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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
INTERNATIONAL DEVELOPMENT ASSOCIATION

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APPRAISAL OF  
AN EDUCATION PROJECT  
IN  
ZAMBIA  
(Second Education Project)

October 29, 1969

Education Projects Department

CURRENCY EQUIVALENTS

US\$ 1.00 = Kwacha 0.714

Kwacha 1.00 = US\$ 1.40

Kwacha 1,000,000= US\$ 1,400,000

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This report is based on the findings of a mission to Zambia in May, 1969 composed of Messrs. C. P. van Dijk (economist) and L. Vera (architect) of the Bank and Mr. J. C. Jones (technical education), consultant to the Bank.



A N N E X E S

ANNEX  
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ZAMBIA

BASIC DATA - 1968

General

Size of Country	290,000 square miles
Total population (estimate):	4,100,000
Annual rate of population growth:	3.2%
Average density of population:	14 inhabitants per square mile
Gross domestic product	\$1,400 million
GNP per inhabitant	\$325
Government current revenue as percent of GDP:	30.4%

Education

Population aged 7-13	715,000
Enrollment in primary schools:	84% of 7-13 age group
Population aged 14-18:	371,000
Enrollment in secondary schools:	10.5% of 14-18 age group
Education expenditure financed by Min. of Education:	
as proportion of GDP:	5.0%
as proportion of budget:	recurrent 17.7% capital 6.6%
Total education expenditure (including non-government):	
as proportion of GDP:	6.2%
per capita	\$20





## APPRAISAL OF AN EDUCATION PROJECT IN ZAMBIA

### SUMMARY AND CONCLUSIONS

- i. The proposed project is designed to increase the supply of high level manpower in Zambia in selected fields by providing extensions to the Schools of Engineering and Education at the University of Zambia and the addition of hostels for 960 students. The total cost is estimated at K 5.3 million (or \$7.4 million) including direct and indirect foreign exchange costs of 72% or K 3.8 million (\$5.3 million). A Bank loan of \$5.3 million is recommended to meet these foreign exchange costs.
- ii. Bank assistance in financing extensions to the University of Zambia was requested by the government in March, 1968 as part of a larger education project. During appraisal in April/May, 1968 the need for the extensions could not be evaluated on the basis of the available planning data. Consequently, the project which became the basis for a Bank loan of \$17.4 million (Loan No. 592-ZA) did not include University extensions. Implementation of this project is proceeding satisfactorily. A new request for Bank financing for University extensions was presented by the government as a separate, second education project in February, 1969, and supported by satisfactory planning data. This proposal was appraised in May, 1969 when a number of alterations were made.
- iii. Crucial shortages of high-level Zambian manpower exist in all sectors of the economy and all professions; most positions requiring a University degree are filled with expatriates causing high labor costs and discontinuity of tenure. Zambians with a University degree numbered only 100 in 1964, the year of independence, and will not exceed 400 by 1970. Meanwhile total requirements are estimated to rise from 3,650 in 1966 to 5,600 in 1970 and 10,000 in 1980.
- iv. The University of Zambia, the country's only degree awarding institution of higher education, opened in 1966 and is rapidly becoming the main source of high-level manpower. Enrollments, now 1,000 students, will grow to 3,400 in 1973 and 5,000 in the later seventies. In spite of this rapid increase, the University will be unable to provide sufficient graduates to meet the demand by 1980. Its output of graduates between 1966 and 1980 is estimated at 6,750 or less than 70% of the country's estimated requirements. Expansion of the University is limited by the availability of qualified secondary school leavers.
- v. University enrollment by faculty is closely geared to meeting specific skilled manpower requirements by profession. Fields of study, identified as priority areas, are the sciences, including engineering, medicine and agriculture, and the training of secondary school teachers.
- vi. The proposed project would assist the School of Engineering and the School of Education to reach the 1973 enrollment targets, thus filling two of the most important gaps in Zambia's supply of high-level manpower. The School of Engineering, with about 360 students in 1973, will produce 80 engineers

annually. The School of Education, with a full-time student equivalent 1/ of 670 in 1973, will train secondary school teachers and primary and secondary school principals. In addition, the proposed project would finance the construction of sufficient hostels to accommodate the increased number of students in these two schools.

vii. The project is urgently needed to allow the University to develop according to its plan, and should be completed in 1972. To meet this target date, the University will start preparatory work, including architects' design, before a Bank loan is obtained. The government hopes that reimbursement of the costs of this preparatory work will be made by the Bank if and when a Bank loan is made.

viii. The project would be directed by a project unit to be created within the University's existing building office, which is headed by a competent resident architect. Procurement would be on the basis of international competitive bidding, except for small construction contracts of less than K 100,000. It is unlikely that any of the construction contracts will be below this limit.

ix. Virtually all costs of the University are borne by the government. Future increases in enrollment will cause total costs of the University to rise but will produce reductions in the cost per student. Estimated expenditures during 1969-1974 are within the financial capability of the government.

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1/ One full-time student equivalent may, for example, comprise four students who each spend one-quarter of their lecture/study hours at the School of Education.

## APPRAISAL OF AN EDUCATION PROJECT IN ZAMBIA

### I. Introduction

1.01 In February/March 1968 a Unesco project preparation mission assisted the government to prepare an education project which was appraised by a Bank mission in April/May, 1968. This project included extensions to the University of Zambia at Lusaka. The University item was found difficult to evaluate due to the absence of a sufficiently detailed development plan for the University as a whole. It was then agreed that such a plan would be prepared to permit completion of the appraisal. In view of the considerable delay foreseen in the preparation of this scheme, the government requested that the University extensions should be deferred in order to avoid delaying the major part of the project. This part constituted the basis of a Bank loan of \$17.4 million (No. 592-ZA) which was signed April 11, 1969.

1.02 In February, 1969 the government made a new request for Bank financing of extensions to the University of Zambia, accompanied by the requisite planning documents. This was appraised in May, 1969, by a Bank mission, composed of Messrs. C. P. van Dijk (economist), L. Vera (architect) and J. C. Jones (technical education specialist, consultant).

1.03 The project comprised the construction and equipment of:

- (a) extensions to the University School of Engineering,
- (b) extensions to the University School of Education,
- (c) student hostels for 960 students, including staff housing for wardens and caretakers.

1.04 The following report deals only with matters directly related to the University of Zambia. Information about the country's social and economic background, the education system, the financing of education and manpower requirements is presented in the appraisal report on the first education project (Report No. PE-2-a, dated March 20, 1969). This information is reproduced in Annex 1 to this report.

### II. Higher Education in Zambia

2.01 The University of Zambia, the country's only degree awarding institution, came into being on November 12, 1965 with an Act of Parliament which vested ultimate responsibility for the University in a Provisional Council. In its first academic year (1966), the University enrolled 312 students. Since then student numbers have risen rapidly: 536 in 1967, 706 in 1968 and 1,010 in 1969.

2.02 From the start, it was decided that the University should cover as many fields as feasible. After only two years of existence, the University had already established eight schools and two departments, the latter for extra-mural and correspondence studies. As a result, enrollments in many of the schools, as shown below, are still very low with low student-staff ratios

and high costs. While a student-staff ratio of 6:1 may not be exceptional for a University which is recently established, a more normal ratio of 10:1 or higher should be attained in the near future.

<u>Schools</u>	<u>Students</u>	<u>Staff</u>	<u>Student Staff ratio</u>
Administration	85	14	6.1
Agricultural sciences	- <u>/1</u>	4	-
Engineering	27	10	2.7
Education	178	26	6.8
Humanities & social sciences	390	48	8.1
Law	51	9	5.7
Medicine	20	20	1.0
Natural Sciences	<u>259</u>	<u>38</u>	<u>6.8</u>
TOTAL	1,010	169	6.0

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/1 A School of Agricultural Sciences has been formally established and has recruited its first staff members; the School has not yet started operations, however; students are taking their first year in the School of Natural Sciences and enrollments are, consequently, shown as zero.

2.03 The present high costs of the University, resulting from unfavorable student-staff ratios and under-utilization of new facilities, is a temporary characteristic of a new and rapidly growing institution. University enrollment is planned to grow to 5,000 students in the later seventies when improved utilization of facilities and student-staff ratios will result. A newly established University Grants Committee, to which the University submits its development plans, has recommended an increase in the student:staff ratio to 10:1 and this is accepted as a target for the early seventies.

2.04 Admission to the University requires appropriate credits in the Cambridge University School Certificate Examination (or its equivalent). The main factor limiting the University's enrollment growth so far has been the small numbers of students leaving secondary schools with this qualification. Secondary education is expanding rapidly, however, and should produce a five-fold increase in output within the next decade. Expanding University enrollments to 5,000 students can therefore be considered as a realistic objective to be attained towards the end of the seventies. Meanwhile, an intermediate target of 3,400 students has been set for 1973 and present investment plans aim at providing facilities for this number.

2.05 Expansion plans by faculty are closely geared to meeting the country's specific manpower requirements. Government applies a quota system governing the number of first-year students entering each of the faculties by the award of bursaries which are offered, not for admission to the University in general, but for admission to defined areas of study. Highest priority is being given to the sciences, including agriculture, medicine and engineering and to education.

2.06 The University started operations in temporary accommodation in 1966 but in the same year construction began of a new university campus some five miles from the center of Lusaka. In March, 1968 the University occupied its first five major buildings on this new campus. Investments in principal buildings completed or currently under construction amount to K 8.2 million (\$11.5 million). Additional facilities for engineering and education and new student hostels are urgently needed by March, 1972.

2.07 To assure that the initial beneficial results of improved planning will not be lost in subsequent years, comprehensive planning of further university development should be a permanent part of the University's administration. So far, the University has been unable to recruit a qualified development officer. During negotiations, assurances were obtained that adequate planning procedures will be established and a qualified planning officer will be appointed by the University.

2.08 Other institutions of post-secondary education are:

- (a) the Northern Technical College, responsible for a variety of technical courses at different levels, including the training of industrial technicians;
- (b) two Higher Teacher Training Colleges in Kabwe and Kitwe, providing two-year courses to train teachers for the junior cycle of secondary schools; and
- (c) the Natural Resources Development College in Lusaka, providing post-secondary courses in agriculture.

### III. Cost and Financing

#### University Financing

3.01 About 87% of the annual recurrent budget of the University is covered by a grant from the central government education budget; for 1969 this amounts to K 2.7 million or 7.4% of the total recurrent education budget of the government. Another 12% of University revenue comes from tuition and boarding fees paid by students; indirectly these fees are also paid by the government through its scholarship system. Tuition fees for Zambian students amount to K 120 annually; boarding fees to K 180. The amount of government expenditure on education and its proportion in the total budget are shown in Annex 2. Expenditures by level of education, including those spent on the University, are given in Annex 3.

