. US\$0 47m

Local -

Funding Secured

Foreign. Nil

Local: -

Financing Gap US\$0 47m

Executing Agency:

Sector Coordinating Unit

Start: As soon as possible

Duration: 18 months

- Objectives:**
- To produce the agro-minerals phosphate and agricultural lime, which are either imported or 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 the world market
 - To create employment opportunities for the local population

Description: The project aims at optimizing the use of existing metallurgical technology for the treatment of ores of alkaline complexes/carbonitites.

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

These alkaline 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 vary from complex to complex, and also within a complex. Some are predominantly phosphate deposits, and others are niobium or rare earths minerals or vermiculite

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

However, the recovery of all valuable minerals in saleable concentrates has been found to be rather difficult in most cases. Fine intergrowth 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.

AAA.6.2 SADC MINING SECTOR HUMAN RESOURCES DEVELOPMENT

Estimated Costs

Financing Gap US\$ 0 784 m

Total· Implementation phase US\$ 0.784 m
Operational life US\$ 0 090 m/year from 3rd year

Foreign (Phase 1): US\$ 0.784 m

Local (Phase 1): -

Executing agency

Mining Sector Coordinating Unit,
Zambia

Funding Secured

Start: -

Foreign Nil

Local: -

Duration.

Implementation

Phase 2 years

Operational life· according to
sector needs

Objectives: The objective of this project is to appoint and set up a Human Resources Development liaison Committee responsible for

- (1) Initiating, launching and promoting sector wide cooperation in the area of Human Resources development between the Government, industrial and educational bodies concerned,
- (11) Setting up and operating a sector Human Resources information system to provide regular updated forecasts and analyses to facility educational planning and to improve effective utilization of Human Resources,

(111) Preparing, initiating and supervising, on behalf of the executing agency, further mining sector Human Resources Development projects identified for implementation and proposing such other actions as may be necessary to promote the development of human resources in the sector

Description: The Mining Sector is one of the SADCC region's most important sources of employment, production, exports and foreign exchange.

The Mining Sector Skilled Manpower Survey (6.0.1) conducted in 1986 estimated that an intake of 16000 - 19 000 skilled personnel would be required over the next 10 years in order to provide for the needs of new mining projects, to allow for the replacement of expatriates in managerial, technical and professional positions

The Human Resources Development Liaison Officer will be responsible for, among other things, provision of advisory services to the SADCC Mining Sector Co-ordinating Unit on the development of human resources for the SADCC Mining Industries

Status: Funding being sought.

AAA.8.1 ENVIRONMENTAL IMPACT OF MINING AND RELATED INDUSTRIES ON
THE WATER QUALITY OF THE RIVERS OF THE ZAMBEZI BASIN

Status: New

Financing Gap:

Estimated costs

Total US\$1,750,000
Foreign:
Local:

Executing Agency Mining Sector Coordinating Unit in cooperation with an agency experienced in mining drainage studies. Close liaison with the Environment and Land Management Sector, Lesotho, Zambezi River Authority and environmental organisations

Funding Secured:

Foreign
Local

Start

Duration Seven years

OBJECTIVES

This project has the following objectives

- (1) To establish the effects of mining & its effluent on ground water and water quality of the rivers of the Zambezi basin (present and past), to include the wetlands;
- (11) To identify and quantify effluent to the Zambezi river basin arising from mining operations in the region and effect on the ecological systems,
- (111) To identify and quantify ground water pollution and depletion arising from mining activity,
- (1V) To create a data-base of information on ground water pollution and mine effluent and their effects in the surrounding environment;
- (v) To identify technical and financial constraints that have had hindered or constrained ground water quality maintenance and effective effluent control;
- (v1) To formulate guidelines on SADC mine effluent, ground water maintenance quality standards and treatment technics.

DESCRIPTION

This project would investigate the sources and fate of heavy metals and other pollutants arising from mining activity (operational and closed mines including ore deposits) in the Zambezi river basin region and quantify the effects on the flora and fauna of the rivers. Major, minor and trace elements other than heavy metals as well as some chemical compounds and other parameters will be included.

