A WORKING LIFE TABLE FOR MALES OF RURAL NIGERIA, 1965*

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1. 1. Introduction

A working life table shows, among other things, the joint effects of age-specific mortality rates and age-specific participation rates on the length of working life. The various causes of withdrawals from participation in gainful employment can be assessed by a careful examination of the internal structure of a working life table.

Most extant working life tables relate to European, North American and Japanese working populations (Azumi, 1958; Garfinkle, 1963; Great Britain, 1959; Wolfbein, 1949). Characteristics of the working population in the developing countries have been investigated in India (Gnanasekaran, 1960), Malaya (Saw Swee Hock, 1965) and Ghana (Kpedekpo, 1969). Tables of working life have been constructed for these countries. Urban and rural labour force were combined to construct an overall working life table.

The major difference between these tables referred to here and the Nigerian working life table is that the latter is constructed from data on rural employment patterns. One reason for this procedure is the lack of data on age-specific mortality rates in the urban areas; estimates of mortality rates from model life tables or from other similar countries would be so unreliable and subjective that they would introduce substantial bias to the analysis. The other factor is the predominance of the rural sector in the Nigerian economy. According to the 1963 census, 84.2% of the population of Nigeria were classified as rural dwellers; 80.2% of all employed persons aged 15 and above and 76.7% of employed males were also classified in the rural sector. The rural sector of the economy becomes a crucial subject for investigation.

II. Sources and Limitations of Data

The mortality data used in the construction of the tables come from a nation-wide survey conducted from April 1965 to May 1966. This provided life table survivors, l_x at exact ages. Data on the age distribution of the labour force come from the population census conducted in November, 1963. The Labour Force was defined to include employed persons aged 6 and above, who were at work or had jobs, whether they were full-time or part-time workers. "Work" was defined as 'economic activity' which contributed to the production of economic goods and services. Unemployed persons consisted of all persons aged 6 and over who, during the week preceding the census enumeration period, were not working but were actively seeking for work.

A major difficulty in defining economic activity in a developing country lies in the determination of what constitutes full-time employment in the rural sector. There is usually full-employment in agriculture which lasts for approximately three-fourths of the year: at the time of clearing the farm land, planting the crops and harvesting season; the other one-fourth of the year may be devoted to hunting, fishing, crafting and moving livestock from the savanah regions to the forest belts. If data on seasonal distribution of hours worked in any given year were available, it would be possible to construct different working life tables based on those who worked continuously throughout the year and those who worked for short periods of time. Any method of adjustment for seasonal unemployment and under-employment would result in dubious estimates of rates of employment. Suffice it to say that rural employment is interspered with considerable under-employment. (Jaffee and Berdecia, 1964).

The second problem encountered was in the census tabulation of employed persons, which was made in respect of all persons aged 15 and above. Such a tabulation is somewhat artificial and unrelated to the rural pattern of employment which starts at a much younger age.

The third problem related to the dating of the events which did not refer to the same calendar year (census year, 1963; mortality data, 1965). It is, however, not considered a very crucial defect that could bias the results. The proportional decrease of the Nigerian rural labour force between 1953 and 1963 was of the order of 6% annually due to structural shift from the rural to the modern sector but this loss of rural manpower was offset by a high birth rate estimated at about 50 per 1000 population.

Finally, the rural labour force is a residual after discounting for migration; the effect of rural to urban migration is to further reduce the available rural manpower.

III. Occupational Distribution of the Rural Labour Force

The occupational distribution of the male rural labour force for 1963 is shown below in Table I.