3.02 The University's request for government financing is submitted on a triennial basis and scrutinized by the University Grants Committee composed of outside University experts and representatives of the Ministries of Finance and Education. The Committee's recommendations have led to a

substantial reduction in the University's budget for 1969 as compared with the University's original submission; the budgets for the years 1970 to 1972 are now under study.

#### Recurrent Expenditure

3.03 Total recurrent expenditure of the University amounted to K 2.4 million in 1968; the budget for 1969 amounts to K 3.1 million - an increase of 28% as compared with an increase of 40% in student enrollments. Overall recurrent costs per student, consequently, decreased from K 3,400 in 1968 to K 3,125 in 1969. Excluding boarding expenses, research, extra-mural work and library expenditure, the remaining costs per student remained virtually constant at K 2,100 per student for both years. A summary of University expenditure is given in Annex 4.

3.04 Recurrent costs per student will probably continue to decrease as student:staff ratios and utilization of physical facilities improve. The total cost of the University, however, will rise sharply as a result of the rapid increase in student numbers; consequently, the direct government grant to the University will probably rise from K 2.7 million in 1969 to K 7.3 million, or 11% of the total education budget, in 1974 (Annex 3). This amount is within the financial capacity of the government; the percentage is within the limits of what is a normal budget allocation for higher education.

#### Capital Expenditure

3.05 Prior to 1967 the government undertook to meet 50% of the capital costs of the University; the balance was financed from different sources, including a U.K. grant of £ 1 million and mortgage loans. In 1967 the government agreed to contribute 100% of future construction costs and allocated K 16 million to the University for the plan period 1966-1970. Between July 1, 1966 and December 31, 1968 nearly K 6.9 million of this amount was spent. The total amount of capital expenditure on the University is shown in Annex 5. At the end of 1968, allocations to the University were reduced drastically as a result of budgetary constraints and growing awareness of the need to reduce University investments to the minimum requirements. For 1969 only K 1.45 million is allocated.

3.06 Apart from the completion of present construction work, the only major investment projects envisaged for the near future, are extensions to the Schools of Engineering and Education, where the need for additional facilities is clearly indicated, and the construction of additional student hostels and staff housing. It is the government's intention to postpone further major investments until present accommodation is more fully utilized. In the early seventies, however, new investments will be needed for the Schools of Medicine and Agriculture.

#### IV. The Need for Higher Education

##### Existing Manpower Situation

4.01 Higher education in Zambia - still in the early stages of development - is unable to meet the rising demand for professional, administrative and managerial personnel with appropriate degree level education. At independence in 1964 only 100 Zambians had obtained a University degree; this number had risen to 150 in 1966. Of a total number of 3,650 posts occupied by degree holders in Zambia in that year, 3,500 posts or 96% were held by non-Africans (Annex 6).

4.02 The situation has changed somewhat in the last few years. Many high-level political positions have been "Zambianized" but a majority of the high-level professional and administrative posts, both in the public and private sector, are still held by expatriate staff, often at high cost to the economy and with discontinuity of tenure. The government acknowledges that "Zambianization" of all middle and high-level positions will take considerable time, extending well beyond 1980.

4.03 Crucial shortages of qualified manpower exist in nearly every sector in the economy. Private enterprise experiences serious difficulties in recruiting personnel with secondary or higher education since most school leavers seek employment in the public sector. Efficiency and productivity in industry and commerce are low and further growth is restricted by a lack of new staff and by the low level of education of those who are already recruited. The public sector, after filling 838 existing civil service vacancies with newly recruited expatriates in January 1968 - most of them in the professional, administrative and executive ranks - still had 4,600 unfilled posts in May, 1968. For 2,100 of these posts, a secondary education or equivalent is required and for 425 posts, a University degree. Nearly all teachers at secondary and post-secondary level are expatriates.

##### Projections of Manpower Requirements

4.04 Government projections of high-level manpower requirements to 1980, drawn up this year in the Office of National Development and Planning indicate a total need for degree level personnel of 12,545 graduates, of whom 1,800 should be engineers and 3,800 teachers.

4.05 These projections are based on somewhat optimistic economic growth expectations and perhaps overestimate the labor market's future effective demand for high-level manpower. More cautious assumptions would reduce the demand projections to about 10,000 graduates by 1980 of whom 1,500 should be engineers and nearly 3,000 teachers; (another 2,300 secondary school teachers should be trained at diploma level in the country's two higher teacher training colleges). These reduced manpower projections have been used for evaluating the proposed project.

### The Supply of High-level Manpower

4.06 The University of Zambia will rapidly become the major source of high-level manpower. Expanding as fast as the supply of secondary school graduates permits, the University will reach a total enrollment of 5,000 students in the later seventies. The annual output of graduates will rise from about 150 in 1970 to over 1,000 in 1980. The total output of Zambian graduates during the period 1966 to 1980 will then amount to 6,750.

4.07 The output of Zambian graduates from foreign universities, at a rate of about 50 per year, will add about 520 graduates to the supply of high level manpower in the same period. The total supply of Zambian graduates, from local and overseas universities, would thus amount to 7,270 by 1980, of whom 3,200 would be teachers and 650 engineers.

4.08 The estimated supply of high-level manpower is therefore considerably below the estimated demand and expatriates will be required to fill considerable numbers of high-level positions well beyond 1980. A more rapid expansion of the University is not feasible in view of the limited supply of qualified entrants. The aggregate teacher demand and supply is well balanced but science teachers will remain in short supply until 1980; the supply of engineers is far below the estimated demand. Adjustment of the university courses to increase enrollments in science and engineering at the expense of non-science enrollments is not yet possible due to the limited number of science students graduating from secondary schools. Partly due to the output of students from schools assisted by the first IBRD education project, these imbalances will be corrected after 1975 so that a more balanced supply of University graduates can be attained in the early eighties.

## V. The Project

### A. Technical Features

#### General

5.01 The proposed project consists of the following extensions or additions to the University of Zambia:

- (a) extension and equipping of the School of Engineering,
- (b) extension and equipping of the School of Education,
- (c) construction and furnishing of student hostels for 960 students, including eight staff houses for wardens and caretakers.

#### School of Engineering

5.02 The undergraduate course in engineering extends over five years; students spend the first year in the School of Natural Sciences and the remaining four years in the School of Engineering, which provides courses in



civil, mechanical, electrical and mining engineering. The ultimate enrollment target is 680 students in these four years but an intermediate target of 360 students has been set for 1975. This would require an annual intake of 100 students and provide an annual output of about 80 engineers. The proposed project would enable the University to raise enrollments in engineering from 27 students in 1969 to this intermediate target of 360 in 1975.

5.03 Enrollments in each of the four departments (civil, mechanical, electrical and mining engineering) will be adjusted to manpower requirements as student numbers increase. Great flexibility in enrollment by department will be required. Curricula and accommodation schedules have, consequently, been designed in such a way that enrollment patterns can be changed when necessary. Courses are general rather than highly specialized. Following some years of industrial experience, students would be encouraged to return for more specialized training leading to a higher degree.

5.04 The curricula would seem to have been prepared for design engineers rather than engineers concerned more directly with production and maintenance for which there is likely to be a major demand. The appraisal mission has been informed that this is not the intention. However, the curricula, as well as the detailed syllabuses, should give direct expression to the industrial aspects of engineering. An assurance to that effect was obtained during negotiations.

5.05 To assure adjustment of the courses and numbers of students to the needs of the economy, a standing advisory committee has been established, representative of the academic, government and private interests concerned.

5.06 Except for a large workshop and some ancillary spaces, the School of Engineering has no facilities at present. The proposed project would provide two lecture rooms, 10 laboratories, 8 seminar rooms and 33 staff offices.

5.07 In addition to the staff of nine lecturers now in service, contracts have been offered to seven staff members. Recruitment takes place through contacts with overseas universities in a variety of countries; these have led, so far, to an adequate supply of qualified teaching staff. The total number of full-time academic staff is expected to increase to 33 by 1973.

#### School of Education

5.08 The School of Education, organized in four divisions (Department of Education, Science Education Center, Library Studies and Institute of Education) offers a variety of courses, of which the 4-year undergraduate course to train secondary school teachers is the most important. The 1973 enrollment target for this course is 900 students, who will take three of their four courses in either Humanities or Natural Sciences and one in Education. In addition the School is organizing courses leading to

the post-graduate certificate of education and master of education degree. The Institute of Education concentrates on in-service courses for heads of primary and secondary schools, lower secondary school teachers, a limited number of primary school teachers and inspectors; it gives assistance to the various teacher training institutions in Zambia. Finally, the School intends to give courses in library studies and in science for students enrolled in humanities and opting for the "scientific approach". The full-time student equivalent 1/ in all these courses is expected to rise from the present level of 178 to 670 students in 1973. The proposed project would enable the University to reach this target.

5.09 The present building of the School of Education is inadequate to accommodate the above-mentioned courses. The proposed project would add to this building a lecture theatre, a language laboratory, an educational television studio, ten special teaching spaces, six seminar rooms and thirty staff offices.

5.10 The present academic staff of the School of Education consists of 26 members from nine different countries. Part of the staff is provided under a U.N. technical assistance grant and recruited through Unesco. Most staff members, however, are recruited with the assistance of the Inter-University Council for Higher Education Overseas in London. Smaller numbers are recruited from other European countries, Australia, New Zealand and India. It is expected that the total academic staff will increase to 67 by 1972 or 1973. No major difficulties are foreseen in recruitment.

#### Student Hostels and Staff Housing

5.11 In the government's request, the proposed Bank financing of students' hostels accounted for about 52% of the total project costs. Partly because of this high ratio, the Bank has subjected the request to a close scrutiny, to assure that only the essential requirements would be included in the project and met at lowest possible cost. The Bank has come to the conclusion that the student hostels are justified for the following reasons: at present nearly 83% of the students enrolled in the University are residential students. Students are admitted from all parts of the country and a relatively small minority (less than 15%) originates from Lusaka. The city has very little private residential accommodation available to meet students' needs. The University will, therefore, have to provide on-campus accommodation for the great majority of its students. This is necessary for full utilization of the University's academic facilities, including those provided under the proposed project, and to reduce the ratio of student failures. Adequate hostel accommodation, with better supervision and guidance of students during their private studies, would result in better student performance and, consequently, a lower cost per graduate. Further advantages of adequate hostel accommodation are greater student participation in extra-curricular activities and better health.

