Economics of Education in

Sierra Leone

[by]

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ABSTRACT

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This paper presents a critical evaluation of Sierra Leone's educational system. From benefit-cost analysis, the social profit-ability of investment in primary and secondary schools is estimated to exceed that in higher education. The manpower requirement and supply projections indicate that the largest shortage is also likely to occur at the middle level. Hence it is concluded that Sierra Leone should place greater emphasis on primary and secondary education. One way of obtaining resources for this is to let the university students bear a larger proportion of total costs. It is argued that such a policy will introduce an element of equity in educational financing.

Introduction

With respect to investment in education, two important questions need to be examined. The first question is that of quantity, i.e., how much should be the aggregate investment in primary and secondary schools, and the institutions of higher learning. After having determined the aggregate level of investment, one must consider the second question which relates to the distribution of total costs of education among the state, private institutions, and those who receive education.

A number of methods have been used by economists to answer the first question, i.e., the optimal level of aggregate investment in the educational system. For example, the benefit-cost analysis has been widely used in many countries to determine the rate of return on the prevailing level of investment in education. Taking social costs and social benefits (and not the private ones) as the relevant elements in the calculus of returns to investment at primary, secondary and university levels, social rates of return are computed providing guidelines for future investment policies. Another technique uses manpower requirement projections to determine the areas of critical shortages which need further investments.

The present paper discusses the following group of issues. Firstly, the existing formal educational system in Sierra Leone is evaluated with the help of the benefit-cost technique (Section I.) After a brief exposition of the benefit-cost methodology as applied to investments in education, the social cost and social benefit streams for representative individuals with primary, secondary/technical and university education are derived. The benefits of education, i.e., the incremental earnings of individuals with a certain educational attainment, are estimated from two data sources: (1) the Household Income and Expenditure Surveys conducted throughout Sierra Leone over the period 1967-70; and (2) the Government of Sierra Leone Civil Service Scales. The internal social rates of return to educational investments are then computed to obtain guidelines for future investment policies. These computations show that the internal rates of return at the primary, secondary/technical and university levels of education are respectively, 20 percent, 22 percent, and 9.50 percent. This clearly indicates higher social profitability of investments in the lower and middle levels of Sierra Leone's educational system.

In section II, using the approach of manpower forecasting, the requirements and supply of trained personnel are estimated for the period 1975-1979. For the purpose of these projections, the trained manpower is classified into three groups: high level (those with university education), middle level (those with some secondary school education and technical/vocational training), and primary and secondary school teachers. The high and middle level manpower requirement projections are based on the planned sectoral growth rates of the Sierra Leone economy and the estimated educational attainment per thousand total employment in each sector. The primary and secondary school teachers' requirements are derived from projected enrollment increases and continuation of the existing student: teacher ratios at various levels. The supply estimates for the three groups of trained manpower are based on the projected enrollments at the University of Sierra Leone, the various teacher training colleges, the School of Nursing, and the technical and/or commercial institutes in the country. Outputs from these institutions are derived by adopting certain assumptions governing progression rates and the proportion of graduates who are Sierra Leonean. The requirement and supply projections are then compared to determine the areas of shortages. Perhaps not surprisingly, it appears that in the next five years, shortages will occur at all the three levels. However, in relative terms, the largest shortfall is expected at the middle level; some 70 percent increase in projected supply will be necessary to meet the requirements.

The policy implications of the benefit-cost and the manpower planning approaches to educational investments are considered in section III. The financial constraints on the education sector are then critically appraised to reach the conclusion that ways and means will have to be found to divert resources from the higher to the lower and middle levels of the educational system. An important method of doing this is to let the university students and/or their parents bear a larger percentage of the total costs. In this context, the cost and benefit internalization proportions at the various levels of education are computed in section IV. It is found that costs are internalized to a much smaller extent than benefits. Also, the cost internalization proportion is found to be highest at secondary level (0.59) followed by that at primary level (0.35) and least in university education (0.28). Since a larger percentage of the total costs are internalized at the lower and the middle levels than at the higher level, it is concluded that educational financing in Sierra Leone is inequitable.

SECTION 1

The benefit-cost technique is built on the premise that education is an investment good. Undoubtedly there is a consumption element involved in acquiring education. But from the point of view of a developing country, the investment rather than the consumption aspect of education requires the greatest emphasis and priority.

The benefit-cost approach to educational planning consists of determining the (social) costs and (social) benefits of providing education up to a certain level to a "representative" student. The costs associated with providing education can be grouped under four main heads viz.

1. direct operating costs including wages and salaries, and purchase of non-durable goods and current services;

2. capital resource costs;

3. earnings foregone by students attending an educational institution; and

4. miscellaneous costs incurred by students and/or by their parents.

With regard to benefits, the principal economic advantage of education is a student's incremental output once he has completed a certain level of education. In a perfectly competitive labour market, an individual's incremental earnings can be taken to represent the added social output generated by investment in his education. The evidence in all modern economies shows that personal earnings are positively correlated with the level of education that an individual possesses. A number of explanations for this high positive correlation have been advanced. At one extreme it is claimed that educational certificates merely act as screening devices for the employers; such credentials predict a higher level of performance but make no direct contribution to it. If valid, the implications of this proposition are most damaging to the economic evaluation of educational investments. The simplest explanation of the observed high association between education and earnings is that the better educated are more productive than the less educated, presumably because of the knowledge they have acquired in schools and universities. But even when their education has taught them no specific skill, the educated people are more productive because they are achievement oriented, are more self-reliant, act with greater initiative in problem-solving situations, adapt themselves more easily to changing circumstances, assume supervisory responsibility more quickly and benefit more from work experience and in-

plant training.[1] Acceptance of this explanation of the higher earnings of the educated is crucial for the benefit-cost analysis of education.

In addition to the incremental earnings, there are a number of indirect and/or spill-over benefits associated with educational investments.[2] The inability of social scientists to quantify the various indirect and/or spill-over benefits of education constitutes the major shortcoming of the benefit-cost approach as applied to investment in education. Although this reduces the usefulness of the benefit-cost technique as applied to education, it does not necessarily render it completely useless. Since all the social costs of education can be quantified but the indirect and/or spill-over benefits escape measurement, the computed rates of return can be interpreted as the lower limits on the true social rates of return to investment in education. If these computed rates are sufficiently "high", one could justify the existing aggregate investment in education or marginal increases in it. Also, if one is not making ambitious comparisons between expenditures on education and that on health or transport but is using the rate of return analysis to compare expenditures between different levels of the educational system, the problems imposed by the exclusion of the indirect and/or spill-over effects need not be very serious.

Application of the Benefit-Cost Methodology to Sierra Leone's Educational System

Sierra Leone, like many other developing countries, has recognized the importance of human capital as a powerful engine of economic development. The total attendance in the nation's educational institutions was found to be about 111,000 in the 1963 Population Census.[3] In 1970/71 roughly 203,000 students were enrolled in the various institutions of learning.[4] The total government

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[1] Mark Blaug, Education and the Employment Problem in Developing Countries, International Labour Office, Geneva, 1973, chapter 3, p. 38.

