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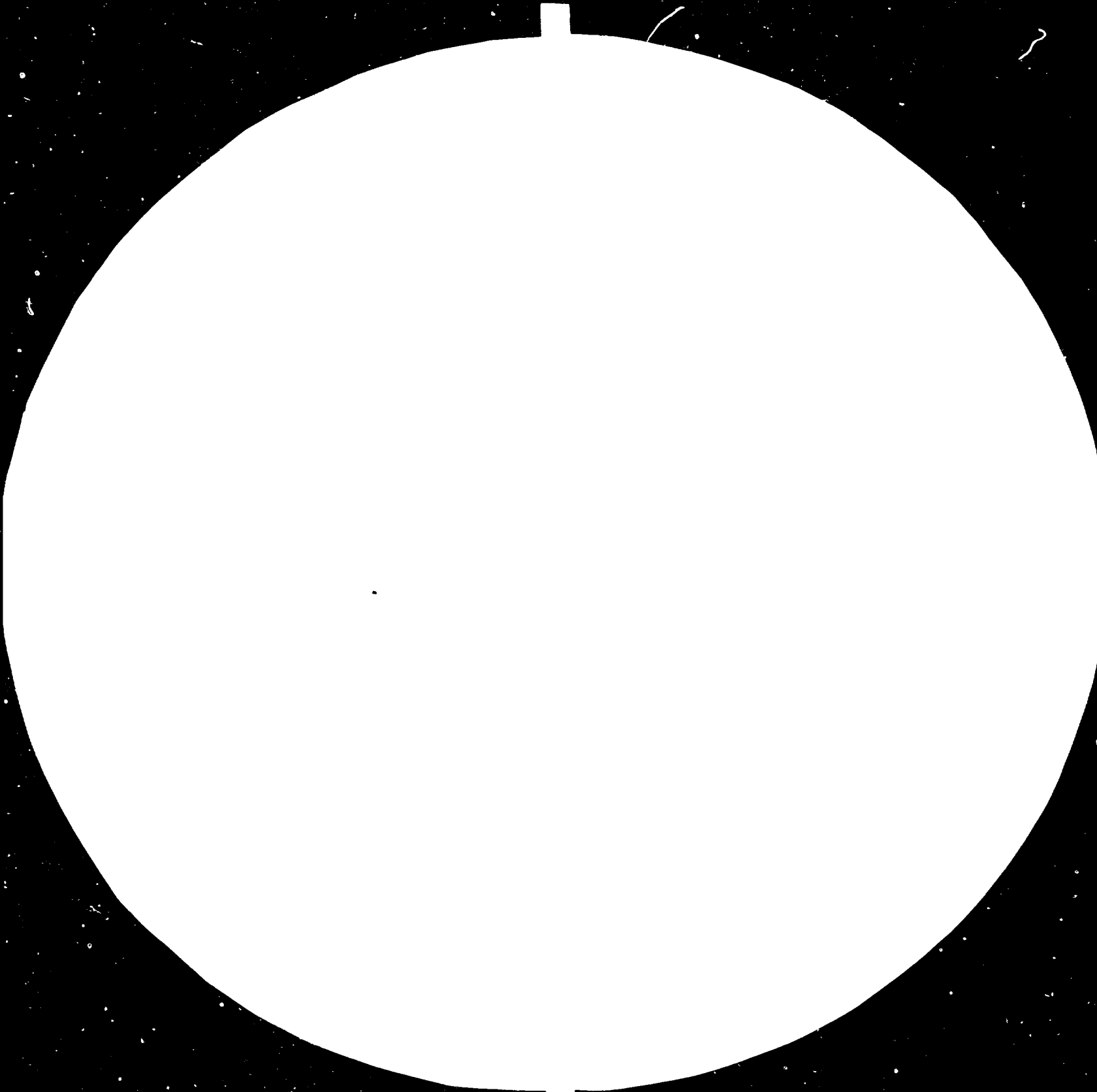

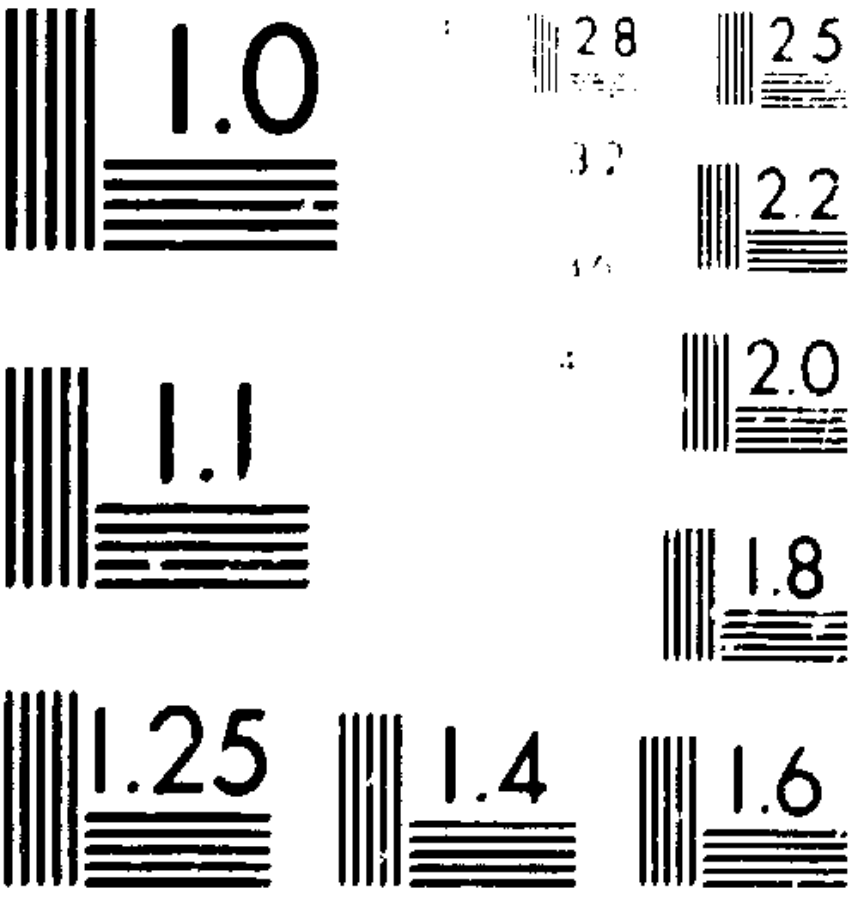
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THE MINERAL INDUSTRY OF

Z A I R E *

Prepared by the

Regional and Country Studies Branch
Division for Industrial Studies

1275

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FOREWORD

Today, mineral resoures and their industrial processing have become almost synonymous with industrial development. The reserves, ownership, distribution, forward processing, values, costs, long-term capital investment, technologies and international flow of minerals are factors involved in evaluating the potential of a resource-based industrialization strategy.

The Regional and Country Studies Branch of UNIDO within its study programme on industrial development prospects in individual and groups of developing countries is giving particular attention to resource-based industrialization, strategies and policies, and, in particular, to the industrial processing of minerals in individual developing countries. Furthermore, within the framework of a resource-based industrialization, the regional potential for trade and joint-ventures in minerals processing is examined.

This paper on the mineral industry of Zaire is intended to provide a first brief overview of the mineral resources of the country, investment and technological recent developments by mineral, assessment of current and future markets, an overview of the manufacturing sector and linkages with the mining sector, direction of trade and strategies and policies relevant to the development of a diversified and self-sustained mineral sector. The paper is to serve national policy-makers and international fora in assessing the current level of resource-based industrialization of Zaire and its potential for further development. The paper may also promote further research in the field of industrial processing of minerals.

The paper first presents an overview of mineral resources in developing countries, shares of developing countries in minerals processing, the importance of trade in mineral-processed products for increased value-added which implies additional benefits for the mineral processing country in terms of both greater government revenues and greater domestic

factor incomes and the creation of both forward and backward linkages that a minerals processing industry has the potential to develop. Subsequently, the paper examines the general contribution of mining to the economy of Zaire, the mineral resources of Zaire (reserves and production quantities), mining activity, industrial applications of the minerals produced and/or processed and market developments. Against this background it is attempted to identify the level of forward industrial processing of minerals and their contribution to the manufacturing sector of Zaire, as well as, the structural shifts by individual manufacturing sectors in terms of MVA in the early and late 1970s.

Subsequently, it is attempted to assess the emerging pattern of trading minerals and terms of trade thereof, as well as, to assess the emerging pattern of strategies in promoting the development of the mining sector in the 1980s. Supporting data are provided whenever available. Due to the limitations of the statistical data, the structural changes of the manufacturing sector are limited only to the MVA at the exclusion of other important indicators such as wages, employment, growth of fixed capital investment, size of establishments and growth of output.

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I. INTRODUCTION

Mineral Resources and Developing Countries

A fundamental aspect of the world mineral resources industries is the geographically concentrated distribution of resource deposits, mining activities and processing activities among the nations of the world. While a few large countries have significant reserves of several of the mineral resources, many countries have reserves of only a few, and some countries have none at all.

Several of the developing countries appear to have relatively large shares of one or more of the world mineral resources.[1/] Outstanding known cases of mineral-resources-possessing developing countries (besides those of petroleum production in Middle East and North Africa) are tin and tungsten in Southeast Asia, cobalt in Zaire, and bauxite in South and Central America. Furthermore, developing countries are among the predominant suppliers of bauxite, copper, nickel, tin, and to a lesser but still an important extent, of lead, iron ore, silver, zinc, manganese, chromium, and molybdenum. Their share in uranium cannot be assessed because of incomplete data while their share in vanadium and platinum are less than 5 per cent.[2/]

In spite of the impressive list of the world's mineral resources owned by developing countries, their share in the supply of processed semi-finished and finished mineral products is, on the average, relatively low. From the data in Table 1 we can see that the geographic distributions of the different stages of production activities of selected minerals differ substantially. However, the differences are not uniform among the various mineral resources.

1/ However, the extent of this share has not been fully assessed, mainly because of the cost of exploration.

2/ See: M.H. Covett, "The Geographic Concentration of World Mineral Supplies" in Resources Policy, December 1975, pp. 375-358.

Table 1

World Geographic Distribution of Selected Mineral Industrial Activity (per cent), 1979

	MINING			1st STAGE PROCESSING			2nd STAGE PROCESSING		
	Dd* market economies	Dg* market economies	Centrally planned econ.	Dd* market economies	Dg* market economies	Centrally plan.econ.	Dd* market economies	Dg* market economies	Centrally plan.econ.
Bauxite	41.2	47.3	11.5						
Alumina				64.0	19.3	16.7			
Aluminium							75.4	6.8	17.8
Copper	39.6	42.2	18.2	49.5	32.5	18.0			
Pig Iron				60.6	5.3	34.1			
Steel							60.3	5.0	34.7
Lead	52.0	21.3	26.7	58.4	13.1	28.5			
Nickel	47.7	27.9	24.4	58.8	17.2	24.0			
Tin	8.0	68.2	23.8	17.2	59.6	23.2			
Zinc	54.4	21.7	23.9	64.5	8.8	26.7			

Source: Based on Data from: U.S. Department of the Interior, Buro of Mines, Minerals in the World Economy, Reprint from the 1980 Buro of Mines Yearbook.