5.12 The University's recent investments have been mostly for academic facilities with boarding accommodation constituting only 15% of capital expenditure. Assuming that the percentage of residential students will remain about 80%, the University will need an additional number of 1,460 boarding places by 1973 to assure the effective use of its teaching space, in addition to 1,240 places which now exist or are under construction. To overcome this backlog in residential accommodation, the University's investment program for the coming years must include an exceptionally high level of allocations for boarding facilities. This need for redressing a temporary imbalance is reflected in the proposed project.

5.13 The boarding places which are included in the Bank project would meet the needs of the Schools of Engineering and Education alone. It is expected that enrollments in the Engineering School will rise to 360 students by the mid-seventies. Excluding short "in-service" courses, enrollments in the School of Education should increase to 1,180 students by that time. Enrollments in the two schools will thus be 1,540 by the mid-seventies, representing an increase of about 1,200 over the present enrollment of about 350. Assuming that 80% of the additional students will be boarders, there will be need for residential accommodation for 960 of the additional students. It is recommended that the proposed project should include such provision. To meet the needs of other schools of the University, the University administration plans to construct 480 additional boarding places in 1972.

5.14 To reduce the high costs of boarding accommodation, the University has agreed to reduce the space standards to an austere minimum. There will be four hostels, each housing 240 students with two students in each room of 130 square feet, as compared with 165 square feet in the University's existing residences; minimum acceptable allowances will be made for circulation space and walls. The size of common rooms for 240 students will be reduced to 1,200 square feet as compared with 1,600 square feet in the existing buildings.

5.15 Staff housing included in the project will be limited to accommodation for a warden and a caretaker in each of the four student hostels.

#### B. Cost of the Project

5.16 The estimated total cost of the proposed project is K 5.3 million or US\$7.4 million equivalent; the estimated foreign exchange component is K 3.8 million or US\$5.3 million representing 72% of the total cost. The costs by type of educational facility are analyzed in Annex 7 and summarized below:

	Kwachas (millions)			US\$ (millions)			% of Total Expend- iture
	Local	Foreign	Total	Local	Foreign	Total	
1.School of Engineering	0.26	0.87	1.13	0.36	1.22	1.58	27.9
2.School of Education	0.21	0.54	0.75	0.30	0.75	1.05	18.6
3.Student Hostels	0.58	1.44	2.02	0.80	2.02	2.82	49.8
4.Staff Housing	0.05	0.10	0.15	0.07	0.14	0.21	3.7
	<u>1.10</u>	<u>2.95</u>	<u>4.05</u>	<u>1.53</u>	<u>4.13</u>	<u>5.66</u>	<u>100.0</u>
Contingencies & cost Increase	<u>0.37</u>	<u>0.85</u>	<u>1.22</u>	<u>0.53</u>	<u>1.19</u>	<u>1.72</u>	
<b>TOTAL</b>	<u>1.47</u>	<u>3.80</u>	<u>5.27</u>	<u>2.06</u>	<u>5.32</u>	<u>7.38</u>	

5.17 The composition of the estimated cost per student by categories of expenditure would be as follows:

	Cost per student place (in US\$)			
	<u>Building</u>	<u>Furniture</u>	<u>Equipment</u>	<u>Total</u>
<u>Academic facilities</u>				
School of Engineering	2,372	171	1,175	3,718
School of Education	1,447	129	142	1,718
<u>Boarding Facilities</u>	1,939	344	29	2,312

5.18 These unit costs compare favorably with similar projects in other countries. Building costs in Zambia, already high at present due to the high costs of imported materials and expatriate labor, are expected to rise by as much as 30% in the next three years. The main cause of this steep increase in costs is the re-routing of shipments owing to present difficulties with Rhodesia. Until recently, most building materials were imported from South Africa via Dar es Salaam. Recently the Government of Tanzania prohibited the entrance of all goods originating from South Africa and as a result it is likely that most of these materials will in the future be procured in Western Europe at much higher cost. It is expected that building prices will rise by nearly 20% in the coming 12 months and will continue to rise at an annual rate of 5% between 1970 and 1972.

5.19 To allow for this anticipated escalation of building costs, the project cost estimates include a price increase allowance of 27%. In addition, an allowance of 15% has been included for physical contingencies.

5.20 The sizes of lecture rooms, laboratories, workshops, offices and other facilities have been based on austere standards. Hostel accommodation for students will provide rooms of minimum size each accommodating two students. Utmost economy will be used in planning circulation spaces and lay-out of buildings.

5.21 The estimated foreign exchange cost, which includes both the direct and indirect foreign exchange components, is high. Most building materials

and all instructional equipment and books are imported. A substantial part of the qualified labor is expatriate; the foreign exchange component of professional services is estimated at 70%.

C. Implementation of the Project

5.22 Project Unit. A project unit would be established in the Office of the University's Resident Architect. It would initiate, coordinate, administer and supervise the implementation of the project. The present Resident Architect, who is fully qualified and has ample experience in university development, would be the Project Director and is acceptable to the Bank. He would be assisted by a full-time estate bursar or quantity surveyor, acceptable to the Bank, by a specialist in equipment procurement, and by an accountant. The unit should be provided with adequate supporting staff and work facilities. Any appointment to the post of Project Director should be acceptable to the Bank.

5.23 Master Plan. While the University has a development scheme, it does not include long term proposals for the comprehensive development of its campus. For future guidance of its further development, the University should now prepare a master plan of the campus. The first phase of this plan which includes the major elements of the development of the campus during the next ten years, (zoning and land-use, circulation patterns and the location of future buildings) has already been completed and is acceptable to the Bank. A more detailed plan of the University's future buildings -- up to the stage at which the University attains its enrollment target of 5,000 students -- should be prepared concurrently with the implementation of the proposed project, but this work should be completed not later than 2 years after the date of the proposed Loan Agreement. This plan should specify the requirements for, and proposed utilization of, space and accommodation, and should indicate the general areas and locations of the required buildings and other facilities. Upon completion, this Plan should be provided to the Bank for its comments. Assurances regarding the preparation of a master plan of the campus, as described above, were obtained during the negotiations.

5.24 Architectural Services. To carry out the design and technical control of the project, the University is engaging the services of architectural consulting firms, which are acceptable to the Bank. These consulting firms would provide the architectural, engineering and technical services for the design of all project items and be responsible for supervision of construction and for certification of contractors' bills. The consulting firms should be required to follow the patterns of the approved first phase of the Master Plan and to study the cost effectiveness of the use of standardization of basic building components, pre-fabrication of parts and modular coordination.

5.25 All contracts for construction amounting to \$140,000 or more and for procurement of furniture and equipment would be awarded on the basis of

international competitive bidding. Although it is unlikely that any of the civil works contracts will be below this limit, it is expected that all will be awarded to local firms.

5.26 Maintenance. Assurances have been obtained during negotiations that adequate funds would be provided annually for the maintenance of project buildings and the maintenance and regular replacement of their equipment.

5.27 Construction Period. It is estimated that the proposed project will be completed in four years, including a 9-month preparation period and a one-year defects and liability period. To accord with the University's overall development plan, buildings should be completed in 1972 which leaves little time for preparation and construction. For this reason, the University started preparatory work, including the employment of architects and the design of the buildings in early October, 1969. It is recommended that the costs of this preparatory work amounting to approximately \$50,000 be reimbursed under the proposed Bank loan. Construction work and equipment procurement will not begin until a loan agreement with the Bank has been signed.

5.28 Disbursements, Disbursements would be spread over four years (Annex 8). The proposed IBRD loan of US\$5.3 million would finance:

- (a) 100% of the foreign exchange costs of instructional equipment and furniture, estimated at US\$985,000;
- (b) 67.5% of the remaining costs of the project consisting of construction and architectural and other professional services. This latter percentage represents the estimated foreign exchange component of the expenditure in these categories.

Undisbursed amounts would be subject to cancellation. Should expenditure exceed the estimated project cost of US\$7.4 million, the excess would be met by the Zambian Government.

## VI. Recommendations

6.01 To ensure the successful implementation of the project, government assurances were obtained during negotiations that adequate planning procedures would be established in the University (including the appointment of a planning officer) and that a master plan for the development of the University campus would be prepared. The curricula and syllabuses of the School of Engineering would be revised. Adequate provisions for the maintenance of buildings and maintenance and replacement of equipment would be made.

6.02 A condition for effectiveness of the proposed loan would be the establishment in the University of a project unit, consisting of a project

director, a full-time estate bursar or quantity surveyor and supporting staff.

6.03 The project provides a suitable basis for a Bank loan of US\$5.3 million for 25 years, including a grace period of ten years.





EDUCATION IN ZAMBIA

This annex comprises certain chapters of report No. PE-2a "Appraisal of an Education Project in Zambia", dealing with the earlier Bank education project 592-ZA. The purpose of the annex is to provide background information not found in the main body of this report which gives only information which is directly relevant to the second education project.

I - SOCIAL AND ECONOMIC BACKGROUND

1.01 The Republic of Zambia occupies a land-locked territory of about 290,000 square miles on a plateau in the southern half of Africa. Population and economic activity are concentrated along the only railway line which runs from Rhodesia via Livingstone in the south through Lusaka in the center to the Copperbelt, centered around Kitwe and Ndola, in the north. Most of the main towns are situated along this line of rail. The industrial center of the country is at present the copper mining region in the north but a new industrial township is being constructed near Kafue.

1.02 The population in 1968 is estimated at 4.1 million. Approximately 55% of the African population is below 20 years of age. About 25% is living in urban centers. The rural population is extremely scattered, living mainly in very small groups. The labor force was about 833,000 in 1966 of which about 500,000 was in the rural subsistence sector.

1.03 Copper mining is the mainstay of the Zambian economy, accounting for about 48% of total GDP, over 90% of total export earnings and nearly 70% of government revenue. Development of other sectors, particularly the rural economy, is urgently needed to reduce Zambia's economic vulnerability and expand employment opportunities for a rapidly rising supply of labor.



## II - THE EDUCATION SYSTEM

### Administration and Organization

2.01 The Minister of Education is responsible for policy, control and supervision of primary and secondary schools and teacher training colleges. A newly created Directorate for Technical Education under a Minister of State controls all technical education outside the secondary schools. The Minister of Agriculture is responsible for agricultural education except for agricultural courses in secondary schools. Control and supervision of the University of Zambia is vested in a Provisional Council.

2.02 The organization of the Ministry of Education is shown in Annex 1a. The Minister and his Permanent Secretary are assisted by an Advisory National Council of Education and by four main divisions of the ministry: Administration, Professional matters, Planning and the Inspectorate. Staff positions in the Ministry are filled by competent officials but most are non-Zambians (mainly from the U.K.) and the turnover is high.