[2] Mark Blaug, An Introduction to the Economics of Education, Allen Lane, The Penguin Press, 1970, chapter 4, p. 108.

[3] Population Census of Sierra Leone, 1963, Vol. 2, Social Characteristics, Central Statistics Office, Freetown, 1965, Table 9, p. 80.

[4] Report of the Ministry of Education for the year 1971: Including Educational Developments and Statistics for 1970/71. Sierra Leone Government, Freetown, Table 1, p. 25.

recurrent expenditure on education also increased from approximately Le4.53 million in 1963-64 to Le 9.215 million in 1970/71.[5] At present, approximately 22.2 percent of the total government current revenue is allocated to education. Compared with this, Le 11.84 million were expended in the fiscal year 1970/71 on agriculture and natural resources, trade, transport and communication, construction, etc.[6] This amount constitutes about 28.5 percent of the central government's current expenditure and is only slightly in excess of the proportion of the government revenue invested in education alone.

One characteristic of the educational expenditure in Sierra Leone should be emphasized. It relates to the differences in the amounts spent on primary, secondary and university education on a per capita basis - (See Table 1). With the enrollments and expenditures of 1970/71, the annual per student central government expenditures at primary, secondary and university levels are Le 16.00, Le 70.00 and L3 2,000.00 respectively. As the level of education increases, some differences in the per capita expenses are justifiable. But can we justify such massive differences in per capita expenditure? The benefit-cost technique may provide an answer to this question.

Table 1: Central Government Expenditure on Education, 1970/71

Education Level (1)	Total Expenditure (in million leones) (2)	Enrollment (3)	Per Student Expenditure (4)
Primary	2.75	166,071	Le 16
Secondary	2.35	33,318	Le 70
University	4.00	2,250	Le 2,000

Sources: For column (2)- Estimates of Revenue and Expenditure and Development Estimates 1972-73, Sierra Leone Government, Freetown 1972, p. 199.

For column (3)- Report of the Ministry of Education for the year 1971. Including Educational Developments and Statistics for 1970/71, Sierra Leone Government, Freetown, Table 1, p. 25.

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[5] Estimates of Revenue and Expenditure and Development Estimates 1972-73, Sierra Leone Government, 1972, p. 199.

[6] ibid, p. 199.

In carrying out a benefit-cost analysis of Sierra Leone's educational system, it is possible to quantify only the direct benefits - the incremental earnings of persons with a certain level of education. These are calculated on the basis of income data from two sources. First, to obtain income streams for individuals with primary, high school/technical or university education we have used the Government of Sierra Leone's salary scales.[7] We have also looked at the salaries for teachers with varying qualifications. These are largely in conformity with civil service scales. To obtain the life-time income profiles of those without any education, we have used a second source, i.e., the Household Surveys conducted by the Central Statistics Office throughout Sierra Leone over the years 1967-1970.[8] In these surveys information is available regarding average annual incomes earned in different occupations. In all, 34 occupations are catalogued. The level of education required to perform successfully in each occupation has to be determined to convert the occupational classification into an educational one. Without such a conversion, it will not be possible to compute the average annual incomes at different levels of educational attainment. For Sierra Leone, there are no data available about the existing educational attainments in different job-clusters or occupations. Consequently, the conversion of occupational categories into educational requirements is largely based on personal judgment. In Table 2 this attempted conversion is set out. (See following page.)

The average median incomes determined from the Household Surveys and the Government of Sierra Leone's civil service scales are presented in Table 3.

Table 3: **Median Incomes at Different Levels of Educational Attainment**
(In Leones Per Year)

Educational Attainment	Median Income		Starting Salary
	Pre 1970/71	Post 1970/71	Post 1970/71
No education	260	292	--
Primary education	390	439	243
High School/Technical Educ.	840	884	607
University education	2,664	2,731	1,436

[7] Report of the Commission of Inquiry into the Civil Service of Sierra Leone 1970 and the Government White Paper Thereon, Government Printing Department, Sierra Leone, p. VIII-XV.

[8] Household Surveys, Household Expenditure and Income and Economic Characteristics, for Urban and Rural areas of the Provinces and the Western Area, Central Statistics Office, Freetown, 1969/71.

TABLE 2

AN ATTEMPTED CONVERSION OF OCCUPATIONAL CATEGORIES INTO

EDUCATIONAL REQUIREMENTS

NO EDUCATION	PRIMARY EDUCATION	HIGH SCHOOL/ TECHNICAL EDUCATION	UNIVERSITY EDUCATION
Retail traders & street sellers.	Salesmen & shop assistants.	Medical workers & technicians.	Doctors & nurses.
Tailors, seamstresses & Upholsterers	Sailors.	Teachers	Teachers
Leather workers	Railroad drivers	Draughtsmen & Engineering Technicians	Administrators- Govt.
Blacksmiths	Motor vehicle drivers	Stenographers & Typists	Directors, Managers etc. - Non-Govt.
Masons & Construction Workers	Postmen & Messengers	Book-Keepers & Cashiers	
Millers, Oil Makers, Butchers & Bakers	Bus conductors	Clerks	
Labourers	Textile production workers	Telephone & Telegraph Operators	
Housekeepers, cooks & maids	Jewellers, gold-smiths & watch repairmen	Printers & Pressmen	
Barbers & hairdressers	Machinists, Fitters, Mechanics & repair-men		
Launderers, Dry cleaners & Pressers	Electric workers		
	Carpenters, Joiners & woodworkers		
	Painters & Paper Hangers		
	Policemen, Firemen & Guards		

The median income of the uneducated is derived from the Household Survey data. The median incomes at other levels of educational attainment are derived from the Sierra Leone's Civil Service Scales. With the help of Table 2 - the conversion of occupational categories into educational requirements - and the Household Surveys' income data, the pre 1970/71 average annual incomes at primary, high school/technical and university education levels work out at Le 398.00, Le 545.00 and Le 1260.00 respectively. Whereas, at the primary education level, the average income on the basis of the Household Surveys is quite in conformity with the civil service scales; for high school/technical and university graduates, the surveys yield a much smaller average income. In fact, the discrepancy between the two increases with the level of education. In our opinion, the difficulty of specifying the educational requirements for some of the occupational groupings is a major cause of this discrepancy. Many occupations tentatively deemed to require high school and/or university education (refer Table 2) really refer to job-titles and not to the nature of the job. For example, the category "Government administrators" would include personnel at various stages of the administrative ladder, some of whom may require university education but others only completed high school or primary education. The same is true for the occupational groups "directors, managers, non-government" since it would include managerial personnel at all levels and in all types of businesses - private proprietorships, partnerships and established companies. On the other hand, at lower levels of education, the occupational groupings relate more to the nature of the job and hence it is easier to specify the educational qualification necessary to succeed in them. Thus, the life-time income stream of the uneducated alone is derived from the Household Surveys. For the income profiles at other levels of education, we have depended upon the civil service scales.[9]

Since the Household Surveys permit the calculation of only the average income for individuals without any education, certain assumptions are adopted to construct the life-time income profile of such individuals. First, an

