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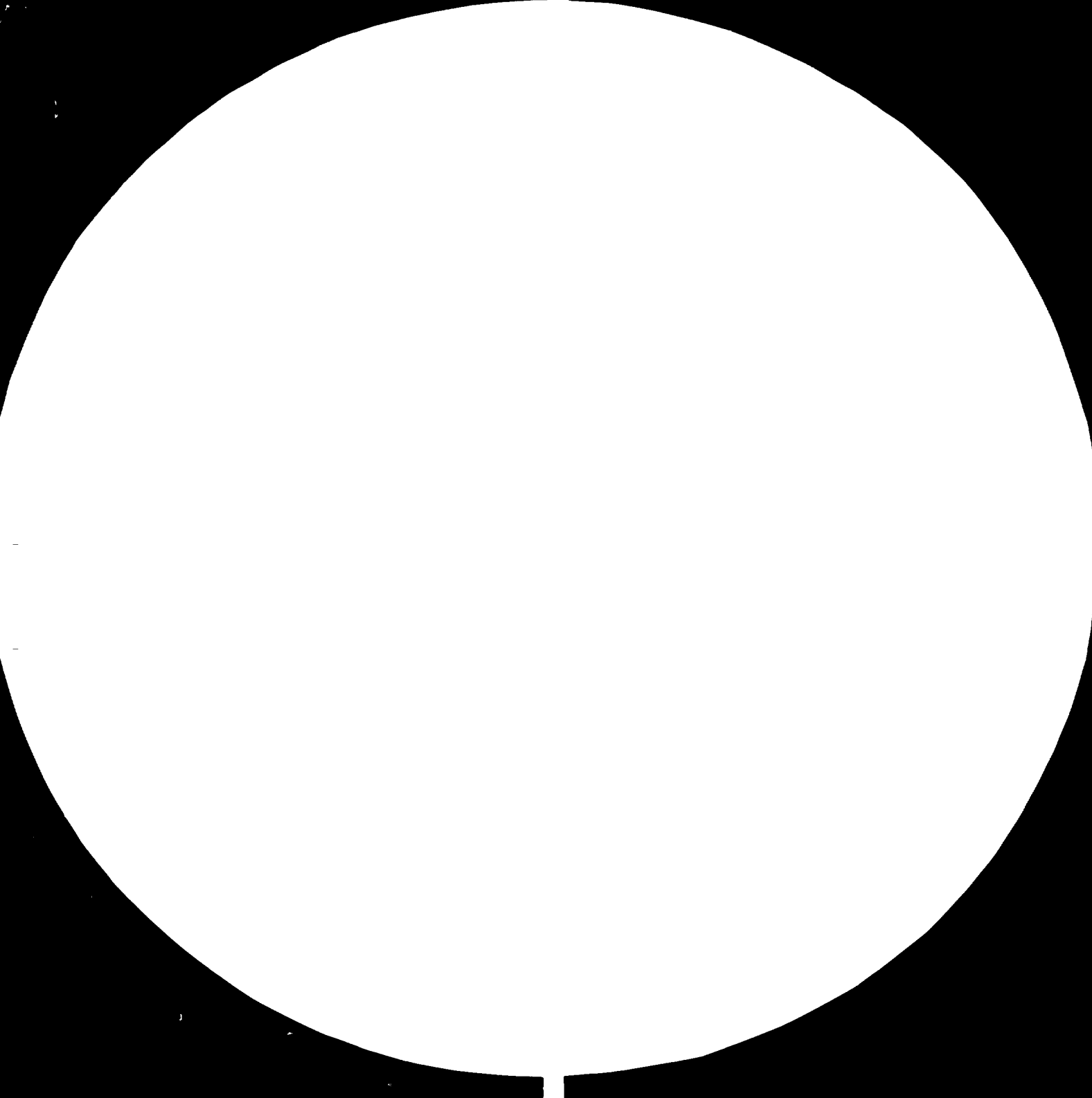