2.03 There is urgent need for a formulation of planning objectives and criteria, particularly as regards finance and manpower development, for the introduction of modern statistical methods and for integration between ministries. The Planning Unit is, however, under-staffed; it has not begun to function effectively and needs strengthening. The Inspectorate needs broader expertise in pre-vocational education. A specialist in agricultural education has been appointed recently; there will be need for specialists in technical secondary education. During negotiations assurances have been obtained that these two units will be expanded. The National Council of Education would be more effective if representatives of the private sector were added.

2.04 There are nine administrative regions, each with a Chief Education Officer and his staff of education officers, who are responsible for general supervision of policy implementation. Training of the regional staff is urgently needed; assurances to that effect have been obtained during negotiations.

### Primary Education

2.05 Primary education is not compulsory; it consists of a lower cycle of 4 years and an upper cycle of 3 years (Annex 1b). Enrollment has more



than doubled from 279,780 pupils in 1960 to 598,198 pupils in 1968 or about 84% of the 7-13 years age group (Annexes 1c and 1d). Government projections show enrollment growing to 857,300 in 1975 and 974,900 in 1980. This latter figure approximates to universal primary education (Annex 1e). Of the 10,655 primary school teachers in service in 1967, 92% are qualified. Many of these latter, however, had only one year of training after two years of secondary education and require further training (para. 2.14).

### Secondary Education

2.06 The secondary course comprises a 2-year junior section, leading to the junior secondary school leaving examination and a 3-year senior section which prepares for the Cambridge University Overseas School Certificate examinations giving access to the University of Zambia and other institutions of post-secondary education.

2.07 Present policy is to admit one-third of primary school leavers to secondary education (which is high in comparison with other African countries and to maintain a progression rate from junior into senior cycle of secondary education of two-thirds of the pupils. In 1968, the respective percentages were 34% and 57%. The progression from junior to senior cycle is too high to provide the required proportion of manpower educated to these two levels. The length of the junior cycle of two years, moreover, is too short. The government therefore intends to convert the present structure, in which a 2-year junior cycle is followed by a 3-year senior cycle (2:3 structure), into a 3:2 structure and to reduce the progression rate mid-way from two-thirds to one half. This will lead to an output of more mature and better educated young people at the end of the junior cycle and to a supply of manpower more in line with the projected requirements at both junior and senior level as shown in para. 4.07.

2.08 The present curriculum is almost entirely academic. During appraisal, agreement was reached on a new curriculum, which would include 8 periods a week of practical work for all pupils in the junior cycle and, in the senior cycle, would create pre-vocational sections, with 10 periods a week allocated to industrial subjects, agriculture, commerce or home economics, for 55-60% of the students. Attendance at these pre-vocational courses would not deny pupils access to higher education.

2.09 Enrollments in general secondary schools have increased sharply: from 2,543 in 1960 to 38,997 in 1968 (Annex 1d). If the government should continue its present admission policy, total enrollment would rise to nearly 90,000 pupils in 1974 and nearly 140,000 in 1980. Given the limitation of the administrative capacity to provide new places and the constraints of finance and teacher supply, it is unlikely that these increases will be realized. The output of secondary school graduates, moreover, would exceed estimated manpower requirements.

2.10 The government would be well advised to reduce the admission rate to about 30% along with the reduction of mid-way progression to 50%. Enrollment would then reach about 80,000 pupils in 1974. Provided the



necessary teachers can be recruited, this figure is a reasonable target for 1974 (Annex 1f).

2.11 Schools are generally well staffed, the teacher-pupil ratio being 1:22, but almost 90% of the teaching force of 1776 is foreign, mostly from the United Kingdom. At the projected rate of growth in secondary school enrollments, the need for teachers would increase to 3160 in 1974 (Annex 1g). Many headmasters are inexperienced. The Institute of Education of the University of Zambia, in cooperation with the Ministry of Education, is developing an urgently needed program for the training of headmasters.

#### Teacher Training

2.12 Primary school teachers are trained in 1 and 2 year courses after the first secondary cycle (Form 2); after 1970 all courses will be two years with a common curriculum and an examination controlled by the Ministry of Education.

2.13 Enrollments in the nine colleges are 2072 students. The teacher-pupil ratio of 1:15 is to be increased to 1:20 as soon as possible. Seventy eight of 141 teacher trainers are Zambians.

2.14 Existing capacity is sufficient to meet requirements for additional primary school teachers. There is, however, an urgent need to retrain the majority of the teachers now in service and the Ministry has decided to extend two existing colleges for this purpose.

2.15 Secondary teacher training is provided at the Higher Teacher Training College in Kabwe and the School of Education of the University of Zambia. A second Higher Teacher Training College in Kitwe will start operating soon. Students are admitted after having completed secondary education. The 3-year diploma courses, started at Kabwe in 1967 for teachers in junior secondary classes, and to start in Kitwe in the near future, will be reduced to 2 years in 1969 to meet the urgent need for teachers. The colleges will also train teachers of home economics, commerce, industrial arts and agriculture for both the junior and senior classes. Present enrollment at Kabwe is 124 but will increase to 750 in both colleges with an annual output of 325 teachers from 1974.

2.16 The School of Education of the University of Zambia provides teacher training courses for students enrolled in Humanities and Natural Sciences. The first group of 40 teachers will leave the University in 1971.

2.17 The combined efforts of the two colleges and the University of Zambia should be able to meet the total demand for secondary school teachers by 1979, including the replacement of foreign teachers, if expanded as planned (para. 4.13). For a number of years to come, however, secondary education will rely on foreign teachers (Annex 13).

2.18 During 1968-1971 650 more foreign teachers will be needed than are now in service. The main source of supply has been the United Kingdom but the Ministry of Overseas Development has indicated that financial limitations would not allow further growth. The Zambian government is launching a recruit





ment campaign amongst overseas sources of teacher supply, including continental European countries, U.S.A., Canada and Australia. This campaign is meeting with an initial measure of success.

### Technical Education and Training

2.19 Organized technical education and training exists only to a limited extent but considerable growth is to be expected consequent upon the recent creation of a separate Directorate of Technical and Vocational Education and Training under a Minister of State directly responsible to the office of the Vice-President, and the proposal to establish National Advisory Councils at technician and craft levels.

2.20 At the pre-vocational level, the David Kaunda Secondary Technical School (under the Ministry of Education) offers four-year courses preparing for apprenticeship in the engineering and building industries or for admission to full-time diploma and degree courses at the Northern Technical College and the University of Zambia, respectively. The school, the only one of its kind in Zambia, has an intake of 120 pupils per year.

2.21 Full-time courses in brickwork and carpentry are given in government Trade Schools at Livingstone, Lukashya, and Mukobeko. Entry is restricted to trainees who are sponsored by industrial firms with whom they spend three months before entering upon the one-year trade school course. Selected trainees may return for an advanced course after completion of a minimum of one year in industry. A UNDP/ILO project presently has under consideration a revision of apprenticeship arrangements and the construction of 12<sup>7</sup> new vocational training centres, raising the output from the existing total of 272 to approximately 2,000 per year. The centres will also train selected craftsmen for supervisory posts.

2.22 Training at technician level is carried out at the Evelyn Hone College of Further Education (Lusaka) and the Northern Technical College (Ndola). The latter is concerned mainly with the engineering and building industries but is associated with "feeder" institutions at Kitwe and Luanshya where commercial and general education courses are offered (Annex 1h). At Ndola a majority of the students are already in employment as apprentices or learners and are released by employers to attend full-time courses of six week's duration three times a year. Recently, full-time courses of two years' duration have been introduced at certificate technician level together with more advanced courses of four years' duration at diploma technician level. The demand for these full-time courses is expected to increase with the economic development of the country and some of the craft training will eventually be transferred to other centres (Annex 1h). At present the intake of new students is of the order of 250 to 300 per year; enrollment in 1967 was 636 full-time and 934 part-time students. A feature of the work of the College is its close co-operation with industry in the conduct of block-release and full-time courses.

2.23 The Evelyn Hone College is responsible for work at a similar variety of levels but mainly in the fields of commerce, home economics, the social services, and general and social education. In addition to a full-time enrollment of some 350 students, the College and its associated



institutions have an evening enrollment of about 2,000 students.

2.24 The University of Zambia is responsible for the training of technologists and engineers. Engineering students follow a five-year course, the first year being common with science courses.

#### Agricultural education and training

2.25 Post-secondary courses in agriculture are conducted by the Natural Resources Development College of the Ministry of Agriculture. At a lower level the Zambia College of Agriculture in Monze has a Junior Technical Officers course for students with two years of secondary education and an Agricultural Assistants course for primary school leavers. Eight Farm Institutes conduct 3-months induction courses for demonstrators and shorter in-service courses for students with primary education; the institutes also train farmers. Twelve Farmer Training Centers give short courses to farmers and farmers' wives. Twelve other centers are under construction.

2.26 The University has established a School of Agriculture which has neither sufficient staff nor accommodation. Seven students were enrolled this year to the School of Natural Sciences but it seems likely that they will be sent abroad for further study.

2.27 Government plans for a rapid development of the agricultural sector would indicate that agricultural education and training should be expanded. The need for such expansion is not yet fully reflected in educational planning and in the proposed project, except for the introduction of pre-vocational agricultural courses in secondary schools. An assessment of existing agricultural training facilities and of the need for further expansion at all levels will be undertaken. Identified needs for further investment in agricultural training institutions could form part of a second education project in the near future.

#### Higher Education

See main body of the report.

### III - COST AND FINANCING OF EDUCATION

3.01 Finance for education is centralized in the budget of the central government. The role played by private schools is negligible. Mission schools, which are grant-aided for 100% of recurrent and 75% of capital costs, are considered part of the public sector.



3.02 Income from school fees is very low; for primary and secondary schools it is estimated at K 300,000, or only 1% of government expenditure on primary and secondary education. Tuition fees of K 36 p.a. and boarding fees of K 162 p.a. are only charged in the small group of ex-federal schools, known as "scheduled" schools. No fees are charged in the majority group of "unscheduled" primary and secondary schools, the trade schools and secondary technical school (except for some small boarding fees in primary schools). Education is also free at the teacher training colleges; in addition, students receive pocket money and travel allowances.

3.03 The Northern Technical College and Evelyn Hone College of Further Education are financed through a government grant to the Boards of Governors and, to a small extent, through income from fees and donations. The University of Zambia is financed through a triennial government grant, which in 1968 covered nearly 90% of all recurrent expenditure; the rest is covered by tuition fees of K 120 p.a. and boarding fees of K 180 p.a. (which are indirectly financed through government bursaries to students) and other income.