* Dd : Developed

** Dg : Developing

For example, while in 1980 developing market economies accounted for 47.3 per cent of world bauxite production, they produced only 6.8 per cent of aluminium (unalloyed ingot metal). This contrasts with 75.4 per cent produced by developed market economies and 17.8 per cent by centrally planned economies. In the production of alumina, developing countries accounted for 19.3 per cent of world production.

Still larger shares for developing countries in the 1st stage of processing of copper and tin are observed. The share of developing countries in copper smelting (or 1st stage processing) is quite considerable. According to Table 1, one third of the world smelter output originates from developing countries with the leading nations being Chile, Peru, Zambia and Zaire. The centrally planned economies account for 18 per cent and the developed market economies for a little more than 49 per cent.

Tin is another exception where developing countries hold the lead both in mining production and smelter production with 68.2 per cent and 59.6 per cent respectively.[3/] However, the developing countries contribution in the 1st stage production of iron ore, lead, nickel and zinc is less, on the average, than half of their mining production in these minerals as Table 1 illustrates.

Apart from statistics on mining and processing production, data on trade between developing and developed market economies also show the geographic concentrations of the stages of metal minerals production. While developing countries export the bulk of their metal minerals in unprocessed form, minerals exports from developed to developing economies are predominantly composed of semi-finished and finished metal products.

The fact that most developing countries export the bulk of their mineral resources in unprocessed or semi-processed stage may mean that they do not obtain the additional economic benefits that subsequent stages

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3/ The regional production structure of tin has changed actually within the last 10-15 years.

of processing may generate. While minerals extraction undeniably contributes to the economic welfare of the mineral producing countries[4/] subsequent stages of processing of mineral materials may generate stronger forward and backward linkages[5/] and higher contributions to value added.[6/]

The difference lies clearly in the type of linkages generated. Studies of the linkage effects of mining activities in numerous economies in which exports are dominated by unprocessed minerals and in which minerals extraction accounts for a high share of GDP, support the conclusion that mining has been particularly weak in creating production and consumption linkages.[7/] Instead it creates at best directly only pecuniary linkages via taxes or royalties on extraction activities extracted by the cognizant authority. Whether or not additional linkages subsequently are created indirectly depends upon the investment projects for which these funds are used.

4/ Although mining investments appear to have impacts in terms of both income and employment, these impacts may become a substantial stimulus to development if incorporated with the economic activity in other sectors - a possibility that increases with the level of existing economic diversification.

5/ The caveat here is that the strength of the linkages increases with the degree of the diversification of the economy.

6/ The increase in value added implies additional benefits for the mineral processing country in terms of both greater government revenues and greater domestic factor incomes. However, the degree of the value added obtained will depend on several economic and institutional factors such as, the quality of the resources, availability of complementary inputs, relative factor costs, etc.

7/ See: Bartsch, William H., "The Impact of the Oil Industry on the Economy of Iran", in R.F. Mikesell, et.al., Foreign Investment in the Petroleum and Mineral Industries, (Baltimore, Md: John Hopkins Un. Press 1971), pp. 237-263; Fry, James and Charles Harvey, "Copper and Zambia", in S.R. Pearson, et al., Commodity Exports and African Economic Development (Lexington, Mass: D.C. Health and Co., 1974), pp. 193-216; Hughes, Helen, "Economic Rents, the Distribution of Gains from Mineral Exploitation, and Mineral Development Policy", World Development, V.3, Nos 11 and 12, 1975, pp. 811-825; Jenkins, Glen and M. Gillis, "The Macroeconomic Impact of the Mineral Exporting Sector on a Developing Economy" In M. Gillis et.al., Taxation and Mining: Non-Fuel Minerals in Bolivia and Other Countries, (Cambridge, Mass: Balling Publishing Co., 1978), pp. 65-94; Killick, Tony, "The Developmental Impact of Mining Activities in Sierra Leone", In S.R. Pearson and J. Cownie: Commodity Exports and African Economic Development, (Lexington, Mass: Lexington Books, 1974), pp. 218-236.

Hence, while the production and consumption linkages work themselves out through the market system, the impact of the mining sector on the economy depends on the institutional structure and the efficiency of the State in taxing[8/] (without stifling the entrepreneurial profit motive) and investing the revenues from mineral extraction in a diversified and productive way for the rest of the economy.

On the other hand, the minerals processing industries have a potential for generating backward and forward linkages. Backward linkages through the purchases of intermediate goods and services and forward linkages through sales to other sectors of intermediate inputs, lead to economic diversification and growth and can be a powerful stimulant to economic development.

In view of the above, for a country endowned with mineral resources such as Zaire, a policy of pursuing the downstream processing of its minerals seems to make a lot of common sense as one means to promote industrial development providing that certain preconditions are met, such as technical possibilities, necessary infrastructure, economic viability, etc. However, Zaire has very little processing activity relative to its mineral wealth. This is a phenomenon not unique to Zaire. Many developing countries are in a similar situation in optimizing their natural resources.

This brief overview on Zaire's industrial mineral activity will endeavour to give an inventory of the mineral resources of Zaire, their level of processing, the type and level of mineral exports and the on-stream or anticipated activities in minerals exploitation, production and processing. In addition, the general contribution of mining to the economy of Zaire and to its manufacturing sector will be discussed. Whenever possible information on technological and marketing developments for Zaire's minerals will be given.

8/ The existence of economic rent in the market value of minerals and the ability to tap it is another problem facing a minerals producing exporting country. See, Helen Hughes and Shamsher Singh, "Economic Rent: Incidence in Selected Metals and Minerals" in Resources Policy, June 1978, pp. 235-145.

II. GENERAL CONTRIBUTION OF MINING TO THE ECONOMY OF ZAIRE

Zaire is a country of 23 million km^2 with a population of approximately 27 million people and a GDP per capita in 1980 of U.S. $210. Although Zaire is one of the largest countries in Africa with abundant mineral resources, its income per capita is relatively low.[9/]

Zaire's low income per capita, inspite of its wealth in mineral resources, is not unique. Many developing countries endowed with mineral resources fail to exploit optimally their economic potential. The reasons behind Zaire's underdevelopment of its mineral sectors are being discussed in various parts of this paper.

Zaire leads the world in the production of cobalt, germanium, industrial diamonds and is ranked sixth in copper output. Zaire's growth since the colonial period has been export-led. The mining industry forms an essential part of Zaire's economic output, with the principal mineral products -- copper, cobalt, germanium and diamonds -- accounting for over 70 per cent of export earnings. Most of Zaire's copper is mined in the Shaba region (formerly the Katanga Province). For several decades, Zaire has been supplying about 7 per cent of market economies' needs in copper, 60 per cent (reduced in the late 1970s to 40 per cent) of cobalt, approximately 39 per cent of the world's industrial diamonds, 20 per cent of its germanium, etc. Of all these minerals in terms of quantity and value, copper and cobalt are the most important.[10/]

In spite of difficulties in developing Zaire's mineral resources, clearly, the mining sector is the mainstay of the Zairian economy accounting for between 70 and 80 per cent of exports by value each year and for about 33 per cent of GDP. However, key economic indicators reveal that GDP has been declining along with the productivity of the mining, agriculture

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9/ See Annex I, Key Economic Indicators, 1974-1978. Latest available data for African countries range between U.S. $120 GDP per capita (Mali) and U.S. $1,260 GDP per capita (Algeria); (IBRD: International Development Report, 1980).

10/ Guy Gran (ed.), ZAIRE - The Political Economy of Underdevelopment, (New York: Praeger, 1979), pp. 122 et seq.

and manufacturing sectors. The external debt now totals over $4,500,000,000. Despite some rescheduling, arrears in payment reached $120,000,000 by the end of 1981, and further arrears of over $250,000,000 were forecasted for 1982.[11/]

Zaire's mineral industry and consequently its general economic condition has been adversely influenced by internal measures (which affected the distribution system of manufactured products and the investment in the industrial sector), the current worldwide recession and the subsequent depression of prices for these mineral products. Further, transport difficulties and the resulting lack of export facilities in 1976 have aggravated the situation in the mineral industry. The Benguela rail link from the Shaba province to the Angolan port of Lobito on the Atlantic coast traditionally took the majority of Zaire's mineral exports but this has been in a bad state of repair in recent years and has been obstructed by the frequent attacks of guerrillas.[12/] Transportation difficulties have been compounded with the shortage of fuel and its increasing cost; the declining investment in new mines (available funds are being allocated toward the maintenance and rehabilitation of existing mines); and lack of skilled personnel.[13/]

11/ World Mining Yearbook, World Mining (Miller Freeman, San Francisco, California), Vol. 35, 1982.

12/ International Minerals/Metals Review, 1980, p. 6 et seq.

13/ Ibid.

III. THE MINERAL RESOURCES OF ZAIRE

Although the exploitable quantities of several additional mineral resources have been assessed, problems related to Zaire's industrial policy, as we discussed earlier, are inhibiting at the present time Zaire's mineral resource development. Moreover, the dramatic drop in copper prices after 1974 resulted in severe foreign exchange shortages thus inhibiting, in general, imports of necessary mining machinery, equipment and spare parts for mining equipment. Thus, plans aiming at bringing total annual copper production to 570,000 tons and annual production of cobalt to 22,000 tons have been postponed. In the last few years, increasing prices of cobalt and relatively stabilized copper prices have alleviated a major economic crisis.14/

An important feature of Zaire's mineral endowment is its industrial minerals. The development of a country is linked to a great extent with the development of its industrial minerals. These non-metallic minerals are used mainly in the construction process and chemical industries. The economic potential of industrial minerals depends not only on type, quantity, grade and location but also on properties like ease of processing, reaction to treatment, and the availability of markets.15/

Zaire has several industrial minerals. Among the construction minerals Zaire has all necessary minerals in order to produce portland cement, as well as asbestos. In terms of the main processing minerals, Zaire has industrial diamonds, diatomite, bauxite, barytes, bentonite, mica, sulfur. Finally, Zaire has chemical and fertilizer minerals, such as salt, sulphur, potash, and phosphates.

The majority of both industrial and non-industrial minerals resources of Zaire are located in 5 regions: Shaba, Kivu-Maniema, Kasai, Oriental

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14/ International Minerals/Metals Review, 1980, op.cit.

15/ J.B. Rivington "Exploring for industrial minerals in developing countries" in Industrial Minerals, 2nd International Congress, Munich 1976, p. 205 et seq. (hereinafter cited as Industrial Minerals, 1977). For further information on the types of industrial minerals see Annex II.

and Lower Zaire. Table 2 details mine production (or identified mineral deposits) in Zaire. The Table provides also data for total world's and Africa's mineral production; the respective shares of Zaire's production in relation to the world mineral production are estimated.

In the ensuing section we will examine the individual mineral resources of Zaire, both industrial and non-industrial, and their potential as related to the industrial and economic development of the country.

1. Bauxite/Aluminium

There are no available estimates of total bauxite deposits. The exploitation of bauxite deposits near Sumbi is taking place under a joint project between the Zairian Government and a Consortium of aluminium smelters[16/] (55 and 45 per cent shares respectively). Hydro-power from the Inga project[17/] on the Zaire river would be used for an aluminium refinery, projected to produce approximately 150,000 - 200,000 tpy aluminium as part of an industrial complex situated near planned deepwater port facilities at Banana. The construction of a second aluminium plant was negotiated between Reynolds Metals Co. of the United States and the Zairian authorities. Further, in the Tshela region the Bauxi-Zaire company has found reserves of bauxite amounting to approximately 65 mi tons with an average content of 35 per cent alumina and a high silica content. However, under present conditions, mining of these deposits would not be profitable.[18/]

16/ The countries involved are Switzerland (Alusuisse), Japan (Sumitomo Aluminium, Yoshida Kogyo, Sumitomo Corp., and Marubeni Corporation), Norway (Norsk Hudro) and possible West Germany, Italy and the USA.

