UNIVERSITY COLLEGE OF RHODESIA AND NYASALAND

THE REQUIREMENTS AND SUPPLIES OF HIGH LEVEL MANPOWER IN NORTHERN RHODESIA 1961–1970

OCCASIONAL PAPER No. 2
DEPARTMENT OF ECONOMICS
SALISBURY
1964

THE REQUIREMENTS AND SUPPLIES OF HIGH LEVEL MANPOWER IN NORTHERN RHODESIA: 1961—1970

THE U.C.R.N. MANPOWER SURVEY SUB-COMMITTEE

University College of Rhodesia and Nyasaland
Department of Economics Occasional Paper No. 2
Salisbury, 1964.

Printed by Unitas Press Ltd., 17 Park Street, Salisbury.

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PREFACE

This report on the High Level Manpower requirements in Northern Rhodesia arose out of discussions with Mr. Alan Pifer in 1960. Subsequently a grant from the Carnegie Corporation made it possible for Professor E. A. G. Robinson of Cambridge University, England, to visit the College in December 1960 to advise on the feasibility of such a survey. On the basis of his report the Carnegie Corporation graciously provided a grant which made available the advice and assistance of Professor F. Harbison, Director of the Industrial Relations Section of Princeton University and Professor G. Seltzer of the Industrial Relations Center of the University of Minnesota, together with that of Professor Robinson, for the purpose of conducting a survey of High Level Manpower requirements in the territories which then constituted the Federation of Rhodesia and Nyasaland. Professor Seltzer was able to visit the College for some months to acquaint himself with the local conditions and Professors Harbison and Robinson were both able to make shorter visits.

The College set up an internal Manpower Survey Sub-Committee of Professors Milton, Taylor and Mitchell to co-ordinate and administer the scheme and to serve as an advisory body. The College also called upon a committee of 12 members of Government Departments, Mining, Farming, Industrial and Management organizations to advise it on matters affecting the survey.

The study fell at an awkward time. The Federation was on the point of dissolution and the political future was uncertain. This complicated the task of those concerned with the study, for the effect of political events on economic growth and on the requirements for high level manpower is vitally important. These uncertainties contributed to the difficulties of estimating future trends of economic growth.

The draft report went through several transformations as the political horizon cleared and as additional factual information became available. The final version has effectively been drafted by Professor W. L. Taylor and Mr. D. S. Pearson of the College Economics Department and has been commented on by the several advisors involved.

There are many variables which affect economic growth and manpower requirements. The trends of some of these variables may be known sufficiently well to provide the basis of accurate forecasting; the trends of others, with the information and analytical resources at

our command, may be uncertain. The effect of other variables, such as political factors, may not only be unpredictable, but also impossible to state in quantitative terms.

For estimating purposes, however, it is necessary to make a number of assumptions about uncertain factors which appear reasonable at the time of writing. Time, before long, will almost certainly falsify some of them. The estimates at the time of writing, therefore, may have an appearance of certainty and verisimilitude which is in fact spurious: the assumptions on which the estimates are based should always be taken into account.

The intention throughout has been to arrive at an estimate of *minimum* High Level Manpower requirements. The tendency in all stages of estimation, therefore, has been to make conservative appraisals of the factors influencing the supply of manpower. We have considered it wiser to err on the side of safety than to over-estimate requirements.

This survey, in fact, must be looked upon as providing a first approximation subject to successive improvements as information increases and knowledge widens.

One of the positive findings of the survey, indeed, has been that there is a lack of official statistics and other information on which estimates of manpower requirements can be based. The uncertainties of these first estimates emphasise the need for a continuing re-assessment of manpower needs as more and more information becomes available. Educational plans must then be related to these revised estimates of manpower requirements. A High Level Manpower Committee under Government auspices is clearly needed for this purpose.

We are grateful to the Carnegie Corporation for providing the funds that made the survey possible; to the members who served on the Advisory Committee; to the various Government officials who provided information vital to the survey; to Professors Robinson, Harbison and Seltzer for their advice and assistance; and particularly to Professor W. L. Taylor and Mr. D. S. Pearson of the College Department of Economics on whose shoulders fell the burden of preparing the final report.

J. C. MITCHELL,
Chairman,
U.C.R.N. Manpower Survey Sub-Committee.

March, 1964.

THE REQUIREMENTS AND SUPPLIES OF HIGH LEVEL MANPOWER IN NORTHERN RHODESIA 1961-1970

I

THE PROBLEM

1. The future development of Northern Rhodesia will depend in part on the natural resources of the country ; but it will also depend in great measure on the availability of trained manpower with the necessary skill to organise production and commerce and to administer the country. Without sufficient trained manpower, development will be much less rapid. Self-government and Africanisation policies will, moreover, imply that there will be considerably increased need to train Northern Rhodesians to replace the personnel, trained abroad, who in the past played a central role in the administration of the country and in its economic development.

2. Education and training is a long process. An immediate increase of scholars at the lowest level will only affect the numbers of High Level Manpower available when these scholars have reached Form II. This will take at least eight years. Thus the planning of training and education needs to be based on a long view of the probable demands for trained personnel.

3. The purpose of this report is to forecast as accurately as possible the needs for skilled manpower in Northern Rhodesia in 1970, and the potential supplies on the basis of present and proposed educational plans, in order to make possible an appraisal of the adequacy of existing policies.

II

THE DEFINITION OF HIGH LEVEL MANPOWER

4. The concept of High Level Manpower (HLMP) has been designed to cover those higher skills that are of critical strategic importance for the development of any economy. It may be defined either in terms of the types of occupations concerned or in terms of the educational attainments required to fill these occupations satisfactorily. The relationship of educational attainments to occupation is not permanent and static. As society develops, the educational qualifications required for occupations in general are likely to rise. In a backward economy certain occupations are necessarily filled at present by persons who lack the full educational qualifications that may be desirable even a few years ahead. We have allowed for this by establishing lower minimum qualifications for the dividing lines between categories which would probably not be justified in more developed countries.