3.04 Recurrent expenditure on education by other Ministries is only K 2.4 million or slightly over 7% of the recurrent expenditures by the Ministry of Education (Annex 1i). Regional and local authorities expenditure on education is negligible; local communities assist in the construction of primary school buildings but even here the major part of the costs is borne by the central government.

3.05 The contribution of private industry is important, although the exact amount is unknown. Participation comes in many forms, such as vocational training directly organized and financed by industry (particularly the mining industry), the sponsoring of students in public schools, scholarships and donations. The total financial contribution of the mining industry is estimated at K 6 million in 1968.

3.06 In aggregate it is estimated that in 1968 K 61.5 million or some 6.2% of GDP was spent on education (Annex 1i):

in K million	<u>Recurrent</u>	<u>Capital</u>	<u>Total</u>
Ministry of Education (net)	34.0	15.3	49.3
Other Ministries	2.5	2.9	5.4
Private sector	6.8	-	6.8
TOTAL	<u>43.3</u>	<u>18.2</u>	<u>61.5</u>

#### IV - EDUCATION AND TRAINING NEEDS

##### Existing manpower situation

4.01 The total working population in 1965/66 was estimated at 805,900 persons with 305,900 in the modern sector of the economy and 500,000 in the rural subsistence sector. The educational level of the African labor force is low. Only a very small number of Africans have



a University degree or a post-secondary diploma; even those who have finished secondary education constitute only 0.2% of the African labor force. In 1966, of 56,150 positions requiring 2 years of secondary education or more, only 17% were filled by qualified Africans. That most middle and high level positions are filled by non-Africans is shown at Annex 1j.

4.02 Crucial shortages of qualified manpower exist in nearly every sector of the economy. Private enterprise experiences serious difficulties in recruiting trainable personnel with secondary or higher education since most school leavers are directed into the public sector. Efficiency and productivity in industry and commerce are low and further growth is inhibited by this lack of staff and by the low level of education of those who are available. The public sector, after filling 838 existing civil service vacancies with newly recruited expatriates in January 1968 - most of them in the professional, administrative and executive ranks - still had 4,600 unfilled posts in May, 1968. For 2100 of these posts, a completed secondary education or equivalent is required and for 425 posts, a University degree. Nearly all teachers at secondary and post-secondary level are expatriates.

#### Future developments

4.03 The number of young Zambians entering the labor market will probably double between 1965 and 1980; their total number can be estimated at 800,000 for the 15-year period. It is unlikely that more than 45-50% of them will find employment in the modern sector, even under very optimistic growth expectations. The remainder will fall back on opportunities for useful employment in the rural sector of the economy, that is, small scale agriculture and closely related services. Unless employment outlets are greatly increased, the absorption of the rapidly growing numbers of new entrants to the labor market could form the crux of the human resource development problem in the near future. In the long run this problem might become more important than the severe shortage of qualified manpower at present.

4.04 In the rural sector, there is urgent need to increase production and raise income levels for several reasons, including the creation of additional employment, as is stressed in the First National Development Plan 1966-1970. Manpower projections should therefore make provision for a gradual up-grading of the rural working population. The primary and secondary school system should adjust its orientation and offer better preparation for rural employment by teaching practical subjects, particularly agricultural science and industrial arts. Agreement has been reached with Government that steps to that effect would be taken.

4.05 In the modern sector, the demand for educated Zambians depends mainly upon (i) the rate of replacement of foreign personnel and (ii) the growth of total employment as a result of economic expansion. Government pressure to speed up the process of Zambianisation is strong and non-Zambians are being replaced at a faster rate than the supply of qualified Zambian manpower permits. Positions are frequently filled with





personnel of inadequate education or experience and there is a danger that such unqualified incumbents will block the way for more highly qualified Zambians as these become available. To avoid long-lasting damage to labor productivity, the output of the education and training system should be increased without delay.

4.06 The growth of total employment in the modern sector of the economy has been considerable. Between 1964 and 1966, total employment rose from 268,700 to 332,900 or by 24%, mainly in manufacturing, construction, transport and communications (Annex 1k). The rate of expansion has probably decreased recently and present conditions, including uncertainty as to the future price of copper, on which the greater part of the economy depends, make it difficult to estimate future employment. It is believed that the rate of expansion is less than originally foreseen in the official manpower projections, the presently estimated annual growth being 8% for the period 1965-1970 compared with original expectations of 11%. For the purposes of this appraisal, the 1966 government manpower forecasts have therefore been reduced correspondingly.

4.07 Projections of manpower requirements for the period 1966-1980, revised by the mission as indicated in paras. 4.04 and 4.06 above, indicate a demand for the following numbers of new entrants to the labor market:

<u>Degree-level</u>		10,000
<u>Diploma level</u>		18,000
including: teachers	2,300	
technicians	1,500	
<u>Secondary (Form 5) level</u>		52,000
including: technicians	1,800	
<u>Junior secondary level</u>		106,000
	TOTAL	<u>186,000</u>

#### Educational Development Needs

4.08 The present output of the Zambian education system is insufficient to meet the manpower needs outlined above. With a Form 5 level output of only 1,600 graduates in 1967, the secondary school system is unable to feed institutions of post-secondary education and to meet labor market demands. Expansion of the University and other post-secondary institutions is hampered by a lack of qualified applicants. A rapid increase in the output from secondary schools in the next few years - which can level off at a later stage is therefore required. In addition, the quality of the secondary school output, especially in science, should be improved.

4.09 Total enrollments in secondary schools should be increased from 39,000 in 1968 to about 80,000 in 1974; this would raise the output from the junior cycle to 9,800 and from the senior cycle to 7,300 a year by 1974. This substantial increase over the next six years should be followed



by a levelling off in the rate of expansion beyond 1974 (Annex 1f). For reasons given in paras. 4.05 and 4.08 above, this rapid increase over the next few years should be preferred to a more even growth path.

4.10 At this rate of growth, the total output to the labor market of students leaving school at the end of the junior cycle or dropping out half way through the senior cycle during the period 1966-1980 would be about 105,300. The output of students with completed secondary education in the same period would be 78,000. These output estimates are roughly in accordance with the requirement figures given above (para. 4.07).

4.11 The secondary school program should be diversified to include practical subjects both at junior and senior level. To prepare students not only for further education but also for direct entry to the labor market, secondary schools should provide pre-vocational courses in industrial subjects, agriculture, commerce and home economics. Agreement on the introduction of such courses was reached with the Government (para. 5.06).

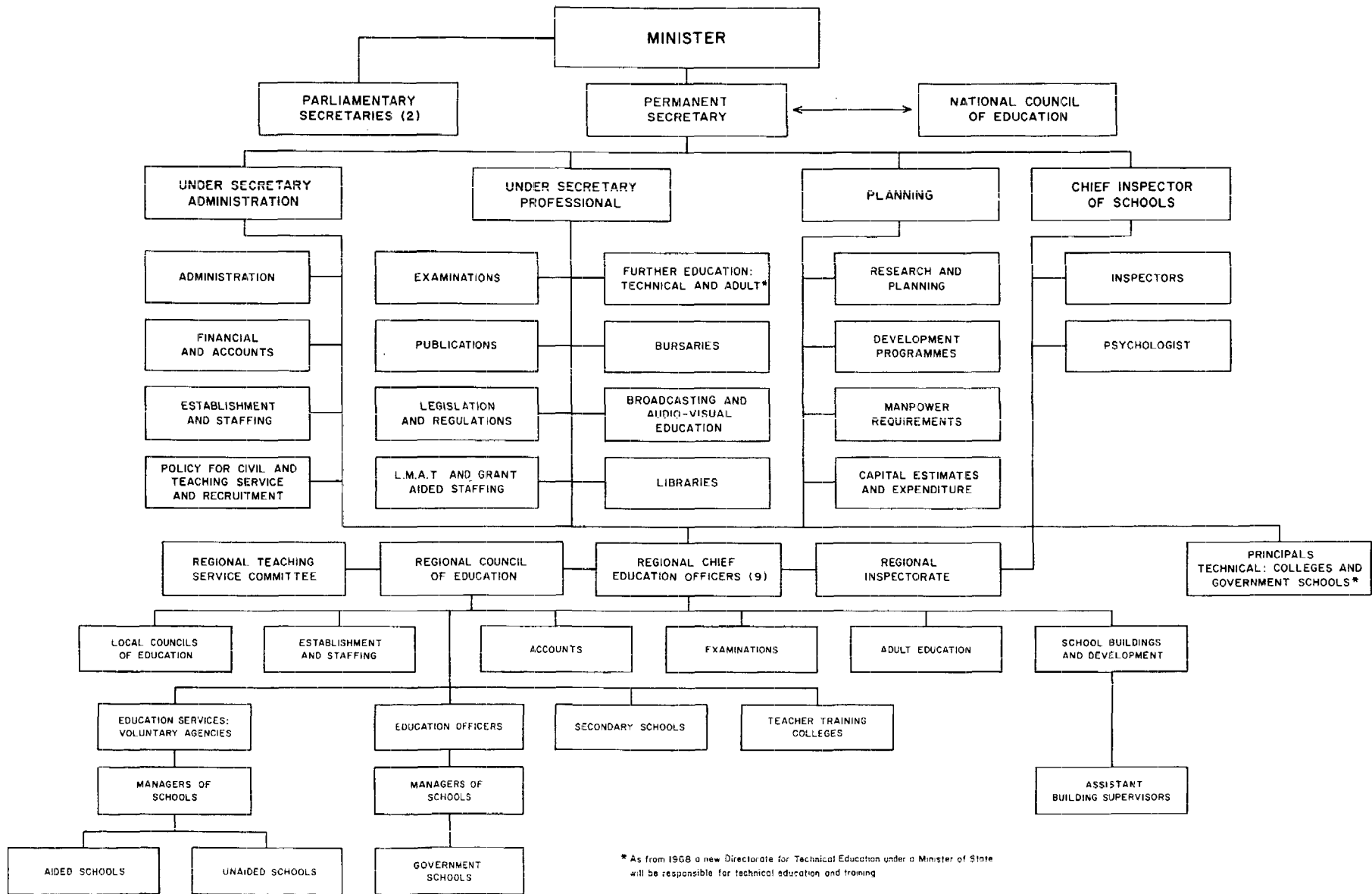
4.12 In the field of primary teacher training no new investments in regular pre-service courses are necessary but provision should be made for in-service courses to up-grade the majority of teachers now in post.