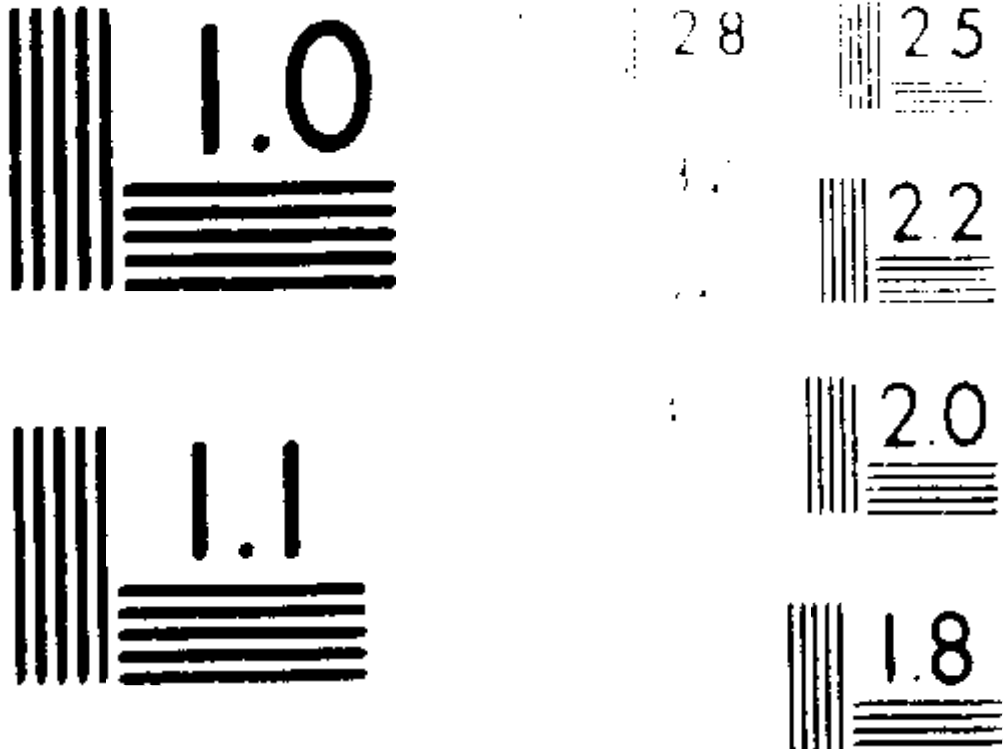
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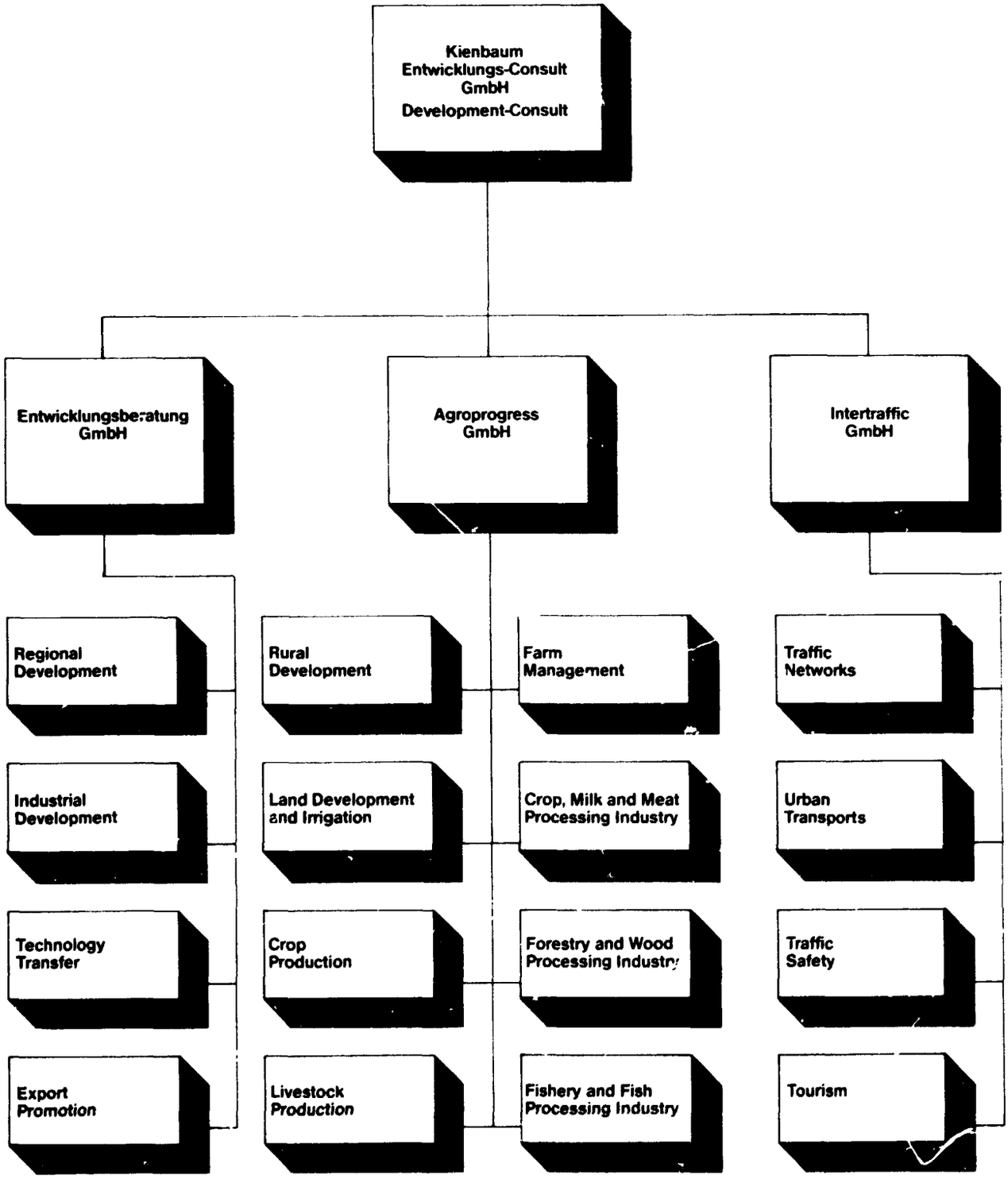


