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Report No. P-1220a-ZA

REPORT AND RECOMMENDATION

OF THE PRESIDENT

TO THE

EXECUTIVE DIRECTORS

ON A

PROPOSED LOAN

TO THE ZAMBIA ELECTRICITY SUPPLY CORPORATION LIMITED

WITH THE GUARANTEE OF

THE REPUBLIC OF ZAMBIA

FOR THE KAFUE HYDRO-ELECTRIC PROJECT

JUNE 21, 1973

Public Disclosure Authorized

CURRENCY EQUIVALENTS

Zambian Kwacha (K)1	=	US$1.56
US$1	=	K0.64

GOVERNMENT OF REPUBLIC OF ZAMBIA
FISCAL YEAR

January 1 - December 31

ZAMBIA ELECTRICITY SUPPLY CORPORATION
FISCAL YEAR

July 1 - June 30

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

REPORT AND RECOMMENDATION OF THE PRESIDENT TO THE EXECUTIVE DIRECTORS ON A PROPOSED LOAN TO ZESCO FOR THE KAFUE HYDRO-ELECTRIC POWER PROJECT

1. I submit the following report and recommendation on a proposed loan in an amount in various currencies equivalent to US$115.0 million to the Zambia Electricity Supply Corporation Limited (ZESCO) for the construction of a storage dam at Itezhi Tezhi, a 300 MW extension of the Kafue power station and a 60 km, 330 kv transmission line. The loan would have a term of 25 years, including 5½ years of grace, with interest at 7¾ percent per annum, and be guaranteed by the Republic of Zambia.

PART I - THE ECONOMY

2. A report entitled "Economic Position and Prospects of Zambia" was distributed to the Executive Directors on January 18, 1973 (R73-11). A summary of this report together with an account of development since January, 1973 was presented in the President's Report dated May 15, 1973 (PA-1229a-ZA) on the loan to Zambia for the third education project, and is attached in Annex I.

PART II - BANK GROUP OPERATIONS

3. As of April 30, 1973 the Bank had made thirteen loans to Zambia totalling $178.6 million after cancellations, of which $123.9 million is now held by the Bank. IFC made its first investment in Zambia in February, 1972, providing $1.1 million for expansion of a shoe manufacturing company. Present and future Bank operations have been discussed in the President's Report on the third education project dated May 15, 1973 and are summarized in Annex II which also contains a statement of Bank and IFC operations as of April 30, 1973 and notes on the execution of ongoing projects. A President's Report on a proposed program loan to Zambia was distributed on May 25, 1973.

PART III - THE ELECTRIC POWER SECTOR

4. Mining, which dominates the Zambian economy by contributing about 98 percent of foreign exchange earnings and employing 16 percent of the wage labor force, is by far the largest consumer of electricity. Copper is the most important mineral and in 1972 the copper industry consumed 92 percent of electricity consumption. Manufacturing industry has increased its electricity consumption by about 20 percent annually in recent years, but its share of total consumption is still small. Per capita consumption is about 1,000 Kwh which is high for an African country, but comparable to per capita consumption in other copper producing countries such as Chile. All principal

cities, industrial centers, and the majority of towns along the line-of-rail from Livingstone to the Copperbelt are supplied with electric power, but the more remote areas are not serviced. Almost half of the people in urban areas have access to electricity compared to 2.5 percent in rural areas. In the past, electricity consumption grew by 6½ percent a year, but for the future a faster growth of 7 tc 8 percent is expected mainly because of a large copper expansion program and changing technology in the copper industry.

5. Total generating capacity in Zambia is presently 843 MW comprising 108 MW at Victoria Falls, 600 MW at Kafue I and 135 MW from small thermal stations. Generating capacity presently available to the interconnected system serving Zambia and Southern Rhodesia is 1884 MW and is adequate to meet the estimated maximum demand until shortly before the Kariba North project on the Zambian side of the Zambezi River is commissioned in late 1975. The construction of the Kariba North station which is being assisted by a Bank loan, will add 600 MW capacity to the interconnected system. By 1977 another 300 MW generating capacity would be required and this would be met by the proposed project.

6. The major wholesale supplier of electric power to Zambia as well as to Southern Rhodesia is the Central African Power Corporation (CAPC) which owns the Kariba dam and the South Bank power station, and transmits power from this and other sources over its extensive 330 kv grid. The CAPC, established following the dissolution of the Federation of Rhodesia and Nyasaland in 1963, is jointly owned and operated by Zambia and Southern Rhodesia. The Corporation is controlled by a Higher Authority for Power (HAP) comprising members from both Zambia and Southern Rhodesia. Following Southern Rhodesia's Unilateral Declaration of Independence (UDI) in 1965, Zambia refused to recognize the members appointed from Southern Rhodesia to the HAP and CAPC. In spite of UDI, CAPC has continued to carry out its day-to-day operations under a management committee, and the interconnected system has operated efficiently for over a decade.

7. Other distributors of power in Zambia are the Copperbelt Power Company (CPC), owned 51 percent by government and 49 percent by the government-controlled mining companies, and ZESCO, which is wholly owned by the government. CPC purchases power from CAPC to supply the copper companies; and ZESCO is engaged in bulk production, transmission, and retail supply to all users in Zambia except for the mines and mine townships. In addition to a few small, isolated hydro-electric and thermal stations, ZESCO operates three hydro-electric generating stations at Victoria Falls and the Kafue Stage I hydro-electric development. Bulk power from these sources is sold to the CAPC but ZESCO also purchases power from the CAPC grid for its retail supply. Until 1972, energy was imported from Zaire for use in the CAPC system. However, Zaire no longer has excess energy and has indicated it would like to import from CAPC's system from 1973 onwards.

8. Future planned development in the electric power sector to 1978 besides this project, consists of the expansion of (a) CAPC's 330 kv

transmission system in Zambia and Southern Rhodesia, and (b) ZESCO's distribution system. Additional generating capacity, expected to be required by 1979, is likely to be met most economically and conveniently by a third stage of Kafue (450 MW) and a further expansion of ZESCO's transmission system. Construction plans for this scheme, however, have not yet been completed.

9. Bank lending has been a major factor in developing the interconnected system in Zambia and Southern Rhodesia. The first Bank loan (145-RN) was made in 1956 for the Kariba dam, the adjacent South Bank station in Southern Rhodesia, and the interconnected 330 kv power system; the second Bank loan (392-RNS) was made in 1964 for power system extension; the third Bank loan (701-ZA) was made in 1970 for the Kariba North Bank station; and the proposed loan would be the fourth loan in support of the power sector in Zambia. A supplementary loan to help finance a cost overrun on the Kariba North Bank project is also contemplated (see Annex II).