5. For purposes of this report the Northern Rhodesian working population of all races and in all occupations has been divided into four

TABLE 1

Formulation of "High-level" Manpower Concept

Category	*Representative Occupational Titles*	*Educational Attainment and/or Requirement*
I. "Professional—Administrative"	—Senior Civil Servants —directors, senior managers and principals of large sized establishments in both the private and public sectors. —professional personnel, e.g., doctors, chemists, engineers, geologists, architects, lawyers, veterinarians, agronomists, etc. —secondary school teachers.	University graduate or other form of post-secondary education (e.g., accountants).
II. "Technical—Executive"	—executive civil servants. —sub-professional personnel, e.g., draftsmen, qualified nurses, laboratory technicians, etc. —principals of medium-sized enterprises. —secondary and technical school teachers*	1-3 years beyond Form IV in college, technical institution or teacher training institution.
III. "Skilled"	—clerical officers in Civil Service, qualified artisans, etc. —first-level supervision, i.e., foremen, section heads, etc. —primary school teachers* —stenographers, accounts clerks, salesmen, advanced farmers, etc.	1-5 years beyond Form III in apprenticeship or special training institution.
IV. "All Others"	—labourers, sales assistants, copy typists, etc.	

*Teachers have been classified as follows:

Non-African Education	*Category*
"Graduate" teachers.	I
"Qualified" teachers.	II
African Education	
Upper Secondary School Teachers.	I
Lower Secondary School Teachers.	II
"Trained" Primary School Teachers.	III

major categories as set out in Table I. Categories I, II and III constitute the High Level Manpower of the country. Category IV represents the remainder of the working population, with which we are not here concerned.

III

THE PROBLEM OF FORECASTING REQUIREMENTS

6. In order to forecast Northern Rhodesia's requirements for High Level Manpower in 1970 it is necessary to proceed by five stages:

(i) To establish the 1961 stock of HLMP, African and non African, both in total and in particular categories.

(ii) To work out a satisfactory method of calculating the proportionate increase of that stock likely to be required by 1970 and thus the actual stock required in 1970, both in total and in particular categories.

(iii) To calculate from this the numbers of trained persons in each category who may be required to provide for the growth of the required HLMP.

(iv) To calculate the probable normal and estimate abnormal wastage during the period 1961-1970 in the 1961 stock of HLMP and thus the numbers needed to be trained or otherwise secured to cover the replacement of wastage, both in total and in particular categories.

(v) To estimate from (iii) and (iv) together the total requirements of HLMP and compare them with the estimated out-turns of people with the appropriate educational qualifications or skills, both in total and in particular categories.

IV

THE 1961 STOCK OF HIGH LEVEL MANPOWER

7. It has been necessary to estimate non-African and African HLMP by different methods in order to make the best use of the available statistical evidence.

(a) Non-African.

8. Using the 55 per cent sample drawn from the Census of Population held in September, 1961, the Central Statistical Office has tabulated the economically active non-African population according to HLMP categories and types of occupation. We have combined these figures into five major sectors, viz. Agriculture, Mining, Education, Government Administration and All Other Activities, with some adjustments in the sphere of Education. Details are given in Table 2.

TABLE 2

Estimate of Non-African HLMP in Northern Rhodesia in 1961(a)

	Category I	*Category II*	*Category III*	*Totals*
Agriculture	60	100	1,280	1,440
Mining	620	740	5,530	6,890
Education	150(b)	430	920	1,500
Govt. Administration	370	580	3,730	4,680
All Other	1,060	4,360	9,000	14,420(c)
Totals	2,260	6,210	20,460	28,930

(a) Based on the 55 per cent sample survey of the Non-African Census of Population, unless otherwise stated.

(b) Calculated on the basis of Annual Reports of the Northern Rhodesia and Federal Ministries of Education.

(c) This total is made up of the following:

Manufacturing	100	490	1,660	2,250
Construction	260	480	1,080	1,820
Finance and Commerce	110	2,580	2,730	5,420
Transport	60	310	1,690	2,060
Other Services	460	450	1,590	2,500
Others n.e.s.	70	50	250	370
Totals	1,060	4,360	9,000	14,420

9. On this basis there were about 28,900 non-Africans in the three HLMP categories in 1961. Total non-African employment in September, 1961 was 32,230 to whom must be added owners of businesses or farms and self-employed persons in the professions or elsewhere. This brings the total of economically active non-Africans, according to the Census sample, to 36,150 and the proportion of non-African HLMP to all economically active non-Africans is found to be 80 per cent.

(b) African.

10. The evidence for the African total of HLMP in Northern Rhodesia is less firm than that for the non-African sector. Comparatively reliable information exists for the copper-mining industry and for government employment, including education and other services. There arise, however, certain problems in establishing minimum qualifications according to which certain types of posts or their present holders may be included in category III.

At present, for example, a number of teaching posts are in fact held by persons whose actual qualifications are less than those properly regarded as attaching to the post. It has been thought right to include such holders of posts in the 1961 total, since before 1970 it may be hoped to raise the actual qualifications above the present standard.

11. In the sectors of Mining and Education, direct information is

available concerning the number of Africans who may be regarded as falling within the HLMP classification. In the case of other sectors, however, less direct methods of estimation had to be adopted. A recent enquiry into the earnings of African employees makes it possible to estimate the numbers of African workers receiving earnings at different levels. In consultation with the Central Statistical Office, it was estimated that Africans earning more than £17 10s. a month in 1961 could reasonably be regarded as possessing the necessary qualifications or skills for at least category III of HLMP or were engaged in occupations which could properly be included in category III.