Kienbaum Entwicklungs-Consult

U P D A T I N G S U P P L E M E N T

to the

F I N A L R E P O R T

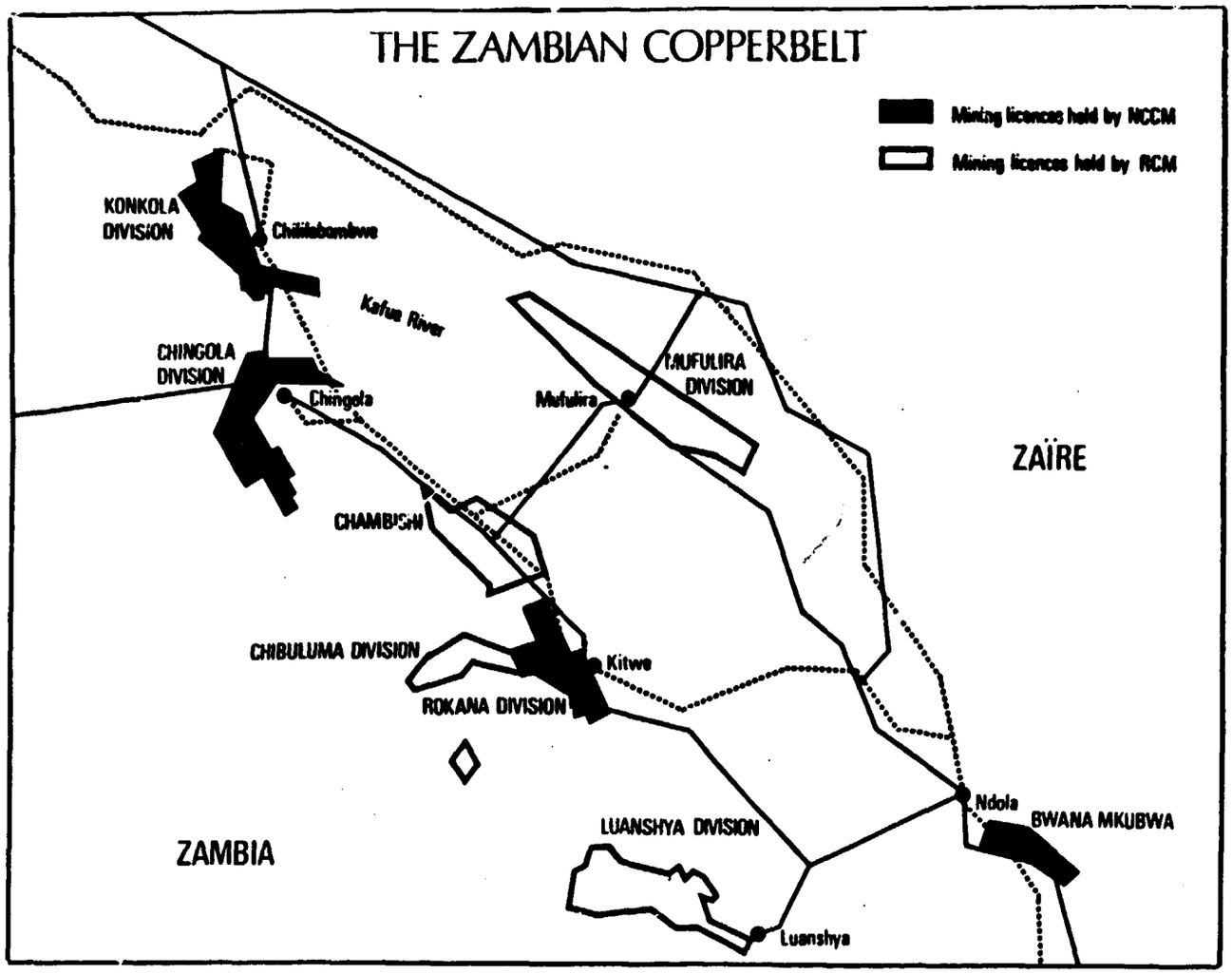
Feasibility Study for Production of Semi-Finished and Cast Copper and Brass Products in Zambia

UNIDO PROJECT TF/ZAM/77/oo1

Lusaka / Gummersbach

18th November, 198o

KIENBAUM ENTWICKLUNGS-CONSULT GMBH


THE ZAMBIAN COPPERBELT
Mining licences held by NCCM
Mining licences held by RCM
KONKOLA DIVISION
Chililabombwe
Kafue River
CHINGOLA DIVISION
Chingola
Mufulira
MUFULIRA DIVISION
ZAÏRE
CHAMBISHI
CHIBULUMA DIVISION
Kitwe
ROKANA DIVISION
Ndola
BWANA MKUBWA
LUANSHYA DIVISION
ZAMBIA
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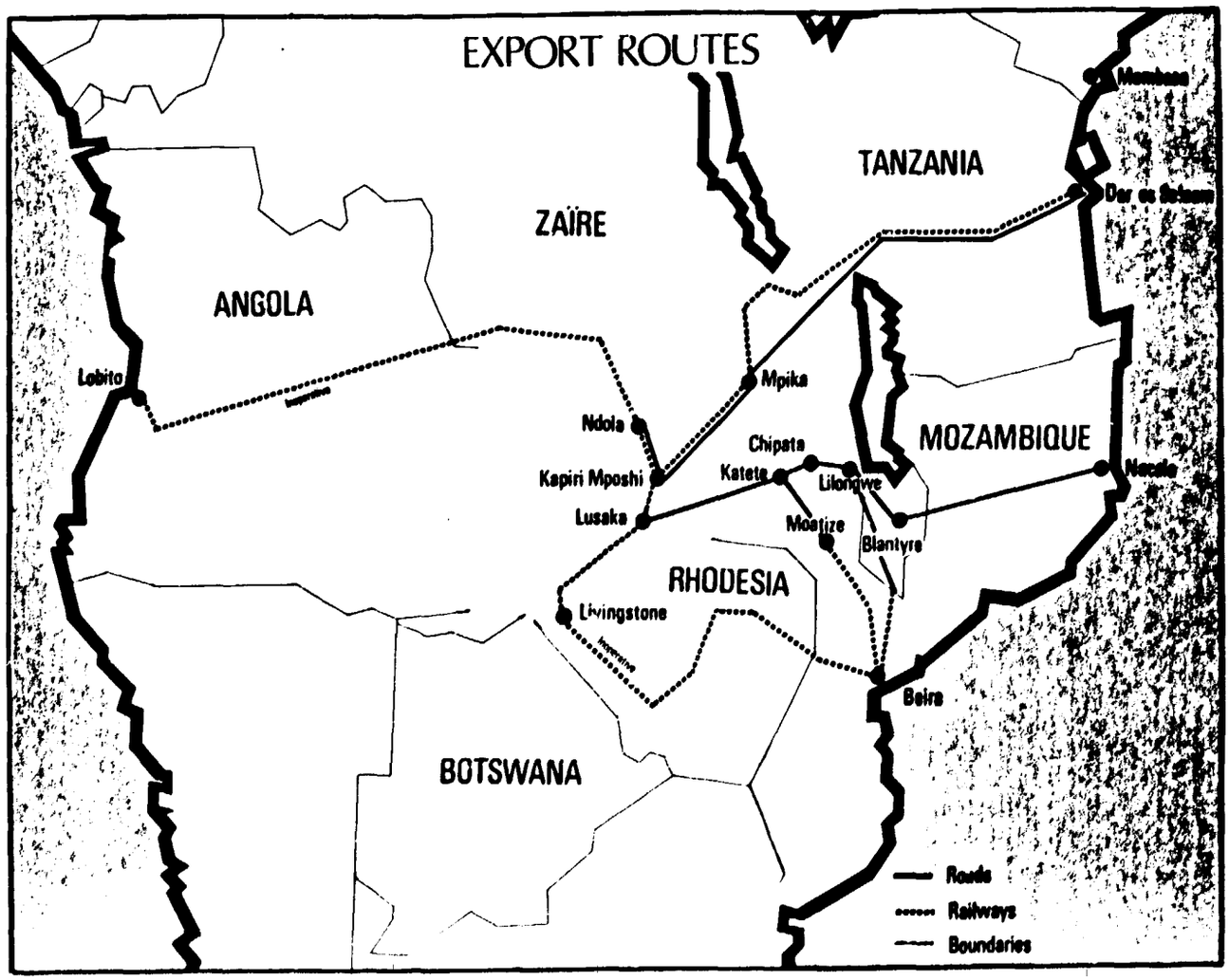
EXPORT ROUTES
TANZANIA
ZAÏRE
ANGOLA
Lobito
Mpika
Ndola
Kapiri Mposhi
Lusaka
Chipata
Katete
Lilongwe
Mwanza
Blantyre
MOZAMBIQUE
Nacala
RHODESIA
Livingstone
Beira
BOTSWANA
Roads
Railways
Boundaries