The project would also investigate the effect of mining activity in areas where such activity is intensive in order to quantify its effect on the ground water quality and quantity. The contribution to water quality and quantity (amount) from mine dumps will also be investigated. In the light of these findings it would recommend ways to ensure that ground water contamination and abstraction did not incur severe environmental effects in the region. In the light of these findings it would recommend standards for effluent.

STATUS:

New projects for which funding is sought.

<u>Status</u>	<u>New</u>	
<u>Estimated costs</u>		<u>Financing Gap</u>
Total	US\$450,000	<u>Executing Agency</u> Sector
Foreign		<u>Coordinating Unit</u> in
Local:		cooperation with an agency
		and operator experienced to
		the problem
<u>Funding Secured</u>		
Foreign		<u>Start</u>
Local		
		<u>Duration</u> One year

OBJECTIVES

This project has the following objectives

- (1) To identify and quantify sulphur dioxide emissions going to the atmosphere and its effects in the SADC region, this to include the biological effects on vegetation
- (11) To relate the sulphur mass being lost to the atmosphere and its existing and potential markets for sulphur,
- (111) To review and identify the technology available for removing sulphur as elemental sulphur from smelter gases, using locally available reductants such as coal fines, coalbed methane, coke oven gas and electrolytic hydrogen,
- (1V) To produce an economic and technical review of the option in the context of the SADC region's constraints and opportunities,
- (v) To identify technical and financial constraints that have prevented or inhibited effective sulphur capture in the region,
- (v1) To create a data-base of information on sulphur dioxide emission and its effects in the region and formulate provisional SADC emission standards

(v11) To come up with monitoring and research projects and identify the knowledge gaps

DESCRIPTION This project would investigate the sources and fate of sulphur dioxide emissions in the SADC region. Findings will determine direction in formulation of emission standards in the region.

The project shall investigate technical options open for the direct reduction of sulphur dioxide to sulphur, market for sulphur in the region and the economics of the routes. Local reductant sources for sulphur dioxide (coal fines, coalbed methane, coke oven gas and electrolytic hydrogen) shall be taken into account.

STATUS: New project for which funding is sought.

AAA.8.3 MITIGATION AND ALTERNATIVE TECHNOLOGIES TO THE USE OF MERCURY AND CYANIDE FOR GOLD RECOVERY, RIVER BANK DEGRADATION AND RIVER SILTATION IN SMALL SCALE MINING

<u>Status</u>	New	<u>Financing Gap</u>	
<u>Estimated costs</u>		<u>Executing Agency</u>	Sector
Total US\$380,000		Coordinating Unit in liaison with a qualified operator	
Foreign			
Local			
<u>Funding Secured</u>		<u>Start</u>	
Foreign		<u>Duration</u>	One year
Local			

OBJECTIVES

The project has the following objectives:

- (1) To establish the effects of cyanide in effluent on the environment and to identify the sources, quantities and usage of mercury and cyanide in the SADC region and to establish the ultimate destinations of their reaction products,
- (11) To evaluate and recommend controls for mercury emission arising from gold mining and to identify and quantify mercury-bearing effluent and emissions in the SADC region,
- (111) To investigate alternative methods/processes for gold recovery other than the use of mercury and cyanide,
- (1V) To evaluate river bank mining of gold and recommend ways to recover this gold with minimal siltation of the rivers,
- (V) To specify the monitoring to include biological methods and control systems needed to enforce them,
- (v1) To establish field pilot projects for demonstrations of mercury and cyanide control,

DESCRIPTION This project would investigate the fate of mercury and cyanide compounds used in mining in the SADC region and quantify their effects on the flora and fauna. An essential component is to explore all possible avenues to find competitive alternative

possible avenues to find competitive alternative solutions, particularly for the use of mercury, or alternate technologies in the recovery of gold

The project should go on to explore avenues pertaining to siltation of rivers due to river bank mining and washing of the mined mineral

The project will also train small scale miners in the use of methods that will minimise the negative effects on the environment.

STATUS:

New project for which funding is sought.