TABLE 3

Estimate of African HLMP in Northern Rhodesia in 1961

	Category I	*Category II*	*Category III*	*Totals*
Agriculture	N(a)	N(a)	1,800(b)	1,800
Mining	N(a)	100	400	500(c)
Education	170	230	1,100	1,500(d)
Government Administration	N(a)	300	2,200	2,500(e)
All Others	N(a)	100	7,400	7,500(f)(g)
Totals	170	730	12,900	13,800

Notes:

(a) N=Nil or negligible.

(b) 4 per cent of Africans employed in Agriculture plus 0.1 per cent of African farmers. This figure is probably over-estimated in terms of the definition of HLMP as used in this paper. It has been used, however, in the absence of a better estimate of HLMP of the type defined here actually employed in agriculture.

(c) According to the *Morison Report* 1962, the Government Printer, Lusaka, pp. 44-45, the proportion of African mineworkers with educational qualifications above Std. VI=1.2 per cent, out of a total labour force of 39,000. It is assumed that the positions occupied by these workers will in future be filled by people with Form II qualifications and they can therefore be regarded as HLMP, of whom about 20 per cent are Category II and 80 per cent are Category III.

(d) Based on Reports of Northern Rhodesia Ministry of African Education.

(e) Based on estimates derived from total employment returns.

(f) Based on numbers earning more than £17 10s. 0d. per month.

(g) No information is available to provide a break-down similar to that in Footnote (c) of Table 2.

TABLE 4

Estimate of Total HLMP in Northern Rhodesia in 1961

	African				*Non-African*				*Totals*			
	I	*II*	*III*	*Total*	*I*	*II*	*III*	*Total*	*I*	*II*	*III*	*Total*
Agriculture	N	N	1.8	1.8	0.1	0.1	1.3	1.5	0.1	0.1	3.1	3.3
Mining	N	0.1	0.4	0.5	0.6	0.7	5.5	6.8	0.5	0.8	5.9	7.3
Education	0.2	0.2	1.1	1.5	0.2	0.4	0.9	1.5	0.4	0.6	2.0	3.0
Govt. Administration	N	0.3	2.2	2.5	0.4	0.6	3.7	4.7	0.4	0.9	5.9	7.2
All Other	N	0.1	7.4	7.5	1.0	4.4	9.0	14.4	1.0	4.5	16.4	21.9
Totals	0.2	0.7	12.9	13.8	2.3	6.2	20.4	28.9	2.5	6.9	33.3	42.7

Note:
Individual figures do not necessarily add up to the total, due to rounding off.

12. The £17 10s. cut-off point has accordingly been applied to the "Government Administration" and "All Other" sectors. In the case of Agriculture, however, the ratio of skilled to unskilled employees is much lower than in other sectors. Income distribution data is not available by sectors and it was somewhat arbitrarily decided to apply half the overall percentage of employees earning more than £17 10s. per month to total Agricultural employees; i.e., 4 per cent instead of 8 per cent. In addition, some African farmers qualify for inclusion in category III and, again somewhat arbitrarily, it has been assumed that approximately one in a thousand of such farmers would qualify.

13. The results of these estimates are given in Table 3, showing total African HLMP in 1961, amounting to 13,800.

(c) Total.

14. Taking these two estimates together, it may be seen that the total stock of HLMP in 1961 was about 42,700 divided approximately between categories as shown in Table 4.

V

THE PAST GROWTH OF HIGH LEVEL MANPOWER AND ITS RELATION TO GROWTH OF DOMESTIC PRODUCT

15. Any attempts to estimate HLMP in Northern Rhodesia in earlier years must be even more speculative. It is believed that it would not be unreasonable to assume:—

(i) that in 1954 non-African HLMP bore the same relationship to total non-African employment as in 1961; and,

(ii) that the rate of growth of total HLMP has been equal to the rate of growth of Gross Domestic Product, after adjusting for price changes. (See Tables 6 and 7).

16. On this basis the approximate growth of total HLMP 1954-61 may be estimated as shown in Table 5. This shows that, whereas during this period total HLMP has grown by 53 per cent, European HLMP has risen by only 29 per cent and African HLMP, starting from a very low level, has risen by 146 per cent.

TABLE 5

Estimated Growth of High Level Manpower 1954–61

	Non-African		*African*		*Total*	
	1954	*1961*	*1954*	*1961*	*1954*	*1961*
Employment (000's)	24.8	32.1	241	238	265	270
HLMP (000's)	22.3	28.9	5.6	13.8	27.9	42.7
Index (1954=100)	100	129	100	246	100	153

VI

ESTIMATED GROWTH OF NORTHERN RHODESIAN ECONOMY

17. During the period 1954-61, for which estimates of the changes of the Gross Domestic Product at constant cost have been made available to us from official sources, the Northern Rhodesia economy has been subject to very considerable fluctuations largely deriving from uncertainties of the copper market, and it is not easy to establish with confidence the underlying trend of growth.

18. One of the principal problems to be solved in attempting to project the possible future growth of Gross Domestic Product in Northern Rhodesia is to discover the *real* rate of growth in the past. Estimates of GDP at 1954 prices were made available to us by the Central Statistical Office and have since been published as a Supplement to the National Accounts. However, the wide fluctuations which took place during this period, induced by changes in the price of copper and hence the *volume* of exports, rendered it virtually useless for purposes of projection.

The calculation of the growth of national product at 1954 prices is shown in Table 6.