C O N T E N T S

A n n e x e s

L I S T O F T A B L E S

0. SUMMARY / CONCLUSION

The results of the updating study show that all aspects, i.e.

- internal market
- export markets
- costs and prices
- utilization of installed capacity and resulting profitability and economic viability
- macro economic benefits

indicate better conditions for an investment in manufacturing semi-finished and cast copper and brass products in Zambia that in 1977 when the original feasibility study was made.
There is no reason to change the proposed technology, as it is still the most appropriate one. No other, better or smaller plants have been developed, and in particular the high flexibility - i.e. a large variety of different products - of the proposed plant provides an outstanding advantage.

The essential elements of the project are :

- The production plant will comprise a smelting unit, a combined hot/cold rolling mill with great flexibility and a tube manufacturing unit.
- The production program will include sheets, strips and tubes of various dimensions and types out of copper and brass as well.
- The overall capacity of the production plant will be 9ooo t per year (3 shifts) with further extension possibilities.
- The plant will create 25o working places.
- The plant will create an added value to local raw materials of appr. 5o %.

- The project will improve supplies of semi-finished and cast copper and brass products to the local market, which are now limited due to shortage in foreign exchange for imports.
- The project will earn foreign currencies by exports.
- The total investment will be about 35 million Kwacha (estimated 1983 prices) 3o million for fixed assets and 5 million for working capital. Out of the total investment capital about 25 million Kwacha will be foreign exchange.
- The implementation of the plant will require a minimum of 3 1/2 years.

So the consultant recommends further procedures as follows :

1. Government decision to proceed.
2. Ministry of Industry/Ministry of State/INDECO - decision, whether the manufacturing plant for semi-finished and cast copper and brass products shall be attached to the ZAMEFA -plant, Luanchya, or whether a separate company shall be built. If the decision is in favour of attaching to ZAMEFA, all further proceedings shall be made in close collaboration with the board and the management of ZAMEFA.
3. Start tracing sources for financing, e.g. with The Development Bank of Zambia, African Development Bank, World Bank, IFC, European Development Bank, KfW, CDC and others and potential private investors as well.
4. Award contract to Consultants for preparation of detailed engineering and tender documents, overall planning and project management.

This conclusion and recommendation so far is made without consideration of additional plans and projects in the sector of copper industries in Zambia. There are however two important projects in preparation which are likely to have some influence on this project for production of semi-finished and cast copper and brass products in Zambia. These projects are the Zambian-Egyptian and the Zambian-Nigerian joint ventures on copper processing. Both projects are part of the Third National Development Plan of Zambia.

If these projects would materialize another more economic concept would be feasible : a hot rolling mill (minimum capacity 8o.ooo t.p.a.) could be erected in Zambia, its output would feed cold rolling mills (capacity 1o.ooo t.p.a. each) in Zambia, Egypt, Nigeria and other countries, even in industrialized countries of Europe, North-America etc. This concept has been studied and described briefly as supplement to Kienbaum Consulting's report on Production of Semifabricated and Cast Copper and Brass Products in Zambia of 2o. April 1978 (see annex "Alternative Concept").

During his stay in Zambia for this updating mission Dr. Mylenbusch has discussed this problem with the Permanent Secretary, National Commission for Development Planning and prepared a Memo on this issue (see annex 4).

It is strongly recommended to include the study of this "alternative concept" in the overall study of the Zambian - Nigerian joint venture.

If this alternative concept would turn out to be feasible, an other less sophisticated and less expensive technology could be applied, thus improving the overall viability and profitability of the copper and brass manufacturing plant in Zambia

1. ASSIGNMENT

On 8th October 1980 UNIDO asked Kienbaum Entwicklungs-Consult by telex dg 55170 to update the market analysis of their feasibility study on production of semi-fabricated and cast brass products in Zambia, which was performed during 1977 and whose final report was delivered in April 1978.