PART IV - THE PROJECT

10. An Appraisal Report entitled "Zambia - Appraisal of Kafue II Hydroelectric Project (Stage II)" No. 86a-ZA dated May 7, 1973 is being circulated separately. A Loan and Project Summary is provided in Annex III.

11. The Project was prepared by government and ZESCO with assistance from their consultants, the Swedish Consulting Group (SWECO). The Project was appraised in the field in August and October 1972, and negotiations were held in mid-April, 1973. Mr. E. C. Chibwe, Permanent Secretary, Ministry of Finance, led the Zambian delegation, which included Mr. P. Siwo, Permanent Secretary, Ministry of Power, Transport and Works, and Mr. B. Munyama, Chairman of ZESCO.

Description and Purpose

12. The Project would form Stage II of a program for the hydro-electric development of the Kafue River - a tributary of the Zambezi and a major source of low cost power in Zambia. The first stage was completed in April, 1972 at a cost of $118 million and consisted of a dam at Kafue Gorge and 600 MW of installed generating capacity.

13. The Project would consist of a storage dam across the river at Itezhi Tezhi (250 km upstream from the Stage I powerhouse), a 300 MW extension of the Stage I power station, and a 60 km, 330 kv transmission line connecting the power station with the CAPC grid at Kafue town. The 600 MW Stage I station presently operates with little water storage and generates 3600 Gwh annually, on average, of which 1800 Gwh is firm. This firm output would increase to 5200 Gwh on completion of the Project and, together with the output from the two additional generators, would enable total annual generation to increase to about 6200 Gwh. Stage III would involve the installation of 450 MW immediately downstream from the Stage I powerhouse.

Execution

14. The Project would be undertaken by ZESCO; SWECO would supervise its construction. Construction of the dam is expected to commence during the latter half of 1973. Partial filling of the reservoir is planned for 1976 and the generating units are scheduled to be installed by the end of that year.

15. The geological formation of the dam site comprises granite overlain by mudstone rock and alluvium overburden. Granite would not be available as part of the immediate foundation for the dam in the valley portion but the mudstone rock would offer adequate support for the proposed dam. The alluvium would be removed to the full depth under the central portion of the dam structure. As there are some faults in the area, the geological conditions, sources of construction material, and project design were reviewed by an international Board of Consultants comprising wellknown experts. They concluded that the system does not constitute an active fault pattern and that there should be no major construction problems.

16. Nearly all of ZESCO's senior staff are expatriates, and there is a shortage of experienced Zambian staff at all levels. However, ZESCO is making extensive efforts to train and recruit staff to keep pace with its expanding operations and is receiving substantial technical assistance from Sweden. To help ensure that competent management would be maintained assurances have been obtained that the Bank would be consulted on appointments to the posts of Chief Engineer and Financial Controller, and that ZESCO would recruit experienced staff to fill vacant key positions.

Project Costs and Financing Plan

17. The cost of the Project, excluding interest during construction, is estimated at US$137.7 million equivalent. Not including physical and price contingencies, civil works account for $58.9 million equivalent and generating plant and transmission equipment for $17.2 million equivalent. Assessments of the Project cost were made by the Project consultants and also an independent firm of consultants. In addition, after prior review by the Bank, bid invitations were issued for construction of the main dam on the basis of international competitive bidding. The tenders were opened in January, 1973 and the contract has been awarded to Impregilo-Recchi, an Italian firm, at a price about 25 percent less than the consultants' cost estimate. The consultants' earlier cost estimate has been reduced accordingly.

18. The contingencies included in the cost estimates still amount to $47.0 million. These are high but justified considering recent cost escalations on civil works projects in Zambia and uncertain transport conditions in the area.

19. The proposed loan would finance the foreign exchange cost of the Project, estimated at $96.3 million equivalent, and interest during construction on the Bank loan, estimated at $18.7 million equivalent. The total Bank loan would thus be $115 million. The loan would be for a period of 25 years including a 5½ year grace period. The local costs of the Project, estimated

at $41.4 million equivalent, would be financed by borrowing from the government on terms similar to the proposed Bank loan. The Government of Zambia has agreed to provide any additional funds required to complete the Project.

ZESCO's Financial Condition

20. ZESCO, incorporated in December, 1969, was established to take over the existing power supply undertakings in Zambia, other than CAPC and the Kariba North Bank Company. The takeover of these entities brought a number of problems which have to be taken into account when assessing ZESCO's financial position. Firstly, the organizations acquired were financed entirely by long-term debt and a small government grant. As a result, ZESCO's capital structure as of June 30, 1972 contained little equity. Secondly, because of inadequate rates and difficult operating conditions, ZESCO's predecessors obtained insufficient revenues, and the combined operations of ZESCO therefore produced a net loss during 1970/71.

21. Measures are being undertaken to improve ZESCO's financial position. The preliminary operating results for 1971/72 indicate a net income of about K1.1 million. A significant upward revision of ZESCO's bulk supply tariffs to CAPC from the Victoria Falls and Kafue stations is currently being negotiated and is expected to be implemented by the end of the year. A 25 percent increase in ZESCO's retail tariffs - from which it derives the bulk of its operating revenues - has been approved by government and will become effective July 1, 1973. These revised retail tariffs, which would be put into effect before the proposed loan becomes effective, would significantly improve ZESCO's financial position. The appraisal forecasts, based on ZESCO's present bulk supply tariffs to CAPC and the revised retail tariffs, indicate that ZESCO would achieve an annual rate of return on its net fixed assets of at least 8 percent and contribute a minimum of 25 percent to the cost of expansion (including Kafue III) to 1977. Assurances have been obtained during negotiations that ZESCO would take all necessary steps to earn an 8 percent return from 1974/75 and that the government would take necessary measures to enable it to do so. In addition, it was agreed that ZESCO would not incur any debt without prior Bank approval unless maximum future debt service is covered at least 1.4 times.

22. To improve its capital structure, ZESCO has asked the government to convert to equity one half of K40.2 million of debt which was assumed when ZESCO took over existing undertakings. No action has yet been taken since the government is presently reviewing its general policy towards its investments in all parastatal organizations. During negotiations, the government agreed that it would not ask for repayment of any portion of this debt during the construction period of the Project if such repayment would have a material and adverse effect on ZESCO's ability to meet its financial requirements. However, even if this debt were not converted into equity, the gradual accumulation of retained earnings is expected to improve the debt/equity ratio to 82/18 by 1979/80.