<u>Status:</u>	New	<u>Financing Gap</u>
<u>Estimated costs</u>		<u>Executing Agency:</u> Sector Coordinating Unit in liaison with an agency from a country that has encountered similar problems would be preferred
Total.US\$490,000		
Foreign.		
Local.		
<u>Funding Secured</u>		<u>Start.</u>
Foreign		
Local		
		<u>Duration:</u> One year

OBJECTIVES

This project has the following objectives

- (1) To identify and quantify emissions and effluents arising from the spontaneous combustion of coal and their effects,
- (11) To evaluate the causes of spontaneous combustion and assess the possibility of an alternative method of control;
- (111) To create a set of guidelines based on practical experience and test work that would enable Governments and coal mine operators to follow the standards for the cost-effective control of this problem.

DESCRIPTION This project would investigate the causes and control of spontaneous combustion at open cast coal mines and in coal dumps in the SADC region It would lay out and implement a test programme at selected mines and in the light of the results recommend standards and techniques to control the problem These techniques aim to improve present ones or preferably replace the existing ones with new and more cost effective alternatives

STATUS: New project for which funding is sought

Status

Financing Gap

Estimated costs

Total US\$270 000

Foreign
Local

Executing Agency MCU in cooperation with a Mineral Law Centre

Funding Secured.

Start

Foreign
Local

Duration

Six months

OBJECTIVES

- (1) To promote new investment in mining will require a clear environmental policy guideline and therefore a better planning for new investors, especially major new investments,
- (11) To contribute to better environmental management of new and existing mines,
- (111) To emphasize options and examples suitable for practical and effective implementation,
- (1v) To prepare a summary of the various options and approaches to regulatory oversight and control of mine, smelter and refinery emissions and effluent (legislated standards, guidelines, control by objective, conditions to a license, provisions in a contractual agreement, codes of conduct, environmental liability etc) indicating the strengths and weaknesses of each approach in application,
- (v) To establish general requirements for environmental assessments, auditing, monitoring and land rehabilitation

DESCRIPTION

This project will compile a handbook on guidelines to environmental regulation and pollution control which will serve the purpose of assisting member States to adopt harmonised SADC standards.

The project will also assist in providing guidelines to Govt Mining Engineers and other officials for laying conditions for new and existing mines

STATUS:

New projects for which funding is sought.

CRITERIA AND PROCEDURES FOR SELECTION OF PROJECTS

These criteria are intended to maintain the coherence of the SADC Mining Sector Programme, within the general framework of the objectives of SADC. 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 the projects already in the programme.

Experience during the implementation of the 1986-1990 Strategy and the political and economic changes taking place in the region and the individual member States have precipitated the need to review the Mining Sector criteria and procedures for project selection.

- Almost all member States are liberalising their economies and are encouraging private sector participation in economic development. The emphasis is on economic viability and efficiency while at the same time maintaining an acceptable level of equity, balance and mutual benefit.
- There is need for the criteria to be consistent with the 1992-1996 Mining Sector Strategy.
- The establishment of the Southern African Development Community.

1 **CRITERIA**

1.1 The basic criteria for project selection is whether or not the project contributes towards the achievement of the sector objectives. These are to

- * Achieve SADC's primary development objectives,
- * Promote investment in Mining,
- * Increase exploration,
- * Increase the contribution of small scale mining,
- * Improve skills in all aspects of mineral resources development,
- * Provide market research,
- * Encourage downstream and upstream processing industries to improve value added,

- * Realise the potential contribution of the gemstone sector to the economies of the member States,
 - * Minimise the adverse impact of mining operations on the environment
- 1 2 Some of the essential components for the projects to be supported under the Mining Sector programme are
- 1) project viability,
 - 11) potential investor,
 - 111) research and development

Bearing in mind the above consideration, several categories of projects may be distinguished.

- Projects of Regional Dimension

Such projects result from a coordination of the programmes between two or more member States, with a view to, promoting inter-trade, exchange of information, and exchange of labour and/or to reduce dependence from external sources

- National Projects with a Regional Impact

These are projects which, although national in nature, cannot be replaced by projects of regional dimension, and for which economic alternatives cannot be found in neighbouring SADC countries

- Pilot Projects and Research Centres for New Technology

Taking into consideration the importance of financial and manpower investments which such projects require, and the economic risks involved, it is preferable to avoid duplication in the region and to permit coordination of objectives and sharing of results of such projects between member States

- Projects that will encourage active involvement of key players in the Mining Industry

The new strategy emphasises a service approach by Government for private sector initiatives. Deliberate actions by the Mining Sector will be required to fully involve the business community at various stages of project development

2. PROCEDURES FOR PROPOSAL EVALUATION AND APPROVAL OF PROJECTS

2.1 The formulation can be done by:

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

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

2.2 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 SADC 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.