17/ In 1974, construction of Phase II of the Inga hydro-electric dam began. Four of the eight 175 megawat (MW) generators have been installed, with the remaining units to be operational by 1982. When completed, the capacity of the Inga complex will be 1,225 MW, increasing the total hydro-electric capacity of the country by more than 150 per cent. The Inga dam is being built with World Bank finance.

18/ Mining Annual Review, published by Mining Journal, (Consolidated Gold Fields PLC, London), 1978-1982.

In general, most of the bauxite is used to make alumina products. Most of the remainder is used as bauxite by the abrasive, refractory, and chemical industries. Bauxite can also be used in the production of high-alumina cement, as an adsorbent or catalyst by the oil industry, in welding rod coatings and fluxes, and as a flux in making steel and ferro-alloys. Aluminium sulphate and other aluminous chemicals made from bauxite are used for water and sewage treatment, dyeing, tanning leather, and sizing paper.

Calcined alumina is used in high-alumina abrasives and refractories and in glass and ceramic products. A good part of the total aluminium consumed is in metallic form for construction end products. The transportation industry also is a major consumer of aluminium. Approximately 10 per cent of total aluminium produced is used in the electrical and communications industry.

Aluminium competes with steel and other materials in containers and packaging.

2. Coal

In 1980, as Table 2 shows, Zaire produced 138,000 tons of coal or 3.6 per cent of total coal production in Africa and 0.1 per cent of world's production. Coal deposits are estimated at more than 750 million tons. The majority of coal deposits are concentrated in the Province of Shaba, as well as in the region of the lake Tanganyika. However, coal does not play a very important role among the minerals exploited in Zaire. The exploitation of coal which has been carried out by the mining enterprises of Falcon Bridge, Emza, Somilno and Carbonage has been declining.[19/] Gécamines which produces more than 90 per cent of the country's coal (124,385 tons in 1980), is using the coal for its own needs.

19/ Andrzej Mieszczeński, "Zasoby Mineralne Zairu", in Przeglad Geologiczny, 27 (1979), No. 11, p. 638-640 (hereinafter cited as Geologiczny).

Table 2

Production of Mineral Resources of Zaire, Africa and the W
1976–1980

Mineral / Year	Zaire					Africa (Total)				
	1976	1977	1978	1979	1980	1976	1977	1978	1979	19-
Asbestos (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	691,640	691,792	543,399	544,399	561,5-
Barite	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a
Bauxite (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	12,239	11,916	13.200	12,997	12,6
Cadmium (tons)	252	246	186	212	168	406	481	440	478	3
Coal (tons)	112,210	127,955	96,771	99,220	138,000	83,364,701	90,955,687	95,861,661	109,383,269	121,212,2
Cobalt (tons)	10,686	10,208	13,144	13,599	14,700	12,861	11,912	15,207	16,775	18,0
Copper (metal content, tons)	n.a. 443,948	n.a. 452,716	n.a. 472,533	n.a. 451,568	n.a. 459,700	n.a. 1,036,928	n.a. 979,742	n.a. 955,453	n.a. 872,525	n.a 900,9
Diamonds (carats)	11,821,000	11,215,000	11,245,000	8,374,000	10,235,000	27,706,142	27,847,702	27,614,676	27,155,000	29,781,2
Gold (kilograms)	2,746	2,715	2,266	2,270	1,243	747,222	731,985	732,905	728,706	697,4
Hydrocarbons (crude petroleum, tons)	n.a. 1,259	n.a. 1,215	n.a. 916	n.a. 1,057	n.a. 1,000	n.a. 285,277	n.a. 305,105	n.a. 278,205	n.a. 327,239	n.a 298,0
Iron ore (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	59,540	64,792	59,408	66,815	60,1
Lime	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a
Lithium	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a
Mica (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	5,741	7,844	8,788	6,422	6,8
Potash (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	254,000	83,000	n.a.	n.a.	n.a
Precious/Semi-precious stones, tons)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a
Manganese ore (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	8,365,304	7,658,265	6,572,714	7,911,385	8,243,6
Rare earth (Monazite, tons)	n.a. 125	n.a. 96	n.a. 77	n.a. 92	n.a. 51	n.a. 284	n.a. 281	n.a. 137	n.a. 142	n.a
Salt	n.a.	n.a.	n.a.	n.a.	n.a.	2,094,812	2,261,577	2,660,724	2,650,393	2,796,5
Silver (metal content, kilograms)	71,300	84,900	89,100	91,700	85,003	263,980	284,349	314,683	317,842	302,4
Sulfur and Pyrite (thousand tons)	37	31	30	30	30	657	730	719	640	61
Tantalum and Niobium (tons)	79	113	47	38	40	905	1,179	781	746	63
Tin (metal content, tons)	3,832	3,662	3,376	2,464	3,159	14,111	13,548	12,871	11,431	12,32
Smelter on Tin (tons)	478	663	496	458	300	5,628	5,440	5,084	5,084	5,00
Tungsten (WO_3 est., tons)	303	216	187	141	91	1,095	955	935	776	72
Uranium (tons)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		
Zinc (metal content, tons)	70,298	81,832	88,533	76,244	67,000	257,414	264,260	265,642	56	233,808
Zinc (SLAB, tons)	60,622	51,049	43,508	43,693	43,800	169,973	183,163	190,801		189,17

Source: Institute of Geological Sciences, Natural Environment Research Council, World Mineral Statistics, 1976–1980 (London, Her Majest) Stationery Office, 198.