TABLE 6

Gross Domestic Product in the Money Economy in Northern Rhodesia at market prices

1954 to 1961(a)

	(£ million) Current prices	*GDP at 1954(b) Prices*	*Index Numbers of GDP at 1954 prices 1954=100*
1954	124.5	124.5	100
1955	156.6	121.0	97
1956	177.3	139.7	112
1957	142.5	143.1	115
1958	127.1	138.4	111
1959	177.9	172.8	139
1960	193.8	183.1	147
1961	187.0	183.0	147
1962	185.3	177.0	142

(a) From: *Supplement to the "National Accounts of the Federation of Rhodesia and Nyasaland, 1954-1962".*

(b) Trend value of GDP at 1954 prices is given by the equation GDP=42.60+8.54 t, where t is time measured in years from 1945. This gives a trend growth in GDP from 1954 to 1961 of 50 per cent.

19. Given the above objections, it seemed preferable to examine the trend in GDP over a longer period, even though this accentuated the

problem of converting to constant prices. On the suggestions of the Central Statistical Office the Gross Domestic Product from 1945 to 1962 was deflated by the index of copper prices. This gave a close approximation to a straight line trend, as shown in Table 7.

TABLE 7

Gross Domestic Product, 1945–1962 (in the money economy)

Year	*£ million at current prices*	*Copper Price Index*	*GDP deflated by Index of Copper Prices(a)*	*Index Nos.* of GDP at 1945 prices*
1945	15.4	100.00	15.40	50
1946	18.1	124.48	14.54	47
1947	27.8	210.60	13.20	43
1948	34.0	216.14	15.73	51
1949	43.9	214.59	20.46	67
1950	58.5	288.41	20.28	66
1951	85.9	355.44	24.17	79
1952	96.9	418.33	23.16	75
1953	112.2	410.11	27.36	89
1954	123.2	400.98	30.72	100
1955	153.5	566.84	27.08	88
1956	172.6	530.55	32.53	106
1957	137.1	354.04	38.72	126
1958	121.6	318.38	38.19	124
1959	171.8	383.51	44.80	146
1960	187.3	396.09	47.29	154
1961	179.8	370.20	48.57	158
1962	178.2	377.20	47.24	154

*1954=100

(a) The "Supplement to the National Accounts" gives a trend value for GDP=40.17+9.46 t, where t is time measured in years from 1945. This gives a trend growth in GDP from 1954 to 1961 of 53 per cent. Extrapolation to 1970 gives GDP (at 1954 prices)=£276.67 million. equivalent to a rise of 45 per cent.

20. Calculation of the line of trend showed that the percentage growth in trend values between 1954 and 1961 was 53 per cent, as already indicated in the calculation of growth of HLMP. (See Table 5). Extrapolation of the trend through to 1970 gave a projected growth rate from 1961 to 1970 of 45 per cent, on the 1961 figure, the lower percentage rate of growth being due to the calculation of a constant absolute growth on rising base year figures.

21. Any attempts to forecast future rates of economic growth must clearly be subject to wide margins of error. Where an overall national development plan is available, this could be used as a basis for estimating HLMP requirements. In the case of Northern Rhodesia, no such plan is available. Accordingly, a straight extrapolation of the past trend appeared to be the safest and least unreliable course to adopt.

22. Except for the educational sector, the method of estimating HLMP is based on an assumed and mutually dependent relationship between growth of GDP and growth of HLMP. In this connection, it appeared that the minimum relationship is a unitary one, i.e., a one per cent growth in GDP is associated with a one per cent growth in HLMP. On the other hand, it can be argued that the Northern Rhodesia economy has reached a stage in its development at which future demands for HLMP will grow at a faster rate than the volume of output. This seems a reasonable assumption in view of the new types of government services likely to be called for (e.g., community development officers) and also the fact that accelerated expansion of manufacturing industry will require initially a more than proportional rise in HLMP in this sector in relation to the increase in output.

TABLE 8

		Level I	*Level II*
All Sectors (Exc. Education)			
Category I		3.4	3.9
Category II		9.1	10.5
Category III		45.1	52.1
Sub-Total		57.6	66.5
Education:			
Category I	0.6		
Category II	1.2		
Category III	4.2		
	6.0		
Total HLMP Stock Required:			
Category I		4.0	4.5
Category II		10.3	11.7
Category III		49.3	56.3
Total:		63.6	72.5

Notes:

(a) Although information was made available regarding expected future requirements on the copper mines and in government service, we were unable to embody this in the projected requirements since it was not expressed in the form adopted in these calculations.

(b) Estimates for education are based on details supplied by the Northern Rhodesia Ministry of African Education. It is assumed that the present non-African education system will not be expanded during the period under review.

(c) Since some up-grading of the labour force can be expected, Category I has been increased relative to Category II: similarly for Category II in relation to Category III. (See Table 9 for percentage increases).

23. Accordingly two assumptions have been made about the relationship of the growth of the HLMP to the growth of GDP. These assumptions yield estimates which indicate the range within which HLMP requirements may be expected to lie. These estimates are referred to in what follows as "Level I" and "Level II".

24. In the case of education, these relationships cannot be applied, since this sector can be regarded as autonomous from the point of view of manpower requirements. Thus an increase in education can take place during periods of economic recession and a buoyant economy does not necessarily lead to an expansion of education. Estimates of the total required stock of HLMP in 1970 can then be made and are summarised in Table 8.

25. In Table 9, the same information is presented in a different form, showing the net increase required in the stock of HLMP between 1961 and 1970, with both growth assumptions and in percentage and absolute figures. In round figures, HLMP in Northern Rhodesia will have to rise by between 20,000 and 30,000 persons during this period, a rate of increase equivalent to between 50 and 70 per cent.