4.13 As detailed in paras. 2.17-2.18 and 4.07, there is a considerable shortage of secondary school teachers. The training of secondary school teachers, both at the Higher Teacher Training Colleges at Kabwe and Kitwe and at the School of Education of the University of Zambia should therefore be greatly expanded to provide the number of teachers required for expansion of secondary education and to replace expatriates now in service before 1980.

4.14 Of high economic priority is the training of technicians and engineers, which has only recently started. Estimated requirements of technicians are specified in para. 4.07. The Northern Technical College program to train engineering technicians at certificate and diploma level will assure an annual output of some 210 technicians, which is still below the country's requirements.



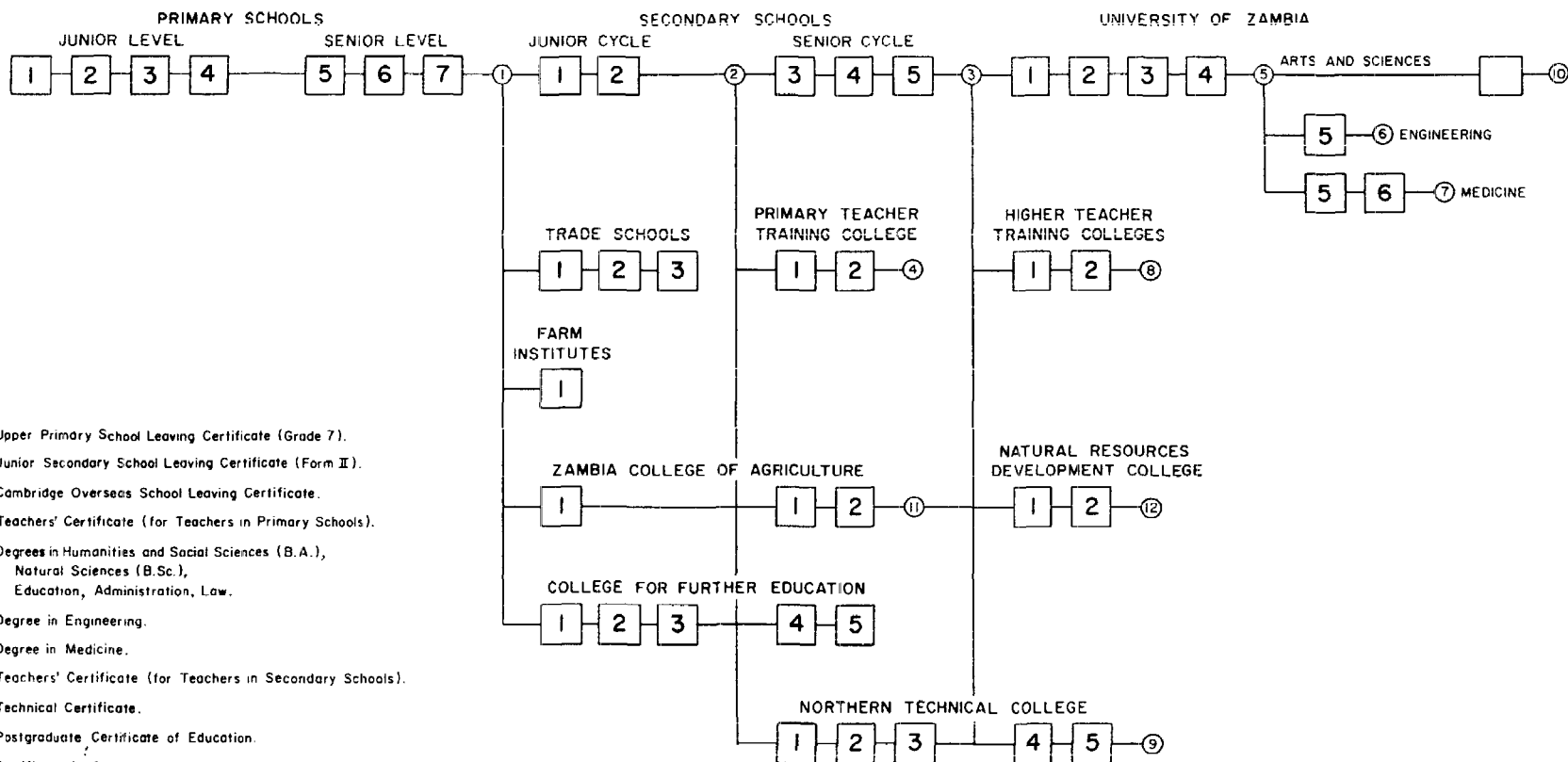
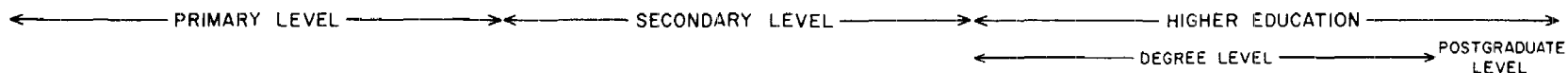
# ZAMBIA: ORGANIZATION OF EDUCATION ADMINISTRATION, 1967



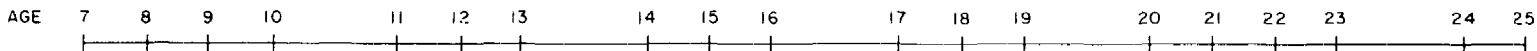
\* As from 1968 a new Directorate for Technical Education under a Minister of State will be responsible for technical education and training



# ZAMBIA: STRUCTURE OF EDUCATION, 1967



- ① Upper Primary School Leaving Certificate (Grade 7).
- ② Junior Secondary School Leaving Certificate (Form II).
- ③ Cambridge Overseas School Leaving Certificate.
- ④ Teachers' Certificate (for Teachers in Primary Schools).
- ⑤ Degrees in Humanities and Social Sciences (B.A.), Natural Sciences (B.Sc.), Education, Administration, Law.
- ⑥ Degree in Engineering.
- ⑦ Degree in Medicine.
- ⑧ Teachers' Certificate (for Teachers in Secondary Schools).
- ⑨ Technical Certificate.
- ⑩ Postgraduate Certificate of Education.
- ⑪ Certificate in Agriculture
- ⑫ Diplomas in Agriculture, Animal Management and Agricultural Commerce

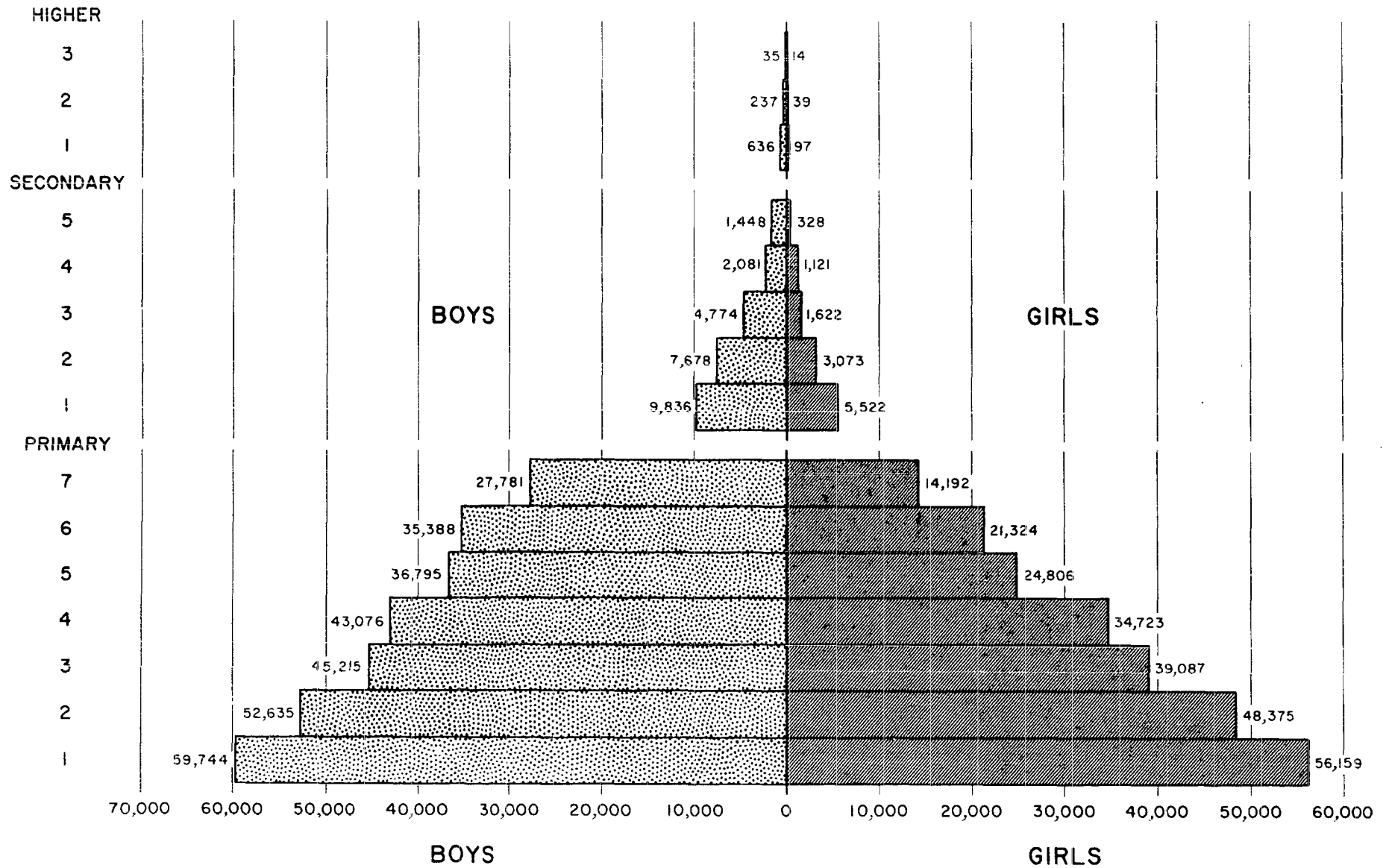


SOURCE: Ministry of Education, Zambia





# ZAMBIA: EDUCATIONAL PYRAMID, 1967



SOURCE Ministry of Education, Zambia

(2R)IBRD-3970



GROWTH OF THE ZAMBIAN EDUCATION SYSTEM  
1960 - 1968

YEAR	Total Primary	S E C O N D A R Y   L E V E L				P O S T - S E C O N D A R Y   L E V E L				
		General	Teacher Training	Trade Schools	Total	Northern Technical College	College of further Education	University of Zambia	Kabwe Higher TTC	Total
1960	279780	2543	1156	1445	5144	-	-	-	-	-
1961	296264	3724	1211	1428	6363		-	-	-	-
1962	319088	5187	1203	1381	7771	223	-	-	-	223
1963	337961	6922	1251	628	8801	184	-	-	-	184
1964	365565	13250	1283	841	15374	519	848	-	-	1367
1965	397110	16738	1429	486	18653	1444	1272	-	-	2716
1966	473331	23799	1510	621	25930	1239	1727	312	-	3278
1967	539300	34139	1857	287	36283	1570 <u>1/</u>	2000 <u>1/</u>	536	56	4162
1968	598198	38997	2072	302	41371	n.a.	n.a.	767	124	n.a.