The updating was to be done during a four-week mission, which started on October 13th, 1980, when Dr. H. Mylenbusch, Executive Director of Kienbaum Entwicklungs-Consult, who has been responsible for Kienbaum feasibility study on production of semi-finished and cast copper and brass products in Zambia and also Kienbaum's previous studies on copper processing industries in Zambia, joined Mr. B.R. Nijhawan, Senior Inter-Regional Adviser and Mr. W. Shen, Senior Expert UNIDO Metallurgical Section, who had come to Lusaka from Vienna. The team was welcomed by Mr. K.C. Sen, Senior Industrial Development Field Adviser, Lusaka, who provided efficient assistance in arranging for meetings with the Ministry of Commerce and Industries, Ministry of Mines, Ministry of State/National Commission for Development Planning, the Development Bank of Zambia, INDECO and others. In addition to his fieldwork in Zambia, i.e. Lusaka and Copper Belt Region Dr.Mylenbusch also visited Zimbabwe, which now can be considered as additional export market area.

Dr.Mylenbusch would like to express his sincere thanks to Mr. Sen, Mr. Nijhawan and Mr. Shen.

2. ANALYSIS OF DEVELOPMENT 1977 - 1980

2.1 General economic situation in Zambia. The economic situation in Zambia during the years 1977 to 1979 was largely influenced by the affects of the final period of regional civil disturbances, in particular in Rhodesia/Zmbabwe. This was the main reason why rather few investments were made during this period. So the overall economic situation remainded more or less unchanged. This can also be learned from statistical data :

Table 1

GDP in Producer's Values at constant 1970 Prices

(Mill. Kw)

1975	1976	1977	1978	1979	1980
1.438	1.558	1.488	1.496	1.362	1.550

Source: Economic Report 1979/Annual Plan 1980
National Commerce for Development Planning

Now, in 1980 however, Zambia is on the verge to start a new period of economic development. This is - among others - demonstrated by the targets of the Third National Development Plan (TNDP) which indicates the following annual growth rates until 1983.

Table 2

Annual Growth Rates
1979-1983

Total	4,8 %
Electricity	6,o %
Manufacturing	8.o %
Mining	1,o %
Construction	5,5 %
Communication and Transport	5,o &

Source: TNDP

The target for GDP in 1983 amounts to a total of 2,246 million Kw, what means 65 % more than in 1979.
The target figure for manufacturing industries is 25o million Kw, compared with 152 million Kw performance in 1979 (= 64 % plus).

It is expected that private investment,local and foreign as well, will come to make us of quite a number of good opportunities in Zambia. Improved local manufacturing and thereby improved local supplies to the Zambian market will have essential accelerating effects as they are apt to overcome the present shortage of imported supplies, which are result of limited funds of foreign exchange.

A better situation than in 1977 however has developed not only in Zambia's internal market but also in its potential export markets. This applies to Mocambique and Angola and, in particular, to Zimbabwe. In the 1977 export market anaylsis Rhodesia was not included due to obvious reasons. Now, in 198o it cam be included and - as shown below - it provides a considerable market potential, which improves the export possibilities for the envisaged semifinished and cast copper and brass products plant in Zambia essentially.

An additional improvement for Zambia's export opportunities in the years to come will result from political and economic, in particular trade agreements which are being negotiated between the Governments of Zambia and her neighbouring countries. Zambia, Zimbabwe, Botswana, Tanzania, Malawi, Mocambique and Angola have different potentials in various areas and they will benefit largely from improved collaboration.

So it was found during this updating study that the overall economic situation in 198o and in particular in the years to come is much more favourable for an investment in manufacturing semifinished and cast copper and brass products in Zambia than it was in 1977.

2.2 Supplies and consumption of semifinished and cast copper and brass products.
The general trend of development of Zambias economic sectors can be learned from the following tables :

Table 3

Gross Domestic Product by Kind of Economic Activity in Producer's Values at Constant (197o Prices)

	1976	1977	1978	1979	Annual Growthrates 1979 - 1983 acc. TNDP
Total Gross Dom.Prod.	1558.2	1488.8	1496.4	1361.5	4,8 %
Agricult., Forestr.& Fish..	166.9	168.2	169.o	153.4	5,5 %
Minging & Quarring	5o3.2	469.7	5o4.8	4o5.1	1.o %
Manufacturing	151.9	141.4	15o.7	151.9	8.o %
Electr. Gas & Water	52.6	57.8	58.3	61.9	6.o %
Construction	157.6	154.3	119.4	96.o	5,5 %
Transport, Commun. and Storage	67.o	62.o	63.2	66.o	5,o %

)Source: Economic Report 1979, TNDP

Except Agriculture the sectors as mentioned in Table 3 are main consumers for semi-finished and cast copper and brass products. So it can be assumed that the demand for these products will grow by about 5 % p.a.

Table 4

Index of Industrial Production-Manufacturing

1973 = 1oo

	1977	1978	1979	198o	1983
Total	95,6	1o2.6	1o8	113	13o
Metal Products	76,3	73,8	7o	77	1o2,5

)Source: Economic Report 1979
198o and 1983 = Calculated acc. TNDP

These figures indicate that manufacturing industries have been suffering during 1978 and 1979 - among others from limited supplies of inputs, i.e. raw materials and semi-finished goods as well.

The following figures on external trade must be analysed with care, as the sharp rise in 1979 - exports is caused by the high copper price in 1979 and the rise in 1979 - imports is caused by increased oil prices.

Table 5

Development of Exports and Imports (Mill.Kw)

	1976	1977	1978	1979	198o
Exports	741	7o8	575	1.117	1.25o
Imports	431	539	5o5	61o	8oo
Balance	+31o	+169	+17o	+5o7	+45o

)Source: Annual Plan 198o
National Comm. of Dev. Planning

More specific indicators can be taken from the actual development of imports of copper and copper alloy semi-finished products

Table 6

Imports of Copper and Copper Alloy Products

1977	1978	1979
248 t	8o9 t	1,546 t

Source: Specific data from Central Statistical Office (2o.1o.198o).