Table I: Occupational Distribution of Male Rural Labour Force

Occupational Code	Occupational Group	Number in Labour Force	Percentage
0	Professional, Technical and related workers	259,786	2.31
1	Administrative, Executive and Managerial Workers	17,361	0.16
2	Clerical Workers	60,188	0.54
3	Sales Workers including Petty Traders	699,644	6.22
4	Farmers, Fishermen, Hunters and Loggers	8,458,312	75.27
5	Miners, Quarrymen, etc.	10,770	0.10
6	Transport and Communication Workers	108,689	0.96
7-8	Craftsmen, Production Process Workers	945,769	8.41
9	Service, Sports, Recreation Workers	464,122	4.13
10	Unspecified Workers	31,061	0.28
11	Unemployed Persons	181,738	1.62
	Total Labour Force	11,237,440	100.00

More than 75% of the labour force were engaged in agriculture and related occupations and 7.8 million persons out of 9.4 million employed persons in agriculture were classified as crop farmers. Handicraft (8.4%) was particularly important. The main categories of handicrafts were tailors, weavers and vehicle mechanics. The rural professional group consisted of school teachers, herbalists and musicians.

IV. Adjustment of Census Labour Force Data

Table 2 below shows the total male population aged 15 and over and the number in the rural labour force.

Table 2: Rural Population and Rural Labour Force of Nigeria

Age Groups	Male Population	In Labour Force	Proportion in Labour Force Per 100
15-19	2,020,050	1,165,242	57.1
20-24	2,433,025	2,099,809	86.3
25-34	3,721,549	3,580,465	96.2
35-44	2,163,010	2,123,393	98.2
45-54	1,142,770	1,120,755	98.1
55-64	623,186	605,139	97.1
65-74	299,755	284,472	94.9
75+	298,078	258,165	86.6
Total	12,701,423	11,237,440	88.5

The proportion in the labour force rises from a minimum in the age-group 15-19 when the young are in full-time attendance at educational institutions or learning trades and reaches a maximum in the age group 35-44. In order to have a greater insight into the age distribution of the population in the labour force, data in Table 2 are split into quinquennial age groups by the use of Newton's formula:

$$P^1_x = \tfrac{1}{2}\sqrt{P_x} + 1/8(P_{x-1} - P_{x+1})^2$$

where P^1_x is the population in quinquennial age group. The resulting population and numbers in the labour force are shown in Table 3.

The adjusted data in the table seem defective in some respects particularly in the age group 30-34, where the proportion was 100.00. To adjust this defect, the proportion working is derived by a different procedure rather than using the maximum value. As the population under study is entirely rural and agriculture, fishing, hunting and handicrafts are the principal occupations, little use will be made of the concept of "those in training" preparatory to entering the labour force such that ${}_5W_x = \tfrac{1}{2}({}_5W_x + {}_5W_{x+5})$. This will not yield a true value of ${}_5W_x$.

Table 3: Rural Labour Force and the Proportions in the Labour Force

Age Groups	In Population	In Labour Force	Proportions in Labour Force Per 100
15-19	2,020,050	1,165,242	57.70
20-24	2,433,025	2,099,809	86.30
25-29	2,003,904	1,861,586	92,90
30-34	1,717,645	1,718,879	100.00
34-39	1,242,678	1,215,428	97.80
40-44	920,332	907,965	98.70
45-49	667,624	655,268	98.10
50-54	475,146	465,487	97.80
55-59	364,282	354,837	97.40
60-64	258,904	250,302	96.70
65+	597,833	542,637	90.80
Total	12,701,423	11,237,440	

Two alternative procedures were considered: one was to assign the mean proportion ${}_5W_x$ in the labour force (92.2%) to all the age groups as the most likely ${}_5W_x$; the second alternative was to take the mean of the ${}_5W_x$ values from the age group 30-34 to the age group 50-54 as the most probable ${}_5W_x$. The latter method was preferred because there is technically no unemployment in the rural labour force.

The adjusted proportions working ${}_5^{W}x$ are tabulated in Table 4 below and shown graphically in Graph I. These rates compare very favourably with those of urban and rural Ghana for about the same period.

V. Table of Working Life

The various components of the working life table are displayed in Table 5. The procedure used in its construction is briefly explained in footnotes. The difference between the average expectation of life and the average expectation of working life increases with age. (See Graph II.)