TABLE 9

Estimated Required Increase in Stock of HLMP in Northern Rhodesia, 1961 to 1970

	Level I		*Level II*	
	000's	*Per Cent*	*000's*	*Per Cent*
Category I	+ 1.5	60	+ 2.0	80
Category II	+ 3.4	49	+ 4.8	70
Category III	+16.0	48	+23.0	69
Total	+20.9	49	+29.8	70

VII

REPLACEMENTS

26. In order to estimate the necessary out-turn of suitably qualified HLMP it is necessary to make provision not only for the growth of the required stock, as has been done in the last few paragraphs, but also for the replacement of those members of the 1961 stock who may cease to be available, either as the result of normal wastage through death or retirement, or as the result of abnormal wastage consequent on emigration or withdrawal as a result of policies of Africanisation or other causes. In the next few paragraphs consideration will be taken only of normal wastage. Abnormal wastage will be discussed later as a part of the more general problems of immigration and emigration.[1]

(1) Wastage could also occur because, as qualifications for occupations rise, so HLMP now qualified for these occupations may be found to be inadequately qualified to fill them. This wastage is recognised but cannot be calculated.

27. The stocks of HLMP subject to such wastage are again set out in Table 10. In a stable advanced country it would be natural to assume an average working life of about 40 years and an annual normal wastage rate of about $2\frac{1}{2}$ per cent. In Northern Rhodesia, where persons tend to retire earlier and in some cases to enter HLMP stock later, and where death during the working life is less abnormal, an assumed average working life of 33 years may, in the absence of specific information, be more appropriate. This implies an annual wastage rate of 3 per cent giving a total wastage of 27 per cent of the 1961 stock over the nine years 1961-1970.[2]

28. If this wastage rate is applied to the 1961 stock of HLMP the results would be those shown in Table 10.

TABLE 10

Estimated Requirements of High Level Manpower for Replacement of Wastage 1961–1970
(thousands)

	1961 Stock	*Normal Wastage (3 per cent)*
Category I	2.5	0.7
Category II	6.9	1.9
Category III	33.3	9.0
Total	42.7	11.6

The figures for wastage have been rounded.

TABLE 11

Total Required Net Intake of HLMP 1961 to 1970
(thousands)

	Category I	*Category II*	*Category III*	*Totals*
For Growth:				
Level I	1.5	3.4	16.0	20.9
Level II	2.0	4.8	23.0	29.8
For Normal Replacement	0.7	1.9	9.0	11.6
Total:				
Level I	2.2	5.3	25.0	32.5
Level II	2.7	6.7	32.0	41.4

(2) This wastage rate should also strictly be applied to new additions to the labour force after 1961. However, in view of the presumed age structure of these recruits, normal wastage may be regarded as negligible and has been ignored.

Total Required Intake:

29. It is now possible to bring together the estimated requirements for growth and the estimated requirements to cover normal wastage and to estimate the total intake of trained HLMP required. It must be emphasised that these figures as yet make no provision for covering any possible abnormal wastage due to a net emigration of persons with HLMP qualifications. (See Table 11).

VIII

INTAKE OF AFRICAN HIGH LEVEL MANPOWER FROM NORTHERN RHODESIA AND OVERSEAS EDUCATION

30. The number of HLMP needed in order to meet these estimated requirements may be obtained in the following ways:

(i) The expansion of the present educational system in Northern Rhodesia from the lower secondary through to post-secondary levels.

(ii) The special training of people already employed but who are not qualified to take HLMP posts.

(iii) By lowering the educational standards required for many of the posts now filled by HLMP.

(iv) By importing suitably qualified persons from outside Northern Rhodesia.

31. It is assumed here that it will not be possible to employ under-qualified persons in HLMP posts to any great degree and that the training up of those in present employment for HLMP positions will not add significantly to the supply. Clearly if Government or other agencies are able to institute special training programmes of sufficient scope, or are prepared as a stop-gap to accept under-qualified personnel for HLMP posts, the estimates which follow will be changed to the extent that this proves possible.

32. Estimates of the prospective out-turn of African HLMP have been derived from the Draft Development Plan prepared by the Northern Rhodesia Ministry of African Education, covering the period 1961/2 to 1970/1. They may need revision in the light of any subsequent decisions or changes of policy.

33. The numbers of Africans of Northern Rhodesia domicile likely to be available for HLMP posts in the three categories have been estimated in Tables 12 and 13. The numbers necessarily depend on the various assumptions regarding male/female ratios and wastage rates of educated women which have been made in preparing the estimate.

34. It will be evident that those estimates assume that in 1970 all those who possessed HLMP qualifications will, in fact, be engaged in performing functions requiring the maximum qualifications that they

TABLE 12

Estimated Out-turn of African High Level Manpower in Northern Rhodesia 1962–70(a)

Form II enrolment	30,930	
less failures (20 per cent)	7,730	
	23,200	
less Form IV enrolment	14,150	
	9,050	
plus Form IV failures	4,250	
	13,300	
less non-participants in labour force(b)	1,000	12,300 in category III
Form IV enrolment	14,150	
less failures (30 per cent)	4,250	
	9,900	
less Form VI enrolment	2,700	
	7,200	
plus Form VI failures	1,750	
	8,950	
less non-participants in labour force(c)	550	8,400 in category II
Form VI enrolment	2,700	
less failures (65 per cent)	1,750	
	950	
less non-participants in labour force(d)	50	900 in category I
Total Supplies of African HLMP		21,600

(a) Separate estimates of African and non-African out-turns from schools are made for statistical convenience only. It is not implied that they will be taught in different institutions.

