



**The United Republic of Tanzania**

**1988 POPULATION CENSUS**

**NATIONAL PROFILE**

**THE POPULATION OF TANZANIA**

**THE ANALYTICAL REPORT**

TANZA

118

1988

**Bureau of Statistics  
President's Office, Planning Commission  
Dar es Salaam**

## FOREWORD

This is the fourth and the final volume in the publication programme of the national profiles. As it was in the 1978 Population Census, the primary purpose of this volume is to analyse the census data and make the results of the analysis accessible to those engaged in development planning. As much as possible, the analysis has been made in a much simpler way than it was done in the previous census. However, some analytical details made in this volume may appear unnecessary to planners and other users.

For the first time in the history of census data analysis, all chapters have been contributed by Tanzanians. The editing work of these chapters was done by Dr. Basia Zaba of the Centre for Population Studies, London Tropical School of Hygiene. Her guidance and advice to the authors helped to bring this document to its successful completion.

The completion of this volume also signals the completion of the census project. The scope of the census is much wider than what is contained in this volume. Since it was not possible to look at every aspect of the census information, a sample of the census data has been drawn up which would be available on diskettes. Researchers who want to acquire the sample census data will be expected to pay for it.

With the completion of the census work, I wish to extend my thanks to many people who were involved in one or the other in the census operation. I would like to acknowledge with gratitude the contributions which were made by the following organizations: The Swedish International Development Agency(SIDA), Overseas Development Administration(ODA), United States Agency for International Development(USAID), United Nations Population Fund(UNFPA), United Nations Economic Commission for Africa(UNECA) and United Nations Children's Fund(UNICEF). Likewise, I would like to acknowledge the vital contributions that Ndugu Mwinyiwesa Idarus and the late Lucy S. Lameck, the 1988 Census Commissars for Zanzibar and Mainland respectively, made to the Census particularly in handling the enormous tasks of census publicity and mobilization of the masses. Their commitment and devotion made significant contributions to the overall efficiency of the census project.

Last but not least, I wish to convey my sincere appreciation to the Party and Government officials at national, regional, district and all other lower levels for their vital role in ensuring the smooth and successful completion of the Census. The publication of this final volume is clear testimony of their vital contributions to the project. On the same line, Regional and District Census Officers and the teachers who participated in the Census in one way or the other should be commended for their immense contributions to the Census.

**N.K Mbalilaki**  
**GOVERNMENT STATISTICIAN**



## CONTENTS

### FOREWORD

### CHAPTER

Page

1 INTRODUCTION  
by S.A.M. Ngallaba

1

Background  
Basis of the 1988 Census  
Scope and Overview of this Volume

2 EVALUATION SMOOTHING AND ANALYSIS OF THE  
AGE STRUCTURE  
by C.L. Kamuzora

7

Introduction  
Detection of Age Errors  
Smoothing the 1988 Age Distribution  
The Age Structure of Tanzania  
Conclusion

3 POPULATION GROWTH DISTRIBUTION AND DENSITY  
by E. Maduhu

28

Introduction  
Population Growth  
Population Distribution  
Rural-Urban Population Distribution  
Population Density  
Conclusion

4 MIGRATION  
by S.M. Aboud

45

Introduction  
Interregional Migration: Tanzania Mainland  
Migration during a Specified Period  
Conclusion

**5 LITERACY AND EDUCATION**  
by D. Kapinga and I. Ruyobya

59

Introduction  
Definition of Literacy  
Comparability of Data on Literacy  
Literacy Achievement  
Regional Differentials  
Rural-Urban Sex Differentials  
Sex and Age Differentials  
School Attendance  
Attendance Status by Age and Sex  
School Attendance Status by Region  
Education Attainment  
Conclusion

**6 ECONOMIC CHARACTERISTICS**  
by G.K. Ngoi

77

Introduction  
Economically Active Population  
Participation Rate  
Unemployment  
Usually Employed Population  
School Attendance

**7 MORTALITY LEVELS AND DIFFERENTIALS**  
by A.J. Mturi and J.J. Rubona

95

Introduction  
Child Mortality Estimates  
Adult Mortality Estimates  
Mortality Trends  
Mortality Differentials  
Overall Life Expectancy  
Life Expectancy Differentials



## **8 FERTILITY LEVELS PATTERNS TRENDS AND DIFFERENTIALS**

115

by A. Chuwa and A. Komba

Introduction

Sources of Fertility Data and Limitations

Measures of Fertility

Total Fertility Rate

Estimation of Current Fertility

Fertility Level

Patterns of Fertility

Fertility Differentials

Rural Urban Differentials

Differentials by Educational Status

Differentials by Marital Status

Differentials by Main Occupation of Woman

Differentials by Economic Activity

Conclusion

## **10 HOUSEHOLDS AND HOUSING CHARACTERISTICS**

152

by N.L.A.M. Musyani

Introduction

Methods Applied

Headship of Households

Number of Rooms per Household

Tenancy

Access to Drinkable Water

Access to Type of Toilet

Access to Electricity

## **11 SAMPLING FOR THE CENSUS**

187

by C. Mkai

Introduction

The Sample Design

Sample Implementation

Conclusion and Recommendations

## **CHAPTER 1 INTRODUCTION**

**By S.A.M. Ngallaba**

### **1.1 BACKGROUND**

The 1988 Population Census was the third census to be undertaken during the post-independence period. It is also the fifth modern census to be taken in the history of census taking in the country.

Understandably, population censuses in statistically underdeveloped countries are the principal sources of information on a wide range of areas which are of vital importance in development planning. In almost every developing country, the need for the population data has tended to exceed the overall capacity of a census to meet those demands. This was clearly observed during the preparatory stage of the 1988 Census when a meeting of users was called to discuss, among other things, about the items pertinent to their areas of interest to be included in the census questionnaire. Under such circumstances, it was difficult to strike a balance between the needs and the capacity of the census without jeopardizing the reliability of the results.

Utilization of the census information has been found to be minimal. This has been attributed by various factors, some of which are listed here. Most users are not aware of the availability of the data, and if they are aware of, they are not able to utilize them because they do not understand their importance. On the other hand, the census data are presented in the form that cannot be understood by the users or in a format which is not required by them. Census results are presented in voluminous reports which are too formidable to be handled by particularly non professionals and are made public already a few years later and thus are too old to be used. Though the 1988 Census tried to eliminate some of these factors, yet this report comes almost five years after the census date. Likewise, it is not certain whether the presentation of the census results has met the requirements of the users and whether they are being fully utilized. However, a deliberate attempt was made to present the data in different regional profiles which were meant to be useful to the users at the regional and district level.

### **1.2 BASIS OF THE 1988 CENSUS**

From the 1988 population Census, a wide range of tables has been published and have been utilized in preparing the different chapters in this report. The tables are constructed on the basis of either de facto or de jure populations. Although the census was conducted on a de facto basis, that is, people were enumerated where they happened to be at the time of the census, some questions required people to provide information about their usual residence, the basis of some of the tables especially those relating to migration. The rest of the tables which constitute the majority are based on de facto population; this includes tables on age, sex, educational background, economic characteristics, fertility and mortality data, and information on household and housing composition.



In the early stages of the planning of the 1988 Census, it was decided to collect extensive information on fertility, mortality, migration, housing, education, economic characteristics and housing conditions through a sample survey within the framework of the census. In this respect, two types of questionnaires were used to cover the entire population. The general questionnaire was used to collect information related to relationship to head of the household, age, sex and citizenship. In addition to the information that was collected in the general form, the detailed questionnaire was also used to collect, on a sample basis, information on education, migration, economic characteristics, fertility, mortality and housing conditions. Most tables base their information from the detailed questionnaire.

Most of the tables presented from the detailed questionnaire are in the form where the cells contain the number of persons in different categories (e.g. educational attainment, number of children, etc.) which are derived from a raised value rounded to the nearest integer, and the marginal totals for each table are obtained by summing up the rounded values. For example, the total population aged 10 years and above derived by summing the cell entries in a table of marital status may appear to be different from the total population 10 years and above obtained by summing the cell entries in a table of economic activity. Such differences are quite small and do not exceed 0.3 percent and should, therefore, be of no significant consequence.