Reference

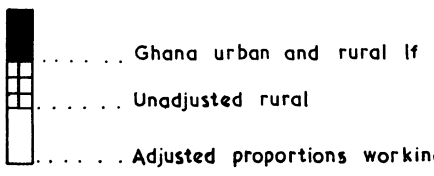


Table 4: Proportions Working

Age Groups	Proportion Working at age x to x + n Unadjusted ${}_5^{W}x$	Adjusted Proportion Working at age x to age x + 5; ${}_5^{W}x$	All Ghana (Urban and Rural Proportions Working ${}_5^{W}x$
15-19	57.70	98.0	95.00
20-24	86.30	98.0	95.00
25-29	92.91	98.0	95.00
30-34	100.00	98.0	95.00
35-39	97.80	98.0	95.00
40-44	98.70	98.0	95.00
45-49	98.10	98.0	94.80
50.54	98.10	98.0	94.21
55-59	97.40	92.0	93.05
60-64	96.70	92.0	90.05
65+	90.80	92.0	77.88

Graph I

MALES: PROPORTIONS WORKING

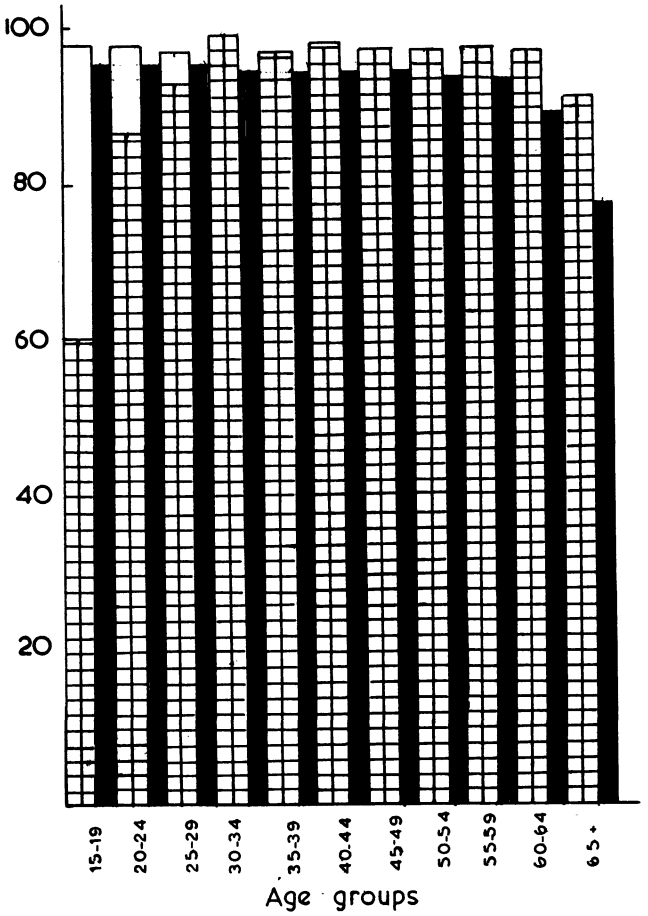
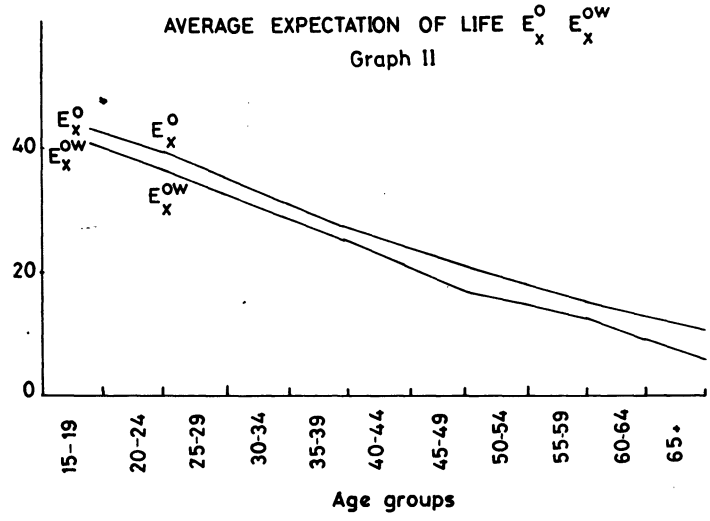