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[9] To anticipate some results of the later section on manpower projections, it is estimated that "public administration" is the largest single employer of university and high school graduates, absorbing 56 percent and 23 percent of their expected supply respectively. Almost all the teachers will also be employed by the Government. Hence, the use of civil service scales appears to be quite appropriate.

individual is expected to work for 30 years.[10]   The computed post 1970/71
average income of Le 292.00 is attributed to the 14th year of service
and to obtain income prior to and subsequent to the 14th year, a compound
rate of growth of 3 percent per annum is assumed to prevail through-
out the individual's working life-span.[11]

With respect to the measurement of costs at the primary, high
school and university levels, the major portion of the direct operating
costs are borne by the central government. The central government expendi-
ture per student in primary schools, high schools and the institutions
of higher learning can be easily calculated from the government budgets
and the total enrollments at the various levels of the education system.
In Sierra Leone, there are a few denominational schools at the primary
level and a great many at the secondary level. These schools obtain
private funds, in addition to getting assistance from the central
government. The costs per student inclusive of the central government grants
and private donations are estimated to be Le 25.00 at primary, Le 113.00 at
high school and Le 1,924.00 at the higher education levels.[12] These are
likely to be slight overestimates of the direct operating costs because in ev-
ery educational institution not all the annual government grants and private
donations are used for current expenditure; a part is expended on durable goods
as well. However, this overestimation is expected to be more or less offset
by the failure to include capital costs. It has not been possible to
obtain per student capital resource costs since complete data on the assets

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[10] This figure is based on the average life expectancy in Sierra Leone
of 45 years and the minimum job-market entry age of 15.

[11] Based on a projected growth rate of GDP at 5.5 percent per annum and
that of population at 2.5 percent.

[12] The primary and the high school estimates are those of J. Edstrom of
IBRD in a working paper entitled "Education Finance, Expenditure and
Unit Costs", p.5 prepared for the Education Review of Sierra Leone,
December, 1973. To obtain the higher education unit costs, we divide
the total government grants in 1972/73 of Le 5.23 million by the esti-
mated number of students at the University of Sierra Leone and the
various teachers training colleges (total students 2,716).

of educational institutions are not available. Consequently, the net result may not be very distorted.

In addition, associated with the education of students in the institutions of higher learning and those in Forms IV and V in the high school, there are the opportunity costs of the earnings foregone. The minimum entry age at the primary level is 5 years in Sierra Leone. Thus a student is 12 years old when he/she completes primary education, and 15 years old when learning up to Form III is attained. The assumption that the opportunity costs of the earnings foregone begin to be incurred in Form IV implies a minimum job market entry age of 15 and this appears to be reasonable.

The miscellaneous costs of education incurred by students and/or their parents include expenditure on tuition fees, books, stationary, uniforms, travel, etc. Fees are charged at all levels of the educational system. In primary education, yearly tuition is Le 3.00 for classes 1 and 2, Le 4.50 for classes 3 to 6 and Le 6.00 for class 7. In secondary schools, the annual tuition fee is Le 21.00 per student. In addition to fees, primary and high school students and/or their parents have to incur costs (annually) for books, stationary, uniforms and travel, which in the absence of relevant data, are put at Le 10.00 and Le 25.00 respectively. Fees are also charged for higher education—averaging annually Le 100.00 per student. But in most cases, these are covered by scholarships awarded to students by the central government. These scholarships also cover the various miscellaneous costs of education, i.e., expenditure on books, stationary, registration, student union charges, etc. For example, in 1972/73, scholarship grants to students at the University of Sierra Leone and the Teachers' Colleges totalled Le 1.14 million, averaging Le 416.00 per student. These grants are already included in the annual direct operating costs at the higher education level of Le 1,924.00 per student. It was on the basis of these benefit and cost magnitudes that the evaluation of education programmes at various levels was undertaken. The social internal rates of return to investment in primary, secondary and university education are 20%, 22%, and 91/2% respectively. In Table 4 the internal rates of return to investment in education are presented for Kenya, Uganda, India and Sierra Leone.

Table 4: Internal Rates of Return in Education - Kenya, Uganda, India
          and Sierra Leone

	Primary Education	Secondary Education	University Education
Kenya (1968)	22	24	9
Uganda (1965)	66	22	12
India (1966)	17	16	13
Sierra Leone (1970/71)	20	22	9. 1/2

Source: Cost-Benefit Analysis in Education. A Case Study of Kenya, World
         Bank Staff Occasional Papers No. 14, IBRD, 1972. Table 4.15, p. 94.

The general percentages of rates of return obtained in the present paper are
seen to be largely in conformity with those for some other developing countries.
Those calculations reported so far have significant implications for the planning
of the education system in Sierra Leone. Discussion of these is deferred to
Section III. In the section that follows, we turn to the manpower planning
approach.

SECTION II

The manpower planning technique involves the estimation of future manpower requirements and supply and the determination of areas of critical shortage. The requirement and supply projections presented in this section are divided into three groups:-

i. <u>High Level</u>, i.e. those positions normally considered to require completion of high school education with four or more 'O' level examination passes and four or more years of university education.

ii. <u>Middle Level</u>, i.e. those positions normally considered to require less than four years of university education such as agricultural certificate training and technical/vocational education, the entry requirements for which may or may not be completion of high school education with four or more 'O' level examination passes; and

iii. <u>Primary and Secondary School Teachers</u> The teachers are separated from the high and middle level groupings for two reasons. First, although they might normally be considered middle level manpower, some high school teachers are university graduates with one year of post-graduate study in education, which would qualify them as high level manpower. Second, unlike many middle level manpower positions which are and can be filled by persons with on-the-job-training in lieu of specific school based education, it is generally thought that teaching requires some kind of pre-service instruction.

There are several methods of making projections about future manpower needs. One such method is to use past trends for projecting future requirements. But, as for many other developing countries, it is not possible to get past data to construct an adequate time series for Sierra Leone. The use of the more sophisticated techniques like the one adopted in the OECD Mediterranean Regional Project (MRP)[13] has to be rejected because of the inadequacy of available data. Consequently, a simple disaggregative approach is adopted in this study. This approach is discussed below in the course of projecting Sierra Leone's manpower requirements for the years 1975-1979. The word 'requirements' is used instead of 'demand' in order to avoid the problems of wage-structure and labour absorption associated with the latter concept. In other words, the requirements are worked out without any specific

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[13] See H. S. Parnes, <u>Forecasting Educational Needs for Economic and Social Development</u>, Paris: OECD, 1962; also R. Hollister, A Technical Evaluation of the first stage of the Mediterranean Regional Project, Paris: OECD, 1967.

reference to the prices of different types of manpower. In respect of Sierra Leone, this is an important qualification since there are some grounds for believing that wage pricing arrangements need examination.[14] Furthermore, filling 'requirements' in public administration - the largest employer of high and middle level as well as teaching manpower - may be restricted by the size of the government's current budget. It should also be noted that our requirement forecasts are conditional upon a set of assumptions about the structure and rate of growth of the Sierra Leone economy set out in the National Development Plan, 1974/75 - 1978/79.[15]

The starting point of the method adopted for projecting high and middle level manpower needs is the distribution of the working population by various industry groups or sectors in the economy. The estimates of 1974 and 1979 workforce distribution by sectors are available in the Plan document and are reproduced in columns (1) and (2) of Table 5.[16] The estimates of the sectoral distribution of high and middle level manpower in 1974 are presented in columns (3) and (4) of this table. These estimates are based on the data available in the Population Census of 1963 and the Household Surveys conducted by the Central Statistics Office. The Census provides a classification of the working population by occupation and sector of employment. In all, 8 occupations and 8 sectors are distinguished in the Census tabulations.[17] The Household Surveys permit computation of educational

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[14] For example the Njala University College graduates from the Faculty of Agriculture experience great difficulty in acquiring jobs because all of them look for placements in Freetown. The rural remunerations are not attractive enough to offset this urban pull.