Area		total number of households	number of short forms	number of long forms	raising fraction used to produce tables
Tanzania	all areas				xxxx
	rural				xxxx
	urban				xxxx
Region 1	all areas				xxxx
	rural				xxxx
	urban				xxxx
District 1	all areas				
	rural				
	urban				
District 2	all areas				
	rural				
	urban				
etc					



As the table above shows, the "xxxx" in the last column indicates that no value for the raising fraction is entered here since table entries at the regional level and above are obtained by summing the relevant district level totals. However, in certain areas particularly Iringa Urban district, the adopted sample frame was never used instead only one enumeration area was chosen for the long form and several others were left out and administered with a short form. This anomaly created many problems and thus demanded a massive raising factor.

It should be noted that most of the tables that have been produced and published refer to the entire population found in both private and collective households. However, certain tables particularly those pertaining to household characteristics refer to the population enumerated in private households. The population which happened to be in collective households such as hospitals, boarding schools, prisons and similar institutions are excluded in such tables.

### 1.3 THE SCOPE AND OVERVIEW OF THIS VOLUME

Like in previous population censuses, the census results have to be analysed and made available for development planning. In this respect, this volume aims at examining critically the 1988 census data and present the analysis to the public, and as much as possible, provide the findings in a way that they would be easily understood by planners who tended to be the guiding factors in preparing this volume. Therefore, the topics covered in various chapters were mainly guided by their relevance to development planning. In the same line, it was decided that appendices of each chapter should follow immediately after the relevant chapter. The internal arrangement within each chapter was decided upon by the author(s). On the other hand, the overall co-ordination and editing of the different chapters were done by Dr. Basia Zaba, demographic consultant from Centre for Population Studies, London Tropical School of Hygiene.

According to the initial publication plan, this volume was to consist of 14 chapters. However, it was discovered, as work on the volume progressed, that certain topics such as those dealing with levels and differentials, should be merged. Again, it was felt that national and subnational projections should be excluded in this volume since they are dealt with in other publications.

Apart from chapter 1 which gives the general scope and overview of the this volume, chapter 2 deals with the quality of the age-sex data generated from the 1988 census. He asserts that age reporting in tanzania has not improved over the last ten years particularly among females. It appears, however, that minimum errors were observed at the youngest ages which indicates that there will improvement in age reporting with time as more and more educated cohorts enter older ages.

Madulu confirms the findings observed by Dr. Maro in the 1978 Census that the evidence shows that the population is unevenly distributed. At the national level, the population density increased from 19.8 persons per sq.km. in 1978 to about 26.2 persons per sq.km. in 1988. Furthermore, Zanzibar still has a far higher population density than the Mainland. At the regional level, regions of Zanzibar had higher population density than the regions on Mainland Tanzania.



With the exception of Dar es Salaam region which is predominantly urban, all Mainland regions had population densities less than 100 persons per sq.km. Within any given region, there is variation in density among districts within a region. The consequence of increasing densities results in increasing pressure on the land which leads to environmental degradation.

On the population growth, it is observed that the population of Tanzania increased at a much slower pace compared to that observed during the 1967-78 intercensal period. In the 1967-78 period the population increased at a rate of 3.0 percent but declined in the 1978-88 period to 2.8 percent per annum. A similar decline in rate of population growth was observed at regional level. Overall, with the exception of Mtwara region (1.4 percent), regions recorded rates of population growth above 2 percent. Similarly, the size of the population continued to grow in absolute numbers.

In chapter 4, Mr. Aboud observes that international migration to Tanzania is mainly from neighbouring countries. Mozambique and Burundi are the leading countries who contribute about half of the total number of immigrants.

Interregional migration is another aspect which is dealt with in this chapter. The movement of the population between one region and another is observed by looking at the lifetime migration pattern, region of birth and region of usual residence. As it was in the 1978 Census, internal migration has followed the usual pattern of age and sex selectivity. Unfortunately, rural/urban migration is not presented in this chapter due to lack of substantive data. However, from the little information that was obtained, Dar es Salaam still occupies the central role as the largest urban area constituting about 30 percent of the total urban population. Its age/sex pyramid bulges at the age groups 15-29 but narrows at the high ages. Dar es Salaam leads in attracting more people than other regions followed by Arusha, Tabora, Mbeya and Morogoro.

Chapter 5 looks at the literacy and education of the population. The analysis is made by Mr. Kapinga and Mr. Ruyobya. The purpose of collecting data on education in a census is to assess the success of the education achievement over a certain period. This also helps to indicate areas where attention can be put by the education planners. Often, such data are used to assess data from other sources which depends heavily on data collection methodology.

There is evidence to prove that the 1988 census data have given important information which note that there has been some significant improvement in education attainment during the last ten years. Likewise, the level of literacy has risen though interregional differentials are still large and males continue to enjoy a higher level of literacy and education than females.

Mr. Ngoi examines the data on economic characteristics of the population. He underscores the fact that while information on economic activity is recognized as of major policy interest, it is not given sufficient coverage in censuses both in data collection and analysis. However, unlike in 1978 Census, the 1988 census some commendable efforts were made to ensure the minimum availability of the economic data from the census.



The author, however, notes some problems with the data collected. For example, persons who neither worked nor were looking for work but might have been available for work during the most of the reference period were not counted as economically active. In making direct reference to the Tanzania's Labour Force Survey (LFS), such information is important when making comparison of the data on usually unemployed with those from the LFS results. The participation rates which represent the number of persons participating or able and willing to participate in one way or another in the production of goods and services relative to the corresponding defined populations in those segments are higher for rural populations and particularly for males. The low overall low rates of participation of females is due to the remarkably low rates of urban females.

Furthermore, Mr. Ngoi observed that the overall unemployment rate (of the usually unemployed) is insignificant though there are sharp age specific and gender specific differences. The low unemployment rates from the census were due to the fact that the long reference period of 12 months eliminated individuals who experienced short spell of unemployment which has been found to be high in the LFS.

In chapter 7, Mr. Mtui and Mr. Rubona dwell on the quality of the mortality data and examine the usefulness of some of the analytical techniques in trying to arrive at the levels of mortality in Tanzania. They note that there were various differences between mortality data collected during the 1988 population census as compared to those of the 1978 census. While in the 1988 information on deaths during the previous twelve months, this information was not collected in the 1978 census. Likewise, the question on the survival status of the spouse (widowhood data) was asked in the 1978 census, it was not included in the 1988 census.

Taking into account of the problems on the data on mortality, it has been possible to obtain estimate on mortality for Tanzania and for the regions. Mr. Mtui and Mr. Rubona observe that mortality has declined during the last ten year period. Mortality differentials can be observed between sexes, rural and urban and among different social and economic characteristics. On rural urban differentials, mortality is lower in the urban areas than what is observed in rural areas. In Iringa, they observe that the situation is different because the urban was too small to provide meaningful estimates for the urban part of Iringa region. Furthermore, they observe that mothers' education has inverse relationship with infant and child mortality. Educated and literate mothers as well as heads of households have a low mortality compared to those of uneducated or illiterate mothers or heads of households. Marital status differentials on mortality present a complicated situation and have to be treated cautiously.

On life expectancy differentials among regions, they observe that the differences range between 45 as observed in Iringa and Kagera regions and 59 in Kilimanjaro region. They, however, note that some regions have made significant improvement during the last ten years. Life expectancy has increased by 11 and 9 years respectively. Decline on the child mortality seem to have an impact on the life expectancy in the census where a similar trend has been observed.



Chapter 8 written by Ms. Chuwa and Ms. Komba looks at the levels, patterns and trends of fertility during the intercensal period. They observe that for sometime fertility in Tanzania has been high and continues to be high with a TFR of 6.5, though it shows a gradual decline in the level of fertility in the country since 1967. Examination of rural-urban differentials reveal that rural women have recorded higher fertility compared urban women. Fertility differentials by education have shown to have inverse relationship with fertility that women with primary education recorded higher fertility compared to those in other categories. However, the results revealed that fertility decreased as the level of education of the women increased.

The study of the occupation of women and fertility shows that women in agricultural sector have higher fertility than those in other occupational groups. The women employed in the modern sector appear to have low fertility. As regards marital status, married and widowed women experienced higher fertility than that of unmarried and divorced women. The most important observation that has been made by the authors is that Zanzibar has a higher fertility than Mainland and that all socio-economic differentials are less marked in Zanzibar.