23. In 1972, the government transferred the Kafue Project - Stage I to ZESCO in exchange for a K84 million loan. Although the asset and liability

have been recorded on ZESCO's books, and thus do not affect the financial structure of ZESCO, the transaction has yet to be completed. During the negotiations it was agreed that as a condition of effectiveness the government vest in ZESCO the legal title to these assets and the loan agreement be signed.

24. As each of the organizations acquired by ZESCO used different accounting systems and procedures, and in some cases had improperly maintained records, ZESCO faced difficult problems in establishing proper accounting records. ZESCO has engaged an accounting firm to serve as auditors and to assist in the establishment of a proper accounting system. An assurance has been obtained that ZESCO will continue to employ auditors satisfactory to the Bank.

Market for Energy Produced

25. The facilities, scheduled to be installed by 1977, are designed to meet the needs of the interconnected system serving both Zambia and Southern Rhodesia and all of the energy produced will be sold to CAPC. Sales by CAPC have been increasing at an average rate of 9 percent per annum during the last seven years. CAPC's sales during 1973/80 are forecast to increase at 8 percent per annum to a total of 16400 Gwh, excluding possible sales to Zaire. Sales in Zambia are expected to increase by 7 percent per annum to a total of 7900 Gwh in 1980, and in Southern Rhodesia by 10 per annum to a total of 8500 Gwh in 1980.

26. Despite UDI, the CAPC has continued to function as a joint entity and has operated the system with great savings to both Zambia and Southern Rhodesia. If the interconnected system, in spite of the two countries' continuous support, should break down, the hydroelectric resources within Zambia would barely meet the estimated requirements in 1977 and the program of construction of the Itezhi Tezhi dam would therefore be appropriate. Under these circumstances the extension of the Kafue power station could be postponed for about 2 years; however, if Zambia were to meet the indicated Zaire power requirements, the phasing of the project would be justified as proposed.

27. Maximum demand on the CAPC system is expected to reach 2460 MW in 1980 with energy requirements at that time reaching 17000 Gwh. Without the Kafue Stage II project, shortages of capacity would be experienced in 1978 and shortages in firm energy resources would occur in 1977. By 1980, these shortages would amount to 507 MW and 5000 Gwh respectively.

28. The energy supply position would also be difficult until the commissioning of Kariba North if there is a period of less than average rainfall. To protect against a possible shortage, the government has agreed to consider, among other measures, a temporary increase in the lake level of the Kafue Stage I reservoir by 1.2 m. This would only affect some marginal pasture land.

Economic Justification and Benefits

29. The proposed Project is the most economic source of the additional power required. Investigations by CAPC and ZESCO of other possible sources

(i.e. hydro-electric development on the Zambezi downstream from Kariba, or thermal stations in Zambia or Southern Rhodesia) have shown that costs of these alternatives would be considerably higher than Kafue II. It would meet CAPC's needs for increased energy, and as such be complementary to investments in additional mining capacity necessary to increase Zambia's foreign exchange earnings, government revenue and employment.

30. The economic return on investment in the Project is at least 18 percent. It was calculated using revenues assessed on the basis of average energy generation and CAPC's prevailing average retail tariff and therefore represents a conservative estimate of the return on the project.

Procurement and Disbursement

31. All goods and services costing over $20,000 would be procured through international competitive bidding in accordance with Bank/IDA guidelines. The Bank loan would be disbursed to finance 70 percent of the total cost of civil works, the c.i.f. cost of the equipment and the foreign cost of the engineering services. A preference margin of 15 percent would be given to Zambian suppliers of equipment. The loan also provides retroactive financing not exceeding $3.0 million for certain preliminary civil works expenditures incurred after July 1, 1972 and for engineering costs incurred after January 1, 1973.

Environmental Aspects

32. The ecological aspects of the Project have been examined, and no serious problems are expected. The most significant impact of the Project on the environment is the elimination of flooding on the flats below the dam in dry years. Such flooding is responsible for much of the grass upon which a large number of cattle and wildlife survive. The reservoir, therefore, will include a sufficient volume of water in addition to that required for the power discharges to induce a degree of flooding necessary to reproduce the natural condition. The reservoir, which would partly be located within Kafue National Park, would not affect any settlements. With time, the reservoir is likely to become important for fishing.

33. Tse-tse flies and snail hosts of schistosmiasis are common in the area. As these would present health hazards to the temporary labor force, the contractor for the Project would be responsible for ensuring that satisfactory sanitary and health measures are established and enforced. The nature of these measures was indicated in the bidding documents for the Itezhi Tezhi dam, and would also be outlined in those for the powerhouse extensions.

PART V - LEGAL INSTRUMENTS AND AUTHORITY

34. The draft Loan Agreement between ZESCO and the Bank, the draft Guarantee Agreement between the Republic of Zambia and the Bank, the Report of the Committee provided for in Article III, Section 4(iii) of the Articles of Agreement, and the text of a resolution approving the proposed loan are being distributed to the Executive Directors separately. The loan documents conform to the normal pattern for loans for power projects.

35. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Bank.

PART VI - RECOMMENDATION

36. I recommend that the Executive Directors approve the proposed loan.

Robert S. McNamara
President

Attachments

June 21, 1973

COUNTRY DATA - ZAMBIA

AREA
752,600 km²

POPULATION
4.25 million (mid-1971)
Rate of Growth: 2.5% (from 1963 to 1969)

DENSITY
5.6 per km²
42.5 per km² of arable land

POPULATION CHARACTERISTICS (1969)

Crude Birth Rate (per 1,000)	42
Crude Death Rate (per 1,000)	17
Infant Mortality (per 1,000 live births)	160

HEALTH (1969)

Population per physician	11,200
Population per hospital bed	280

INCOME DISTRIBUTION

% of national income, lowest quintile	..
highest quintile	..

DISTRIBUTION OF LAND OWNERSHIP (1969)
94% of the land is communally owned.