[15] National Development Plan, 1974/75-1978/79, Ministry of Development and Economic Planning, Central Planning Unit, Freetown, August 1974.

[16] ibid, Chapter III, section 2.4, p. 27. Since teacher requirements are derived from the projected enrolment increases in primary and secondary schools (and not on the basis of sectoral growth rates), the 1974 and 1979 work force in the sector Public Administration and other services is net of the estimated teaching personnel in these two years.

[17] 1963 Population Census of Sierra Leone, Vol. 3, Economic Characteristics, Central Statistics Office, 1965, Table 13, p. 100. See Annex I, Table 1.

attainment in each occupation.[18] The professional, technical, administrative, managerial and clerical occupations are intensive in the use of high and middle level manpower.[19] Multiplying the sector-occupation matrix (footnote 17) by the occupation-education matrix (footnote 19), the high school/technical/vocational and university education requirements of the various sectors are determined. These sectoral high and middle level educated manpower requirements per one thousand total employment in each sector are presented below:

SECTOR	HIGH LEVEL	MIDDLE LEVEL
Agriculture	0.153	10.7
Mining	2.584	33.3
Manufacturing	8.463	143.1
Construction	14.476	171.4
Electricity and Water	19.563	199.9
Commerce	3.565	107.4
Transport & Communication	21.004	181.5
Public Administration	75.446	195.7

Multiplying these by the corresponding sectoral working populations (in thousands), columns (3) and (4) of Table 5 are obtained. Similarly, multiplying the sectoral high and middle level coefficients by the 1979 work force distribution, columns (5) and (6) of this table are derived. The new recruitments for high and middle level manpower over the years 1975-1979 are then given by the differences between columns (5) and (3) and (6) and (4).

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[18] op.cit.Table 19. The national educational attainments in each occupation are the 'weighted' average of the rural-urban educational attainments in the Provinces and the Western Area. The weights (derived from the 1963 Population Census) are the number of workers in each occupation cross-classified by Province and Sector of employment.

[19] See Annex I, Table 2.

Table 5

Total and Sectoral High Level (HL) and Middle Level (ML) Manpower Requirements: 1974/75 - 1978/79

Sector	Occupied Work Force (000 Man Years)		Number of Jobs Classified				Recruitment New		Replacement of Present Stock		Manpower Requirements	
	1974	1979	HL 1974	ML 1974	HL 1979	ML 1979	HL 1975-1979	ML 1975-1979	HL	ML	HL	ML
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Agriculture	805	870	123	8,614	132	9,256	9	642	10	675	19	1,317
Mining	33	28	85	1,099	75	966	-10	-133	5	76	-5	-57
Manufacturing	52	62	440	7,441	567	9,588	127	2,147	39	654	166	2,801
Construction	26	35	376	4,456	478	5,656	102	1,200	33	388	135	1,588
Electricity and Water	4	4	78	800	78	800	--	--	5	60	5	60
Commerce	81	95	288	8,699	399	10,203	51	1,504	24	721	75	2,225
Transport and Communication	28	33	588	5,082	714	6,171	126	1,089	50	431	176	1,520
Public Administration	41	52	3,546	8,024	3,923	10,176	377	2,152	283	699	660	2,851
Total	1,070	1,179	5,524	44,215	6,306	52,816	792	8,734	449	3,704	1,231	12,305

The replacement requirements caused by death or retirement of members of the present stock of educated manpower (columns (3) and (4) of Table 5) should be added to the new recruitments. An attrition rate of 1.50 percent per year for all high/middle level manpower is used for this purpose. The estimated replacement needs for 1975-1979 are recorded in columns (9) and (10) of Table 5.

The total requirements for high and middle level manpower calculated in the above manner are expected to be approximately 1,230 and 12,305 respectively. Of the total high level manpower requirements of 1,230, some 660 or 56 percent are expected to be employed in the sector entitled "public administration and other services." The share of this sector in the middle level manpower requirements is around 23 percent. The other important sectors in order of their high level manpower needs are: transport, storage and communications (14 percent); manufacturing (13 percent); construction (11 percent); commerce (6 percent) and finally agriculture (2 percent). On the basis of the middle level manpower needs, the various important sectors are: manufacturing (23 percent); commerce (18 percent); construction (13 percent); transport, storage and communications (12 percent) and agriculture (11 percent). Since no expansion of the electricity, water and sanitary services sector is planned and the fact that employment in mining is expected to decline, these sectors do not figure prominently in the high and middle level manpower requirements of 1975-1979.

The requirements for primary and secondary school teachers are based on projected school enrolments which are presented in Annex I, Tables 1 and 2. These projections are not based upon any "optimal" rate of growth but are derived from past trends in rates of progression (i.e., the proportion of pupils in Class I who proceed to Class II and so on up the education ladder) and the trends in growth of enrolment in Class I. During the 1960's enrolment in Class I grew at 4.8 percent per annum (much more slowly than the total primary enrolment growth of 7.7 percent). In the last part of the decade, the increase in first year enrolment averaged only about 1 percent per annum. On the assumption that enrolment in Class I will return to an average annual increase of 4 percent, the total primary enrolment can be expected to grow at about 5 percent per annum during the plan period. The projected primary enrolments are shown in Annex II,Table 1. The high school enrolment patterns presented in Annex II,Table 2 are based on an implied

rate of enrolment growth of 5.9 percent per annum for the 1975-1979 period.
At present, the proportion of primary school pupils in Class VII who pro-
ceed to Form I the following year is found to be approximately 58 percent.
For the purpose of projections, it is assumed that roughly the same per-
centage of Class VII pupils will find places in high schools the following
year. The progression rates from one form to the next are assumed to be
those currently obtained in the various high schools. The computations
necessary to derive the teacher requirements are shown in Tables 6 and 7.
Thus, the primary and high school teacher requirements over the five-year
plan period are 2,920 and 1,195 respectively.