Mr. Musyani looks at the household data and characteristics of the private households. In his introductory remarks, he rightly note that the household should be and is considered to be the basic social and/or economic unit of a society. Changes at the household level are bound to have repercussions at the upper levels of the society.

In his analysis of the household data, Mr. Musyani observes that the household size for "nuclear", "extended" and "composite" households in Mainland Tanzania vary between 3.9 and 7.6 persons per household. Furthermore, rural households have higher household size than that of households in urban areas. At the regional level, the Zanzibar regions have a higher household size than their counterpart in Mainland Tanzania.

Chapter 9 which is contributed by Mr. Mkai examines the nature of the sample used in the 1988 census. He observes that due to the delay in completing the geographical work which is the basis of the census frame, there was not enough time for the regional and district officials to scrutinize the enumeration area(EA) lists. This caused problems in identifying properly some of the EAs and hence some of the EAs were not utilized. Mr. Mkai identifies another problem which is on omission and interchanging of selected EAs. This, as he asserts, was brought about by the fact that Census Officers, particularly trainers, did not participate effectively with the field supervisors and enumerators in counterchecking such discrepancies.

On the precision of the estimates, the coefficients of variation indicate that such variations can be observed, among other variables, in the socio-economic variables such as 'not employed' and 'cultivators'. He recommends that in future censuses, more attention should be directed when drawing the sample design and the collection of data. This, together with the control of non-sampling errors will go a long way to enhance the quality of the census data.

## CHAPTER 2

### EVALUATION SMOOTHING AND ANALYSIS OF THE AGE STRUCTURE

by C. Lwechungura Kamuzora

#### 2.1 INTRODUCTION

Societies at lower levels of modernisation are characterised, among other things, by lack of modern society numeracy and literacy, resulting in mistatement of age at census enumeration, in addition to common age errors due to digit preference and sex-specific reasons. In this chapter detection of errors in age reporting, subsequently smoothing out these is attempted; and a brief analysis of the age structure is presented.

#### 2.2 DETECTION OF AGE ERRORS

The reported sex and age ratios in single years from the 1988, 1978 and 1967 Population Censuses of Tanzania are shown in Table 2.1. The patterns of the two ratios are further shown in graph form in Figures 2.1 and 2.2 respectively. Errors typical in age reporting, and similar to those in the 1978 and 1967 censuses are observed: the age ratios show significant age heaping at even numbers and digits ending in 0 and 5. However accurate age reporting is observed at ages 3 to 6. Thereafter the degree of heaping increases with age, due to the older populations, having been born far in the past when also literacy was lacking. The sex ratios are much below 100 in the twenties and early thirties, showing a surplus of females at these ages caused by overstatement of age by women at teen ages and under-reporting by women above the mid-30's. The latter subsequently produces high sex ratios at older ages.

Similar errors for the successive censuses are indicated by the low levels in the index of dissimilarity given below.

Index of Dissimilarity: Tanzania, 1967/78, 1978/88

	Males	Females
1967/78	4.5	4.5
1978/88	3.1	3.5

With the plausible assumption that fertility, hence the age structure has remained constant, the smaller the index the more similar the age-structures are, meaning similar errors. The extent of errors in age reporting are shown by a number of measures. Used here will be Whipples's and Myer's indexes, and census survival ratios.



Table 1.1 Sex and Age Ratios: Tanzania 1967 1978 1988 Censuses

Age	SEX RATIOS			AGE RATIOS					
	1967	1978	1988	1967		1978		1988	
				Males	Females	Males	Females	Males	Females
0	99	94	99	-	-	-	-	-	-
1	100	97	100	88	86	95	93	78	77
2	98	96	99	100	101	98	100	110	110
3	98	98	98	111	109	105	103	101	100
4	95	96	97	100	105	100	103	100	102
5	102	101	101	96	92	103	99	103	100
6	99	98	98	106	109	101	103	102	105
7	102	98	101	99	94	94	93	92	89
8	96	95	99	100	108	112	115	111	115
9	107	99	103	92	88	84	83	87	84
10	108	101	102	133	131	128	126	127	127
11	104	98	101	58	63	69	73	70	70
12	118	108	100	151	139	134	126	130	131
13	114	104	101	84	84	88	89	87	85
14	110	103	98	98	100	104	107	109	114
15	110	107	104	112	105	103	100	99	93
16	96	105	98	96	104	100	100	109	115
17	96	101	103	80	70	80	74	76	68
18	76	86	87	145	165	154	164	158	166
19	77	82	80	68	59	63	60	57	58
20	60	69	73	155	201	149	180	177	196
21	80	86	81	66	53	70	59	59	55
22	71	76	79	137	153	127	142	136	142
23	78	83	82	79	72	78	77	80	78
24	72	90	83	68	72	93	82	87	84
25	76	77	80	198	199	138	160	150	158
26	80	90	85	66	67	89	83	79	79
27	93	96	92	83	68	75	66	83	74
28	73	82	81	152	196	147	178	156	176
29	94	101	90	56	44	64	50	50	43
30	75	78	74	254	340	199	273	254	339
31	113	114	116	39	29	52	38	44	30
32	100	93	95	185	202	144	173	160	183
33	106	110	101	66	62	85	72	69	67
34	99	92	104	54	54	58	60	71	60
35	98	90	83	246	252	188	203	181	222
36	101	101	99	64	65	89	84	85	76
37	118	113	105	82	68	61	52	63	57
38	94	95	90	141	168	171	202	165	188
39	106	111	101	52	42	55	42	51	39
40	81	76	71	314	426	245	358	280	425
41	117	113	120	30	22	40	30	39	25
42	108	105	101	181	188	171	173	153	170
43	108	102	106	84	85	80	84	85	82
44	112	109	105	34	33	48	44	45	38
45	111	98	83	360	370	266	297	255	345
46	116	110	119	50	50	63	59	73	55
47	132	116	116	60	46	61	52	57	51
48	97	95	94	189	226	200	241	179	214
49	106	112	111	59	50	43	33	44	30
50	84	78	69	269	341	307	463	356	596

Continued. Table 1.1 Sex and Age Ratios: Tanzania 1967 1978 1988 Censuses

Age	SEX RATIOS			AGE RATIOS					
	1967	1978	1988	1967		1978		1988	
				Males	Females	Males	Females	Males	Females
51	110	129	123	28	23	37	25	31	20
52	104	117	111	83	88	156	178	175	194
53	111	138	122	209	201	81	67	78	69
54	110	110	105	45	43	68	69	53	49
55	98	104	90	180	203	165	200	214	278
56	112	140	127	85	80	102	83	86	66
57	123	150	128	74	63	53	44	56	51
58	98	112	107	142	167	203	222	206	242
59	107	104	123	33	27	35	33	25	17
60	85	91	75	559	704	438	503	642	1022
61	107	107	116	22	18	28	24	22	15
62	109	95	110	157	156	143	158	152	165
63	108	103	120	97	95	58	60	83	80
64	102	115	124	39	38	100	81	48	37
65	94	91	92	355	438	198	245	253	425
66	134	107	182	39	30	51	48	71	40
67	126	145	163	128	108	75	58	68	55
68	93	115	108	117	142	193	224	193	240
69	98	120	105	36	33	33	29	23	20
70	88	100	87	567	656	447	530	782	984
71	112	117	119	18	15	29	26	16	12
72	110	119	106	182	175	112	122	170	203
73	101	140	133	81	88	128	119	56	53
74	108	149	149	37	36	52	42	82	59
75	109	110	103	346	338	241	285	231	319
76	105	113	133	19	22	62	62	58	49
77	132	131	192	469	425	46	44	46	31
78	128	130	129	48	50	305	318	280	334
79	135	140	125	42	34	29	23	22	17
80	104	96	86	500	625	449	646	761	1089
81	120	137	120	19	17	27	20	18	13
82	131	122	114	165	157	156	166	98	106
83	128	121	125	81	88	74	82	128	130
84	156	163	146	48	41	57	41	51	37
85	135	115	100	333	355	262	379	265	369
86	133	171	133	37	39	59	38	53	43
87	150	98	133	174	148	57	93	90	86
88	124	152	123	62	67	135	93	141	141
89	121	109	113	79	84	73	93	46	44
90	129	133	102	317	296	269	224	472	544
91	121	116	151	17	19	27	33	11	8
92	142	214	122	207	189	96	72	155	215
93	138	204	182	77	77	156	119	96	72
94	131	113	166	7	7	54	88	56	47
95	127	167	125	5637	5793	220	183	252	265
96	100	211	105	0	0	67	50	51	63
97	100	108	144	100	100	13	27	9	5
98	100	242	84	100	100	45	25	165	117
99+	100	137	58	200	200	871	1539	233	335