ACCESS TO PIPED WATER (1969)

% of population - urban	87.0
- rural	10.5

ACCESS TO ELECTRICITY (1969)

% of population - urban	46.4
- rural	2.5

NUTRITION

Calorie intake as % of requirements	95
Per capita protein intake (grams per day)	69

EDUCATION (1970)

Adult literacy rate %/1	43
Primary school enrollment %	80

GNP PER CAPITA in 1971: US $350

GROSS NATIONAL PRODUCT IN 1971 (estimate)

	US $ Mln.	%
GNP at Market Prices	1,509	100.0
Gross Domestic Investment	477	31.6
Gross National Saving	253	16.7
Current Account Balance	-224 /2	-14.9
Exports of Goods, NFS	697	46.2
Imports of Goods, NFS	713	47.2

ANNUAL RATE OF GROWTH (%, constant prices)

	1960-65	1965-70	1971
GNP at Market Prices	+5.6	+5.5	+0.5
Gross Domestic Investment	+19.5	+29.8	+14.5
Gross National Saving	..	+10.2	-53.5
Current Account Balance	.	.	.
Exports of Goods, NFS	..	+1.1	-7.0
Imports of Goods, NFS	..	+10.4	+5.2

TERMS OF TRADE (1964 = 100)

	1964	1965	1966	1967	1968	1969	1970	1971
Price index Exports of Goods (1)	100	112	156	156	170	234	201	160
Price index Imports of Goods (2)	100	101	104	103	113	117	121	126
Terms of Trade (1) : (2)	100	110	150	151	150	201	166	127

OUTPUT, LABOR FORCE AND PRODUCTIVITY IN 1971 (estimates)

	Value Added		Labor Force		V.A. Per Worker	
	US $ Mln.	%	'000	%	US $	%
Agriculture	219	15.2	656	54.3	334	28
Industry	718	49.8	176	14.5	4,087	342
Services	506	35.0	298	24.6	1,698	142
Unallocated	.	.	79	6.6	.	.
Total/Average	1,443	100.0	1,209	100.0	1,193	100

GOVERNMENT FINANCE

	General Government	Central Government (K. Mln.) 1971	Central Government % of GDP 1971	Central Government % of GDP 1969-71
Current Receipts	)	309.0	28.0	32.1
Current Expenditure	)	327.3	29.7	22.5
Current Surplus	) not available /3	-18.3	-1.7	9.6
Capital Expenditures	)	142.5	12.9	12.6
External Assistance (net)	)	35.3	3.2	1.7

/1 of population 10 years and older
/2 contains substantial amount of private capital flight
/3 figures do not differ significantly from "Central Government"

.. not available
. not applicable

COUNTRY DATA - ZAMBIA

MONEY, CREDIT and PRICES

	1965	1969	1970	1971	1972
		(Million K. outstanding end period)			
Money and Quasi Money	113.7	281.5	371.9	318.5	341.1
Bank Credit to Government	-84.9	-120.5	-155.1	19.3	148.0
Bank Credit to Private Sector /1	42.5	114.2	142.9	183.1	165.4
		(Percentages or Index Numbers)			
Money and Quasi Money as % of GDP	..	19.4	29.0	31.0	.
General Price Index (1963 = 100)	107.9	134.2	139.5	147.1	154.7
Annual percentage changes in:					
General Price Index	+4.9	+3.2	+4.0	+5.5	+5.2
Bank credit to Government	.	.	.	.	.
Bank credit to Private Sector /1	..	+24.9	+25.1	+28.1	-9.7

BALANCE OF PAYMENTS

	1970	1971	1972/3
	(Millions US$)		
Exports of Goods, NFS	959.6	700.4	804.2
Imports of Goods, NFS	658.7	749.4	738.6
Resource Gap (deficit = -)	300.9	-49.0	65.6
Factor Payments (net)	-46.8	-61.0	-94.8
Net Transfers, private	-147.1	-152.0	-136.5
Balance on Current Account	107.0	-262.0	-165.7
Direct Foreign Investment			
Net MLT Borrowing			
Disbursements	27.7	41.5	42.0
Amortization	-14.6	-10.2	-25.0
Subtotal	13.1	31.3	17.0
Capital Grants	0.8	1.1	0.7
Other Capital (net)) Other items n.i.e.)	39.2	-37.8	5.2
Increase in Reserves (+)	160.1	-267.4	-142.8
Gross Reserves (end year)	538.9	290.3	168.0
Net Reserves (end year)	536.8	269.4	126.6

MERCHANDISE EXPORTS (AVERAGE 1970-72)

	US $ Mln	%
Copper	757.2	94.2
Lead, Zinc, Cobalt	32.8	4.1
All other commodities	13.4	1.7
Total	803.4	100.0

EXTERNAL DEBT, DECEMBER 31, 1971

	US $ Mln
Public Debt, incl. guaranteed	795
Non-Guaranteed Private Debt	..
Total outstanding & Disbursed	..

DEBT SERVICE RATIO for 1971 /2

	%
Public Debt, incl. guaranteed	9.8
Non-Guaranteed Private Debt	..
Total outstanding & Disbursed	..

RATE OF EXCHANGE

Before February 1973
US $ 1.00 = Kwacha 0.714
Kwacha 1.00 = US $ 1.40

Since February 1973
US $ 1.00 = Kwacha 0.643
Kwacha 1.00 = US $ 1.56

IBRD/IDA LENDING, (Mar. 1973) (Million US $):

	IBRD	IDA
Outstanding & Disbursed	64.0	-
Undisbursed	49.3	-
Outstanding incl. Undisbursed	113.3	-

/1 Includes parastatal bodies
/2 Ratio of Debt Service to Exports of Goods and Non-Factor Services
/3 Preliminary estimates

.. not available
. not applicable

RECENT ECONOMIC DEVELOPMENTS[1/]

1. The economy of Zambia is dominated by the copper industry, which contributes nearly 40 percent of GDP, 95 percent of exports and, up to 1970, 60 percent of government revenue. It follows that the world copper price has a large and pervasive effect on the economy. Since independence in 1964, copper prices have been notoriously unstable, fluctuating between K700 and K1,300 per ton. Because the government has no adequate instruments to insulate itself from the vagaries of the copper market, the economy is inherently unstable.

2. GNP per capita is relatively high (estimated at $355 in 1971), but there is a distinct contrast between the modern sector and the traditional rural sector. The modern sector is concentrated in the Copperbelt Province where the mining activity is located and along the "line-of-rail" which is the central area of the country where European farmers settled in the colonial era and a number of industries have been established. Almost half the population lives in the Copperbelt and near the line-of-rail, and is involved in the modern sector. The rest of the population is scattered over the country and is mainly engaged in small-scale agriculture.