The first step in estimating the supply of high/middle level manpower
and teachers is to obtain the projected enrolments at the University of
Sierra Leone, the various Teacher Training Colleges, the School of Nursing
and the Technical and/or Commercial Institutes in the country. Outputs
from these institutions can then be based upon certain assumptions govern-
ing progression rates and the proportion of graduates who are Sierra
Leonean. These hypotheses are summarized in Annex III. Being derived from
very limited enrolment progression data, these may contain some margin of
error. The supply figures are calculated one year ahead of manpower re-
quirements to allow for a lag between graduation and job placement.

The projected enrolments in the University, the Teacher Colleges and
the Technical Institutions are taken from the National Development Plan
which in turn obtained them from the principals of various colleges and
institutions. These enrolment projections are presented in Table 8.

The graduates from Fourah Bay College in the Faculties of Arts (ex-
cept those in the Department of Education), Economic and Social Studies
and Pure and Applied Science belong to the high level manpower category.
The successful candidates from the Department of Education are classified
as high school teachers. Njala University College comprises two faculties –
those of agriculture and education. The graduates of the Faculty of Agri-
culture are included in the high level manpower, those of the Faculty of
Education are assumed to augment the supply of high school teachers.
From the various teacher training institutions, the candidates obtaining
the Higher Teachers Certificate are included in the supply of high school
teachers; the certificate holders are assumed to constitute the supply of
primary school teachers. All those who pass through the technical institutes

TABLE 6

PRIMARY SCHOOL TEACHER REQUIREMENTS: 1971/72 - 1979/80

YEAR	TOTAL PRIMARY SCHOOL ENROLMENTS[a] (1)	INCREASE IN ENROLMENT OVER PREVIOUS YEAR (2)	NEW TEACHERS REQUIRED TO:		TOTAL (3)+(4)
			MEET INCREASED ENROLMENTS[b] (3)	REPLACE EXISTING TEACHER STOCK[c] (4)	
1971/72	177,750	11,640	365	210	575
1972/73	188,640	10,890	340	225	565
1973/74	199,040	10,400	325	240	565
1974/75	208,960	9,920	310	250	560
1975/76	219,050	10,090	315	265	580
1976/77	229,590	10,540	330	275	605
1977/78	238,770	9,180	285	290	575
1978/79	248,320	9,550	300	300	600
1979/80	258,260	9,940	310	315	625
1974/75 to 1978/79	1,144,690	49,280	1,540	1,380	2,920

/a   Assuming the continuation of the present trends in primary school enrolment growth.

/b   Assuming the continuation of the present teacher - pupil ratio of 1:32.

/c   Assuming the attrition rate of the present stock of 4 percent of which 20 percent are qualified teachers.

TABLE 7

HIGHSCHOOL TEACHER REQUIREMENT: 1971/72 - 1979/80

YEAR	TOTAL HIGHSCHOOL ENROLMENTS/a (1)	INCREASE IN ENROLMENT OVER PREVIOUS YEAR (2)	NEW TEACHERS REQUIRED TO:		TOTAL (3) + (4)
			MEET INCREASED ENROLMENTS/b (3)	REPLACE EXISTING TEACHER STOCK/c (4)	
1971/72	35,507	2,189	210 /d	50	260
1972/73	39,455	3,950	180	55	235
1973/74	43,190	3,735	170	60	230
1974/75	46,860	3,670	165	65	230
1975/76	50,410	3,550	160	70	230
1976/77	53,°50	3,440	155	70	225
1977/78	57,930	4,130	190	75	265
1978/79	61,720	3,740	170	75	245
1979/80	65,150	3,430	155	80	235
1974/75 to 1978/79	270,820	18,530	840	355	1,195

/a   Assuming continuation of the present trends in highschool enrolment growth.

/b   Assuming continuation of the 1970/71 teacher - student ratio of 1:22.

/c   Assuming the attrition rate of 2.5 percent for qualified and 4.0 percent for unqualified teachers.

/d   This figure is higher than 1:22 teacher - student ratio but represents the actual increase in teacher stock from 1,495 in 1970/71 to 1,760 in 1971/72.

Table 8

Projected Enrollments in the University of Sierra Leone, Teacher Training
Colleges and the Technical Institutes - 1973/74 - 1978/79

Institution	Provisional Actuals 1973/74	Projections				
		1974/75	1975/76	1976/77	1977/78	1978/79
Fourah Bay College						
Faculty of Arts (except Department of Education)	466	460	466	490	495	499
Economic & Social Studies	128	127	128	125	210	125
Pure & Applied Science	340	374	416	451	479	525
Department of Education	71	75	80	85	90	90
Njala University College						
Faculty of Agriculture	174	177	205	214	241	214
Faculty of Education	289	300	314	311	306	306
Milton Margai Teachers' College	345	350	350	350	350	350
Primary Teacher's Colleges	1036	1310	1500	1880	2070	2160
Technical Institutes	1230	1180	1520	1690	1880	2060

Source: National Development Plan, 1974/75 - 1978/79, Freetown, August, 1974.
Part C, Chapter XVI, Tables 5,6,7, and 8, pp. 250-253.

are assumed to belong to the middle level manpower. The drop-outs from
the University are counted as the middle level manpower.

With the help of the assumptions about completion rates, the per-
centage of Sierra Leoneans in various institutions and the duration of
different education programs, the supply of the high and middle level man-
power and the high school and the primary school teachers over the plan
period can be calculated. The Sierra Leoneans returning from study abroad
should be added to the indigenous supply of the high level manpower. At
present, there are approximately 1200 Sierra Leonean students abroad,
and this number is assumed to remain fairly constant over the next five
years. Some of these students will be high school graduates; others will
be graduates from the University of Sierra Leone seeking advanced degrees
abroad. In calculating the high level manpower supply, it is assumed that
the net inflow of persons returning from study abroad will average 30
graduates per year during the period 1975-1979. Finally, the high level
supply figures are net of those Sierra Leonean graduates from the University
who go on to the Department of Education for a one-year diploma course.
These graduates are consequently shown under the supply of high level
teachers. The supply projections for the 1974/75-1978/79 Plan period are
presented in Table 9. For the sake of comparison, the requirements of
educated manpower are reproduced in column (2) of this table. The absolute
shortfalls (requirements - supply) are shown in column (3) and the per-
centage increase in the supply needed to meet the requirements are pre-
sented in column (4).

It would appear from the calculations that for the duration of the
1974/75-1978/79 Plan period, the economy is likely to encounter shortages
at all the four levels. In relative terms, the largest shortfall is ex-
pected at the middle level. At present the high school curriculum is ex-
tremely oriented towards purely academic subjects, and so, the high school
dropouts cannot augment the supply of middle level manpower unless some
kind of practical training can be provided to them.