(b) Assumes about 20 per cent of Form III out-turn will be girls of whom 40 per cent are lost to the labour force. At the end of 1961 15 per cent of Form II enrolment were girls.

(c) Assumes about 20 per cent of Form IV out-turn will be girls of whom 30 per cent will be lost to the labour force. At the end of 1961 about 15 per cent of Form IV enrolment were girls.

(d) Assumes about 20 per cent of Form VI out-turn will be girls of whom 25 per cent will be lost to the labour force. At the end of 1961 the enrolment of girls in Form VI was negligible.

TABLE 13

Category	*Estimated out-turn of Schools, etc.*	*Estimated out-turn of Correspondence Colleges, etc. (a)(b)*	
I	900	—	900
II	8,400	—	8,400
III	12,300	1,500	13,800
TOTAL	21,600	1,500	23,100

(a) The low out-turn of Correspondence Colleges is due to the very low pass rate which past experience suggests must be applied.

(b) The numbers who will probably register for correspondence courses have been estimated on the basis of registrations over the past few years, supplied by the Northern Rhodesia Ministry of African Education.

possess. Furthermore, in relation to the distribution in categories I and II, it is assumed that all those who pass the "A" level examinations (or equivalent) will in fact succeed in finding places at Universities, or in other institutions of advanced education, and in passing the necessary examinations.

35. The figures in Table 12 represent the expected out-turn of the orthodox educational system. Account must also be taken of less orthodox forms of education—in particular of Correspondence Colleges. If what is believed to be a reasonable allowance for such methods of obtaining qualifications is made, the total potential supply of African HLMP may be expected to be approximately as shown in Table 13.

IX

IMPLICATIONS OF THESE ESTIMATES OF REQUIREMENTS AND OF OUT-TURN OF AFRICAN EDUCATION

36. If these estimates of the probable out-turn of African education are of the right order of magnitude, what are the implications with regard to the necessary non-African and expatriate element in Northern Rhodesia HLMP? In Table 14, the *total* projected requirements of HLMP in Northern Rhodesia up to 1970 are compared with the projected supplies of *African* HLMP. The results indicate both the size of the required additional intake and the numbers and proportions of additional requirements, at both levels, in the total HLMP stock in 1970, *on the assumption that the estimates of African supplies given in Table 12 cannot be increased* and the alternative sources of HLMP set out in paragraph 30 cannot be exploited.

37. In 1961 Africans provided 32 per cent and non-Africans 68 per cent of the HLMP of Northern Rhodesia. On the basis shown in Table 14, in 1970 local Africans would provide 52 per cent and local non-Africans and/or expatriates 48 per cent of the HLMP of the country at Level I, or 46 and 54 per cent respectively at Level II.

TABLE 14

Comparisons of Total Requirements and Local African Supplies of HLMP in Northern Rhodesia, 1961–1970
(Thousands)

	Category I	*Category II*	*Category III*	*Total*
1. Total requirements:(a)				
Level I	2.2	5.3	25.0	32.5
Level II	2.7	6.7	32.0	41.4
2. Local African Supplies:(b)	0.9	8.4	13.8	23.1
3. Balance Required:				
Level I	+1.3	— 3.1	+11.2	+ 9.4
Level II	+1.8	— 1.7	+18.2	+18.3
4. Total Required Stock in 1970:(c)				
Level I	4.0	10.3	49.3	63.6
Level II	4.5	11.7	56.3	72.5
5. African Stock in 1970:(d)	1.0	8.9	23.2	33.1
6. Additional Stock Required:				
Level I	+3.0	+ 1.4	+26.1	+30.5
Level II	+3.5	+ 2.8	+33.1	+39.4
7. 6 as percentage of 4:				
Level I	+75%	+14%	+53%	+48%
Level II	+78%	+24%	+59%	+54%

Notes:
(a) From Table 11.
(b) From Table 13.
(c) From Table 8.
(d) 73 per cent of African Stock in 1961 plus African supplies, as given in Table 13.

38. It can be calculated, on the basis of Level I, that if local Africans occupy 80 per cent[1] of all posts in 1970 in Education and Government employment, this will absorb approximately 13,000 of the 33,000 Africans available. Of the remaining 41,000 posts, local Africans would then fill only 20,000 or 49 per cent, and the remaining 51 per cent would have to be filled by local non-Africans or expatriates. At Level II, the number of remaining posts rises to over 48,000 and the proportion of local Africans available to fill them falls to 40 per cent.

39. If, alternatively, it were thought desirable that 80 per cent of all posts in education and government administration should be held by local Africans and that local Africans should fill 50 per cent of all other HLMP posts (which would imply that approximately 60 per cent of all HLMP posts were held by local Africans) it would be necessary to have available about 34,000 Africans with HLMP qualifications at Level I or about 39,000 at Level II. At Level I, the supply and de-

(1) This figure of 80 per cent is arbitrarily assumed to be the minimum level of Africanisation in the public service which a future Northern Rhodesia Government is likely to accept. Theoretically, the level of Africanisation can be anywhere between 0 and 100 per cent. The actual figure will depend upon factors which cannot be foreseen.

mand would be just about in balance, but at Level II the supply of local Africans with HLMP qualifications would need to rise by 5,600 or about 25 per cent beyond the total of 23,100 assumed in Table 12. (These figures are summarised in Table 15).