These figures however cannot been considered, to indicate Zambias actual needs for these products.
As a matter of fact the general demand is much higher than actual supplies, which are provided for specific purposes - investments e.g. - on the basis of specific import licences. As it could be learned during field research from local dealers and consumers the potential requirements may be assumed to be at least twice, most probably three times the volume of supplies. This was said to apply in particular for copper tubes, but copper and brass sheets as well.

But not only current production consumes semi-finished and cast copper and brass products but also investments.

Table 7

Planned Investments 1979 - 1983
(Mill. Kw)

Mining	673	2o %
Manufacturing	45o	13,5 %
Construction	243	7,2 %
Electricity	19o	5,7 %
Transport & Communication	64o	19 %
TOTAL :	3.354	1oo %

Source: TNDP

As can be learned from these figures approximately two third of all investments during TNDP are likely to go into those sectors, which are main consumers of copper and copper alloy products

Finally it may be mentioned that also improved transport facilities will contribute to increased imports and exports as well and so stimulate the future development of Zambia's industries.

Table 8

Export and Imports by Route
(Tonnes 1ooo)

	1978		1979	
	Export	Import	Export	Import
Dar-es-Sal. Road	1o1	75	12o	98
Dar-es-Sal. Rail	41o	282	213	2o5
Lobito	76	o,2	43	5o2
Zimbabwe	-	-	213	251
TOTAL:	539	436	6o6	619

Source: Economic Report 1979

2.3 Costs and Prices

The average annual rate of inflation in Zambia during 1977 - 198o was between 15 and 2o %. For specific cost factors however the increase in cost or price was considerably below or beyond these figures.

Copper

The copper price is fixed by London Metal Exchange (LME). The development of this price is shown in the following Table :

Table 9

COPPER PRICE
(EL Wire Bars, LME)

1977	1978	1979	1980
1.016	1.084	1.560	1.200

Source: Economic Report 1979
1980 = actual 15. November 1980

Irrespective the fact that copper as raw material represents an essential cost factor in the calculation of ex-factory-prices for semifinished and cast copper and brass products its importantance for the economic profibility of a Zambian Copper Manufacturing Plant is of indirect nature. The sales prices of copper products use to be oriented at actual copper prices LME; so the cost factor "copper metal" is a neutral one with regard to profit and loss calculation.

Labour

As a result of government regulations the increase of labour costs in 1978 and 1979 was only around 5 % p.a. For 1980 and the years to come as well industrialists however expect an increase of about 10 to 15 % p.a.

Electricity

As may be learned from Economic Report 1979 the average selling price per kwh (0.72 Ngwee) was not changed since 1977. According to a ZESCO-statement the cost of electricity may be expected to remain stable also in the years to come.

Transport

The increase of transport and shipping-costs during 1977 - 1980 was about 7 % p.a.), as they are controlled by Contract Haulidge (CH). Their future increase must be expected to be in the range of at least 10 % due to higher oil prices.

Imported Goods

As supplies of imported goods were below actual demand - due to lack of foreign exchange - prices for imported goods rose considerably more than the internal rate of inflation. Figures of various items, including spares and semi-finished goods ranged between 3o to 4o % p.a.

Summing up it is found that the changes in costs and prices since 1977 werde in favour and not disadvantageous for local manufacturing of semi-finished goods in Zambia.

2. 4 Potential Export Markets

As already indicated when elaborating on the general development of Zambia's economic situation more peaceful conditions during the years to come will allow an improved concentration on economic development in Zambia and her neighbouring countries as well. In particular the new situation in Zimbabwe allows to include this country into the market area which can be considered as the preferential export-market-area for Zambian-made semi-finished and cost copper and brass products.
This is of special importance as Zimbabwe has manifold manufacturing industries, in particular copper and brass products fabricating industries which supply the Zimbabwe and many export markets outside the region as well.

The overall economic development of the countries of the preferential market area is illustrated by the figures as given on the following page.
Some specific data on Zimbabwe which was not indluded in the original study, are given on the next following page. It may also be mentioned here that Zimbabwe recently became partner country of the EEC-ACP-Lomé Agreement and that Zimbabwe has become member of World Bank in September 198o.

Table 1o

PREFERENTIAL MARKET AREA
Basic Economic Indicators

	Zambia	Zimbabwe	Kenya
1. Population, mill.(78)	5,8	6,9	14,7
2. GNP,bill $ (78)	2,5	3,3	4,8
3. GNP per capita ($) (78)	48o	48o	38o
4. GNP growthrate 7o-78 (%)	2,3	3,4	6,7
5. Industrial growthrate 7o-78 (%)	4,3	-)+	1o,4
6. Manuf.Ind.growthrate 7o-78 (%)	o,6	-)+	11,7
7. GD Investment growthrate 7o-78 (%)	-2,9	o,8	2,3
8. Value added in manufacturing 76 (mill($)	213	32o	357

Source: World Dev. Report 198o, IBRD

)+ no data available

Malawi	Tanzania	Mocambique	Botswana	Angola
5,7	16,9	9,9	o,7	6,7
1,o	3,9	1,4	o,3	2,o
18o	23o	14o	469	3oo
6,5	5,o	-3,2	-)+	-2o,o
6,8	2,3	-5,1	-)+	-4,1
6,7	4,5	-6,1	-)+	-12,8
1,1	1,9	-9,6	-)+	-1o,9
53	156	82	-)+	38

Table 11

Basic Economic Indicators Zimbabwe

	1975 mill.$	1978 mill.$	1975-1978 growth
GDP (Market Prices)	2.o11	2.332	16 %
Mining & Quarrying	126.3	145	15 %
Manufactu··ing	45o	454	1 %
Construction	94	74	./.12 %
Electricity & Water	5o	56	12 %
Transport & Communication	132	144	9 %

Source: Dep. of Information, Salisbury

This total market area represents a potential of 67,3 million consumers, producing a total GNP of 19 billion Dollar and an added value in manufactered goods of roughly 1.25 billion.