Notes: * = Billion n.a. = not available (a) = Li content only

SECTION 1

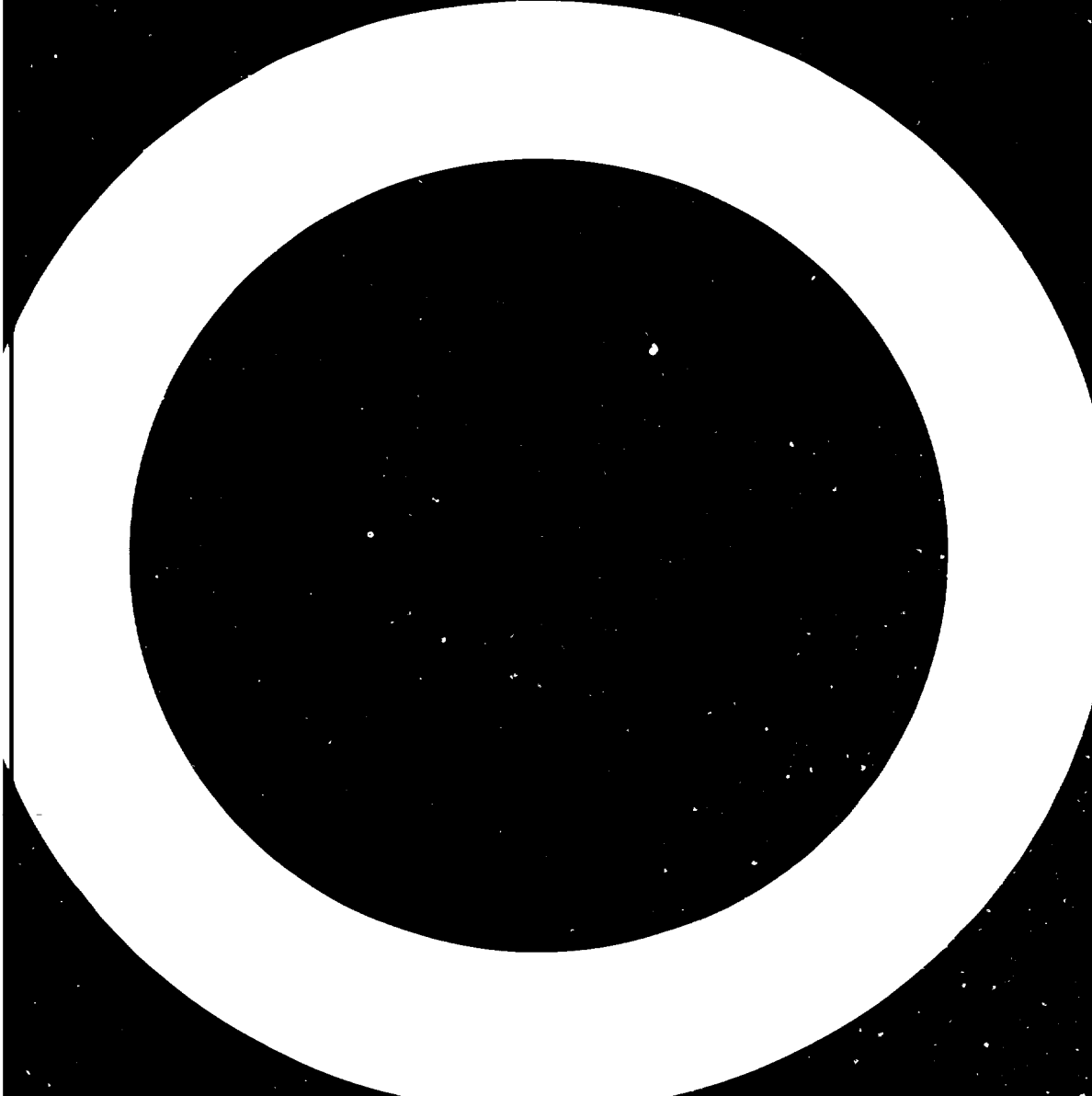
Table 2

...uction of Mineral Resources of Zaire, Africa and the World.
...-1980

	Africa (Total)			World (Total)					Zaire/ Africa	Zaire/ World
	1978	1979	1980	1976	1977	1978	1979	1980	1980 (%)	1980 (%)
...7	543,399	544,399	561,546	4,800,000	4,800,000	4,700,000	4,900,000	4,900,000	n.a.	n.a.
...792	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
...a.	13,200	12,997	12,658	80,600	84,800	84,600	88,400	91,600	n.a.	n.a.
1 916	440	478	388	17,200	18,600	17,700	18,900	18,500	43.29	0.908
...481	95,861,661	109,383,269	121,212,240	3,349,000*	3,518,000*	3,540,000*	3,722,000*	3,799,000*	3.6	0.1
...587	15,207	16,775	18,010	19,100	19,100	23,200	25,800	28,200	81.6	52.1
...912	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
...a.	955,458	872,525	900,953	7,850,000	7,950,000	7,900,000	7,900,000	7,800,000	51.0	5.0
...742	27,614,676	27,155,000	29,781,290	38,800,000	39,200,000	39,500,000	39,200,000	42,200,000	34.3	24.2
...702	732,905	728,706	697,450	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	0.178	0.103
...985	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
n.a.	278,205	327,239	298,090	2,903,000	3,009,000	3,082,000	3,160,000	3,014,000	0.33	0.033
...105	59,408	66,815	60,152	903,000	847,000	858,000	911,000	904,000		
...792	n.a.	n.a.	n.a.	n.a. a/	n.a. a/	n.a. a/	n.a. a/	n.a. a/	n.a.	n.a.
n.a.	n.a.	n.a.	n.a.	6,000 a/	5,500 a/	5,700 a/	6,600 a/	6,900 a/	n.a.	n.a.
n.a.	n.a.	n.a.	n.a.	198,000	206,000	220,000	215,000	197,000	n.a.	n.a.
...844	8,788	6,422	6,895	24,200,000	25,900,000	26,100,000	25,500,000	28,500,000	n.a.	n.a.
...000	n.a.	n.a.	n.a.							
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.20	0.062
...265	6,572,714	7,911,385	5,243,662	25,000,000	23,600,000	23,000,000	26,300,000	26,400,000	n.a.	n.a.
n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
281	137	142	71	20,900	26,100	28,800	30,800	28,600	n.a.	n.a.
...577	2,660,724	2,650,393	2,796,536	168,000,000	157,000,000	162,000,000	167,000,000	160,000,000	n.a.	n.a.
...349	314,683	317,842	302,481	9,735,000	10,461,000	10,648,000	10,720,000	10,283,000	28.1	0.826
730	719	640	615	51,500	52,700	54,200	55,100	56,400	4.87	0.053
1,179	781	746	631	23,000	22,000	23,008	35,000	35,000	6.33	0.114
3,548	12,871	11,431	12,320	6,200,000	6,600,000	6,400,000	6,300,000	6,200,000	25.64	0.050
5,440	5,084	5,084	5,002	5,716,000	5,925,000	5,980,000	6,372,000	6,109,000	5.99	0.004
955	935	776	728	52,000	53,000	60,000	61,000	63,000	12.5	0.144
n.a.	n.a.									
4,260	265,642	201,836	233,808	6,200,000	6,600,000	6,400,000	6,300,000	6,200,000	28.65	1.08
3,163	190,801	184,556	189,170	5,716,000	5,925,000	5,980,000	6,372,000	6,109,000	23.15	0.716

1976-1980 (London, Her Majesty's Stationary Office, 1982),. World Mineral Statistics, 1976-1980

SECTION 2



3. Cobalt

Cobalt is a by-product of copper. The position of copper exports, as the major export commodity of Zaire, was taken over in 1979 by cobalt whose share rose from 23.2 per cent in 1978 to 45.6 per cent of the total in 1979, mainly because of price increases. Zaire accounts for about 60 per cent of world cobalt production annually; known cobalt reserves are estimated at 450,000 tons.[20/] In 1980, Zaire produced 14,700 tons of cobalt (Table 2) or 52.1 per cent of world's cobalt production and 81.6 per cent of cobalt production in Africa. Although other countries produce cobalt as well, Zaire offers the quality needed by sophisticated technological sectors such as aeronautics. The relative decline in the world demand for cobalt, in 1980 and 1981 was partly due to higher price and resulted in a slowing down of production.[21/] The production of cobalt has also suffered from the same causes affecting the mining industry in general, such as, the severe shortage of foreign exchange after 1974, insufficient funds to purchase mining, processing, and replacement parts and equipment; lack of skilled personnel, and transportation problems.

The Government agency Gécamines which is responsible for most mining operations in Zaire is the primary producer of cobalt.[22/] A plan which aimed at bringing the total annual production capacity of cobalt to 22,000 tons has been shelved because of insufficient funds. As already mentioned in 1980, production of cobalt was 14,700 tons. Production in 1981 remained at the same level. However, in 1982, Zaire reduced its output of cobalt to 10,120 tons because of a slump in sales to the USA.[23/]

For the last few years, as a result of transportation difficulties, cobalt has been exported by air. Rising world prices for cobalt, especially since 1978/79, have made this mode of transportation feasible.

20/ Zaire's cobalt production can be split into 75 per cent marketable metal and 25 per cent impure cathodes.

21/ International Minerals/Metals Review, 1980, op.cit.

22/ Gécamines accounts as well for all production of Zaire's germanium and cadmium along with most of the production of silver, gold and copper.

23/ World Mining Yearbook, August 1982, op.cit.; Mining Annual Review, 1982, op.cit.

As a matter of fact it appears that, in real terms, major Zairian export increases in 1979 are due to cobalt, mainly because of high world prices for that mineral during the period.[24/] The market showed favourable growth in prices by the end of 1977, primarily because of the decision by the General Service Administration (GSA) of USA to build up American strategic stocks of cobalt. The situation was particularly favourable to Zaire which is the main world producer of the metal (70 per cent of world production) and supplies the US market with 40 per cent of its total output.[24a/]

However, in September 1981, Sozacom, the state-controlled metal marketing agency, had to reduce the price of its cobalt from $25/lb down to $17.26/lb. This reduction was the result of the announcement from the U.S. General Services Administration (GSA) in late 1981, that further U.S. purchases would be discontinued because of high prices.[25/]

Relatively recent developments in the cobalt production include an agreement between Zaire and the Belgian metallurgical group Hoboken-Overpelt to build an extra-fine powder factory able to use 450 tons of cathodes from Zaire. The main prospective buyer of this planned production scheme is the USA. Of Zaire's cobalt production, the United States, Canada, Japan and Western Europe consume around 95 per cent, particularly in their electrical and equipment industries.[26/]

24/ International Minerals/Metals Review, 1980, op.cit. p. 14

24a/ Mining Annual Review, op.cit., 1978, p. 489.

25/ On February, 1982, Sozacom lowered its price again, to $12.50/lb.

26/ World Mining Yearbook, August 1982, op.cit.

Major uses of cobalt are in transportation, especially aircraft, electrical (magnets)[27/], machinery (primary cutting tools)[28/], paints (mainly driers), ceramics, chemicals and others. Cobalt is also dependent on other metals with which it is used to make alloys.

4. Copper

As it was mentioned earlier, copper production and exports are among the major foreign exchange earners for the country. Known copper reserves are estimated at 23 million tons.[29/] Production of copper in 1980 was 459,700 tons, or approximately 6 per cent of total world production and 51 per cent of copper production in Africa (Table 2)[30/] while the output for 1981 was estimated at 495,000 tons. The dramatic decline in copper prices after 1974 caused a severe shortage of foreign exchange with subsequent negative effects on the whole economy.[31/] A plan which aimed to bring total annual production capacity of copper to 570,000 tons has been postponed because of insufficient funds,

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27/ The magnets are especially useful because of their greater energy product compared with other types of magnets of the same size. The automotive industry is particularly interested in cobalt rare-earth magnets because of the possibilities for weight reduction in such devices as wiper motors, electrical fuel pumps, fan motors, distributors, and other uses. The cost of these devices has been declining since a combination of rare-earth metals and cobalt (misch-metal-cobalt) has been introduced (U.S. Dept. of the Interior, Bureau of Mines, Minerals Yearbook, Vol. 1, 1980, p. 305 et seq.).

28/ Another industry that has benefited from cobalt alloys is the petroleum industry. A special alloy (containing 34.4 per cent cobalt) has been used in drilling gas wells to depths of approximately 20,000 feet thus avoiding frequent replacement of well tubing. This alloy contributes in prolonging tenfold the lifetime of tubing. Moreover, because of constant tubing diameter can be maintained, gas production per well could be doubled. This alloy can be used in such parts as logging tools, valve stems on wellheads, springs, and safety value systems (Minerals Yearbook, ibid.)

29/ International Minerals/Metals Review, 1980, p.7, et seq. The copper exploited in Zaire is of two different geological associations. The first association is with cobalt and uranium and the second association is with zinc and lead (Geologiczny, op.cit.)

30/ Mining Annual Review, 1982, op.cit.

31/ International Minerals/Metals Review, 1980, op.cit.

lack of skilled personnel and transport difficulties.[32] It was hoped, at that time, to continue the expansion further and to reach 600,000 tons of copper. These targets were later abandoned.[33]

One of the projects that was a casualty of the economic difficulties in the late 1970s, was the P_2 smelter and refinery development, which remains unfinished. Loans for this project have not yet been fully utilized. Some of the funds have been spent in other areas which are considered essential to the maintenance of production, such as the development of the open pit at Dima, and a third rotary kiln at Kakontwe. Continuation and completion of the P_2 expansion plant using the remaining funds is expected to start in 1983. If this project materializes, copper production from the Shaba province could increase by 100,000 tons a year.[34]

Other developments affecting copper production is the completion in 1981 by Dravo Engineers and constructors of the first phase of an open pit mine project with Gécamines and further progress on the construction of the power line, Shaba-Inga. By mid-1981, over 80 per cent of the work on the converter station at Inga and more than 60 per cent of that at Kolwezi has been completed. These improvements will affect positively the Tenké Fungurumé copper-cobalt project which is now led by Cogemizo, with a 26.5 per cent holding. The Tenké project was originally planned in the early 1970s to have besides cobalt an annual output of 130,000 tons of refined copper but it was halted in 1976. Plans for the project have been revised for a return to construction in 1982. Reports suggest that planned output may be reduced to 30,000 or 40,000 tons of copper concentrate a year and it will be sent to Gécamines for further treatment.[35]

The largest use of copper is in electrical equipment and supplies. Electric motors and related apparatus require copper to achieve adequate electrical performance. Electronic and communication systems require copper in the form of cable and related electric parts. Copper is mainly used in underground lines while for overhead power transmission lines aluminium is used. Furthermore, copper and its alloys are used by the

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32/ International Minerals/Metals Review, 1980, op.cit.

33/ World Mining Yearbook, August 1982, op.cit.

34/ Ibid.

35/ Ibid.

construction industry mainly for its corrosion resistance properties; in non-electrical industrial, farm and household machinery; in the transportation industry; in the chemical industry and in many types of gags from watches to microscopes and utensils to decorative items.

5. Diamonds

World industrial diamond resources are estimated to be approximately 680 million carats and total world production in 1980 at 42.2 million carats.

Zaire produces both gems and industrial diamonds. In 1980 (Table 2) Zaire produced 10,235,000 carats of diamonds. Zaire's production represented about 24.2 per cent of total world production of diamonds and about 34.3 per cent of Africa's diamond production. Taking into account the quantity of industrial diamonds exploited, Zaire occupies first place in the world (in 1980 about 73 per cent of world industrial diamond reserves and approximately 36 per cent of total world production of industrial diamonds). The majority of deposits is situated in the Province of Kasai, in the regions of Lubilashi and Lubi-Kula[36/] and in the region of Tschikapa.[37/] There are also known deposits of diamonds on the plateau Kwango and Kuandelunge, in the upper part of the Lukenia river and in the basin of the Lomala river.[38/] Gemstones are divided into basic series based on the processing required. Industrial diamonds are divided into die stones, dressers, drilling and bort.

Diamonds are mined mainly by Miba (the Bakwanga Mining Company)[39/], a joint Zairean/Belgian/British company[40/] which has the mining licenses

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36/ Deposits are mainly of the industrial type.

37/ Deposits are mainly of the jewellery type.

38/ Geologeczny, op.cit.

39/ About 60 per cent of Miba's output is industrial diamonds; about 35 per cent are of 'near gem' quality; and 5 per cent of gem quality. Miba was owned by the Belgian company Sibecka but it is now controlled by the Zaire Government.

40/ The share of the capital of Zaire in the Company amounts to approximately 50 per cent.

tor 73,000 sq.km. Production has fallen in the 1970s from 11.8 million carats in 1976, to 8.3 million carats in 1979 and 10.2 million carats in 1980. Although production has relatively fallen, the volume of gravel treated has increased. In spite of this, output has fallen because of a considerable drop in grade diamonds.