TABLE 15

Estimates of Possible Levels of "Africanisation" of HLMP in Northern Rhodesia in 1970
(Thousands)

		Limit I	*Limit II*
(i)	Number of Africans available	33.1	33.1
(ii)	Number of posts in Education and Government Administration.(a)	16.5	18.1
(iii)	Africans required for 80 per cent of (ii)	13.2	14.5
(iv)	Number of posts in all other sectors	41.1	48.4
(v)	Africans available to fill (iv)	19.9	18.6
(vi)	Africans required for 50 per cent of (iv)	20.5	24.2
(vii)	Africans required for (iii) and (vi)	33.7	38.7
(viii)	Increase in African supplies required to meet (vii)	0.6	5.6

Note:
(a) Derived from Table 8, assuming the same ratio of "Government Administration" to "All Other" as shown in Table 4.

X

PROSPECTS OF LOCAL NON-AFRICAN SUPPLIES

40. Even though the supply of local Africans with HLMP qualifications might prove sufficient in total to meet the degree of Africanisation assumed in paragraph 37, this still leaves important sectors of the economy to be manned, especially at Category I level. The next stage is accordingly to set against this required additional stock in 1970 the prospective numbers of non-Africans likely to be available from inside Northern Rhodesia. These are represented by the probable survivors of the present non-African stock of HLMP and by the number of trained non-African HLMP of Northern Rhodesian domicile that are likely to emerge from non-African education in Northern Rhodesia.

41. On the basis of present policies and the present expectations of the growth of the non-African education system, the out-turn of non-African HLMP is estimated to be as shown in Table 16.

42. If these estimates of the out-turn of non-African education are taken, together with the prospective survivors of the present non-African HLMP stock, and assuming that our estimates of local African supplies are substantially correct, it is possible to calculate the net immigration that would be necessary to cover the estimated HLMP needs of Northern Rhodesia. (See Table 17).

TABLE 16

Estimated Out-turn of High Level Manpower from Education of Non-Africans 1962–70(a)

Supplies to Category III		
Form II. Out-turn 1961-70	15,000	
less Numbers continuing to Form IV	— 9,000	
less Non-participants in Labour Force(b)	— 800	
Net Out-turn of Category III		5,200
Supplies to Category II		
Form IV Out-turn 1961-70	9,000	
less Numbers continuing to Form VI	— 900	
less Non-participants in Labour Force(c)	— 900	
Net Out-turn of Category II		7,200
Supplies to Category I		
Form VI enrolment	900	
less Non-participants in Labour Force(d)	— 100	
Net Out-turn of Category I		800
Total:		13,200

(a) Separate estimates of African and non-African supplies have been made for statistical convenience only. This does not imply that they will be trained in separate institutions.
(b) Assumes that 50 per cent will be females of whom 25 per cent will not enter the labour force.
(c) Assumes that 45 per cent will be females of whom 25 per cent will not enter the labour force.
(d) Assumes that 25 per cent will be females of whom 25 per cent will not enter the labour force.

43. Of the 1961 non-African HLMP stock, a proportion is likely to be lost to the Northern Rhodesia economy as a result of Africanisation of government services. The total of non-African HLMP in government service, including education, in 1961 was approximately 6,200. The similar figure for Africans was 4,000 making a total of 10,200. It is understood that it is the intention to reduce the proportion of non-Africans in government service in the immediate future to 25 per cent or about 2,500. This would imply a short-term loss of 3,700 if they all emigrated from Northern Rhodesia. There would in addition be the loss of any wives and children who might possess HLMP qualifications and be working. Even if allowance is made for the latter, the immediate loss from this would not represent more than about one eighth of the total stock of non-African HLMP in 1961.

44. In the longer run what is at issue, on the assumption that the Northern Rhodesia economy will grow at the rate estimated above, is whether the demand for HLMP by the copper mines, other industrial and commercial concerns, the self-employed professions and the government itself, so far as it requires new types of specialists or replacements of some of those leaving its employment, will increase more rapidly than the supply. At Level I, the problem could appear to

be one of unemployment rather than labour shortage of HLMP; at Level II, however, a net inflow of about 5,000 HLMP from outside Northern Rhodesia will be required over the period 1961 to 1970.

TABLE 17

Comparison of Requirements and Supplies of HLMP in Northern Rhodesia, 1961–70
(Thousands)

	Category I	*Category II*	*Category III*	*Total*
(i) Additional Stock Required(a)				
Level I	3.0	1.4	26.1	30.5
Level II	3.5	2.8	33.1	39.4
(ii) Local Non-African Supplies(b)	2.5	11.7	20.1	34.3
(iii) Surplus (+) Level I	−0.5	+10.3	− 6.0	+3.8(c)
or Deficit (−) Level II	−1.0	+ 8.9	−13.0	−5.1(c)

(a) From Table 14.

(b) 73 per cent of non-African stock in 1961 plus non-African supplies as given in Table 16.

(c) If the non-African HLMP displaced from their posts by Africanisation emigrate permanently from Northern Rhodesia the additional stock needed in each category would be

Category I	300
Category II	800
Category III	2,600
Total	3,700

Additional emigration of non-Africans would of course increase these totals.

45. Concentrating for the moment on the problem raised at Level II, such figures as exist for migration of non-Africans into and out of Northern Rhodesia are not adequate to show with clarity what has been happening in recent years. Figures are available for immigration to the extent that they show for all that have arrived in the Federation the particular country to which the immigrant has initially been travelling. The recorded figures of European immigrants and emigrants for recent years have been published by the Federal Ministry of Economic Affairs in the *Economic Report, 1963*. There are no records of subsequent movements between the three territories of the Federation nor of inter-territorial movements of residents. Accordingly, these figures can throw little light on the net migration into Northern Rhodesia and a more accurate source of information is to be found in the results of the Censuses of Population held in 1956 and 1961.