Table 5: Working Life Table for Males

Age Groups	Survivors at exact age x l_x	Years Lived in interval $5L_x$	Proportion Working $5W_x$	Number Working at exact age x l^W_x	Number in the Labour Force in age interval $5L^W_x$	Total Years in interval T^W_x	Average Years of Working Life e^{oW}_x	Average Years of life e^o_x
15-19	629	3,095	0.98	616	3,032	24,926	40.5	42.9
20-24	609	2,995	0.98	597	2,935	21,894	36.7	39.2
25-29	588	2,895	0.98	577	2,838	18,959	32.8	35.5
30-34	569	2,785	0.98	558	2,730	16,121	28.9	31.6
35-39	545	2,660	0.98	534	2,608	13,391	25.1	27.8
40-44	519	2,497	0.98	509	2,448	10,783	21.2	24.1
45-49	480	2,265	0.98	470	2,218	8,335	17.1	20.8
50-54	426	2,000	0.98	417	1,903	6,117	14.7	18.1
55-59	374	1,732	0.92	344	1,593	4,214	12.3	15.3
60-64	319	1,425	0.92	293	1,310	2,621	8.9	12.5
65+	251	-	0.92	231	1,311	1,311	5.7	10.0

1. Column 2: Survivors at exact age taken from 1966 National Abridged life table for males.
2. Column 3: Computed from Column 2 by formula: $5L_x = \frac{5}{2}(l_x + l_{x+5})$.
3. Column 4: Taken from Column 2 of Table 4.
4. Column 5: Column 2 x Column 4.
5. Column 6: As in Column 3 or Column 3 x Column 4.
6. Column 7: $\sum_{15-19}^{65} L^W_x$
7. Column 8: T^W_x / l^W_x
8. Column 9: Taken from 1966 Abridged life tables for males.

Graph II



VI. Losses from the Working Life

The major cause of loss (see Table 6) during working life is mortality in ages 15 to 65 which accounted for 79.4% of all losses. Old age, infirmity, permanent disability and retirement accounted for 20.6% of all losses.

In the rural labour force there is no clear dividing line between working and retirement. Permanent disability and old age are more meaningful in considering withdrawal from the rural labour force than retirement.

Of the total rural labour force estimated at over 11,237,440 in 1965, the total loss rate was 16.1 per 1000. Losses due to retirement were 2.6 per 1000. These compare with Ghana 2.4 per 1000 and Britain (1955) 9.7 per 1000.

Very little significance should be attached to retirement as a measurable concept in the rural economy. There is no system of retirement benefit or old age pension scheme. The extended family networks meet the social and financial obligations of the old. The tendency is for those who are physically strong to continue to participate in some sort of economic activity rather than contemplate complete withdrawal from the labour force.

Table 6: Losses from the Working Life

Age Groups	Total Losses due to all causes $5^{S^W}_x$	Losses due to deaths $5^{d^W}_x$	Losses due to deaths per 1000 $5^{m^d}_x$	Losses due to other Causes $5^{p^W}_x$	Losses due to other causes per 1000 $5^{m^r}_x$
15-19	19	19	6.3	-	-
20-24	20	19	6.5	1	-
25-29	19	19	6.7	-	-
30-34	24	23	8.4	1	-
35-39	25	25	9.6	-	-
40-44	39	38	15.5	1	-
45-49	53	53	23.9	-	-
50.54	73	38	20.0	35	18.4
55-59	51	31	19.5	20	12.6
60-64	62	42	32.1	20	15.3
65+					
Total	385	307	-	78	

Column 1: $5^{S^W}_x = l^W_x - l^W_{x+5}$; $5^{S^W}_x = 5^{r^W}_x + 5^{d^W}_x$

Column 2: $5^{L^W}_x \cdot 5^{m}_x$

Column 4: $5^{r^W}_x = 5^{S^W}_x - 5^{d^W}_x$

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