Figure 2.1: Sex Ratios  
Tanzania 1967, 1978 and 1988 Censuses

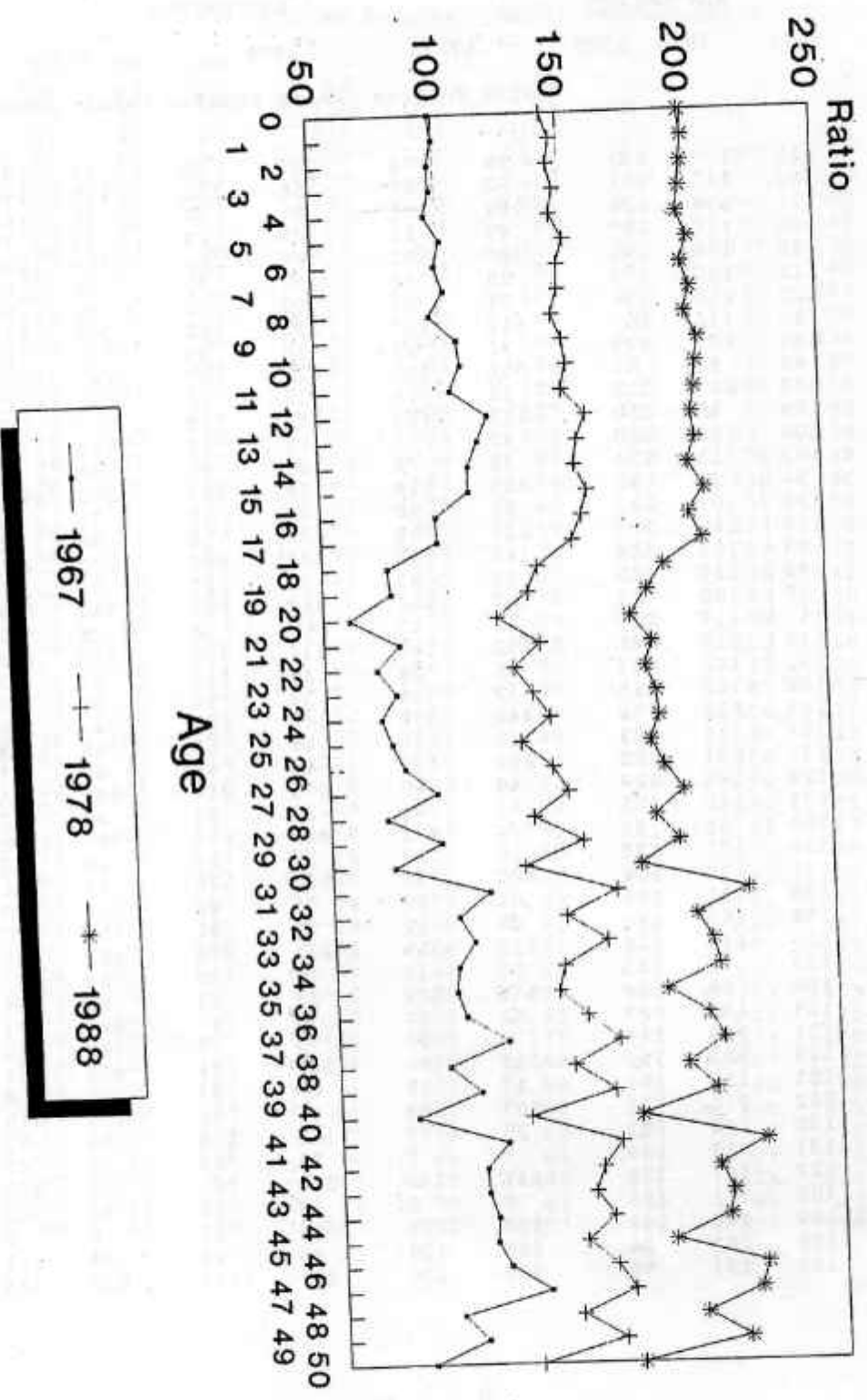


Figure 2.1 Cont'd: Sex Ratios  
Tanzania 1967, 1978 and 1988 Censuses

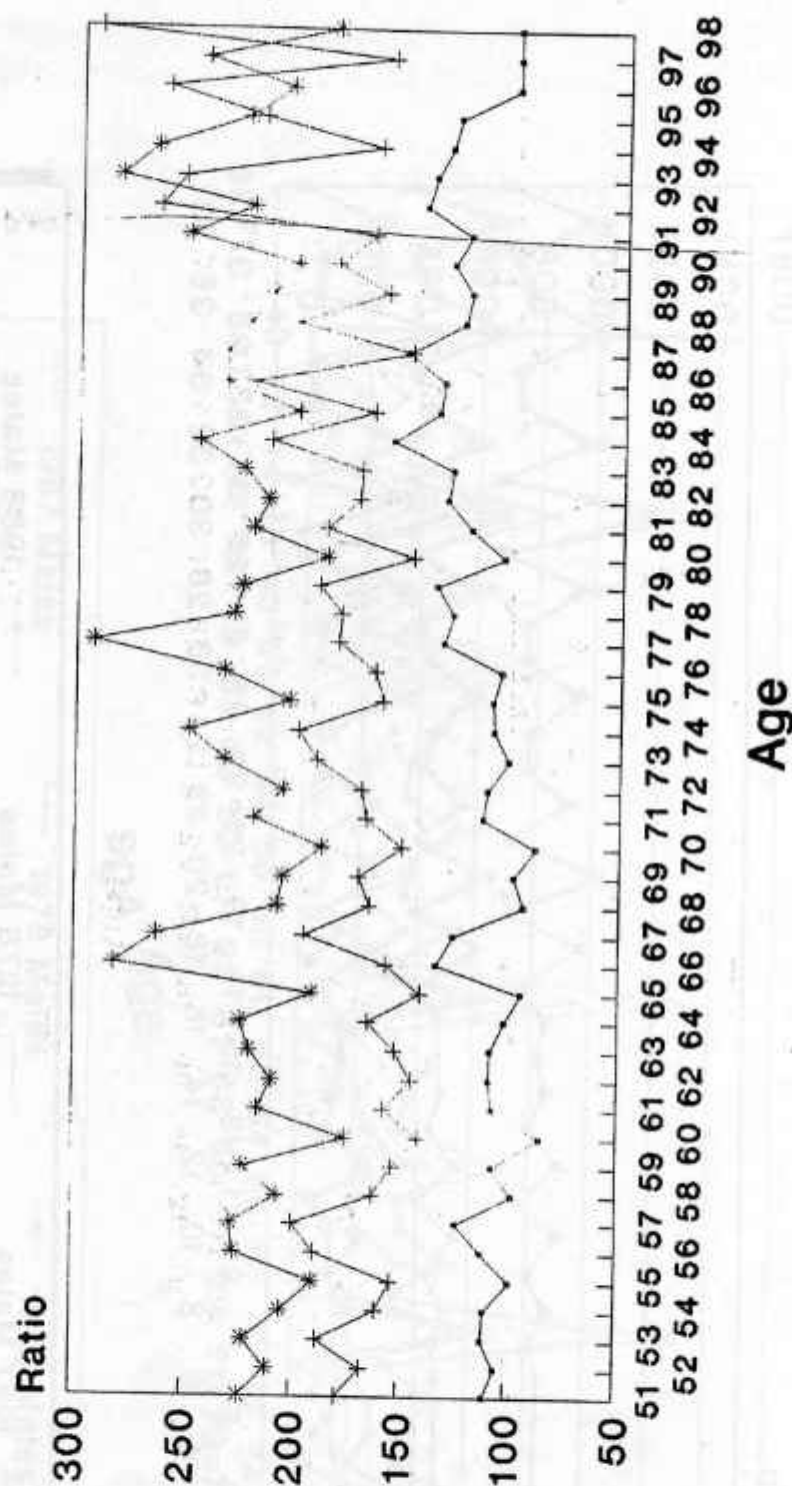




Figure 2.2 Age Ratios  
Tanzania 1967, 1978 and 1988 Censuses

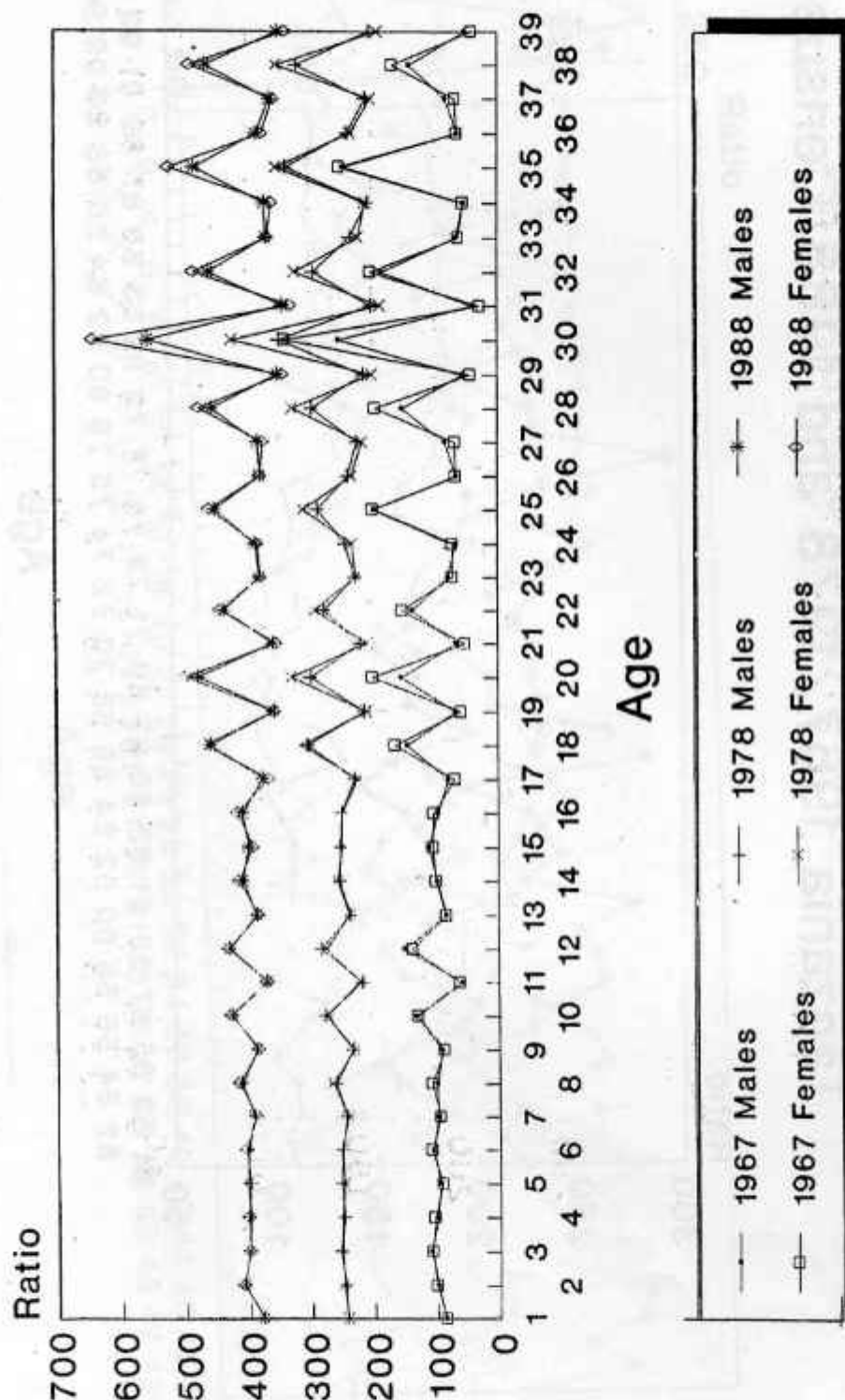
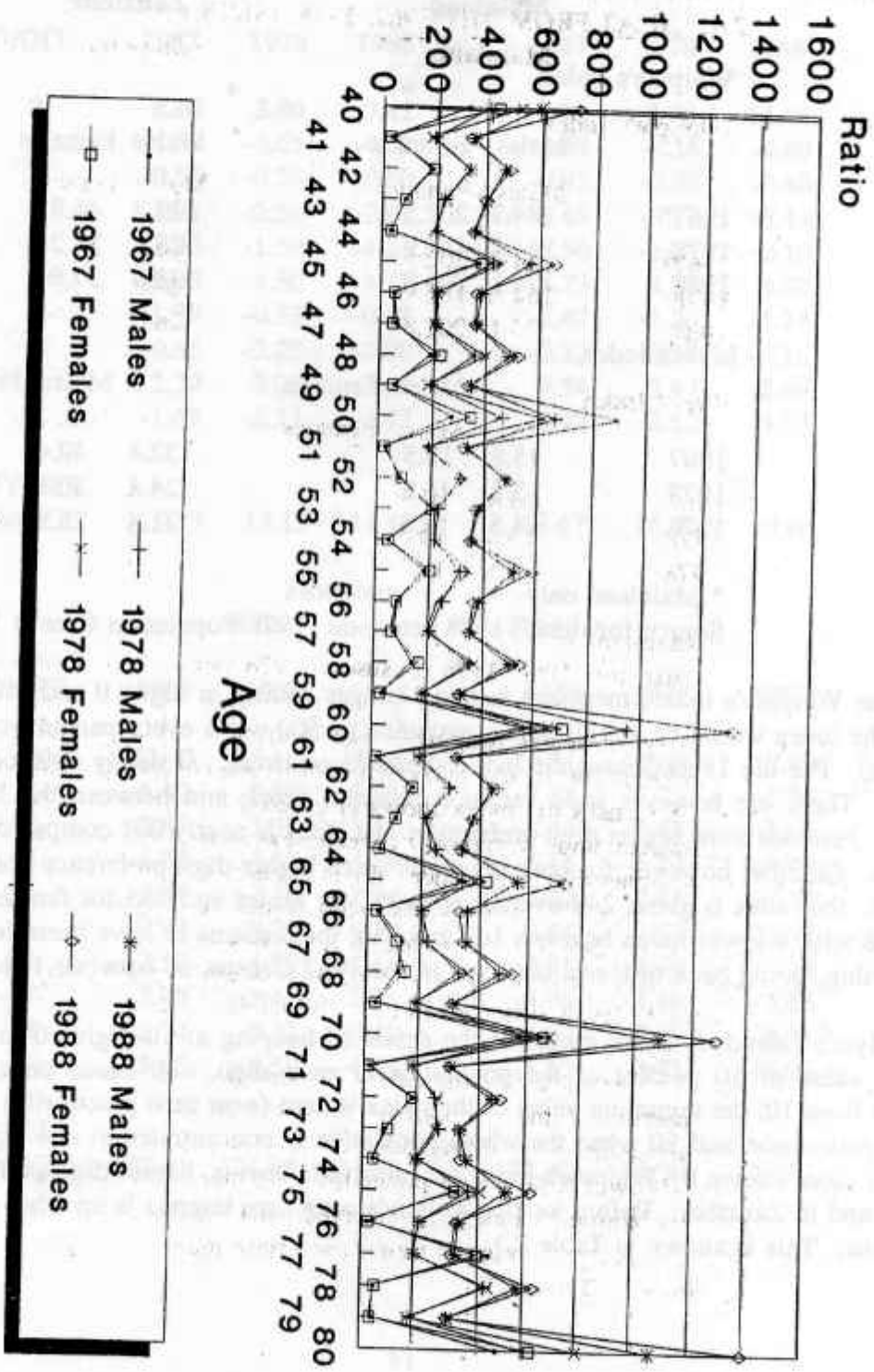


Figure 2.2 Cont'd: Age Ratios  
Tanzania 1967, 1978 and 1988 Censuses





In Table 2.2 are Whipple's and Myer's indexes from the 1988 and earlier, i.e. 1967 and 1978 Censuses. Note that they have been calculated from census volumes and compared to earlier calculations (will note only)

**TABLE 2.2 WHIPPLE'S AND MYRE'S INDICES: TANZANIA MAINLAND AND ZANZIBAR FROM THE 1967, 1978, 1988 CENSUSES**

	Mainland		Zanzibar	
Whipple's Index				
	Males	Females	Males	Females
1967*	184.7	202.5	39.3	46.8
1978	164.8	185.9	28.8	34.2
1988	175.1	201.8	28.6	37.0
Myer's Index				
	Males	Females	Males	Females
1967	15.8	19.5	32.4	40.4
1978	13.2	16.8	24.4	30.3
1978	14.5	18.7	21.8	25.9

\* Mainland only

Source for 1967, 1978 censuses: 1978 Population Census Vol. VIII.