In 1981, the officially reported output of diamonds as shown in Table 3, by Miba was 5,753,568 carats; the Miba mines was aiming to raise production to 9,000,000 carats in 1982 and to 12,000,000 carats per year beginning in 1983. This is expected to require an investment of some U.S. $40,000,000. Total output of diamonds in 1981, which were sold through the Government minerals sales agency Sozacom, is estimated to 10,000,000 carats.[41/] Zaire's diamond distributors market their diamonds through the London stock exchange. There is an estimation, however, that approximately 5 million carats are smuggled annually out of the country, mainly to the Congo.[42/]

Table 3 Diamond Production by MIBA* in 1980 and 1981

	1980	1981
Production (carats)	8,001,076	5,753,568
Volume of gravel treated (m^3)	1,191,784	1,498,883
Grade (carats/m^3)	6.71	3.84
Deliveries (carats)	8,101,525	5,961,531

Source: Mining Annual Review, 1982, op.cit.

Note: In 1981, renovation and refitting of treatment plants and also construction of a plant to treat kimberlite were completed. Miba will mine the Mbujimayi river bed and adjacent alluvial beaches from the end of 1983. These projects will cost $80 million.

41/ World Mining Yearbook, 1982, op.cit.

42/ Ibid.

Certainly, the Zairian diamond industry seems to have survived its break with De Beers Central Selling Organization (CSO)[43/] quite successfully. One of the main reasons for this success is probably that over 70 per cent of Zaire's output is in industrial grade diamonds, and demand for these diamonds has been less elastic than for other categories.[44/]

The principal uses for industrial diamond stones are in drilling bits and reaming shells, single- or multiple-point diamond tools, diamond saws, and diamond wire-drawing dies. These tools and equipment are used in transportation, electrical and non-electrical machinery, construction, mineral services, abrasives, stone, clay, glass and dimension stone.

6. Gold

World total gold resources are estimated to be approximately 1,970 million troy ounces and world total mine production in 1980 was reported at 1.2 million carats.[45/]

Gold occurs practically on the entire territory of Zaire. However, the most significant deposits and about 70 per cent of the production are in the Province Oriental. About 20 per cent of gold production takes place at the Province Kivu-Maniema.

Gold production is undertaken by the Kilo-Moto mining company, Samirki and Gécamines throughout Zaire. Output by these companies declined from 4,456 kg in 1970 to 2,746 kg in 1976 and 1,243 kg in 1980 (Table 2). This fall in production was attributed, as mentioned in other sections, to the international economic situation, inflation,

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43/ For more than 40 years, De Beers has controlled the world diamond trade -- one of the most profitable monopolies of the 20th Century. The CSO is the general name for a group of De Beers companies which sort the diamonds into industrials and gemstones (more than 2000 categories), then classify and price them.

44/ World Mining Yearbook, August 1982, op.cit. (Industrial diamonds are used for drilling, cutting and grinding tools of industry).

45/ U.S. Department of the Interior, Bureau of Mines, Minerals Facts and Problems, 1980.

transport delays, management problems and other factors affecting, in general, the economy. In 1980, Zaire produced approximately 0.1 per cent of world's gold production and approximately 2 per cent of Africa's.

A ten year prospecting scheme with the plan of building up reserves started at the end of 1975 within the Kilo-Moto gold mines concessions and has so far concentrated on the Kilo area. Exploitable reserves were estimated in 1978 to be approximately 38,000 kg of gold. However, for efficient mining a new treatment plant with advanced technology is required. It is estimated that such a new plant should cost approximately U.S. $46 million.[46/]

Besides jewelery and decorative purposes, gold has many end uses such as in dentistry; in electronic devices; in the aerospace industry (especially in jet engine assembly); in radiant heating and drying devices and heat-insulating windows for large buildings as a reflector of infrared radiation. Gold alloys are used in chemical process equipment.

7. Iron and Steel

There are iron ore deposits in Upper Zaire, Shaba and in Western Kasai, in the Luebo area. Exploitation of iron ore deposits has been attempted by public companies but the economic problems of the country have prevented the development of iron ore deposits. An example is the Maluku steel complex which was built in 1972, with anticipated annual capacity of 150,000 tons. However, only 3,254 tons were produced in 1981.

The Zaire Government, aware of the problems, has decided to give greater encouragement to the private sector and several of the public companies are retroverting under a system of private control. Private sector partners are also being sought for the development of the Maluku steel complex. The world non-ore resources have been estimated to be approximately 217,000 million short tons of contained ore and world mine production, in 1980, at 904 million short tons of contained ore (Table 2).

46/ International Minerals/Metals Review, 1980, op.cit.

Most of the iron ore used for other than iron making and steel-making purposes, is applied in the manufacture of cement and heavy-media materials which are used in coal preparation plants. Smaller quantities are used in the manufacture of ferro-alloys, paint, high-density concrete aggregate, ferrites, and as a mineral additive to animal feed.[47/]

8. Lithium (Spodumene)

There are approximately 30 million tons of spodumene reserves in Manono[48/] containing about 6 per cent of lithium oxide. Zaire is listed among the world's main producers of this mineral. Accounting third in importance with Chile and the U.S.A. as the first two major producers, Zaire's lithium carbonate and lithium hydroxide resources account for approximately 24.3 per cent of world's total (or 5,657,000 metric tons - Table 2).[49/] However, the mining of lithium from the hard rock deposits of Manono requires a great deal of power.

Lithium is an alkali metal with unique chemical and physical properties which account for its extensive use in the world of industrial chemicals. As a matter of fact, lithium is the basis of chemical processing industry producing approximately 70 inorganic compounds of lithium.

Lithium uses and applications include lubricating greases, ceramics, glasses, glazes, welding fluxes, aluminium reduction cells, dehumidifying and air-conditioning equipment, sanitizers, polymerization catalysts, and pharmaceuticals.[50/] Lithium primary and secondary batteries as well as its application in controlled fusion reactions are both supported in industrial countries by Government research budgets.

World lithium resources are estimated to be approximately 8,400 thousand short tons of contained lithium. At current consumption levels, world reserves of lithium ore and brines are estimated to be

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47/ Minerals Facts and Problems, op.cit.

48/ The Manono reserve contains also 165,000 tons of tin.

49/ Industrial Minerals, 1977, op.cit.

50/ Lithium chemicals are used in the production of vitamin A and in the manufacture of hormones and antihistamines.

sufficient for over 200 years. However, lithium applications and consumption are increasing steadily within a wide range of applications in energy, medicine, industry, food, transportation, home and recreation.

9. Manganese

Zaire produces about 8 per cent of world production of rich manganese ore. The current production rate is approximately 350,000 tons/year of exportable material (as estimated on the basis of known reserves). World reserves of manganese are estimated to be able to meet demand up to the year 2000.[51/] The principal use of manganese is for the production of iron and steel and the demand of manganese for this purpose far exceeds all other demands.

The only producer and exporter of manganese ore has been the Kisenge Manganese Mining Company (SMK). The Company's economic condition as well as the demand and price of manganese is influenced by the market fluctuations of steel. In order to counter this measure, the company is intending to increase its output and to diversify the uses of manganese in other than steel products.[52/] The total world manganese production in 1978 has been estimated to be approximately 9,582 thousand short tons manganese content.

The greater part of manganese use in steel applications is in the areas of construction, transportation, appliances and equipment, machinery, cans and containers, oil and gas industries. Manganese compounds are used as oxidizers, catalysts, and chemical intermediates.

10. Petroleum

Crude Petroleum output (in the coastal zone of Zaire) amounted to 1.0 million tons in 1980 (Table 2), much below the estimated optimum annual capacity. This decline in output has been the result of deteriorating

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51/ Advances in technology will bring lower grades and more refractory ores, including the ocean-floor deposits into use.

52/ To this end, the following projects are being considered: a facility to make manganese dioxide by the electrolytic method; a factory to make dry cell battery casings; a facility in Shaba for calcination and electrolysis of the ore (Industrial Minerals, 1977, op.cit.).

capital equipment and shortage of investment. As a result of this decline, imports of petroleum have increased while the only existing refinery, Sozir, at Lower Zaire has been operating at below full capacity.[53/] Sozir uses locally produced crude mixed with imported crude. A desalination plant began operation in April 1981, intending to enable the refinery to function with indigenous crude only. Since Zaire's crude oil has properties (60 per cent fuel oil) better suited to meeting the needs of industrial countries, almost the entire crude production is being exported. Three operating companies are engaged in oil exploration in Zaire: Zaire Gulf, Zairep (100 per cent Petrofina) and Esso Zaire (subsidiary of Exxon).

11. Tin, Columbium, Tantalum, Tungsten

The deposits of tin which are almost always accompanied by the minerals of Columbium (Neobium), Tantalum, Tungsten (Wolfrum) and Bismuth, occur on the territory of the Provinces Oriental, Kivu and Shaba.

Several enterprises with mixed capital deal with the exploitation of tin and related metals. Generally, the capital share in these enterprises of Zaire is considerable. Among the most important are: Cobalt Mines (exploits cassiterite, colombite, tantalite, beryl and gold); Enterprise Minière de Zaire (exploits cassiterite); Symetain (exploits cassiterite and tungsten); and Sominki (exploits cassiterite, wolframite, colombite-tantalite, gold); Zaire Etain (produces approximately 20 per cent of the total tin production).

The exploitation of tin has been declining in recent years From 24,061 tons produced in 1945, it declined to 12,734 tons in 1952, 8,010 tons in 1967, 6,640 tons in 1969 and 3,159 tons in 1980 (Table 2).[54/] These figures reflect the exhaustion of deposits and all the mining companies are affected by this problem. The fall in output arises at a time when tin prices are improving in international markets. Bearing in mind the excellent market situation, it is worth noting that substantial investment

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53/ International Minerals/Metals Review, 1980, op.cit. p.8.

54/ Geologiczny, op.cit.

would nevertheless enable the deposits in Manono to be exploited more profitably. The Manono reserve is estimated at 165,000 tons of tin. As mentioned earlier, it also contains 30 million tons of spodumene.

Last year, the Government put forward a tin mining recovery plan aiming at improving production, recoveries, research and prospecting. The two main producers have been Sominki, operating in the Kivu-Maniema region, and Zaire Etain, which operates in the Shaba province. A new company known as SMDG, started operations in 1980, working small alluvial deposits. Enterprises Minières Zairoises is ready to start again tin and tungsten mining operations and last year contracted with GKW Contractors Ltd. to renovate and re-equip a number of mines. The project is scheduled for completion in 1985. An alluvial tin deposit at Kania contains more than 3,000 tons of cassiterite grading around 1 kilogram (2.2 pounds) per cubic meter. During 1981, agreement was reached whereby Société Minière de Kania (Somika) will develop and mine the deposit. Société Minière de Goma has also commenced mining of a small alluvial tin deposit at Kalimibi. Société Minière de Katondo is also reported to be embarking on a tin mining project. Of the exported tin, the bulk is in the form of ore and concentrate and only about 13 per cent is in the form of unwrought metal.[55/]

Zaire produces about 6 per cent of world's tungsten production and the entire tungsten ore and concentrate are exported to the USA (approximately about 1 per cent of total U.S. imports). The major end use of tungsten is in cutting and wear-resistant materials (65 per cent), primarily as tungsten carbide. Other major end-use categories are mill products, specialty steels (tool, alloy, and stainless), hard-facing rods and materials, superalloys and chemicals.[56/]

Zaire produces approximately 0.2 per cent of world's total net production of colombite and approximately 6.5 per cent of tantalite. Almost the entire production of both minerals are exported to the USA

55/ World Mining Yearbook, 1982, op.cit.