2.3 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 SADC 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 State(s) concerned, supported by the Sector Coordinating Unit present(s) the project for consideration at a meeting of the Technical Committee of Officials which makes an appropriate recommendation to the Committee of Ministers

f) Approval

Project proposals must be considered and approved by the Sector Committee of Ministers which recommends to the Council of Ministers for adoption

g) Emergency 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 Conferences, specific projects may be communicated to interested cooperating partners directly

In the case of a project located in one country, the member States 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, SADC projects agreements should be signed by the member States directly involved and cooperating partners, and witnessed by the Sector Coordinator. Such parties and, in particular, should indicate clearly the reporting and monitoring procedures

5 PROJECT IMPLEMENTATION

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

5.1 Assistance from the Coordinating Unit

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

5.2 Financial Management

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

5.3 Reporting

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 of Officials and the Committee of Council of Ministers and Summit of Heads of State and Government, at the scheduled meetings.

Annex 2

Funding Status of Projects

MINING

Project Title	Estimated Cost			Funding Secured		Funding	Financing	COMMENTS/STATUS
	Total	Foreign	Local	Amount	Source	Under Negotiation	Gap	
<i>US\$ Million</i>								
OVERALL COORDINATION								
AAA 0 0 Support to the Mining Sector Coordinating Unit	0 70	0 70	0 00	0 50	(FRA) (NORDICs)	0 00	0 00	Strengthening of the Unit is underway with the secondment of Nordic Experts.
AAA 0 3 Sharing of Mineral Processing Facilities	0 80	0 80		0 80	(AUSTRIA)	0 00	0 00	Experts from Austria and France Study under implementation by an adviser to the SADC supported by a Zambian counterpart
AAA 0 6 Small Scale Mining and Minerals Beneficiation	2 50	2 50		2 50	(FRG)	0 00	0 00	Project is under implementation
AAA 0 7 Regional National Geological Minerals and Mining Bibliographic Data Banks	1 20	1 20				0 00	1 20	Follow up of project AAA 0 2 Funds being sought
AAA 0 9 Exploration of the Kalahari Sands	0 10	0 10				0 00	0 10	Funding being sought
AAA 0 10 Establishment of a Regional Seismic Network and Data Centre	8 30	6 80	1 50	1 50	(SADC)	0 00	6 80	Follow up of Project AAA 0 5 Funding being sought
AAA 0 11 Inventory of Mineral Resources in the SADCC Region	0 68	0 62	0 06	0 06	(SADC)	0 00	0 62	Follow-up of Project AAA 0 2 Funding being sought
AAA 0 1 Mining Investment Forum	1 9	1 9		1 9	(EU)			Follow up of Project AAA 0 8
MOZ 0 1 Regional Geophysical and Geochemical Map Compilation Facility	5 9	5 9		5 9	(EU)	0 00	0 00	Project to be implemented in Conjunction with ESAMRDC
TAN 0 1 Establishment of a Gemological Institute	0 2	0 2		0	(FRA)	0 00	0 20	Funding being sought
ZIM 0 1 Central Isotope Geochronology Laboratory	0 4	0 4	0	0 4	(EC)	0 00	0 00	Laboratory completed and operational Funding secured for operational costs
Sub-total	22 68	21 12	1 56	13 76		0 00	8 92	
PRECIOUS METALS AND MINERALS								
AAA 1 2 Diamond Exploration in SADC region	0 39	0 39					0 39	Funding being sought
Sub total	0 39	0 39	0 00	0 00		0 00	0 39	
METALIC MINERALS								
AAA 3 4 Integrated Alumina/Aluminium Calcination Industry	0 50	0 50		0 50	(ADB)		0 00	Feasibility Study completed resulting in production of a bankable document Investors sought
AAA 3 6 Assessment of Heavy Mineral Sand Deposits and Feasibility of a Titanium Oxide Plant	0 13	0 13					0 13	Follow up project to United Nations Revolving Fund for Natural Resources Exploration (UNRFNRE) preliminary evaluation Funds being sought for Phase 1 (market survey and evaluation)
Sub-total	0 63	0 63	0 00	0 50		0 00	0 13	