1/ Includes evening-classes, 1967 figures for College of Further Education estimated by Min. of Ed.

Source: Ministry of Education, Zambia



ENROLLMENT TARGETS FOR PRIMARY EDUCATION - 1967-1980

YEAR	G R A D E				TOTAL LOWER CYCLE	G R A D E			TOTAL UPPER CYCLE	TOTAL BOTH CYCLES	TOTAL AGE-GROUP 7-13 YRS.	PRIMARY ENROLLMENTS AS PERCENT. OF 7-13 YRS. AGE-GROUP
	1	2	3	4		5	6	7				
1967 <sup>1/</sup>	115,903	101,010	84,302	77,799	397,014	61,601	56,712	41,973	160,286	539,300	683,000	79.0
1968 <sup>1/</sup>	121,801	114,083	98,520	83,735	418,139	64,165	60,676	55,218	180,059	598,198	715,000	83.7
1969	122,000	120,600	113,000	97,500	453,100	67,000	63,500	60,100	190,600	643,700	753,000	85.5
1970	129,000	120,800	119,400	111,900	481,100	78,000	66,300	62,900	207,200	688,300	794,000	86.7
1971	130,000	127,700	119,600	118,200	495,500	89,500	77,200	65,600	232,300	727,800	832,000	87.5
1972	132,000	128,700	126,700	118,400	505,500	94,600	88,600	76,400	259,600	765,100	865,000	88.5
1973	134,000	130,700	127,400	125,100	517,200	94,700	93,700	87,700	276,100	793,300	899,000	88.3
1974	136,000	132,700	129,400	126,100	524,200	112,600	93,800	92,800	299,200	823,400	925,000	89.0
1975	139,000	134,600	131,400	128,100	533,100	119,800	111,500	92,900	324,200	857,300	950,000	90.2
1980	159,000	151,500	144,000	139,800	594,300	130,900	126,800	122,900	380,600	974,900	1,051,000	92.7

<sup>1/</sup> Actual figures.

Source: Ministry of Education, Zambia



ENROLLMENT TARGETS FOR SECONDARY SCHOOLS  
IN 1000'S

YEAR	OUTPUT FROM PRIM. SCHOOLS	PERCENTAGE OF OUTPUT FROM PRIM. SCHOOLS TO SEC. SCHOOLS	F O R M					TOTAL	TOTAL AGE-GROUP 14 - 18 YEARS	ENROLLMENTS AS PERCENTAGE OF AGE GROUP
			1	2	3	4 <sup>1/</sup>	5			
1967	42.0	41.7	15.0	10.7	4.2	2.6	1.6	34.1	357	9.6
1968	55.2	34.0	14.3	13.4	6.2	3.2	1.9	39.0	371	10.5
1969	60.1	30.0	16.6	13.6	8.8	5.6	2.9	47.5	387	12.3
1970	62.9	30.0	18.0	15.8	9.0	7.9	5.0	55.7	402	13.9
1971	65.6	30.0	18.9	17.1	15.0	8.1	7.1	66.2	430	15.4
1972	76.4	30.0	19.7	18.0	16.2	7.5	7.3	68.7	450	15.3
1973	87.7	30.0	22.9	18.7	17.1	8.1	6.8	73.6	459	16.9
1974	92.8	30.0	26.3	21.7	17.8	8.6	7.3	81.7	481	17.0
1975	92.9	28.0	26.0	25.0	20.6	8.9	7.7	88.2	508	17.4
1976	110.4	28.0	26.0	24.7	23.7	10.3	8.0	92.7	536	17.3
1977	117.4	25	30.9	24.7	23.5	11.9	9.3	100.3	569	17.6
1978	119.3	25	32.8	29.4	23.5	11.8	10.7	108.2	595	18.2
1979	121.2	25	33.4	31.2	27.9	11.8	10.6	114.9	618	18.6
1980	122.9	25	33.9	31.7	29.6	14.0	10.6	119.8	638	18.8

<sup>1/</sup> Enrollment in Form 4 equivalent to 50% of the output from Form 3 (Junior cycle)

Source: Bank Mission estimates





ZAMBIA

TEACHERS IN SECONDARY SCHOOLS  
DEMAND AND SUPPLY

YEAR	ENROLLMENTS PROJECTIONS '000	TEACHERS NEEDED	Z A M B I A N T E A C H E R S			NUMBER OF EXPATRIATES REQUIRED	EXPATRIATES + increase - decrease	
			IN POST	OUTPUT FROM				TOTAL BY END OF YEAR
				H.T.T.C.	UNIVERSITY			
1968	39.0	1776	198			1578		
1969	47.5	1837	198			1639	+ 61	
1970	55.7	2155	198	137		335	+ 318	
1971	66.2	2561	335	88	40	463	+ 269	
1972	68.7	2658	463	150	80	693	- 31	
1973	73.6	2847	693	150	140	983	- 41	
1974	81.7	3160	983	325	230	1538	+ 23	
1975	88.2	3412	1538	325	360	2223	- 303	
1976	92.7	3586	2223	325	500	3048	- 511	
1977	100.3	3880	3048	325	500	3873	- 531	
1978	108.2	4186	3873	325	500	4698	- 519	
1979	114.9	4445	4698	325	500	5523	-	
1980	119.8	4634	5523	325	500	6348	-	

Source: Bank Mission estimates



NORTHERN TECHNICAL COLLEGE

Table "A"

Enrolments at the Northern Technical College and associated institutions, 1967

Courses	Full-time & block release							Part-time day & evening						
	A	B	C	D	E	F	G	A	B	C	D	E	F	G
Automobile engineering	110													
Electrical engineering	147													
Fabrication engineering	81													
Mechanical engineering	140								8					
Telecommunication engin.	39													
Commercial & gen. edc.		99	20					81	326	173	138	33		
Apprentice introductory								15	75		28	30	12	15
	517	99	20					96	409	173	166	63	12	15
	636							934						

Key: A=Ndola; B=Kitwe; C=Chingola; D=Mufulira  
E=Luanshya; F=Kabwe; G=Lusaka.

Table "B"

Projections of Future Enrollments

Type of course	Enrollments							
	1968	'69	'70	'71	'72	'73	'74	
Full-time	76	134	195	240	285	310	320	
Block-release	526	570	610	640	660	680	680	
Part-time day/evening	29		No estimate					
Total enrollment	631	704	805	880	945	990	1000	

Maximum day load	339	419	500	560	615	650	660
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Table C

Projected Output of Craftsmen and Technicians

Qualification	Approx. Annual Output	
	1968	1974
Craft	165	140
Technician	85	210
Total	250	350

Note.- It is very difficult to estimate the "output" of the Northern Technical College, a majority of whose students will be industry-based and may leave at any point in a course of from one to four years duration. Moreover, a course may commence with a craft bias and terminate at the technician level. In the following approximation it has been assumed that, for most courses, students who leave at a "half-way" stage can be included in the craft output.

Table D

Present Teaching Staff

Qualification	Teacher training		Total
	Trained	Untrained	
Degree or equivalent qualification	7	2	9
National diploma or certificate (U.K.)	2	7	9
City & Guilds of London Institute	1	4	5
Other	1	8	9
TOTALS	11	21	32

Table E

Staff Requirements

	'68	'69	'70	'71	'72	'73	'74
Max. day loading	339	435	500	560	615	650	660
Equiv. no. of classes	23	27	32	36	39	39	40
No. of teaching staff	32	38	45	51	55	56	56
" " lab. & workshop tech.	2	4	5	5	6	6	7
Student/teacher ratio	10.6	11.4	11.1	11.0	11.2	11.8	11.8

Source: Northern Technical College, Ndola



TOTAL NATIONAL EXPENDITURE ON EDUCATION AND TRAINING - 1968

(in K '000)

	-----PUBLIC SECTOR-----					--PRIVATE SECTOR--		Total
	Ministry of Education	Civil Service Training	Ministry of Agriculture	Ministry of Health	Other Ministries	Private Companies	Private Persons (fees)	
<u>Recurrent expenditure</u>								
Administration, etc.	2210.4							2210.4
Primary education	16571.6							16571.6
Second. education	8727.4							8727.4
Teacher training	1320.4							1320.4
Technical & further	1266.4	336.0	1168.4	257.6	673.5	6000.0	151.0	9852.9
Adult education	920.6							920.6
University of Zambia								
1968 grant	1400.0							1400.0
transfers	1388.2							1388.2
bursaries	600.0							600.0
Other expenditure	283.2							283.2
Total Ministry of Education	34688.2							
Fees	- 660.0						660.0	--
Total recurrent	34028.2	336.0	1168.4	257.6	673.5	6000.0	811.0	43274.7
<u>Capital expenditure</u>	15868.5	100.0	550.0	770.0	1510.0	.....		18798.5
(minus bursaries)	- 600.0							- 600.0
<u>Total</u>	49296.7	436.0	1718.4	1027.6	2183.5	6000.0	811.0	61473.2

Source: Estimates of Revenue and Expenditure, 1968





EDUCATIONAL ATTAINMENT OF ZAMBIAN LABOUR FORCE  
1965/1966

(percentages show educational attainment as percentage of total labour force)

	<u>Africans</u>	<u>%</u>	<u>Non-Africans</u>	<u>%</u>	<u>Total</u>	<u>%</u>
Degree	150	-	3,499	10.5	3,649	0.5
Diploma or A-level	517	0.1	5,944	17.0	6,461	0.8
Secondary (O-level)	1,516	0.2	11,965	34.3	13,481	1.7
Lower secondary (F2)	7,282	0.9	11,409	32.7	18,691	2.3
Below Form 2	261,681	33.9	1,944	5.5	263,625	32.7
Total Modern Sector	271,146	35.1	34,761	100.0	305,907	38.0
Below Form 2 (subsistence)	500,000	64.9	-	-	500,000	62.0
Total labour force	771,146	100.0	34,761	100.0	805,907	100.0

(percentages show proportion African : Non-African for each educational level)