56/ Minerals Yearbook, 1980, op.cit.

in the form of concentrates. Major end uses are in steelmaking (special structure applications) for both minerals as well as in aerospace for columbium and in electronics for tantalum.[57/]

12. Uranium

The last few years, prospecting has indicated that uranium deposits are mainly in the areas of Shinkolobwe. The main actual resources can be evaluated to 1,800 tons and to 1,700 tons the supplementary resources. Zaire is ranking seventeenth among the world's uranium possessing countries.[58/]

Uranium exploration continues in a number of areas and is being carried out by Saarberg Interplan, Agip and Cogema, with interest for exploration also shown by the United Kingdom.[59/]

13. Zinc

Zaire produces approximately 1.1 per cent (content of ore) of world mine production of zinc. Of the 67,000 short tons produced in Zaire in 1980 (Table 2) approximately 70 per cent was being primarily smelted. Gécamines is the primary producer of zinc. Of the processed zinc, Zaire exports approximately 42.4 per cent to the USA. In terms of USA imports, this amounts to a 6.4 per cent of total USA imports of blocks, pigs, or slabs.[60/]

Zinc products are used for galvanizing, zinc-base alloys, brass products, zinc oxide, rolled zinc, light-metal alloys, etc.[61/] Several industries are using zinc products such as the industries of transportation; rubber; construction; domestic appliances; industrial, agricultural and commercial machinery; electrical components; sporting goods and toys; scientific and professional equipment; sound and television equipment, fertilizers, etc.[62/]

57/ Minerals Yearbook, 1980, Vol. III, op.cit.

58/ OECD and IAAE: Uranium Ressources, Production et Demande, (OECD, Paris, France, Dec. 1977).

59/ World Mining Yearbook, 1982, op.cit.

60/ Minerals Yearbook, ibid. p. 1022.

61/ Ibid.

62/ Ibid.

14. Other Minerals and Construction Materials

In 1978, the United Nations Development Programme (UNDP) and the Zairian Government undertook jointly a project to evaluate phosphate deposits discovered in Lower Zaire.

The deposits of salt stone are being exploited for the local needs in the Shaba Province as well as deposits of rare earths (mainly monzonite exploited in the Province Kivu-Maniema and in the basin of the river Ubanghi in the Shaba Province).[63/]

Among the minerals with less economic significance one could include the deposits of asbestos (in the regions of lake Mobutu, mountain Maymbe and in Shaba)[64/]; barite (in the lower Zaire and Shaba); mica in Kivu; sulfur and potash in Kivu; precious and semi-precious stones and ornamental stones on the entire territory of Zaire[65/]; marble (near Kimpese in lower Zaire)[66/]; and hydraulic cement (about 0.06 of world's hydraulic cement production in 1977).[67/]

The adverse general economic conditions of the mid-seventies have affected cement operations, such as the Ciment-Lacs near Kalemie on Lake Tanganyika which discontinued its production when the nearby coal mine, Makala, was shut down in October 1975, because of lack of spare parts and diesel fuel.[68/] In 1976, Ciments-Lacs produced 40,000 tons

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63/ U.S. Dept. of the Interior, Bureau of Mines, Minerals Yearbook, 1980, Vol. III, Area Reports: "The Minerals Industry of Zaire", pp. 1061-1066.

64/ Asbestos is a general name applied to a number of fibrous mineral silicates differing in chemical and physical composition from the others.

65/ For example, malachite (which is the green carbonate of copper) has been used as an ornamental stone for centuries and has been profitably exported.

66/ Contracts for the sale of marble to neighbouring countries have been sought (Minerals Yearbook, 1980, ibid.)

67/ Geologiczny, op.cit.

68/ Minerals Yearbook, ibid.

but ceased operations in 1979 because of flooding. Additional cement plants are under development or are operating at Kinshasa and Kisangani. The largest cement manufacturer of Zaire is the Société des Ciments du Zaire (CIZA). CIZA's plant at Lukala had a capacity of 630,000 tons, but produced only 231,381 tons of cement in 1978 and even less in 1979.[69/] However, during the first half of 1982, output increased by 20.9 per cent (to 243,000 tons). The increased output is attributed to increased demand from other African countries, such as Burundi, C.A.R., Republic of Congo and Angola. In general, Zaire's market for construction materials is still weak.

Finally, output of lime was mainly for meeting the needs of Gécamines. Lime production also declined by -4.2 per cent between 1979 and 1980 (from 115,342 tons to 110,803 tons).[70/]

69/ Minerals Yearbook, op.cit.

70/ Mining Annual Review, 1982, op.cit.

IV. THE MANUFACTURING SECTOR AND LINKAGES WITH THE MINING SECTOR

Although Zaire is in fact one of the most industrialized countries in developing Africa, its manufacturing establishments often operate below their production capacity because of foreign exchange shortages, lack of credits and insufficient supplies of fuel and spare parts.

As Table 2 details, in the early seventies several manufacturing branches which have linkage potential with several of the industrial and non-industrial minerals available in Zaire had a growth momentum which was carried over from the decade of the sixties.* However, in the mid-seventies, several economic and political factors (as it was explained in earlier sections) affected both the manufacturing and the mining sectors as well as the economy as a whole. These factors contributed to the declining of productivity and exports; shortages in foreign exchange; and inability to acquire replacement equipment and/or machinery needed in manufacturing, mining, construction and other sectors of the economy.

Reportedly, manufacturing value added (in terms of constant 1975 U.S.$) grew over the 1960-1965 period at an average annual rate of 8.0 per cent, at 18.0 per cent between 1965 and 1970 and at 3.1 per cent between 1970 and 1974. During 1974-1980, manufacturing value added declined by -7.97 per cent. The mining and quarrying sector declined at an average annual rate of -3.4 per cent between 1960 and 1965 and grew by 21.6 per cent between 1965 and 1970, and 2.2 per cent between 1970 and 1975. The year 1974 was the peak of the growth year for mining as well as for manufacturing. Between 1974-1980, the sector has experienced an annual average decline of -6.45 per cent. Smaller or larger declines have been registered in all sectors of the economy between 1974 and 1980 with GDP

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* With the end of the colonial era, Zaire emerged as an independent nation with virtually no industrial capacity. Since the country inherited an "abnormally" small industrial base relative to her size and mineral wealth, a substantial part of the very fast rate of manufacturing growth that occurred during the early years can be explained as a response to a disequilibrium in supply-demand conditions created by the ending of colonialism.

declining at an average annual rate of 7 per cent.[71/]

Table 4 provides information on patterns in manufacturing indices in 1972 and patterns and trends in manufacturing value added between 1972 and 1979. Specifically, the table reports the distributions by branch of manufacturing value added (denoted by MVA in the table), in 1972 and 1979; wages and salaries in manufacturing (denoted by WAGES), employment in manufacturing (denoted by EMP), gross fixed domestic capital formation in manufacturing (denoted by CFI), number of establishments (denoted by EST), and gross output (denoted by GO), in 1972.[72/]

Because of incomplete data we will make the assumption that the shifts of MVA by manufacturing branch reflect similar shifts in gross output. However, we will not be able to make such an assumption for the rest of the manufacturing indices which often may move in a different direction than that of the manufacturing value added.[73/]

As Table 4 reports, MVA earned in ISIC 3110, food products, accounted for 11.9 per cent in 1972 and for 19.1 per cent in 1979 (or the most available recent year) of the total MVA; industrial chemicals (ISIC 3510) 5.3 per cent and 11.3 per cent; beverages (ISIC 3130) 21.4 per cent and 26.3 per cent; footwear (ISIC 3240) 7.9 per cent and 6.0 per cent; textiles (ISIC 3210) 7.1 per cent and 10.6 per cent; tobacco (ISIC 3140) 6.9 per cent and 6.2 per cent; petroleum refineries (ISIC 3530) 6.5 per cent and 3.5 per cent; other non-metallic minerals products (ISIC 3690) 2.4 per cent and 3.3 per cent; iron and steel (ISIC 3710) 2.9 per cent and 5.0 per cent; non-ferrous metals (ISIC 3720) 1.6 per cent and 1.8 per cent; metal products except machinery (ISIC 3810) 2.4 per cent and 2.3 per cent; non-electrical machinery (ISIC 3820) 3.6 per cent and 3.2 per cent; electrical machinery (ISIC 3830) 1.6 per cent and 1.7 per cent; transport equipment (ISIC 3840) 2.0 per cent and 3.2 per cent; and other manufactures (ISIC 3900) 6.3 per cent.

71/ UNIDO Data Base: Information supplied by the United Nations Statistical Office, with estimates by the UNIDO Secretariat.

72/ Data for 1979 in these manufacturing indices are not available.

73/ A case in point are wages and/or number of employees.

Table 4 Zaire - A Comparison of Distributions by Branch, 1972 and 1979

	(3110) Food Products			(3130) Beverages			(3140) Tobacco			(3210) Textiles			(3220) Wearing Apparel		
	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio
NVA	11.4	19.1	1.6	21.4	26.3	1.2	6.9	6.2	0.9	7.1	10.6	1.5	4.1	4.2 5/	1.02
Wages	11.1	-		11.3 1/			3.3 1/			14.3			3.3		
EMP	18.0	-		-			7.2 1/			15.7			5.2		
GFI	0.9	-		n.a.			n.a.			8.6			0.4		
EST	29.4	-		3.8 1/			0.8 1/			4.4			6.7		
CO	16.3	-		12.3 2/			9.2 2/			12.9			3.8		

	(3230) Leather and Fur Products			(3240) Footwear			(3310) Wood Products			(3320) Furniture and Fixtures			(3410) Paper		
	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio
NVA	0.4	0.4	1.0	7.9	6.0	0.8	3.1	0.8	0.26	0.5	0.5 5/	1.0	0.2	0.3 5/	1.5
Wages	0.5 1/			6.1			3.0			1.2			0.9		
EMP	0.5 1/			5.3			3.2			2.1			0.4		
GFI	n.a.			n.a.			n.a.			n.a.			0.8		
EST	1.4 1/			1.0 1/			4.4			4.6			1.3		
CO	0.2 1/			5.4 1/			1.2			0.4			1.1		

	(3420) Printing and Publishing			(3510) Industrial Chemicals			(3520) Other Chemical Products			(3530) Petroleum Refineries			(3540) Misc. Products of Petroleum and Coal		
	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio
NVA	0.9	1.1 5/	1.2	5.3	11.3	2.1	0.5	0.3 5/	0.6	6.5	3.5	0.5	0.0	0.0	
Wages	3.5			7.1 3/			0.4 2/			0.0 3/			7.1 3/		
EMP	2.9			4.1 3/			0.2 3/			0.0 3/			1.9 3/		
GFI	4.4			n.a.			n.a.			0.0			0.7 3/		
EST	7.2			5.9 3/			0.8 3/			0.2 3/			0.8 3/		
CO	2.6			8.1 2/			0.7 2/			0.0 2/			12.2 2/		

	(3550) Rubber Products			(3560) Plastic Products			(3610) Pottery, China and Earthenware			(3620) Glass			(3690) Other Non-metallic Mineral Products		
	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio
NVA	0.2	0.3 6/	1.5	0.0	0.0		0.2	0.2	1.0	3.6	0.6	0.2	2.4	3.3	1.4
Wages	2.0			0.0			3.2			0.7			3.7 3/		
EMP	1.2			0.0			2.6			0.4 3/			3.3 3/		
GFI	13.2			0.0			0.1			n.a.			n.a.		
EST	1.3			0.0			3.6			-			-		
CO	0.8			0.0			2.7			0.6 2/			4.6 2/		

	(3710) Iron and Steel			(3720) Non-ferrous Metals			(3810) Metal Products Except Machinery			(3820) Non-electrical Machinery			(3830) Electrical Machinery		
	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio
NVA	2.9	5.0	1.7	1.6	1.8	1.1	2.4	2.3	1.0	3.6	3.2 5/	0.9	1.6	1.7 5/	1.1
Wages	1.2			n.a.			3.5			2.8			0.9		
EMP	0.6			n.a.			2.7			0.9			0.5		
GFI	0.1			n.a.			4.7			1.1			0.1		
EST	0.8			n.a.			7.0			2.6			1.0		
CO	0.7			n.a.			3.5			1.9			0.4		

	(3840) Transport Equipment			(3850) Professional and Scientific Equipment			(3900) Other Manufactures		
	1972	1979	Ratio	1972	1979	Ratio	1972	1979	Ratio
NVA	2.0	3.2 5/	1.6	0.0	0.0	0.0	6.3	2.8	0.4
Wages	9.6			0.0			2.4		
EMP	6.3			0.0			1.6		
GFI	8.6			n.a.			n.a.		
EST	7.5			0.0			5.2		
CO	7.5			0.0			1.7		

Source: UNIDO Data Base: Information supplied by the United Nations Statistical Office, with estimates by the UNIDO Secretariat.