TABLE 9

THE PROJECTED SUPPLY OF HIGH AND MIDDLE LEVEL MANPOWER AND TEACHERS - 1974/75 - 1978/79

	SUPPLY (1)	REQUIREMENTS (2)	SHORTFALLS (3)	PERCENTAGE CHANGE IN NECESSARY SUPPLY (4)
High level	832	1,231	399	48
Middle level	7,173	12,305	5,132	72
High school teachers	996	1,195	199	19
Primary school teachers	2,616	2,920	304	11

SECTION III

The benefit-cost calculations of Section I and the manpower require-
ments and supply projections of Section II have identical policy implica-
tions. Since primary and secondary/technical education is found to be
socially much more profitable than higher education and the greatest
relative shortage is expected to occur for the middle level manpower, it
is evident that the future educational policy in Sierra Leone should
place greater emphasis on the development of the lower and the middle
levels of the educational ladder. Also, the prevailing rates of return at
the various levels of the educational system can be expected to hold be-
yond marginal increases in investments because the manpower projections
technique predicts shortages at all levels. More funds can be made avail-
able for primary and secondary/technical education by diverting resources
from higher education. Of course, it can be argued that a 9 1/2 rate of
return on higher education is not unimpressive, especially when one bears
in mind that it is the lower limit on the true social rate of return on
investment at this level. But a realistic assessment of resources likely
to be available for the education sector suggests that no option, other
than diversion of funds from higher to lower levels of education, may be open.

The Central Government's current expenditure on education has grown
rapidly over the past decade, with an average rate of increase of 10
percent per annum in constant 1970/71 prices. It constituted about 23
percent of current revenue and 25 percent of current expenditure in 1972/73.
This represents a considerable increase over its 1962/64 share of 15 and 18
percent of current revenue and expenditure respectively. The current edu-
cation expenditure was 2.2% of GDP in 1963/64. In 1973/74, it is expected
to account for 3.6 percent of GDP. It is highly unlikely that substantially
more than 23 percent of the government's current revenue will be devoted
to education in the years to come. If one assumes that the GDP will increase
at an average annual rate of 5.5 percent and some 25 percent of the current
revenue will be devoted to education, the total resources available for
education will be approximately Le88 million over the 1974/75-1978/79 plan
period. With enrolments in educational institutions at the levels pro-
jected in the last section, this resource constraint implies pegging of
unit costs at all levels of the education system. No expansion or improve-
ment at the middle or at the lower levels of the educational ladder will be

possible unless more resources can be made available.

An expansion of primary education can be supported not only on economic grounds (22 percent rate of return) but on socio-political grounds as well. Even with the attainment of the primary enrolment projections in the plan (4 percent per annum in the years 1975 onwards) substantially less than one-half of the 5 - 11 year population will be in schools. The need for improving the quality of education in primary and secondary schools is no less acute than increasing the enrolments. On the basis of repeater and drop-out data provided by the Planning Unit of the Ministry of Education, it has been estimated that at the high school level, some 50.9 student years are required to produce one high school graduate with 4 or more 'O' level passes.[20] Undoubtedly the social and family environment in which a student has to live is responsible for this. But the quality of schools also leaves a lot to be desired. In 1973/74, only 45 percent of the secondary school and 40 percent of primary school teachers were qualified. As the various teachers colleges enhance the supply of qualified teachers their percentage in the total teacher stock will increase but so will the salary bill.[21] Thus, expansion and improvement of primary, secondary and technical education will require substantial resources which may have to be found in the education sector itself.

The diversion of resources from the higher to the lower and the middle levels of education must be accomplished without entailing any reduction in university output. This is so because even at this level no surplus is forecasted over the plan period. A reduction in the total in-take of resources without a corresponding decrease in student output will require efforts at rationalization of expenditures at the University of Sierra Leone and its two constituent colleges. A possible discontinuation of the Honours Programmes with enrolments of less than five students should receive serious consideration.

A need for reducing the unit costs of higher education in Sierra Leone is also imperative. The ratio of social unit costs in higher education to that in primary education is in the neighbourhood of 66 for Sierra Leone. For some developed countries (New Zealand, the U.K. and the U.S.A)

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[20] J. Edstrom, op. cit., p. 6.

[21] By the end of the Plan Period, roughly 68 percent of secondary and 56 percent of primary school teachers will be qualified.

the same ratio is 17.6.[22] Moreover, if one considers only the costs to
the Central Government, this ratio for Sierra Leone rises to over 120.

A second method of diverting resources from the higher to the lower
and the middle levels of education is to let the university students and/or
their parents bear a larger percentage of total costs. This in fact,
brings us to the second question of the planning of educational investment,
namely, how to apportion the total costs between the students, the pri-
vate institutions and the government. This is the subject of the next section.

SECTION IV

In Sierra Leone - as in most other countries - governmental inter-
vention in the educational sector is very substantial. Why isn't invest-
ment in education left to the private sector? Is there any reason why pri-
vate education choices would fail to obtain socially desirable (optimal)
results? Answers to these questions ought to be sought before evaluating
the existing governmental intervention in the education system of Sierra Leone.

Quite generally, one can think of two ways in which the working of
the competitive system may not produce socially optimal results. First, if
the prices set in private markets do not capture for the individual all the
social benefits of the goods he sells, or impose on him all the social costs
of the goods he buys, private choices are unlikely to produce socially
optimal results. Secondly, the competitive system may not produce an
ethically 'just' distribution of income. In both these situations, some kind
of governmental intervention will become necessary.[23] With specific refer-
ence to education, the incremental life-time earnings (after taxes) of the
educated over those of the uneducated may not equal the social benefits of
education. If individuals have to bear all the social costs of education
there is likely to be underinvestment in education from the point of view
of the society. On the other hand, if education is 'costless' to those who
receive it, and incremental earnings capture all the social benefits of

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[22] Mark Blaug (1973), op. cit., Chapter 2, p. 24.

[23] Harry G. Johnson, "Individual and Collective Choice" in Man and Social
Sciences, William Robson (ed.), George Allen and Unwin Ltd., London, p.6.

education, there will be overinvestment in education from a social point
of view.

Let mpc = $\underline{a}$ msc and mpb = $\underline{b}$ msb where mpc = marginal private
cost, msc = marginal social cost, mpb = marginal private benefit, msb =
marginal social benefit and $\underline{a}$ and $\underline{b}$ are indices of internalization of
msc and msb. Then if $\underline{a} > \underline{b}$, msb $>$ msc and underinvestment will result. On
the other hand, if $\underline{a} < \underline{b}$, msb $<$ msc and overinvestment in education will be
the likely outcome. Thus, the crucial question centers on the values of
$\underline{a}$ and $\underline{b}$. Without government ownership of educational institutions or
government financial aid to private educational institutions and/or the
students, all the costs of education will be internalized and $\underline{a}$ = 1.
Although the life-time earnings of those with education are higher than the
earnings of those without education, it is unlikely that the difference
between the two captures all social benefits of education. Thus, $\underline{b}$ will
be less than 1. With $\underline{a}$ = 1 and $\underline{b} < 1$, individual decisions would lead
to underinvestment in education. This prima facie, is the economists'
case for governmental intervention in education on the grounds of promoting
efficient use of scarce resources in order to maximize social benefit. To
determine whether the current governmental support of the education sys-
tem in any country can be justified on these 'efficiency grounds', one has
to evaluate the approximate values of $\underline{a}$ and $\underline{b}$ that obtain with the existing
governmental policies towards education.