The Whipple's index, measures heaping at ages ending in digits 0 and 5: with no age heaping the index would be at 100 (and a maximum of 500 when every person would be at the two digits). For the 1988 Census the index shows large errors: at nearly 190 for Tanzania as a whole. There are however wide variation between sexes, and between the Mainland and Zanzibar. Females show higher digit preference: the index is nearly 201 compared to about 175 for males. Zanzibar however, for both sexes has much higher digit preference compared to the mainland: the index is about 249 overall, with 231 for males and 265 for females. Compared with 1978 with a lower index between 165 and 186, there seems to have been deterioration in age reporting, going back to levels observed in the 1967 Census, of between 184 and 203.

Myer's (blended) index measures the extent of heaping at all digits, 0 to 9. With the expected value of 10 percent of the population at each digit, and based on a summary of deviation from 10, the minimum value of the index is zero (near zero practically) when there is no digit preference, and 90 when the whole population is concentrated at one figure. Patterns similar to those shown by Whipple's index are observed; that is, higher digit preference among females, and in Zanzibar. Before looking at trends over time interest is on what digits heaping takes place. This is shown in Table 2.3.

**TABLE 2.3 DIGIT PREFERENCE AND MYER'S INDEX: TANZANIA MAINLAND  
AND ZANZIBAR 1967 1978 1988 CENSUSES**

DIGIT	Mainland			Females		
	Males					
	1967	1978	1988	1967	1978	1988
0	8.03	5.80	7.42	11.20	8.75	11.01
1	-4.50	-3.65	-4.11	-4.89	-4.16	-4.69
2	-0.59	-0.38	-0.60	-0.92	-0.38	-0.88
3	-2.81	-2.58	-2.91	-3.45	-3.12	-3.45
4	-3.32	-1.59	-1.61	-3.50	-2.07	-2.19
5	5.33	4.30	4.52	4.73	4.58	4.97
6	-1.99	-0.53	-0.18	-2.47	-1.36	-1.24
7	-0.85	-2.22	-2.08	-2.32	-3.18	-3.15
8	2.39	3.09	2.52	3.54	3.47	2.68
9	-1.69	-2.23	-2.97	-1.92	-2.52	-3.07
MYER'S INDEX	15.75	13.19	14.46	19.47	16.79	18.66

DIGIT	Zanzibar			Females		
	Males					
	1967	1978	1988	1967	1978	1988
0	22.47	15.10	12.95	30.84	22.46	17.69
1	-6.42	-5.10	-5.15	-7.37	-5.76	-5.88
2	-2.67	-1.37	-1.41	-3.66	-2.43	-1.95
3	-4.84	-4.33	-3.86	-6.12	-5.42	-4.49
4	-4.54	-3.48	-2.94	-5.32	-4.42	-3.74
5	9.94	9.28	8.39	9.54	7.84	7.97
6	-2.59	-1.87	-1.44	-3.61	-2.96	-2.13
7	-2.96	-3.42	-2.75	-4.96	-4.49	-3.65
8	-2.74	-0.22	0.49	-3.03	-0.07	0.21
9	-5.65	-4.59	-4.28	-6.32	-4.75	-4.03
MYER'S INDEX	32.41	24.38	21.82	40.38	30.30	25.87



Although earlier it was seen that heaping takes place also on even digits, yet those ending in 0 and 5 dominate in the problem. Further, on the Mainland, 8 is a third digit preferred; peculiarly this does not appear to be the case in Zanzibar.

As shown by the Whipple's index there seems to be deterioration in digit preference over time, except \_though still worse than the Mainland\_ among Zanzibari males where it seems there is some improvement with a continuing fall of the index with time.

In Table 2.4 are age, sex and joint age-sex scores based on five-year age distributions for the 1988 and earlier censuses.

**TABLE 2.4 AGE, SEX AND JOINT AGE-SEX SCORES BASED ON FIVE YEAR AGE GROUPS: TANZANIA 1967, 1978, 1988 CENSUSES**

	Age Ratio Score		Sex Ratio Score	Joint Age-sex Score
	Males	Females		
1967*	15.6	15.8	14.8	75.7
1978	12.1	11.1	9.3	51.1
1988	8.1	10.0	9.9	47.7

\* Mainland

Source for 1967, 1978 censuses: 1978 Population Census Vol. VIII.

Improvement is demonstrated by a decline in the scores. These are however observations on five-year groupings; they do not invalidate the finding above of deterioration at single years.

The last method used here to detect errors in age data are the 1978/88 census survival ratios. These are shown in Table 2.5 and Figure 2.3. Although these are below 1.0 as expected, yet, as can be contrasted with the model life table ratios (level  $E_0=46-50$ ), the mortality level for Tanzania (see the mortality chapter in this volume), they fluctuate from age-group to age-group, an indication of age-group error transfers. Similar observations were made from the 1967/78 ratios (1978 Census Volume VIII). The various measures above have indicated age errors in the data: there is therefore need for smoothing them out.

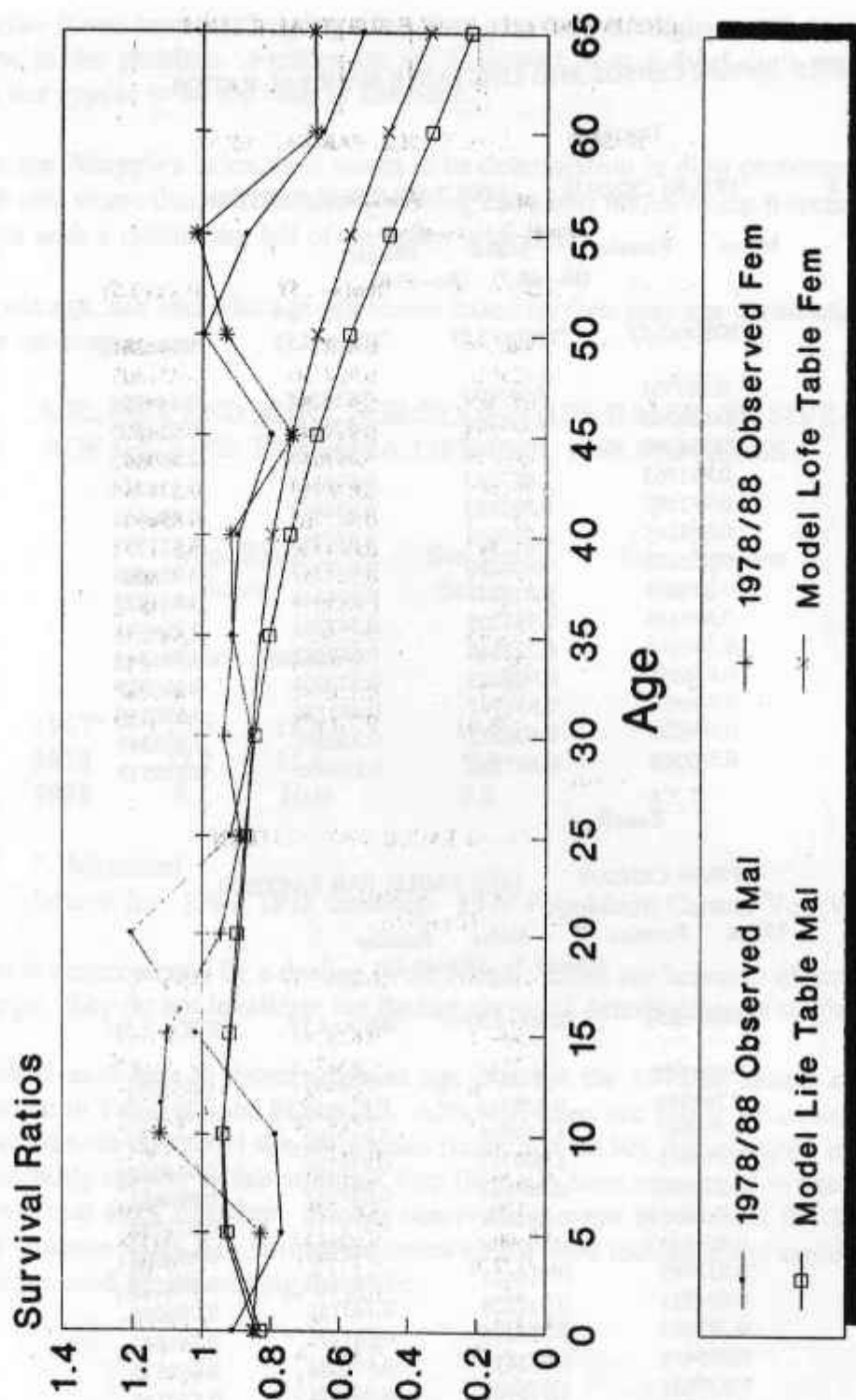
TABLE 2.5 1978/88 CENSUS AND LIFE-TABLE SURVIVAL RATIOS