1/ 1964 2/ 1969 3/ 1970 4/ 1971 5/ 1975 6/ 1976

Changes in the distribution of any series, both absolute and relative to other series, are most easily analyzed by reference to the columns of the Table denoted by "ratio". These columns report the ratios of the MVA shares in 1979, to corresponding shares in 1972. Ratios of greater than 1.0 indicated that the share in MVA of the industrial branch in question has increased; ratios of less than 1.0 indicate that it has decreased accordingly.

From Table 4 we can observe that the relative performance of different industrial sub-sectors varied considerably over the 1972-1979 period. Among the sub-sectors that increased their MVA is primarily the sub-sector of the Industrial Chemicals (ISIC 3510) with a ratio of 2.1, followed by the sub-sectors of Iron and Steel (ISIC 3710) and Food Products (ISIC 3110) with a ratio of 1.6 respectively. Other sub-sectors with rapid growth are those of Textiles, Paper, Rubber Products and other Non-metallic Minerals. Specifically, the intermediate and capital manufactured goods and transport equipment registered the most rapid growth (the estimated average annual growth rate between 1972 and 1979 was 25.5 per cent). All the other manufacturing activities in the category of intermediate and capital goods, such as gravel, cement, asbestos cement, bottles, metal containers, barrels, structural metalwork, basic chemicals, spinning and weaving, wood-processing, etc. registered declines in their manufacturing value added.

Information on processed minerals in Zaire is available on the company level, especially for Gécamines, which is the main mineral producer of Zaire. Table 5 details Gécamines' mines production and processing activities between 1971 and 1980. Gécamines accounts for 63 per cent of the country's revenue and it has produced in 1980 (besides copper and cobalt) 43,848 tons of zinc ingots and 168 tons of cadmium rods. The refining of copper abroad has also enabled Gécamines to recover 78,756 kg of silver and 115 kg of gold. In addition, Gécamines has produced metallurgical processors and building materials for its own needs.

Table 5

Zaire: Mine Production by Gécamines, 1971-1980

Products	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Copper (Unit: 1,000 t)										
Electrolytic in ingots	207.8	216.3	230.2	254.6	226.0	65.8	98.7	102.9	103.1	144.0
Exported cathodes	69.9	81.9	90.7	69.6	78.6	207.5	194.2	142.8	125.1	135.4
Blister	107.9	113.2	128.6	130.0	145.8	123.5	144.4	135.1	141.5	137.5
Exported block	17.8	16.5	11.0	13.8	12.1	10.9	13.4	10.3	0	8.8
In various exported products	2.4	0.3	0.2	3.1	0.9	0	0.2	0.2	0.1	-
Total Copper Production	405.8	428.2	460.7	471.1	463.4	4o7.7	450.9	391.3	369.8	425.7
Cobalt (Unit: t)										
Electrolytic in blocks	7,647	6,592	8,613	9,074	7,132	6,000	5,538	6,578	7,509	7,995
In granules	4,007	4,107	3,787	3,586	3,062	2,289	3,384	5,245	4,897	5,234
Exported cathodes for further processing	1,983	1,657	2,682	3,737	2,830	2,397	832	988	938	1,364
In various exported products	881	687	-30	1,148	614	0	454	384	685	-111
Total Cobalt Production	14,518	13,043	15,052	17,545	13,638	10,686	10,208	13,095	14,029	14,482
Zinc (Unit: 1,000 t)										
Ingots	0	0	0	66.9	65.6	60.6	51.0	43.5	43.7	43.8
Cadmium (Unit: t)										
Rods	0	0	0	271.7	214.0	252.0	246.4	186.0	212.0	168.0
Silver (Unit: t)	45.7	58.8	62.1	51.3	71.3	60.4	84.9	89.1	91.7	78.8
Gold (Unit: kg)	83	98	93	145	155	130	12	129	104	115

Source: Mining Annual Review, 1982, op.cit.

While Zaire has the potential to develop a better manufacturing sector and stronger linkages with the mining sector, such a development has not taken place as yet. Besides the range of internal and external factors mentioned earlier that have influenced Zaire's economic and minerals development, there is also the possibility that the growth of Zaire's manufacturing has been weakening as a result of the special national and international role of Zaire's minerals. For Zaire, minerals extraction and export are the main earners of foreign exchange, create employment, and are the main contributors to the gross national product of the country. Concentration on the importance of minerals may have diverted development efforts away from a more integrated development approach.

V. DIRECTION OF TRADE AND EXPORT ROUTES

The mining sector accounts for between 70 and 80 per cent of exports by value each year and for about 33 per cent of GDP. As we pointed out earlier, the economic crisis of Zaire has been attributed to many external and internal factors. However, deteriorating terms of trade have been the main factor to Zaire's crisis. The fall in the international purchasing power of copper in 1975, brought a sudden and dramatic change in Zaire's trade position.[75/] These trade effects were coupled with the effects of adverse internal economic measures bringing about a serious damage to all the sectors of the economy. The most visible effects have been drastic drops in the volume of imports (approximately 50 per cent) and revenues from taxes on foreign trade (from approximately 38 per cent of GDP during 1974 to 29 per cent in 1975), as well as, from difficulties in meeting external debt service obligations. In spite of the contraction in the volume of imports, the current account remained in deficit at least up to 1980, mainly because of Zaire's disadvantageous trade position. In 1980, a large positive balance was materialized mainly because of the exports of mining products. In value, this increase was not registered in 1981 because of the fall in the prices of copper and cobalt.

Table 6 below details indices of import (Col.2) and export (Col.3) prices of Zaire and Zaire's terms of trade (Col.4) between 1970 and 1978. These indices can be compared with the terms of trade of developing countries in general (Col.5). Columns 6 and 7 report world copper prices and price index.

Comparing columns 4 and 5 we observe that since 1973, the terms of trade of both Zaire and the developing countries, in general have deteriorated. However, Zaire's trade position has had a more drastic drop than the average terms of trade of other developing countries. This drop is correlating closely to the declining index of copper prices.

75/ From 1967 to 1974, the price of copper average U.S. $1.20 per pound (1977 prices). During the period 1975-1978, the average was $0.61 per pound.

Table 6 Terms of Trade and Related Indicators, 1970-1978
(1970 = 100)

	ZAIRE			Developing Countries 1/	World Copper Price 2/ (per pound)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	Import Price Index	Export Price Index	Terms of Trade	Terms of Trade	Prices (in 1977 constant U.S.$)	Index
1970	100.0	100.0	100.0	100	148.7	100.0
1971	103.8	79.6	76.7	95	105.2	70.7
1972	114.7	79.5	69.3	93	94.2	63.4
1973	132.9	115.2	86.7	101	130.1	87.5
1974	179.8	149.0	82.3	94	120.1	80.8
1975	213.2	108.3	50.8	84	62.5	42.0
1976	210.5	125.0	56.3	87	69.6	46.8
1977	229.0	128.9	56.2	89	59.4	40.0
1978	262.2	138.4 3/	52.3	n.a.	53.8	36.2

1/ Average excludes petroleum exports.

2/ London Metal Exchange

3/ Estimated

Source: IBRD, Commodity Trade and Price Trends, Report No. EC.166/78, August 1978

Since 1977, cobalt exports began to play a very important role. In 1979, cobalt exports took the lead, in terms of value.

The main trading partners of Zaire's mineral exports, in 1979, were Belgium (37.5 per cent of total exports), Angola (21.2 per cent), United States (11.4 per cent) followed by Mozambique, EEC countries and Japan. Zaire's imports come mainly from the EEC countries (Table 7). While the bulk of imports (73.4 per cent) were in the form of processed goods imported for final use, the bulk of Zaire's exports (96 per cent), were in the form of non-processed or semi-processed goods exported for total processing or additional processing.[76/]

76/ UNIDO Data Base, op.cit.

Table 7 ZAIRE: Principal Destinations of Exports (values in U.S. $ million and percentage of the total exports), 1977-1979

	1977	%	1978	%	1979	%
Belgium[1/1a/]	574.2	32.3	704.3	34.2	870.2	37.5
Angola	414.8	23.3	447.2	21.7	491.9	21.2
United States	162.9	9.1	212.3	10.3	264.8	11.4
Mozambique	154.0	8.6	181.7	8.8	199.9	8.6
France[1/]	150.3	8.4	135.4	6.5	150.6	6.4
United Kingdom[1/]	92.9	5.2	174.3	8.4	129.5	5.5
Italy[1/]	145.4	8.1	121.6	5.9	108.4	4.6
Japan	81.2	4.5	76.6	3.7	104.8	4.5
Total exports in US $ millions	1,775.7		2,053.4		2,320.1	

1/ Countries belonging to the E.E.C.

1a/ Belgium continues to take the largest share of Zairian exports, accounting for 37.5 per cent of total exports by value in 1979. This was an increase from 32.3 per cent in 1977.

Source: Lloyds Bank Report, Zaire, 1979.

An important export route is that of the port of Matadi which handles approximately 237,000 tons of minerals exports.[77/] The East African Railway Corporation ships minerals from Shaba by way of Lake Tanganyika to Dares-Salaam, Tanzania. Other routes are through Zambia, Southern Rhodesia and Botswana to Mozambique[78/] and South African ports.[79/]

Table 8 reports shares of imports and exports classified according to stage of process and use. The most dramatic shifts evident are toward increased share of non-processed goods exported to be processed and the decreased share of processed goods exported for further processing.

77/ Geologiczny, op.cit.

78/ Not always available because of political reasons. This has resulted in longer and more expensive routes, higher production costs and reduced sales.

79/ Minerals Yearbook, op.cit.