The total and individual resource costs of education in Sierra Leone
are presented in Table 10 below. These cost estimates are based on the 7
year primary and 5 year secondary education programmes. The costs incurred
by the primary school students consist of tuition fees and expenditure on
books, stationery, uniform and travel. At the secondary education level,
a student's share of total costs is made up of (in addition to tuition fees,
etc.) the opportunity costs of earnings foregone while attending forms IV
and V. At the higher education stage, the costs incurred by students and/or
their parents consist exclusively of the opportunity costs of earnings fore-
gone because the scholarship grants to students cover all other costs
associated with acquiring education. The cost-internalization coefficient
is highest at the secondary level education followed by that in primary edu-
cation. The cost-internalization coefficient $\underline{a}$ is the least in university
education - only 0.28 - implying that only 28 percent of total costs of
education at this level are borne by students and/or their parents.

TABLE 10

TOTAL AND INDIVIDUAL RESOURCE COSTS OF EDUCATION IN SIERRA LEONE, 1972/73

EDUCATION LEVEL	COSTS NOT INCURRED BY STUDENTS/PARENTS (1)	COSTS INCURRED BY STUDENTS/PARENTS (2)	TOTAL (1)+(2) (3)	$\frac{a}{(2)/(3)}$
Primary	Le 175	Le 95.50	Le 270.50	0.35
Secondary	565	811.00	1,376.00	0.59
University	7,696	2,930.00	10,626.00	0.28

The inability of social scientists to quantify the external/spill-over effects of education renders impossible the task of computing $\underline{b}$s at the three levels of education. If one adopts the current practice in the literature on benefit-cost analyses of education, the preliminary estimates of $\underline{b}$ can be obtained as a ratio of after tax to before tax incomes at various levels of education. In deriving after tax income, we have deducted not only the income tax but the burden of all taxes; i.e. import taxes, export taxes, company taxes, excise duties etc.[24] In Table 11, both before and after tax incomes by different education levels are reported. Because of the regressivity of the tax structure $\underline{b}$s increase with the level of education/income.

Comparing $\underline{a}$s and $\underline{b}$s in Tables 10 and 11, it is clear that $\underline{b}$s exceed $\underline{a}$s at all levels of education. If this is interpreted as causing over-investment in education and if the difference between $\underline{b}$ and $\underline{a}$ at each level of education is taken as an indicator of the extent of overinvestment, one can conclude that there is relatively greater overinvestment in higher education than at any other level.

The lower $\underline{a}$s than $\underline{b}$s can, of course, be justified on the grounds of equity. To bring about an equitable pattern of income distribution, it is thought that the least the state can do is to throw open the doors of

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[24] K. Ketkar, "Distribution of Tax Burden in Sierra Leone", Mimeographed, November 1974.

TABLE 11

MEDIAN ANNUAL INCOMES BEFORE AND AFTER TAXES BY LEVEL OF EDUCATION
SIERRA LEONE, POST 1970/71

EDUCATION	BEFORE TAX INCOME (1)	AFTER TAX INCOME (2)	b (2)/(1)
None	Le 300	Le 237	0.79
Primary	452	357	0.79
Secondary/Technical	1,003	883	0.88
University	2,829	2,532	0.90

educational institutions to all and reduce - if not eliminate - the costs of
education for the individual. Thus, lower as than bs can be justified on the
ground of introducing equitable distribution of income. However, it appears
that as have to satisfy one more requirement before this explanation of govern-
mental intervention in the education system is accepted. It is that a at
elementary education should be lowest followed by that for high school and
college levels. Since completed elementary education is a prerequisite for
entering high school and only high school graduates can enroll in a university/
college, a system whose aim it is to bring about equality of educational
opportunity can not be one which makes education more accessible at higher than
at lower levels. But this is exactly the ranking of computed as for Sierra
Leone. Because a large percentage of total costs are internalized at the
secondary level, the socio-economically deprived cannot complete secondary
schools, the society will not be any nearer than before to achieving an equitable
income distribution. In fact, future income distribution is likely to be
more inequitable than the present. This is so because those who complete
secondary schools (who are necessarily from the richer sections of Sierra
Leone community) get higher education virtually free. This induces all secon-
dary school graduates to also undertake higher education which is likely to
lead to the rich becoming richer.

This undoubtedly strengthens the justification for diverting a greater burden of the total unit costs of higher education onto the students and/or their parents. Such a diversion would release central government resources which could be used for expanding and improving the socially more profitable primary and secondary/technical education.

SECTION V

To sum up, the rate of return analysis of Sierra Leone's educational system reveals that it is primary and secondary/technical education which is socially more profitable than university education. On the basis of projections of manpower requirements and supply over the next five years, the greatest relative shortages are expected to occur at the middle level and not at the university level of the education system. This clearly calls for greater investment at the lower and middle levels of the education ladder. Given that approximately 25 percent of the government's recurrent budget is being spent on the education sector, it is unlikely that more funds can be made available for investment in the primary and secondary/technical education. Hence, ways and means need to be devised to divert resources from the higher to the lower levels of the education system. Such a diversion can be achieved through two methods:

    a. rationalization of expenditure at the institutions of higher learning; and

    b. a shift of a part of the total unit costs of higher education onto the students and/or their parents.

The second method, in addition to releasing funds for investments in the lower and the middle levels of education, will increase the cost internalization coefficient at the higher education level. If a part of these funds are used for reducing the cost internalization coefficients at the lower levels of education, the education system in Sierra Leone would become more equitable.

ANNEX I
Table 1

The Working Population (in '000) Cross-Classified By Sector and Occupation

Occupation Sector	Professional, Technical,etc.	Administrative Managerial,etc.	Clerical Workers	Sales Workers	Farmers etc.	Transport and Communication Workers	Craftsmen etc.	Service Recreation
Agriculture	0.409	0.044	0.164	0.170	699.49	0.103	1.583	0.094
Mining	0.347	0.065	0.472	0.041	42.75	0.572	2.334	1.067
Manufacturing	0.113	0.092	0.373	0.128	0.283	0.221	39.79	0.200
Construction	0.231	0.314	0.640	0.029	0.096	0.669	13.80	0.367
Electricity & Water	0.109	0.014	0.176	0.055	0.025	0.082	1.70	0.085
Commerce	0.098	0.358	1.51	46.69	0.246	0.599	2.88	0.739
Transport and Communications	0.296	0.187	1.15	0.033	0.015	10.09	3.90	0.497
Public Administration	9.46	1.31	2.47	0.095	0.160	0.951	3.98	11.10

Source: 1963 Population Census of Sierra Leone, Vol. 3, Economic Characteristics Central Statistics Office, 1965,
          Table 13, p. 100.

ANNEX I

Table 2

Educational Attainments By Occupation Groups

Occupation	High School/Technical/ Vocational	University Education
Professional, technical, etc.	415.4	198.8
Administrative, managerial, etc.	487.2	166.1
Clerical workers	755.7	33.3
Sales workers	79.6	0.6
Farmers, fishermen, miners, etc.	9.9	0.0
Transport and communication workers	119.7	18.1
Craftsmen and labourers	135.4	7.4
Service and recreation workers	231.8	0.00

Source: Computed From Household Surveys, Central Statistics Office, 1969/71.