3. Since independence the government's main economic and social goals have been, firstly, to narrow the gap between urban and rural standards of living by increasing the productivity of small-scale agriculture, and secondly, to raise the general level of education, as well as develop a wide range of technical, administrative and managerial skills to lessen the dependence on expatriate expertise. The expansion of education facilities has been impressive since independence, but in spite of this the shortage of educated and skilled manpower has remained Zambia's most important structural constraint in economic development. Little progress was made in improving the standards of living of the rural population. Two factors have affected economic progress during the first years of independence. The Unilateral Declaration of Independence in Southern Rhodesia in 1965 forced Zambia to sever her close ties with Southern Rhodesia at a considerable cost and disruption to the development program, and the decision in 1968 to assume state control over most of the important sectors of the economy caused a great strain on the administrative capacity of the country.

4. In the Second National Development Plan 1972-1976 (SNDP), the general economic and social goals mentioned above are restated. However, the Plan recognizes that in spite of all effort which might be made to stop the flow of people leaving rural areas, this will not prevent all such movements. It therefore stresses the need to further develop the modern sector, including mining. In the past, expenditure for agriculture was thinly spread over the country, with little impact anywhere. Under the SNDP, the government intends to concentrate its efforts in a number of areas with sufficient potential where an integrated approach to rural development will be attempted.

5. Economic developments in 1970 and 1971 are in sharp contrast with those up to 1969. Between 1964 and 1969, gross national income at constant prices grew on the average by almost 17 percent a year. More than half of

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1/ This account of the economy is included in the President's Report on the Third Education Project, dated May 15, 1973.

this increase, however, resulted from the improvement in terms of trade, (rising copper prices), 1.5 percent from a relative decline of factor payments abroad, and 5.5-6 percent from the physical increase in production (GDP). The sharp increase in world copper prices had placed Zambia in a strong financial position. The government's budget and the balance of payments produced growing surpluses. In the course of 1970, however, the economic tide turned as a result of a combination of unfavorable factors.

6. The two most important factors were no doubt the sharp decline in copper prices in the second half of 1970 from K1200 to K780 a ton and, in September 1970, the partial flooding of the Mufulira mine which accounted for 25 percent of Zambia's copper output. As a result of lower copper prices and production losses, the value of copper output in 1971 was 40 percent lower than in 1969. GNP per capita is estimated to have fallen from $425 in 1969 to about $355 in 1971.

7. The decline in prices and output of copper had, of course, also strong adverse effects on government revenue and the balance of payments. The deterioration in the budgetary situation, however, was compounded by two additional factors: first, recurrent expenditures had been allowed to increase sharply, and, second, government revenue from the mining sector declined also sharply because of new capital allowances granted under the 1969 Master Agreement governing state participation in the mining industry. Previously, capital depreciation allowances were based on estimated asset life, but, in order to boost production from some 700,000 tons at present to some 900,000 tons by 1976, all capital expenditure was made tax deductible in the year it occurs. This will result in lower revenue in the medium-term, but increase the tax base substantially after completion of the expansion program in 1976. As a result of the factors mentioned above, the recurrent budget, which in 1970 still had a surplus of K176 million - more than enough to finance all development expenditures - showed a deficit of K18 million in 1971. Foreign reserves declined from a peak of K432 million in August 1970 to K100 million by June 1972 (3 months' imports), but this sharp decline cannot be explained by the unfavorable development of prices and output of copper alone. There can be little doubt that legal and illegal capital flight has increased since 1969. In 1971 alone, it may have amounted to more than K100 million, most likely in reaction to the government's decision to have the country's retail and wholesale business transferred to Zambian ownership.

8. During 1972, the government took a number of steps to restore financial balance. To improve the balance of payments, imports of certain luxury goods and consumer goods that are also produced locally were prohibited, and a surtax on dutiable imports was introduced. Exchange control regulations were tightened, including measures to curb capital flight. Preliminary indications are that these measures have had some success; since June, 1972 the level of external reserves has remained stable at an equivalent of somewhat over two months' imports. To improve the budgetary situation, new tax measures were introduced in the 1972 and 1973 budgets. Austere spending policies reduced recurrent expenditure in 1972 by nearly 2 percent. These policies are to be continued in 1973. Nevertheless, it appears unlikely that the government will be able to generate any budgetary

savings in 1973. Although by the mid-1970s a substantial increase in mining revenue can be expected as a result of the expansion program currently underway, a continuation of the government's policy of increasing non-mining tax revenue and, at the same time, containing recurrent expenditures is necessary if the government is to make a substantial financial contribution to its own development budget once again.

9. To limit deficit financing, government development expenditure was severely cut in 1972 and 1973 to a level of some K115 million in both years as compared to levels originally intended under the Second National Development Plan 1972-1976 of some K175 million in 1972 and K185 million in 1973. In 1972, the government was ill-prepared for the need to cut development expenditure. Cuts were made in an indiscriminate way without proper consultation with spending ministries with the result that some severe disruption in ongoing priority programs occurred. In 1973, the determination of priorities has been made in a far more rational and selective manner. Preference has been given to the completion of ongoing high-priority projects, such as those supporting the copper expansion program and education. Projects of relatively low priority such as new roads, improvements and extensions of airports and government office buildings have been postponed. The government has recently begun to redefine priorities and levels of development expenditure for the remainder of the plan period (1974-76) in the light of the expected resource availability.

10. The government is now actively seeking foreign assistance for projects for the execution of high priority development programs that it originally intended to finance domestically. But the government will have great difficulty during the next two or three years in providing local counterpart funds to foreign loans, and especially in projects where the foreign exchange component is low, some local cost financing by external agencies is required. It will also take some time before disbursements from new foreign loans will become available. In the interim, to keep deficit financing within tolerable bounds and to prevent further cuts in the development program, it would appear necessary for Zambia to seek quick-disbursing non-project aid.

11. Zambia's immediate economic future is clouded by the closure of the border between Zambia and Rhodesia last January. With the help of a United Nations Special Mission, the government is drawing up an emergency program to maintain the country's transport capacity until the Tan-Zam Railway between Dar es Salaam and Zambia opens in 1975 or 1976. The direct and indirect economic costs of the border closure are difficult to evaluate. Volume of exports might not be adversely affected, but since the tonnage of imports is roughly twice that of exports, it will be much more difficult to maintain the normal level of imports. Therefore, in the short-term, scarcity of raw materials, intermediate goods and equipment is likely to affect the level of production. However, no decline is expected in copper production from the 1972 level. The recent increase in copper price may actually lead to an increase in the value of exports. With lower imports, production in the rest of the economy would fall and cause a loss in government revenue, thereby exacerbating the already precarious budgetary position.