Table 8 ZAIRE: Shares of Exports and Imports Classified According to Level of Processing 1970 and 1978 and Trend Growth Rates 1970-1975 and 1975-1978

Exported/Imported Goods	Exports: Share of total exports (Percentage) 1970	1978	Exports: Growth rate (Percentage) 1970-1975	1975-1978	Imports: Share of total imports (Percentage) 1970	1978	Imports: Growth rate (Percentage) 1970-1975	1975-1978
Non-processed goods for further processing	17.75	43.06	13.64	18.19	3.94	8.95	26.81	-11.98
Processed goods for further processing	81.17	53.27	6.24	-2.84	13.96	12.13	13.80	-7.73
Non-processed goods for final use	0.26	0.36	9.68	0.02	4.50	5.48	12.43	2.91
Processed goods for final use	0.82	3.31	32.12	16.89	75.60	73.44	10.29	-3.49

	Exports 1970	Exports 1978	Imports 1970	Imports 1978
Total trade SITC 0-9 in 1000 current US dollars	735,366	899,362	532,975	796,714

Source: UNIDO data base, op.cit.

Note: Calculations are based on current US dollar prices.

VI. STRATEGIES AND POLICIES - PROSPECTS AND OUTLOOK

The interest of governments in mineral resources is expressed in different policies in regard to minerals development. Certain governments adopt the policy of close control of mineral resources treating them as public utilities, while others limit themselves to policies that encourage and promote the development of the mineral sector through private initiative. The Zairian Government has experienced both types of development policies and at this time, as it was mentioned earlier, tries to encourage the private mineral sector.

Mineral policy objectives should pursue optimum benefits for Zaire from present and future use of minerals. Optimization should entail economic, political and social factors. To this end, strategies and policies should endeavour to achieve the following:

- o To develop a viable and diversified mineral sector
- o To develop opportunities for further mineral processing
- o To ensure national self-determination in mineral development
- o To create employment (direct or indirect)
- o To promote backward and forward linkages in order to maximize value added within the country
- o To pursue best market opportunities and to increase returns to Zairians from mineral exports
- o To improve a minerals conservation policy
- o To strengthen the contribution of minerals to regional and national development
- o To take into consideration the environmental and social impact of minerals development.

Among the main problems frustrating the outcome of policies and strategies and inhibiting the development of the mining industry in the short run are, in general, the business cycle, the volatility of prices, rapidly rising capital costs, scarcity and cost of finance.[80/]

80/ Rex Bosson and Bension Varon, The Mining Industry and the Developing Countries, IBRD, (Oxford University Press) 1977, p.184.

Zaire's mining activity has been affected by all these factors as well as by the Government's policies. However, the effects on the minerals processing sector have become obvious with a lag time in output. Mining activities including extraction and processing change their production capacities ususally slowly, mainly because several years are required before new capacity can become operational. When policy actions are restrictive or create insecurity to investors, responses are usually quicker then when supportive measures are extended. The political uncertainty in Zaire during the sixties and seventies and the fiscal instability have affected the profitability of the mining companies and consequently their investment and operational activities both in terms of extraction and processing. However, since in the eighties the Zairian Government has adopted policies that are attracting new investment, several activities have been initiated and/or implemented, the results of which are becoming or will become noticeable.

For example, mining activity in copper has experienced a clear upswing since 1980. Reportedly, in 1980, 14.7 mt of ore have been extracted from Zaire's mines and especially those of Gécamines. This tonnage is higher than the average tonnage for the last five years. The revival in copper production is the result of sustained efforts, by Gécamines, to regain the level of productivity existing before the events of the internal strife in the seventies. Reorganization, retraining of personnel, refurbishing of stocks of essential supplies, and renovation of plants are among the management tasks that brought about the change. Also part of the improvement is believed to come from open-pit mines. The basic reason is the partial modernization of the means of transporting the ore from open-pit mines to the West.[81/] Gécamines efforts are to a great extent the result of the Zairian Government's decision, in 1980, to give to the private sector the necessary support by overhauling needed infrastructure, by liberalizing the economy, by allowing companies to have foreign currency, especially if the imports have been considered essential to industry.

81/ Mining Annual Review, 1982, op.cit.

Furthermore, at the end of June 1981, the IMF granted to Zaire a loan of 912 million in Special Drawing Rights (SDRs, equivalent to U.S. $1,050 million).

Reportedly, as a result of all these major national and international efforts, the financial situation of Zaire is as follows:

- o inflation has declined. The inflation rate was over 100 per cent in 1979, and it was brought down to 50 per cent in 1980. The currency of Zaire was again devalued on June 1981 by 40 per cent.
- o GNP grew at 1.8 per cent in 1980 and 1.6 per cent during the first half of 1981.
- o The trade balance improved. In 1980, a positive balance was materialized (with mining products constituting approx. 84 per cent of exports).
- o A budgetary deficit of 21.0 billion or greater was expected in 1981 and 1982 against a deficit of 21.2 billion in 1980.
- o The external debt of Zaire was reported in 1982 to be U.S. $5.1 billion. The 14 creditor nations accepted a spreading out of the yearly unpaid amounts.

World price developments for copper and cobalt clearly have a decisive influence on Zaire's income. Following the price fluctuation of copper and the export revenue losses from cobalt, Zaire applied to EEC under the new "Sysmin" system which was instituted during the second Lomé Congress. Zaire was granted 40 million crowns in order to modernize and improve Gécamines.

The three-year recovery plan focusses on the following areas of public investment with corresponding budget allocations:

- o agriculture, 11 per cent
- o immediate productive mines, 26 per cent

- o transport, 38 per cent
- o energy, 20 per cent
- o health, 2 per cent
- o education, 3 per cent.

Clearly, the mining sector receives due attention with 26 per cent of the budget allocated directly to it and 38 per cent and 20 per cent allocated to transport and energy sectors respectively.

Retrospectively, although Zaire has the potential to develop a strong mineral sector that could provide the pivotal force for rapid industrialization via production and consumption linkages and increased government revenues/foreign exchange receipts, it has not yet achieved this goal. International, regional and national constraints have been inhibiting the path towards an indigenous resource-based industrialization. Relatively recent concerted national efforts, improvements in the world economic conditions and changing patterns of the international investment and finance structure are contributing to increasing, albeit slow, integrated activity in the minerals exploitation area in terms of primary production, processing, development of indigenous energy sources and necessary infrastructure.

ZAIRE - Key Economic Indicators 1974-78

	1974	1975	1976	1977	1978
GDP[1/] (constant 1970 prices)	2,340	2,210	2,115	2,074	2,054
Real Annual Growth	5.4 %	0.6 %	-.3 %	-1.9 %	-1.0 %
Money Supply[2/]	779	908	815	1,066	1,307
Total Exports[1/]	1,283	799	1,063	1,239	1,399
Total Imports[1/]	911	974	1,432	1,258	1,410
Trade Balance[1/]	372	-175	-369	-19	-11
Balance of Payments[1/]	-273	-508	-384	-508	-524
Total Debt[1/]	n.a.[2/]	2,561	3,088	3,306	3,537
Total Debt Payments Doc.[1/]	n.a.[1/]	196	176	317	476
Debt Service Ratio	n.a.[1/]	24.5 %	16.5 %	25.6 %	34 %
Consumer Price Index[3/]	200	273	446	738	1,499
All Minerals Index[3/]	120	115	101	106	100
Agriculture Index[3/]	112	106	118	107	103
Manufacturing Index[3/]	130	119	109	101	96
Copper Production[4/]	498	496	444	490	420

Sources: U.S. Embassy in Zaire, International Monetary Fund, Bank of Zaire, 1979.

1/ Value in millions U.S.$.

2/ n.a. = not available.

3/ 1970 = 100.

4/ In thousand of metric tons.

ANNEX II

INDUSTRIAL MINERALS AND INVENTORY OF RESOURCES OF ZAIRE

1. Industrial Minerals and their Industrial Applications

Industrial minerals have been classified in three groups:

(i) construction minerals
(ii) process minerals
(iii) chemical minerals

(i) Construction Minerals: Construction minerals are mostly of low value and are used usually close to the source of demand. This category of minerals includes limestone and clay or shale which are the necessary inputs of portland cement. In the construction minerals are included also the gravel and sand essential constituents of concrete; these materials are important building materials in developing countries. These materials have several applications in construction, such as clay is used for brick, clay and pipe manufacture; gravel for ballast; sand for asphalt and as a filler; limestone as a source of lime for calcium silicate; bricks and mortar for dams and harbour works, building and roadstone; gypsum used as a set-retarding additive in the cement-making process as well as in the manufacture of plaster and wallboard in developing countries; asbestos used as an additive in the manufacture of asbestos-cement pressure pipes for drainage and irrigation schemes.[82/]

The above mentioned construction materials are mostly used domestically. Pumice or perlite and vermiculite are scarcer minerals of higher value and can be exported for processing and inclusion in light-weight concretes.[83/]

(ii) Process Minerals: Minerals in this category may be grouped according to their end uses, such as:

82/ Industrial Minerals, 1977, op.cit.

83/ These minerals may also be classified as process minerals.

Abrasives (garnet, diatomite, tripoli); ceramics (ball clay, feldspar, talc); glass and foundry (silica sand); metallurgical (bauxite, fluorite), refractory (magnesite, chromite, high-alumina materials); general industrial minerals (barytes, bentonite, graphite, kaolin, mica). Diamonds should also be included in this category.

The unit value of these minerals is relatively high and can be exploited profitably in small quantities even from very remote areas.[84/]

(iii) Chemical and Fertilizer Minerals: This group of minerals includes salt, sulphur, some pure limestones, potash and phosphate. The development of this group of minerals depends on their quality and the ability to exploit them on a large scale.

In developing countries this group of minerals as well as process minerals are more likely to be produced for export markets while the group of construction minerals due to their physical and economic characteristics (bulky, low value per unit) are used more for the domestic market.[85/]

84/ Industrial Minerals, 1977, op.cit.

85/ Ibid.

ANNEX III

National, Regional and International Organizations related to Zaire's Economic/Industrial Development

Agricultural Development Fund (ADF)
African Development Bank (ADB)
Association Nationale des Entreprises Zairoises (ANEZA)
Banque Commercial Zairoise (BCZ)
Banque du Zaire (BDZ)
Banque Internationale pour l'Afrique Occidentale (BIIAO)
Centre d'Etude Financières, Economiques et Bancaires (CEFEB)
Caisse Centiale de Coopération Economique (CCCE)
Canadian International Development Agency (CIDA)
Conference of East and Central African States (CECAS)
Deutsche Entwicklungsgesellschaft (DEG)
Economic Community of the Great Lakes Countries
Economic Development Institute (EDI)
Entreprises Zairoises
European Bank (EIB)
Fonds d'Aide et de Coopération (FAC)
Food and Agriculture Organization (FAO)
Group of African, Caribbean and Pacific States (ACP Group)
International Development Association (IDA)
International Finance Corporation (IFC)
Kreditanstalt fur Wiederaufbau (KfW)
"Nouvelle Garantie Banque de Zaire" (NGBZ)
Office de Gestion de la Dette Exterieure Publique (OGEDEP)
Organization of African Unity (OAU)
Organization of Petroleum Exporting Countries (OPEC)
Office de Promotion des Petites et Moyennes (OPEZ)
Pan African Institute for Development (PAID)
Société Belge d'Investissement (SBI)
Société Internationale Financière pour les Investments et le Developpement en Afrique (SIFIDA)
Société Financière de Développement
United Nations Econmic Commission for Africa (ECA)
United Nations Development Programme (UNDP)
Union Zairoise de Banques (UZB)

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