TABLE 1

PRIMARY SCHOOL ENROLMENTS, 1960/61 - 1979/80 [1]

	/2 1960/61	/2 1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80
Class 1	23,984	38,164	39,690	41,280	42,930	44,650	46,430	48,290	50,220	52,230	54,320
2	14,631	26,334	29,390	30,560	31,790	33,060	34,180	35,750	37,180	38,670	40,220
3	12,373	25,208	26,330	29,390	30,560	31,790	33,060	34,380	35,750	37,180	38,670
4	9,774	22,953	23,950	25,020	27,920	29,030	30,200	31,400	32,660	33,960	35,320
5	7,955	20,227	21,810	22,750	23,770	26,520	27,580	28,690	29,830	31,030	32,270
6	6,208	16,708	18,200	19,620	20,480	21,390	23,870	24,820	25,820	26,850	27,930
7	4,207	16,513	18,380	20,020	21,590	22,520	23,530	26,260	27,310	28,400	29,530
TOTAL	79,132	166,107	177,750	188,640	199,040	208,960	219,050	229,590	238,770	248,320	258,260

Implied rate of enrolment growth p.a. 1970/71 - 1979/80 : 5.0%

/1 (i) Class 1 enrolments increase 4% p.a.

   (ii) Apparent progression Rates:

       Class 1 - 2 : .77   Class 4 - 5 : .95
       Class 2 - 3 : 1.00 Class 5 - 6 : .90
       Class 3 - 4 : .95   Class 6 - 7 : 1.10

/2 Actual enrolments.

TABLE II /1
SECONDARY SCHOOL ENROLMENTS, 1960/61 - 1979/80

	/2 1960/61	/2 1970/71	/2 1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80
FORM 1	1,881	11,460	11,080	12,370	14,010	15,110	15,760	16,470	18,380	19,120	19,880
II	1,514	8,180	8,694	9,090	10,550	11,490	12,390	12,930	13,510	15,070	15,680
III	1,320	5,999	7,077	7,130	7,450	8,650	9,420	10,160	10,600	11,070	12,360
IV	844	4,525	4,997	5,660	5,700	5,960	6,920	7,540	8,130	8,480	8,860
V	560	2,932	3,281	4,200	4,760	4,790	5,010	5,820	6,330	6,830	7,120
LVI	99	233	196	330	420	480	480	500	580	630	680
UVI	47	189	182	175	300	380	430	430	450	520	570
TOTAL	6,265	33,318	35,507	39,455	43,190	46,860	50,410	53,850	57,980	61,720	65,150

	1960/61	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80
4 + 'O' level passes	n.a.	385	460	590	670	670	700	810	890	960	1,000
2 + 'A' level passes	n.a.	108	98	95	160	210	230	230	240	280	310

Implied rate of enrolment growth p.a. 1970/71 - 1979/80 : 7.6%

/1 Assuming: (i) Form I enrolments equal 70% primary class 7 enrolments of previous year.

(ii) Apparent progression rates:
Form I - II :   .82   Form IV -V :   .84
Form II - III :   .82   Form V - LVI :   .10
Form III - IV :   .80   Form LVI - UVI :   .90

(iii) 14% Form V enrolments pass 4 or more 'O' Level examinations.
54% Form UVI enrolments pass 2 or more 'A' Level examinations.

/2 Actual enrolments.

ANNEX III

1. At Fourah Bay College, the following proportion of new enrollments are assumed to complete the four-year program:

Faculty of Arts (excluding Department of Education)	80%
Department of Education (one year post-graduate program)	90%
Faculty of Economic and Social Studies	85%
Faculty of Pure and Applied Science	85%

Between 1971 and 1979, Sierra Leoneans are expected to constitute 80% of graduates in all faculties except the Department of Education, where Sierra Leoneans will make up 90% of the graduates.

2. At Njala University College, the following completion rates and proportion of Sierra Leonean graduates are assumed to prevail:

DEPARTMENT OF AGRICULTURE:

    4-year degree program:

    --90% completion rate:

    --Sierra Leonean graduates: 70% total graduates, 1971 - 1979.

    2-year certificate program:

    --68% completion rate:

    --Sierra Leonean graduates: 80% total graduates, 1971 - 1979.

DEPARTMENT OF EDUCATION:

    4-year degree program:

    --95% completion rate:

    --Sierra Leonean graduates: 87% total graduates, 1971 - 1979.

    3-year High Teacher Certificate Program:

    --70% completion rate:

    -- Sierra Leonean graduates; 90% total graduates, 1971 - 1979.

3. For the Milton Margai Teacher College 3-year program leading to the Higher Teacher Certificate, a completion rate of 92 percent is assumed. Sierra Leoneans are expected to constitute 92 percent of total graduates, 1971 - 1979.

4. At the primary teacher colleges, all students are assumed to be Sierra Leonean. The completion rate for the 3-year program is expected to be 94 percent.

5. At the technical/vocational institutes, all students are assumed to be Sierra Leonean. For lack of any information, a 100 percent completion rate is assumed to prevail for the students in those institutions.

REFERENCES

1. Mark Blaug (ed.) Economics of Education, 2 Penguin, 1969.

2. Mark Blaug An Introduction to the Economics of Education, Allen Lane The Penguin Press, 1970.

3. Mark Blaug Education and the Employment Problem in Developing Countries, International Labour Office, Geneva, 1973.

4. J. Edstrom "Education Finance, Expenditure and Unit Costs" paper presented at the Sierra Leone Education Sector Mid-Review Conference, Freetown, December 1973.

5. Estimates of Revenue and Expenditure and Development Estimates 1972-73 Sierra Leone Government, Freetown, 1972.

6. R. Hollister A Technical Evaluation of the first stage of the Mediterranean Regional Project, OECD, Paris, 1967.

7. Household Surveys, Central Statistics Office, Freetown, 1968-71.

8. Harry G. Johnson "Individual and Collective Choice" in Man and the Social Sciences, William Robson (ed.), George Allen and Unwin Ltd., London.

9. Kusum Ketkar "Distribution of Tax Burden in Sierra Leone" Memeographed, Fourah Bay College, University of Sierra Leone, Freetown, November 1974.

10. National Development Plan, 1974/75 - 1978/79, Ministry of Development and Economic Planning, Central Planning Unit, Freetown, August 1974.

11. H. S. Parnes Forecasting Educational Needs for Economic and Social Development, OECD, Paris, 1962.

12. Population Census of Sierra Leone, 1963, Vol. 2, Social Characteristics, Central Statistics Office, Freetown, 1965.

13. Report of the Commission of Inquiry into the Civil Service of Sierra Leone 1970 and the Government White Paper There on, Government Printing Department, Sierra Leone, 1970.

14. Report of the Ministry of Education for the year 1971: including educational developments and statistics for 1970/71, Sierra Leone Government, Freetown.

15. H. H. Thias and M. Carnoy Cost-Benefit Analysis in Education A Case Study of Kenya, IBRD, 1972.