Tanzania				
AGE x	1978/88 CENSUS		LIFE TABLE: FAR EASTERN	
	Males	Females	Males	Females
			(Eo=46.7)	(Eo=49.8)
	'10S(x+2.5)'	'10S(x+2.5)'	'10S(x+2.5)'	'10S(x+2.5)'
0	0.987701	0.946034	0.828247	0.844281
5	0.886753	0.925020	0.924530	0.931807
10	0.774366	1.013386	0.937185	0.939957
15	0.951763	1.087283	0.919344	0.916254
20	0.991185	0.880633	0.897967	0.890661
25	0.849245	0.799605	0.876757	0.871752
30	0.805838	0.835289	0.847765	0.854005
35	0.806894	0.819545	0.804440	0.831272
40	0.895136	0.947205	0.743751	0.796095
45	0.747335	0.723548	0.667375	0.741842
50	0.876018	0.988043	0.572004	0.665875
55	0.808936	0.834797	0.455176	0.570318
60	0.808956	0.808273	0.330391	0.458247
65	0.532502	0.567536	0.216955	0.335537

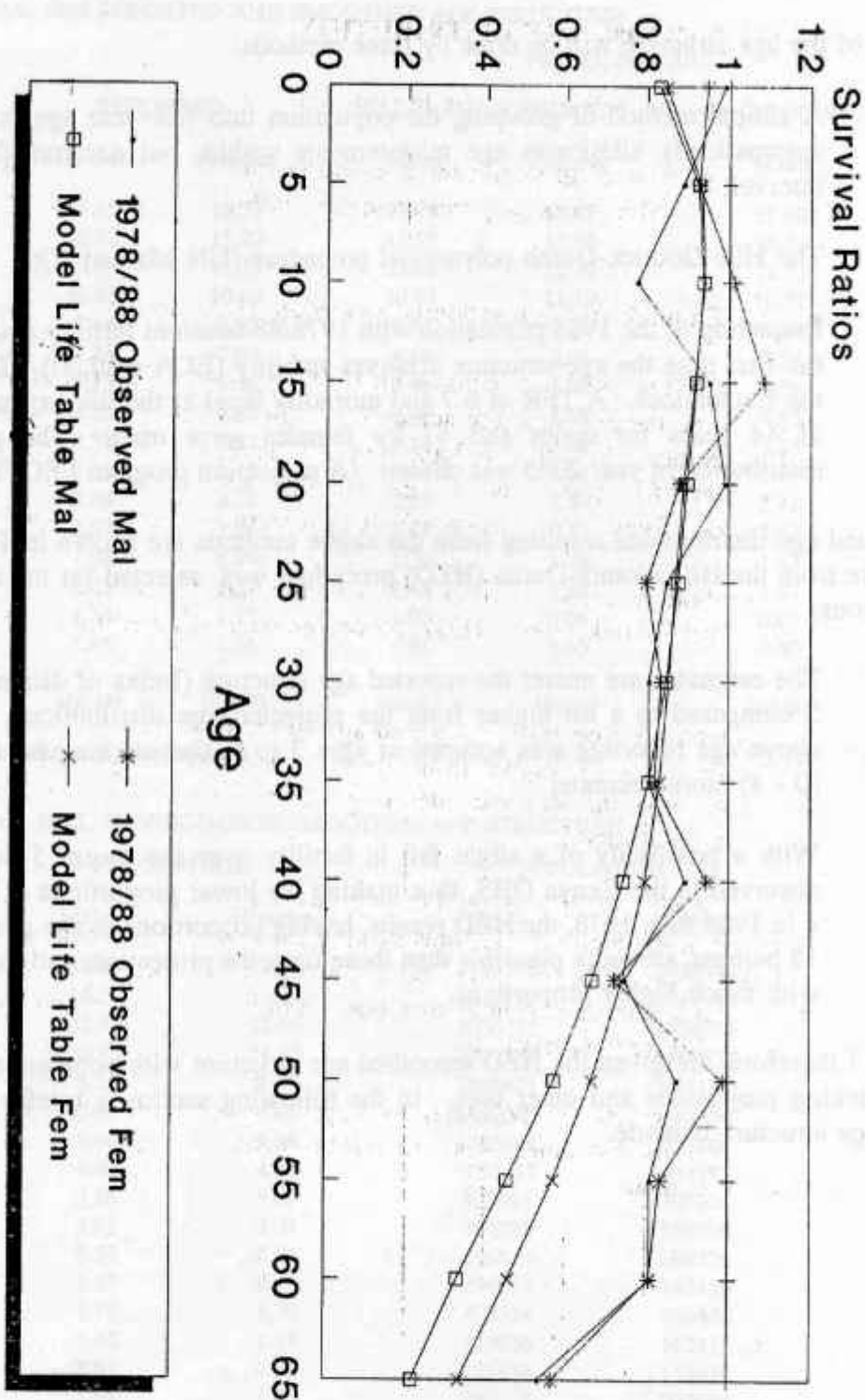
Zanzibar				
AGE x	1978/88 CENSUS		LIFE TABLE: FAR EASTERN	
	Males	Females	Males	Females
			(Eo=46.7)	(Eo=49.8)
	'10S(x+2.5)'	'10S(x+2.5)'	'10S(x+2.5)'	'10S(x+2.5)'
0	0.909325	0.850421	0.828247	0.844281
5	0.766968	0.828923	0.924530	0.931807
10	0.786047	1.119899	0.937185	0.939957
15	1.016945	1.099785	0.919344	0.916254
20	1.204955	0.946164	0.897967	0.890661
25	0.918832	0.887994	0.876757	0.871752
30	0.855143	0.937001	0.847765	0.854005
35	0.912495	0.910621	0.804440	0.831272
40	0.894321	0.917228	0.743751	0.796095
45	0.797431	0.737273	0.667375	0.741842
50	0.995459	0.931410	0.572004	0.665875
55	0.870931	1.016606	0.455176	0.570318
60	0.648338	0.670619	0.330391	0.458247
65	0.532222	0.674562	0.216955	0.335537



Figure 2.3 Cont'd: Survival Ratios  
Zanzibar



# Figure 2.3: Survival Ratios Tanzania





### 2.3 SMOOTHING THE 1988 AGE DISTRIBUTION

Smoothing of the age structure will be done by three methods:

- (a) A simple method of grouping the population into five-year age intervals. This automatically eliminates age mistatements within, but not transfers across an interval;
- (b) The Hill-Zlotnick-Durch polynomial procedure (UN Manual X);
- (c) Projection of the 1988 population with 1978/88 constant fertility and mortality till the first time the age-structure achieves stability (ECA method). This evens out the fluctuations. A TFR of 6.7 and mortality level at the life expectancy at birth of 44 years for males and 47 for females were used. The projected age distribution of year 2083 was chosen. (A projection program PEOPLE was used).