12. The estimated direct cost of the emergency is still highly uncertain. The Zambian government estimates that in order to maintain the flow of strictly essential imports, an additional budgetary outlay of about K44 million would be necessary in 1973. To cover the foreign exchange cost it has actively tried to mobilize loans and grants from various governments as well as suppliers' credits. Indications are that the necessary amounts will be forthcoming. To cover the local cost connected with the emergency the government intends to increase its borrowing from the non-banking sector and in the Euro-Dollar market, thereby avoiding a diversion of funds intended for the development budget.

13. Because of its considerable mineral and agricultural development potential, Zambia's longer-term economic prospects are good despite her dependence on copper and her landlocked position so far from markets, provided she continues successfully to weather the recent economic and political storms. In the future, Zambia's need to borrow will be much greater than in the past. Because of limited borrowing in the past, Zambia's debt service obligations are low. Thus, there is considerable scope for further borrowing abroad at conventional terms. If, for example, Zambia contracts foreign loans in the amount of $175 million on the average each year from 1973 through 1985, which would be well above the level of borrowing in the recent past, the debt service ratio would still not exceed 10 percent by 1985.

STATUS OF BANK GROUP OPERATIONS IN ZAMBIA

A. STATEMENT OF BANK LOANS AND IDA CREDITS
(as at April 30, 1973)

Loan Number	Year	Borrower	Purpose	US$ Million Amount (less cancellations) Bank	IDA	Undisbursed
74	1953	Zambia	Railways	14.0 1)	-	-
145	1956	Central African Power Corp.	Electric Power	40.0 1)2)	-	-
197	1958	Zambia	Railways	9.5 1)2)	-	-
392	1964	Central African Power Corp.	Electric Power	3.9 1)2)	-	-
469	1966	Zambia	Highways	13.3	-	-
562	1968	Zambia	Forest Planting	5.3	-	2.2
563	1968	Zambia	Highways	10.4	-	-
592	1969	Zambia	Education	17.4	-	15.0
627	1969	Zambia	Livestock	2.5	-	1.7
645	1969	Zambia	Education	5.3	-	2.0
685	1970	Zambia	Crops Farming	5.5	-	3.8
701	1970	Kariba North Bank Co.	Power Station	40.0	-	23.6
882	1973	Zambia	I.F. Farming Project	11.5	-	11.5
			Total	178.6		
			of which has been repaid	42.3		
			Total now outstanding	136.3		
			Amount sold 38.6			
			of which has been repaid 26.2	12.4		
			Total now held by Bank	123.9		
			Undisbursed of Bank held total	59.8	-	59.8
			Undisbursed of participations	.8	-	.8

1) Guaranteed by Zambia and the UK

2) Amounts shown represent Zambia's half of loans also benefiting Southern Rhodesia

B. STATEMENT OF IFC INVESTMENT
(as at April 30, 1973)

Year	Obligor	Type of Business	Amount in US$ Loan	Equity	Total
1972	Zambia Bata Shoe Co. Ltd.	Shoe manufacturing	0.85	0.23	1.08
		Total gross commitments	0.85	0.23	1.08
		less cancellations, terminations, repayments & sales	0.39	-	0.39
		Total now held by IFC	0.46	0.23	0.69
		Undisbursed of IFC held total	0.22	-	0.22
		Undisbursed of participations	0.18	-	0.18

C. PROJECTS IN EXECUTION/1

Loan No. 562 Industrial Forestry Project: $5.3 million loan of October 5, 1968; Closing Date: June 30, 1977

Execution of the project is making more rapid progress than expected at the time of appraisal. There is a lack of accountants and the project management still relies on the services of a member of our Agriculture Development Service. We have suggested that government seek technical assistance from bilateral sources until qualified Zambian accountants become available. Project costs have proved to be higher than expected so that the disbursement percentage applicable to expenditures other than direct imports will have to be reduced from 44 to 25.

Loan No. 592 First Education Project: $17.4 million loan of April 11, 1969; Closing Date: September 30, 1974

The project became effective in July, 1969, but was initially delayed some 12-14 months due to management problems and prolonged negotiations regarding studies and the consultant's contract which eventually led to the efficient and economical modular construction system ultimately adopted for the project schools. Construction is now proceeding well. The efficient construction method would have regained six months of delay but for the government's financial problems which resulted in a cutback of funds early in 1972 and the extension of the closing date by 2½ years. The Northern Technical College (Nortec) item ($1 million) is behind schedule because of a review of the government's technical education policy which has now been completed. This review has resulted in greater emphasis on pre-employment training and less on apprenticeship than originally envisaged; the school is now being redesigned. The entire project was to cost US$36.2 million; the government now expects a US$3.41 million cost overrun which it will finance itself.

Loan No. 627 Livestock Development Project: $2.5 million loan of June 30, 1969; Closing Date: November 30, 1974

The project was expected to be completed by mid-1974 and development has begun on all but one of the beef ranches. However, progress is now at a standstill and serious financial problems have emerged. Financial viability of the Zambia Cattle Development Limited (ZCDL),

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/1 These notes are designed to inform the Executive Directors regarding the progress of projects in execution, and in particular to report any problems which are being encountered, and the action being taken to remedy them. They should be read in this sense, and with the understanding that they do not purport to present a balanced evaluation of strengths and weaknesses in project execution.

which is responsible for execution, and also of some of the ranches to be developed under the project, is uncertain. Management problems and government policy which held down prices on beef and milk while costs rose rapidly are the principal causes. At the government's request the Bank and Barclay's Bank, a co-lender, assisted government officials in reappraising the project. We concluded that the project be reduced to include only those components which offer promise of becoming viable, that management be given authority to operate fully on a commercial basis, that organizational changes be introduced to that end, and that prices on beef and milk be raised. The government has subsequently raised these prices and is considering the other recommendations.

Loan No. 645 Second Education Project: $5.3 million loan of November 30, 1969; Closing Date: August 31, 1973

This project is almost complete, but a delay in the initial stages caused by periodic building material shortages, contractors limited managerial capacity and insufficient local representation by one firm requires a nine months' extension of the Closing Date (to June, 1974) to allow for the construction guarantee period and for the closing of the accounts.

Loan No. 685 Commercial Crops Farming Project: $5.5 million loan of June 5, 1970; Closing Date: December 31, 1975

The project is scheduled for completion in mid-1975. After a slow start, the project is now making satisfactory progress. So far, 66 assisted tenants have been settled, 23 of them since the end of the last growing season. During that season, assisted tenants produced 400,650 kg tobacco, representing 7 percent of the national crop; yields were slightly above the national average of 901 kg/ha.