In particular Kenya and Zimbabwe with their considerable manufacturing industries will provide excellent and growing market chances for export of Zambia.

3 RESULTS OF THE UPDATED MARKET STUDY

Sales Prognosis 1980 - 1990

As outlined in chapter 22 the actual requirements for semi-finished and cast copper and brass products in Zambia may be estimated to be - based on 1979 imports of 2.546 t - between 6.000 t. p.a. minimum and 9.000 t p.a. maximum. Tubes, sheets and plates which are proposed to be the main products of the new plant use to make up approximately 80 % of imported semi-finished and cast brass products in Zambia (see Annual Statements of External Trade, C.S.O.).

This calculation results to actual requirements in 1979 of 5 - 7.500 t.p.a. of copper and brass tubes, sheets and plates in Zambia.
The countries of the preferential export market area represent in 1979 a total potential market for semi-finished copper and brass products of 20.000t p.a. (caluclated from various factors such as population, GDP, industrial production and others). Basing on these figures and assuming an average growth rate of manufacturing industries of 7 % p.a. (which with regard of target figures of national development plans must be considered to be conservative), the future market potentials for copper and brass sheets, plates and tubes calculate as follows :

Table 12 Market Potentials

Markets	1979	1985	1990
Zambia	5000 t	7500 t	10.500 t
Pref. Export-market Area	20.000 t	30.000 t	42.000 t
Total	25.000 t	37.500 t	52.500 t

When it is assumend that the new plant for copper and brass plates, sheets and tubes succeeds in achieving market shares of 75% in Zambia and 40% in its preferential export markets the achievable sales figures read as follos:

Table 13

Market Chances

Markets	1979	1985	1990
Zambia	3.750 t	5.625 t	7.875 t
Pref. Export-market Area	8.000 t	12.000 t	16.800 t
TOTAL :	11.750 t	17.625 t	24.675 t

Compared with the situation in 1977 this means, that the specific market situation for copper and brass sheets, plates and tubes in 1980 looks much more favourable than in 1977 and that it is well justified to establish a capacity of 10.000 t. p.a. with extension possibilities.

4. REVIEW OF FINANCIAL FEASIBILITY

As far as possible within the limited period of time also the financial feasibility was reviewed. With due consideration of the various factors of inflation a new overall-calculation of the investment has been worked out. Its main results for the first phase (without extension) are presented in the following tables :

Table 14

Fixed Investment (mill.Kw)

	Local Currency	Foreign Currency	Total
Infrastructure & Civil works	2	-	2
Buildings	2	1	3
Machinery & Equipment	-	25	25
Pre-Production Costs	1	2	3
TOTAL :	5	28	33

Table 15

Needed Capital (mill Kw)

	Local Currency	Foreign Currency	Total
Investment Capital	5	28	33
Working Capital	2,5	1,5	4
TOTAL :	7,5	29,5	37

The figures show that inflation in machinery supplying countries and in Zambia caused an increase of needed capital of nearly 6o %, compared with 1977.

As prices for manufactured goods rose more than costs of labour utilities etc. in Zambia (see also chapter 2.4) the overall profitability shows better results than 1977 :

Table 16

Profitability

		Mill.Kw.
1.	Sales revenues	4o
2.	Production costs	2o
3.	Gross profit	2o
4.	Interests	4
5.	Depreciation	1
6.	Profit before tax	15
7.	Corporate tax	7,5
8.	Net profit	7,5

This improved profitability is caused however mainly by better utilization of installed capacity.
As a result of higher profitability the probable pay back period will be reduced to fiye years.

5. SUMMARY

The results of the updating study show all aspects, i.e.

- internal market
- export markets
- costs and prices
- utilization of installed capacity and resulting profitablity and economic viability
- marco economic benefits

indicate better conditions for an investment in manufacturing semi-finished and cast copper and brass products in Zambia that in 1977 when the original feasibility study was made.
A tabulated statement comparing the essential para,eters 1977 to 198o is given on page 19.
There is nc reason to change the proposed technology, as it is still the most appropriate one. No other, better or smaller plants have been developed, and in particular the high flexibility - i.e. a large variety of different products - of the proposed plant provides an outstanding advantage.

The essential elements of the project are :

- The production plant will comprise a smelting unit, a combined hot/cold rolling mill with great flexibility and a tube manufacturing unit
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- The project will earn foreign currencies by exports.
- The total investment will be about 35 million Kwacha (estimated 1983 prices) 3o million for fixed assets and 5 million for working capital. Out of the total investment capital about 25 million Kwacha will be foreign exchange.
- The implementation of the plant will require a minimum of 3 1/2 years.

So the consultant recommends further procedures as follows :

1. Government decision to proceed.
2. Ministry of Industry/Ministry of State/INDECO - decision, whether the manufacturing plant for semi-finished and cast copper and brass products shall be attached to the ZAMEFA -plant, Luanchya, or whether a separate company shall be built. If the decision is in favour of attaching to ZAMEFA, all further proceedings shall be made in close collaboration with the board and the management of ZAMEFA.
3. Start tracing sources for financing, e.g. with The Development Bank of Zambia, African Development Bank, World Bank, IFC, European Development Bank, KfW, CDC and others and potential private investors as well.
4. Award contract to Consultants for preparation of detailed engineering and tender documents, over all planning and project management.