	<u>Africans</u>	<u>%</u>	<u>Non-Africans</u>	<u>%</u>	<u>Total</u>	<u>%</u>
Degree	150	4.0	3,499	96.0	3,649	100.0
Diploma or A-level	517	8.0	5,944	92.0	6,461	100.0
Secondary (O-level)	1,516	11.0	11,965	89.0	13,481	100.0
Lower secondary (F2)	7,282	39.0	11,409	61.0	18,691	100.0
Below Form 2	261,681	99.0	1,944	1.0	263,625	100.0
Total Modern Sector	271,146		34,761		305,907	100.0
Below Form 2 (subsistence)	500,000	100.0	-	-	500,000	100.0
Total labour force	771,146	96.0	34,761	4.0	805,907	100.0

Source: Manpower Report, Zambia Government 1965/66



EMPLOYMENT BY INDUSTRIAL SECTORS. 1954 - 1966  
(EXCLUDING RURAL SUBSISTENCE SECTOR)

	1954	%	1964	%	1966	%
1. Agriculture, forestry and fishing	39,500	15	35,500	13	33,500	10
2. Mining and quarrying	50,900	19	50,600	19	55,000	17
3. Manufacturing	17,800	7	20,900	8	31,600	9
4. Construction	59,200	22	31,000	11	70,300	21
5. Electricity, water and sanitary services	2,400	1	2,200	1	3,400	1
6. Commerce	17,100	7	20,900	8	27,100	8
7. Transport and communications	9,000	3	11,400	4	21,400	6
8. Private domestic service	29,600	11	35,500	13	35,000	11
9. Other services	39,600	15	61,300	23	55,700	17
TOTAL	265,200	100	268,700	100	332,900	100
of whom:						
Africans	240,400	91	237,000	88	303,400	91
Non-Africans	24,770	9	31,700	12	29,500	9

Source: Economic Report, Republic of Zambia 1967



GOVERNMENT RECURRENT EXPENDITURE 1964/65 - 1969

(in K'000)

	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>1967<sup>II</sup> **</u>	<u>1968</u>	<u>1969</u>
1. Total recurrent government account/budget *	152,074.6	214,383.0	244,474.2	124,169.0	249,790.7	279,554.8
2. Minus: Appropriations from general revenue to capital	<u>46,472.0</u>	<u>75,000.0</u>	<u>80,000.0</u>	<u>24,000.0</u>	<u>54,000.0</u>	<u>80,000.0</u>
3. Net recurrent expenditure	<u>105,602.6</u>	<u>139,383.0</u>	<u>164,474.2</u>	<u>100,169.0</u>	<u>195,790.7</u>	<u>199,554.8</u>
4. Budget Min. of Education	14,148.4	19,583.8	25,166.2	15,650.0	31,618.8	36,330.0
5. Budget Techn. & Voc. Education	-	-	-	-	1,107.3	1,575.0
6. Add: Bursaries ***	212.4	569.6	732.0	270.0	642.8	550.0
7. Transfer Univ. grant	-	+ 69.4	- 880.6	- 577.0	+ 1,388.2	-
8. Total recurrent education expenditure	<u>14,360.8</u>	<u>20,222.8</u>	<u>25,017.6</u>	<u>15,343.0</u>	<u>34,757.1</u>	<u>38,455.0</u>
- do - as a % of 3	13.6%	14.5%	15.2%	15.3%	17.7%	19.3%

\* Including "Constitutional and Statutory expenditure"

\*\* Six months' period July-December 1967

\*\*\* Bursaries are included in the capital budget of the Ministry of Education and Commission for Technical and Vocational Education

Source: Financial Reports 1964/65 and 1965/66  
Estimates of Revenue and Expenditure 1966/67, 1967<sup>II</sup>, 1968 and 1969.



PROJECTED RECURRENT EXPENDITURE MINISTRY OF EDUCATION  
AND COMMISSION FOR TECHNICAL AND VOCATIONAL EDUCATION 1969-1974

K'000

(in constant 1969 prices)

	<u>1969</u>	<u>%</u>	<u>1974</u>	<u>%</u>
Administration, etc.	2,518.4	6.5	4,000.0	6.0
Primary education	17,417.7	45.3	28,792.3	43.6
Secondary education	10,636.4	27.7	18,512.8	28.0
Teacher training	1,367.3	3.6	1,847.9	2.8
Technical and vocational education	1,575.0*	4.1	2,218.7	3.3
Adult education	1,347.1	3.5	1,500.0	2.3
University of Zambia	2,700.8	7.0	7,310.0	11.1
Bursaries	550.0**	1.4	1,500.0	2.3
Other expenditure	<u>342.3</u>	<u>0.9</u>	<u>400.0</u>	<u>0.6</u>
Total recurrent education budget	38,455.0	100.0	66,081.7	100.0

\* Budget of the Commission for Technical and Vocational Education

\*\* Included in capital budget

Source: Bank Mission estimate.





## UNIVERSITY OF ZAMBIA

RECURRENT EXPENDITURE 1968 and 1969

(in K'000)

	Actual Expenditure 1968	Estimate 1969
<u>Administrative Services</u>		
General Administration*	392.0	542.3
Staff development	10.8	70.0
Catering officer	326.5	309.4
Students' Residences	65.6	82.9
Health Services	4.8	6.0
Buildings' Officer	135.8	141.9
Computer Center	16.2	30.6
Project Office	45.8	46.4
Horticultural Officer	61.3	64.0
Sub-Total	1,058.8	1,293.5
<u>Academic Schools and Departments</u>		
Administration	55.6	79.4
Agricultural Sciences	-	25.5
Correspondence studies	101.5	58.9
Education	96.0	151.8
Engineering	38.8	82.6
Extra-mural studies	84.5	118.4
Humanities and Social Sciences	256.7	330.0
Law	53.7	65.9
Medicine	21.4	134.2
Natural sciences	269.1	310.1
Library	241.2	303.5
Sub-Total	1,218.5	1,660.3
Research	125.9	128.0
Grand-Total	2,403.2	3,081.8

\* Including expenditure for the Provisional Council, Vice-Chancellor, Registrar, Bursar and Dean of Student Affairs.



UNIVERSITY OF ZAMBIA - CAPITAL EXPENDITURE, 1965-1970

	<u>Transitional/First Development Plans</u>	<u>University Development Plan</u> <sup>1/</sup>	<u>Actual Govt. Grants</u>	<u>Actual Expenditure</u>	
	K	K	K	<u>Govt. Funds</u>	<u>Total</u>
Up to 30 June 1966	2,000,000	1,915,000	2,000,000	1,915,000	1,915,000
July 1, 1966 - June 30, 1967	5,052,000	3,338,000	2,600,000	3,338,000	5,203,000
1968	3,500,000	4,477,000	4,258,000	3,605,000	5,771,000(est.)
Sub-Total	<u>10,552,000</u>	<u>9,730,000</u>	<u>8,858,000</u>	<u>8,858,000</u>	<u>12,889,000</u>
1969	4,724,000	4,767,000	2,872,000	2,872,000	3,384,000(est.)
1970	2,724,000	4,097,000			
<u>TOTAL</u>	<u>18,000,000</u>	<u>18,594,000</u>	<u>(11,730,000)</u>	<u>(11,730,000)</u>	<u>(16,273,000)</u>

<sup>1/</sup> As revised in mid-1968 before economy cuts. Government-financed sector only.



EDUCATIONAL ATTAINMENT OF ZAMBIAN LABOR FORCE  
1965/1966

	<u>Africans</u>	<u>% <sup>1/</sup></u>	<u>Non-Africans</u>	<u>% <sup>1/</sup></u>	<u>Total</u>	<u>% <sup>1/</sup></u>
Degree	150	-	3,499	10.5	3,649	0.5
Diploma or A-level	517	0.1	5,944	17.0	6,461	0.8
Secondary (O-level)	1,516	0.2	11,965	34.3	13,481	1.7
Lower Secondary (F2)	7,282	0.9	11,409	32.7	18,691	2.3
Below Form 2	261,681	33.9	1,944	5.5	263,625	32.7
<b>Total Modern Sector</b>	<b>271,146</b>	<b>35.1</b>	<b>34,761</b>	<b>100.0</b>	<b>305,907</b>	<b>38.0</b>
Below Form 2 (subsistence)	500,000	64.9	-	-	500,000	62.0
<b>Total Labor Force</b>	<b>771,146</b>	<b>100.0</b>	<b>34,761</b>	<b>100.0</b>	<b>805,907</b>	<b>100.0</b>
	<u>Africans</u>	<u>% <sup>2/</sup></u>	<u>Non-Africans</u>	<u>% <sup>2/</sup></u>	<u>Total</u>	<u>% <sup>2/</sup></u>
Degree	150	4.0	3,499	96.0	3,649	100.0
Diploma or A-level	517	8.0	5,944	92.0	6,461	100.0
Secondary (O-level)	1,516	11.0	11,965	89.0	13,481	100.0
Lower Secondary (F2)	7,282	39.0	11,409	61.0	18,691	100.0
Below Form 2	261,681	99.0	1,944	1.0	263,625	100.0
<b>Total Modern Sector</b>	<b>271,146</b>		<b>34,761</b>		<b>305,907</b>	<b>100.0</b>
Below Form 2 (subsistence)	500,000	100.0	-	-	500,000	100.0
<b>Total Labor Force</b>	<b>771,146</b>	<b>96.0</b>	<b>34,761</b>	<b>4.0</b>	<b>805,907</b>	<b>100.0</b>

<sup>1/</sup> Percentages show educational attainment as percentage of total labor force.

<sup>2/</sup> Percentages show proportion African:Non-African for each educational level.

Source: Manpower Report, Zambian Government 1965/66.









THE UNIVERSITY OF ZAMBIA

ESTIMATED ANNUAL EXPENDITURES AND LOAN DISBURSEMENTS

( in thousand dollars equivalent )

	1969	1970		1971		1972		1973		Total	
	Loan	Loan	Country	Loan	Country	Loan	Country	Loan	Country	Loan	Country
Siteworks <u>1/</u> Loan Country		130	100	160	50	10				300	150
Construction <u>1/</u> Loan Country		800	280	1000	540	950	530	300	150	3050	1500
Furniture <u>1/</u> Loan		50		260		150		60		520	
Equipment <u>1/</u> Loan		60		280		170		70		580	
Professional Services <u>1/</u> Loan Country	50	250	120	150	90	20	20	10	10	480	240
Unallocated Loan Country		10		50	20	100	50	210	140	370	210
Total Loan Country	50	1300	500	1900	700	1100	600	650	300	5300	2100

1/ Including price escalation