MINING

NON METALIC MINERALS							
AAA 4 3	Establishment of a Refractory Industry						- Study completed Member States are following recommendations Zimbabwe considering a feasibility report on Establishment of a refractory facility
AAA 4 5	Non Metallic/Industrial Minerals	0 18	0 18	-	0 18 (FRA)		Market Survey underway
AAA 4 6	Assessment of Vermiculite Production in the SADCC Region	0 08	0 08			0 08	Project underway in Malawi Component for Zimbabwe not funded
AAA 4 8	Promotion of Ornamental Stones	0 08	0 08	-	-	0 08	This project is also a follow-up to project AAA 4 5 Funding being sought Possibility of funding it with being done in South Africa being considered
AAA 4 9	Development of Gypsum Production in the SADCC Region	0 10	0 10		0 10 (CFTC)	-	Study underway
AAA 4 1	Metallurgy of Ores from Alkaline Complexes	0 47	0 47			0 47	Although funding has not been secured some work to be initiated through Universities in the region
Sub-total		0 91	0 91	0 00	0 28	0 00	0 63
MANPOWER							
AAA 6 2	Appointment of a SADCC Sector Human Resources Liaison Development Officer and Support Staff	0 78	0 78			-	0 78 Although funding has not been secured work has been initiated under auspices of Universities in the region
AAA 6 3	Setting up of a Mining Sector Industrial Training and Development Advisory Unit	1 68	1 68	-	-		1 68 Funding being sought
AAA 6 4	Redesign and development of SADCC Mining Technician Courses Facilities	0 18	0 18				0 18 Funding being sought
AAA 6 5	Requirements for strengthening of regional Mining Sector educational Units	0 11	0 11				0 11 Funding being sought
Sub-total		2 75	2 75	0 00	0 00	0 00	2 75
MINING EQUIPMENT AND CONSUMABLES							
AAA 7 3	Study on the Manufacture of Electrodes						Study completed Report under consideration by member states
AAA 7 4	Central Data Bank for Mining Equipment and Spares Manufactured in the SADCC Region	0 06	0 06		0 06 (NORDICs)		Project continues to be implemented by a Zambian counterpart
AAA 7 5	Rationalization of Rock Drill Steel Manufacturing Industries in the SADCC Region						Project completed
AAA 7 6	Rationalisation of the Manufacture of Wear Resistant Liners and Rail Track and Fittings in the SADCC Region						Project completed

MINING							
AAA 7 7	Manufacture of Activated Carbon from Coconut Shells in the SADCC Region	0 07	0 07		0 07 (CFTC)		Study completed Recommendations being followed up
LES 7 1	Manufacturing of Diamond Tools in Lesotho	0 08	0 08		0 08 (CFTC)		Project under review in the light of South Africa joining SADC
Subtotal		0 21	0 21	0 00	0 21	0 00	0 00
ENVIRONMENTAL PROTECTION							
AAA 8 1	Environmental Impact of Mining and Related industries on the Water Quality of the Rivers of the Zambezi Basin	1 75	1 75	0 00	0 00		1 75 New project for which funding is sought
AAA 8 2	Air Pollution from Mine Emissions in the SADC Region	0 45	0 45	0 00	0 00		0 45 New project for which funding is sought
AAA 8 3	Mitigation and Alternative Technologies to the Use of Mercury and Cyanide for Gold Recovery River Bank Degradation and River Siltation in Small Scale Mining	0 38	0 38	0 00	0 00		0 38 New project for which funding is sought
AAA 8 4	Effects of Spontaneous Combustion of Coal	0 49	0 49	0 00	0 00		0 49 New project for which funding is sought
AAA 8 5	SADC Environmental Regulatory Framework for Mining	0 27	0 27	0 00	0 00		0 27 New project for which funding is sought
Subtotal		3 34	3 34	0 00	0 00	0 00	3 34
GRAND TOTAL		30 91	29 35	1 56	14 75	0 00	16 16