SURVEY ON UPDATED PARAMATERS

	1977	198o	Change	Remarks
1. General Economic Situation				improved
2. Zambian Market	3.75o t	5.ooo t	+ 33 %	possible more
3. Regional Market	1o.ooo t	2o.ooo t	+ 1oo %	possible more
4. Technology			-	same technology
5. Working Places	25o	25o	-	
6. Costs			+ 2o %	local costs only
7. Prices			+ 35 %	imported goods more
8. Investment Capital	24 Mill Kw	37 Mill Kw	+ 54 %	due to inflation
9. Profitability (Second Year of Operation)	9,2 %	2o %	+117 %	due to better utilisation of capacity
1o. Pay Back Period	8,5 years	5 years	./.41 %	
11. Macroeconomic Benefits				same/improved

A N N E X E S

1. S.I.D.F.A.'s Introducing Letter

2. Minute of Meeting with Ministry of Commerce and Industry

3. Minute of Meeting with National Commission for Development Planning

4. Memo on Copper Processing in Zambia

UNITED NATIONS

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20 October 1980

TO WHOM IT MAY CONCERN

Dr. Mylenbusch is a UNIDO Consultant who has been deputed by the UNIDO Vienna to Lusaka for a few weeks to undertake the following study.

Feasibility Study on Production of
Cast Brass Products

Any assistance that you could offer to facilitate his work will be greatly appreciated.

K. C. SEN
Senior Industrial Development Field Adviser

Mr.
16.11.88

MINUTE OF MEETING

Meeting with the Hon. Minister of Commerce and Industry Hon. R, Chisupa

Mr. Keshap C. Sen, UNDP Senior Industrial Development Field Adviser Zambia introduced Mr. B.R. Nijhawan, UNIDO Senior Inter Regional Adviser (Metallurgical Industries), Mr. Shen, Senior Expert UNIDO Metallurgical Section and Dr. H. Mylenbusch, Senior Expert for Manufacturing industries of Kienbaum Consulting.

Mr. Sen reported about the history of UNIDO studies on copper processing industries in Zambia: first study on copper processing industries, second study on Zambian-Egyptian joint venture, third study on copper and brass semi-finished products in 1977/78 which now is being updated.

All studies were performed by Kienbaum Consulting.

The Hon. Minister confirmed that the joint venture with Egypt is still under consideration and subject of negotiations between the two Governments. Recently the plan for a joint venture with Nigeria has come up.

All this, declared the Minister including the production of semi-finished and finished copper and brass products in Zambia must be seen together under the general objective to increase the added value to copper within the country. So the project for manufacturing semifinished copper and brass products would fully meet with the general development strategy of the Zambian Government. This Government would decide and proceed quickly, as soon as detailed proposals were presented.

Mr. Nijhawan stressed, that these development projects should be seen under the aspect of the year 2000, when manufacturing industries are to play a much more important role in the economies of developing countries.

Mr. Mylenbusch declared that according to his findings the preconditions for copper and brass manufacturing have changed favourably during the last two years. In particular new potential export markets as e.g. Zimbabwe and Mozambique have come into the picture.

Mr. Shen explained his specific involvement in the copper and brass manufacturing project and stressed his sincere hope that the Government of Zambia will take quick decision once the updated study will be presented.

The meeting closed at 12.30

Dr. H. Mylenbusch

Minutes of the Meeting held with National Commission for Development Planning, Permanent Secretary, Dr. L. Chivuno on 17 October 1980 at 10.00 a.m.

21.10.80

Present: Mr. K.C. Sen, SIDFA UNIDO Lusaka
Mr. B.R. Nijhawan, UNIDO Senior Interregional Adviser (Metallurgical Industries)
Mr. W. Shen, Senior Industrial Development Officer (Metallurgical Industries Section UNIDO)
Mr. H. Mylenbusch, Senior Expert Manufacturing Industries of Kienbaum Consulting

Mr. Sen introduced Mr. Nijhawan, Mr. Shen and Mr. Mylenbusch and reviewed briefly the history of the copper processing project. Dr. Chivuno committed his thanks, also in the name of the Zambian Government for the quick reaction of UNIDO for updating the study on semi finished and cast copper and brass production in Zambia. He stressed the importance of producing higher added value goods out of copper and copper alloys in Zambia to become less dependent on world raw copper demand and world market prices. He confirmed that Zambia's industry is likely to make fast progress. Many investments in the private sector are coming up and also the government is on the way to realize several important projects.

Mr. Shen stressed the necessity for quick action, once the findings of Dr. Mylenbusch's updating mission will be presented.

Dr. Chivuno confirmed to do so. Finally Mr. Sen and Dr. Chivuno discussed the information mission of Zambian experts to several countries as preparation for the Zambian-Nigerian joint venture copper fabricating plant project.

Mr. Sen informed the Permanent Secretary that UNIDO had agreed to extend the team to five members and to provide finance. Dr. Chivuno thanked UNIDO and confirmed to name the additional team members and to select the countries to be visited soon.

Mr. Mylenbusch offered his assistance when the team would come to Germany. This was noticed with thanks by Dr. Chivuno and Mr. Sen as well. The meeting ended at 10.45 a.m.

[illegible]

Ref: Copper processing industries in Zambia

1. The Third National Development Plan 1[illegible] - 1[illegible] (TNDP) of Zambia includes three major investments in copper processing industries:

   - local manufacturing of semi-finished and cast copper and brass products
   - Zambian - Egyptian joint venture
   - Zambian - Nigerian joint venture

2. With regard to facts in copper processing technology

   - first stage: hot rolling, minimum capacity 80.000 - 100.000 M/T p.a.
   - second stage: cold rolling, minimum capacity 10.000 - 20.000 M/T p.a.

   It is obvious, that the three projects of the TNDP must not be seen seperately but under integrating aspects.

   It is, e.g., most likely that a hot rolling mill, located in Zambia's Copperbelt, supplying cold rolling mills in Zambia, Egypt, Nigeria and eventually further countries like Syria or Pakistan will prove to be an optimum concept. Otherwise, Zambia is running the risk that the major benefits of the joint ventures go to the other countries, leaving Zambia as supplier of - preferably cheap - raw copper.

Brief Data

Kienbaum Consulting Group

Registered Capital	DM 3.000.000
Total Billings 1978	DM 34 million
Staff	245 and Associates

Projects 1970–1979 in

Latin America	49
Africa	67
Near/Middle East	17
South East Asia/Far East	28
Total	161

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