46. For the years 1956 to 1961, the increase in the non-African population of Northern Rhodesia approximated closely to the natural in-

TABLE 18

European Migration Exclusive of Inter-Territorial Movements*

(Thousands)

	Immigrants initially destined for Northern Rhodesia	*Emigrants last resident in Northern Rhodesia*	*Net Migration*
1959	4.1	3.3	+0.8
1960	3.3	3.0	+0.3
1961	3.3	4.0	−0.7
1962	3.1	2.9	+0.2
Average 1959-1962	3.4	3.3	+0.1

*Territorial emigration figures are estimates.

crease (the excess of births over deaths) during the period. This suggests that over the last few years emigration was probably of the same order as immigration, implying an average emigration of about 3,400 a year over the period. *Of these only a fraction would have been non-African HLMP.* The latter represents about 34 per cent of the total non-African population of both sexes and of all ages. Thus the average emigration of actual HLMP in the recent past has probably been somewhere about 1,200 a year, and the immigration of the same order of magnitude. In addition, if children emigrate with parents after some years in school there will be a subsequent loss of the intake from education. If emigrants and any accompanying children are, as they are likely to be, older on average than immigrants, even if they are replaced by equal numbers of immigrant children, there may in effect be some export of education.

47. On the other hand, there is no reason to assume that past experience of non-African immigration into Northern Rhodesia is of any relevance to the country's prospects of attracting immigration of HLMP in the future. In particular, it is possible—though unlikely—that these vacancies might be filled by persons from other parts of the African continent. Northern Rhodesia's success in attracting immigrants of the required calibre will depend more on the conditions of service offered than on past or present trends of non-African migration.

48. In regard to possible supplies of non-African HLMP, the following broad conclusions seem to emerge:

(i) Any non-African HLMP who are displaced from non-specialist jobs by Africanisation but wish to stay in Northern Rhodesia are likely to be able to find opportunities to do so, even though it may be necessary for some persons with Category II qualifications to accept Category III jobs.

(ii) The HLMP requirements of 1970 at Level II, seem likely to imply a net immigration of about 500-600 HLMP per annum.

(iii) On the basis of past experience this may represent an average emigration of about 900 HLMP and an average immigration of about 1,500 HLMP per annum. While this implies a large figure for total immigration (probably in excess of 6,000 per annum) it is still smaller than the immigration of the period 1955-57.

(iv) If this number of additional HLMP is required, the non-African population and the number of non-African children in schools is likely to increase in Northern Rhodesia, as it would appear to have done in some of the West African countries after independence.

(iv) The central issue is whether conditions in Northern Rhodesia are likely to remain such that the copper mines and industrial and commercial concerns are able to attract by offers of employment the numbers of HLMP they are likely to need. There is no reason to think that they will be unable to do so.

XI

GENERAL CONCLUSIONS

49. The more general conclusions of this study may be summarised as follows:

(a) The total required stock of trained and educated high level manpower in 1970 seems likely to be between 64,000 and 72,000 as compared with approximately 43,000 in 1961.

(b) On the basis of what is understood to be the likely out-turn of High Level Manpower from African education *as at present planned*, the total stock of locally available Africans with High Level Manpower qualifications seems likely to be about 33,000 persons in 1970.

(c) If African higher level education cannot be further expanded, the proportion of African High Level Manpower posts seems likely to increase from about 32 per cent of all posts in 1961 to between 46 and 52 per cent in 1970. This ratio could be consistent with 80 per cent Africanisation of public services and education, but Level II would imply that only about 40 per cent of all High Level Manpower posts in industry, commerce, mining and agriculture could be Africanised, compared with about 30 per cent in 1961.

(d) If all High Level Manpower posts are to be filled and wastage covered, Northern Rhodesia will need a total inflow of educated and trained High Level Manpower that may be as much as 1,500 a year. While this is a large figure, it is probably not larger than the HLMP immigration in the years 1955-57. The

attainment of the target of High Level Manpower will depend on the conditions in Northern Rhodesia being such that recruitment of qualified persons can be achieved by the industrial, commercial and mining companies concerned.

(e) Although in aggregate HLMP requirements in Northern Rhodesia may, at most, exceed estimated supplies by about 5,000, this masks a surplus of between 9,000 and 10,000 in Category II, with deficits of 6,000 to 13,000 in Category III and 500 to 1,000 in Category I. The Category I shortfall will almost certainly have to be made good by immigration, but this only implies a net influx of not more than 100-150 HLMP in any one year.

(f) The surplus in Category II will be available to fill part of the deficit in Category III and at this level it should not prove an insuperable problem to devise means of expanding the supply of Africans educated to Form II level. If an immediate start were made, the provision of an additional 1,100 Lower Secondary School places (allowing for failures) would prove sufficient, though it is appreciated that this means a 40 per cent expansion in Lower Secondary School places.

(g) If these additional 5,000 HLMP were provided by local Africans, this would raise the total African proportion at Level II from 46 to 53 per cent. This would enable the objective of 80 per cent Africanisation of Education and Government Service to be attained, while at the same time the proportion of African HLMP in the rest of the economy would rise from 38 per cent in 1961 to 49 per cent by 1970. To the extent that non-Africans in Category II refused to accept jobs in Category III and preferred to emigrate, the proportion of African HLMP would rise but so also would the overall shortage of HLMP. At Level I, on the other hand, this would probably prove the natural solution to the problem of HLMP unemployment.

(h) If Northern Rhodesia fails to secure the total of High Level Manpower required, the consequence is likely to be less efficient administration, less progress with education, less productive industry, commerce, mining and agriculture. While it is not possible to estimate with any sort of precision the quantitative effects, there would almost certainly be a decline in the rate of growth of the national income. A relatively small decline would mean that the national income would grow no faster than population. On the other hand, the post-war experiences of such countries as Germany and Israel have shown how increased supplies of trained High Level Manpower do stimulate rapid economic expansion.