Loan No. 701 Kariba North Bank Hydro-electric Power Project: $40.0 million loan of July 29, 1970; Closing Date: July 1, 1976:

The cost of the Kariba North Hydro-electric Project, for which the Bank made a loan of $40 million in July, 1970 to cover the foreign exchange expenditure, has turned out substantially higher than estimated at the time of appraisal. When bids were opened in October, 1970 it became clear that the foreign exchange expenditure alone would be more than $10 million higher. That increase was attributable to world wide price increases on heavy electrical equipment over and above appraisal estimates and high contingency allowances included by contractors in their bids for unexpected expenditures arising from Zambia's position as a land-locked country. Subsequently, changes in exchange rates in December, 1971, delayed provision of access roads to the site and staff housing on the site, and adverse rock conditions have caused further significant increases in cost. In addition, the main civil works contractor experienced

severe financial difficulties and was forced into receivership in February, 1973. A new contractor has been selected to complete the main civil works. Construction work has restarted. Negotiations are now under way to finalize the contract; a work schedule and revised cost estimates, including the effect of the recent currency realignments, are being prepared. A supplementary loan is contemplated as soon as the cost estimates have been revised.

Loan No. 882 Integrated Family Farming Project: $11.5 million loan of February 28, 1973; Closing Date: June 30, 1979

Conditions of effectiveness are likely to be met shortly, but one month's extension of the termination date of May 28, 1973 might be required.

C. BANK GROUP OPERATIONS

1. As of April 30, 1973, the Bank had made thirteen loans to Zambia and IFC one investment.[1/] Four loans were made for railways and electric power before Zambia became independent and are guaranteed by the UK as well as Zambia. After independence, four loans were made for agricultural development, two for education, two for highways, and one for the Kariba North hydroelectric station. Total lending to date has been $178.6 million after cancellations, of which $83.9 million is for electric power, $47.2 million for transportation, $22.7 million for education and $24.8 million for agriculture. Six loans are fully disbursed and the first loan made in 1953 (No. 74-RN) was repaid in full in February, 1972. The IFC made its first investment in Zambia in February, 1972, providing $1.1 million for expansion of a shoe manufacturing company.

2. Progress on Bank operations in Zambia has been adversely affected by the difficulties Zambia has faced over the past few years. The Unilateral Declaration of Independence in Southern Rhodesia in 1965 forced Zambia to sever her close ties with Southern Rhodesia at a considerable cost and disruption to the development program. Shortage of educated and skilled manpower has interfered with progress on some projects while recent cost escalations have caused difficulties on others, especially the Kariba North Bank project. Finally, the sharp fall in copper prices forced the government to rephase capital expenditures on the first education project for which the government is providing 52% of project cost. The recent border closure, however, is not expected to cause significant delays on Bank financed projects as the government is giving transport priority to goods required for development projects supporting the mining industry, education and agriculture.

3. We propose to continue assisting Zambia in achieving her development objectives of (i) correcting the rural-urban imbalance, (ii) distributing wealth; and (iii) providing employment and educational opportunities. Zambia hopes to achieve these objectives by investments in (a) the power sector supporting the mining expansion program which yields income for strengthening lesser developed sectors, (b) manufacturing industries to become less dependent on imports and to expand employment opportunities, (c) agricultural production and processing industries to make Zambia self sufficient in most foodstuffs; (d) rural development projects to increase production and benefit large numbers of rural poor, and (e) education and other social sectors for human resources development.

4. A mixed farming project, aiming at increasing maize, sunflower and beef production to national self-sufficiency, has been appraised, and an integrated rural development project in areas of high agricultural potential has been identified. Assistance in telecommunications and urban development is also envisaged. And in addition to the education project recently presented to the Board, further assistance to the education sector is expected primarily for technical education.

1/ A loan of US$33 million for a third education project and an IFC investment of $1.2 million were approved by the Executive Directors on May 31, 1973 and June 12, 1973 respectively. A program loan of $30 million was approved by the Board on June 14, 1973.

Zambia - Kafue Hydro-electric Project (Stage II)

LOAN AND PROJECT SUMMARY

Borrower: Zambia Electricity Supply Corporation (ZESCO)

Guarantor: Republic of Zambia (GRZ)

Amount: Various currencies equivalent to US$115 million

Terms: Interest Rate: 7¼%
Amortization: 25 years including 5½ years of grace

Project Description: The main features of the Project to be constructed over the period 1973-79 are:

(1) a storage dam across the Kafue River at Itezhi Tezhi consisting of:

(a) rock and earthfill dam, 1500 m in length, and 55 m maximum height above riverbed, involving about 8 Mm^3 of fill;

(b) two diversion tunnels in rock, each with a cross-sectional area of 190 m^2 and a length of 500 m, incorporating regulating structures and gates; and

(c) concrete chute spillway with three radial gates;

(2) an extension of the Stage I Kafue power station located 250 km downstream from the dam, and consisting of the installation of two 150 MW generating units with ancillary civil works and switchyard extensions; and

(3) a 330 kv single circuit transmission line, 60 km in length, connecting the Kafue power station to the Central African Power Corporation (CAPC) grid at Kafue town.

In addition to increasing the firm energy of the Kafue power station, the dam would provide sufficient water storage to permit additional water discharges in dry years to reproduce the annual flood cycle downstream of the dam on which present agricultural development depends. The storage could be increased to allow for possible future irrigated agriculture on the Kafue Flats. Regulation of the river flow provided by the Project would also be useful for subsequent development under a third stage of the Kafue Project.

Estimated Cost: Project costs are estimated at $137.7 million, with $96.3 million (about 70%) in foreign costs and $41.4 million in local costs. A more detailed breakdown is set forth in the following table:

	Million US$		
	Foreign	Local	Total
Preliminary works	1.0	3.0	4.2
Civil Works	36.8	22.1	58.9
Equipment	15.6	1.6	17.2
Engineering	5.9	0.4	6.3
Site supervision	2.8	1.3	4.1
Sub total	62.1	28.6	90.7
Contingencies - physical	7.7	3.9	11.6
Contingencies - price	26.5	8.9	35.4
Total construction cost	96.3	41.4	137.7
Interest during construction on Bank loan	18.7		
Total including interest	115.0		

Financing Plan:	Million US$
Bank	$115
Government	$41.4

Estimated Disbursements (US$ thousands): For the civil works, disbursements would be made against a percentage of the amount of the contractor's periodic invoices. For engineering services and equipment, payments would be made in full on the basis of the foreign costs of contractors awarded. The schedule of estimated disbursements in US$ thousands is as follows:

73/74	74/75	75/76	76/77	77/78	78/79
12,100	22,700	26,750	19,450	17,000	17,000

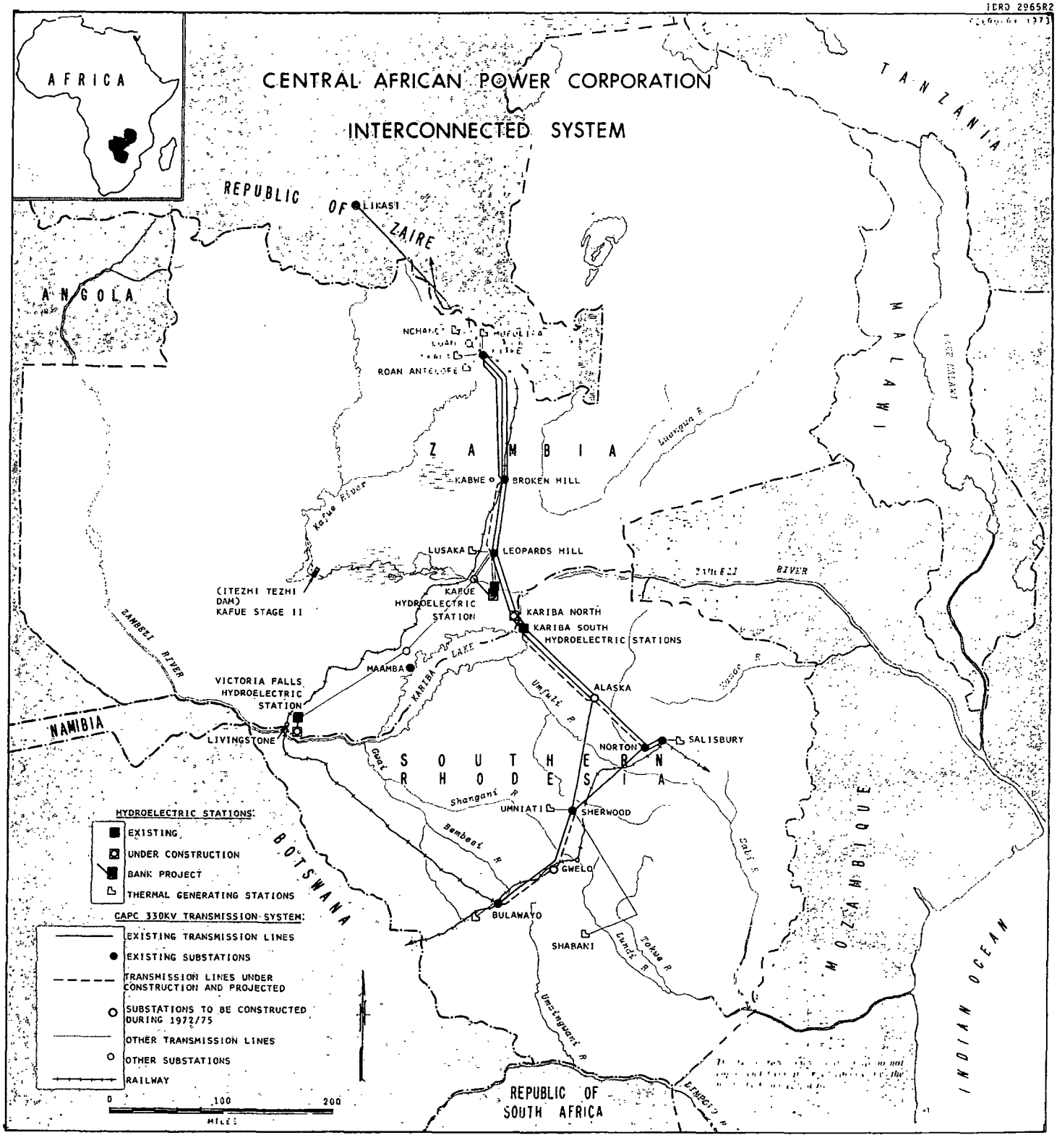
Procurement Arrangements: Procurement will be on the basis of international competitive bidding, except for items involving expenditures of less than $20,000. These exempted items would be procured on the basis of government tendering procedures. The proposed loan also include retroactive financing for engineering services since January 1, 1973 and for certain preliminary civil works started during 1972 and currently under construction. These items are estimated to involve a maximum cost of $3.0 million equivalent. Bid invitations for construction of the dam were issued to prospective tenderers after review by the Bank and an award has been made. Bids for the Kafue power station extension will be invited by the end of 1973.

Rate of Return: Estimates made on the basis of the prevailing tariffs indicate that a return on investment for the Project is at least 18 percent.

Estimated Project Completion Date: December 31, 1978

Appraisal Report: Report No. 86a-ZA dated May 7, 1973

IBRD 2965R2


CENTRAL AFRICAN POWER CORPORATION
INTERCONNECTED SYSTEM
AFRICA
REPUBLIC OF ZAIRE
LIKASI
ANGOLA
TANZANIA
MALAWI
NCHANGA
ROAN ANTELOPE
ZAMBIA
KABWE
BROKEN HILL
Luangwa R.
Kafue River
LUSAKA
LEOPARDS HILL
ZAMBEZI RIVER
(ITEZHI TEZHI DAM)
KAFUE STAGE II
KAFUE HYDROELECTRIC STATION
KARIBA NORTH
KARIBA SOUTH
HYDROELECTRIC STATIONS
KARIBA LAKE
MAAMBA
VICTORIA FALLS HYDROELECTRIC STATION
LIVINGSTONE
NAMIBIA
ALASKA
Umfuli R.
NORTON
SALISBURY
SOUTHERN RHODESIA
Gwai R.
Shangani R.
UMNIATI
SHERWOOD
Bembesi R.
GWELO
BULAWAYO
BOTSWANA
SHABANI
Lundi R.
Tokwe R.
Umzingwani R.
Sabi R.
MOZAMBIQUE
INDIAN OCEAN
REPUBLIC OF SOUTH AFRICA
Limpopo R.
HYDROELECTRIC STATIONS:
EXISTING
UNDER CONSTRUCTION
BANK PROJECT
THERMAL GENERATING STATIONS
CAPC 330KV TRANSMISSION SYSTEM:
EXISTING TRANSMISSION LINES
EXISTING SUBSTATIONS
TRANSMISSION LINES UNDER CONSTRUCTION AND PROJECTED
SUBSTATIONS TO BE CONSTRUCTED DURING 1972/75
OTHER TRANSMISSION LINES
OTHER SUBSTATIONS
RAILWAY
0
100
200
MILES