The smoothed age distributions resulting from the above methods are shown in Table 2.6. The age structure from the Hill-Zlotnik-Durch (HZD) procedure was selected for the following two related reasons:

- (a) The estimates are nearer the reported age structure (Index of dissimilarity below 5 compared to a bit higher from the projected age distribution): as observed above age reporting was accurate at ages 3 to 6, thus making for the age group (0 - 4) more accurate;
- (b) With a possibility of a slight fall in fertility over the recent 5 or so years, as observed in the Kenya DHS, thus making for lower proportions at age-group 0 - 4 in 1988 than 1978, the HZD results, having proportions at age-group 0-4 below 18 percent, are more plausible than those from the projection, and the 1978 census with much higher proportions.

In Table 2.7 therefore, are given the HZD smoothed age structure with population numbers for analysis, making projections and other uses. In the following section a brief analysis of the Tanzania age structure is made.

TABLE 2.6 1988 REPORTED AND SMOOTHED AGE STRUCTURE

PROJECTED 2083

AGE	REPORTED		HILL-ZLOTNIK-DURCH		88 CONSTANT FERT. /MORT.	
	Males	Females	Males	Females	Males	Females
0	17.15	16.57	17.99	17.87	19.80	19.44
5	16.12	15.20	15.52	13.58	15.35	15.08
10	13.84	12.87	13.45	12.90	12.73	12.50
15	10.95	10.92	10.63	11.10	10.71	10.52
20	7.44	8.97	8.35	9.37	8.89	8.73
25	7.23	7.99	6.69	7.66	7.27	7.14
30	5.17	5.46	5.48	5.98	5.86	5.95
35	4.75	4.87	4.40	4.59	4.85	4.76
40	3.31	3.51	3.56	3.66	3.84	3.97
45	3.10	3.12	3.01	3.08	3.03	3.17
50	2.48	2.73	2.58	2.59	2.42	2.58
55	2.07	1.95	2.17	2.13	1.82	1.98
60	1.86	1.95	1.79	1.70	1.41	1.59
65	1.45	1.17	1.45	1.33	1.01	1.19
70	1.24	1.17	1.02	0.86	0.61	0.79
75+	1.86	1.56	1.81	1.60	0.40	0.60
Total	100.00	100.00	100.00	100.00	100.00	100.00
Index Dissimilarity with reported			2.53	4.58	5.16	5.22

TABLE 2.7 HILL-ZLOTNIK-DURCH SMOOTHED AGE STRUCTURE

AGE	PERCENTAGE		POPULATION		
	Males	Females	Total	Males	Females
0	17.99	17.87	4134159	2012049	2122109
5	15.52	13.58	3359590	1747143	1612447
10	13.45	12.90	3036721	1504715	1532006
15	10.63	11.10	2507348	1189152	1318196
20	8.35	9.37	2046971	934131	1112840
25	6.69	7.66	1658040	748090	909949
30	5.48	5.98	1323464	613404	710060
35	4.40	4.59	1036217	491797	544419
40	3.56	3.66	832941	398224	434717
45	3.01	3.08	701723	336580	365143
50	2.58	2.59	595814	288229	307585
55	2.17	2.13	494773	242450	252323
60	1.79	1.70	402554	200444	202110
65	1.45	1.33	319836	162115	157720
70	1.02	0.86	215854	113619	102235
75+	1.81	1.60	392555	202966	189589
Total	100.00	100.00	23058560	11185110	11873450
Index diss.	2.53	4.58	5.22		



## 2.4 THE AGE STRUCTURE OF TANZANIA

The age structure of Tanzania is best observed by a first impression of its pyramid shown in Figure 2.4 in comparison with those of Asia and developed countries represented by, respectively Malaysia and West Germany, then a detail summary in Table 2.8 in terms of proportions in the typically interesting broad age groups, namely at young, middle (the core labour force) and old ages.

TABLE 2.8 THE 1988 AGE STRUCTURE OF TANZANIA, AND MALAYSIA 1987 AND WEST GERMANY 1986

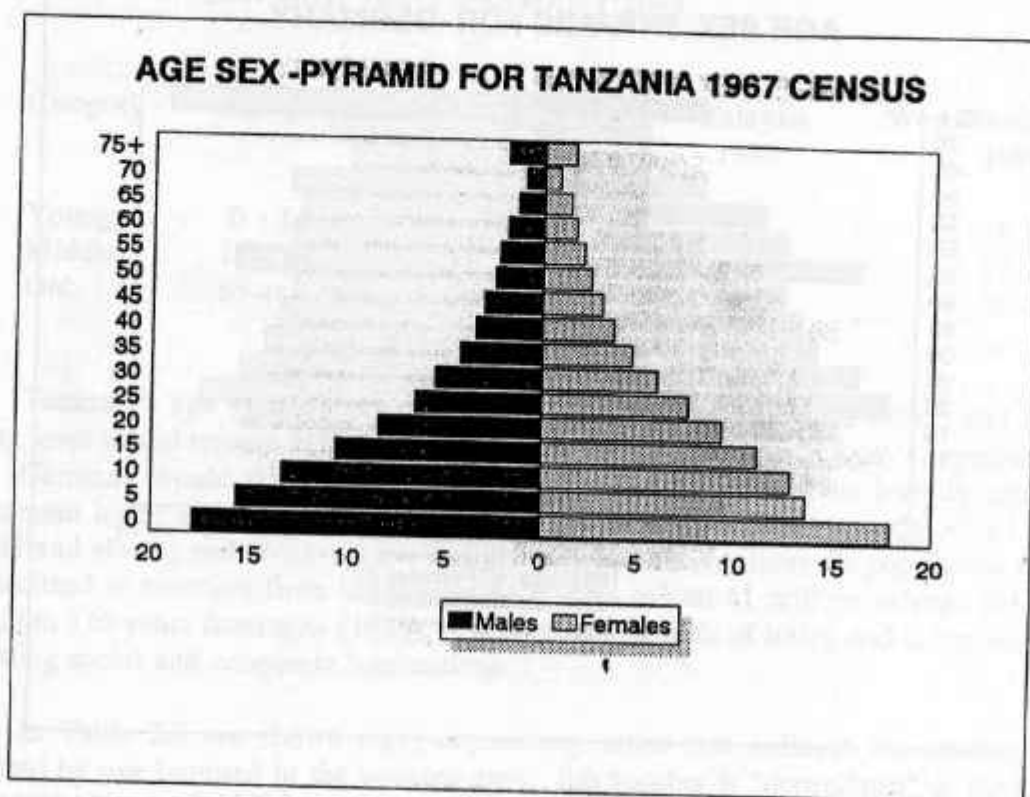
Category	Age-group	Tanzania 1988	Malaysia 1987	West Germany 1986
Young:	0 - 14	45.7	37.8	14.9
Middle:	15 - 64	50.0	58.4	70.0
Old:	65 and over	4.3	3.8	15.1

- Sources: 1. Tanzania Central Bureau of Statistics (Dar es Salaam).  
2. United Nations, 1988 Demographic Yearbook (New York: UN)

Tanzania depicts a typical young age structure: broad at the base with about 46 percent of its total population below age 15, and tapering off quickly up towards older ages, where only 4.3 percent of its total population is 65 years and older. Malaysia is visually similar to Tanzania, but it is less young with about 38 percent of its total population below age 15; further, looking at the base of its age pyramid it is less spread out, e.g. 7 percent or less of its total population in age group 0-4 compared to Tanzania with more than 9 percent. A contrast, typical old age structure, is West Germany (to be used inter-changeably with Germany, and their demography is virtually similar), with relatively very small proportions, about 15 percent at young ages below age 15, and much higher proportions, above 15 percent at older ages of 65 years and above.

Interesting are the causes for the differences, more so the social and economic implications of these varying age distributions. Why Tanzania and Malaysia have young age structures and Germany an old one is of dramatic interest but with a straightforward textbook answer. The explanation becomes clear by first explaining Tanzania and Malaysia. These two countries have broad based age structures because of long past periods of high fertility, e.g. a total fertility rate (TFR) of about 6 (children per woman); this is commonly understood. Of course Malaysia's base is a bit less broad due to recent fertility declines for the last 20-25 years, from a TFR of about 6 children to the current 3.5.

**FIG 2.4**



**FIG 2.4**

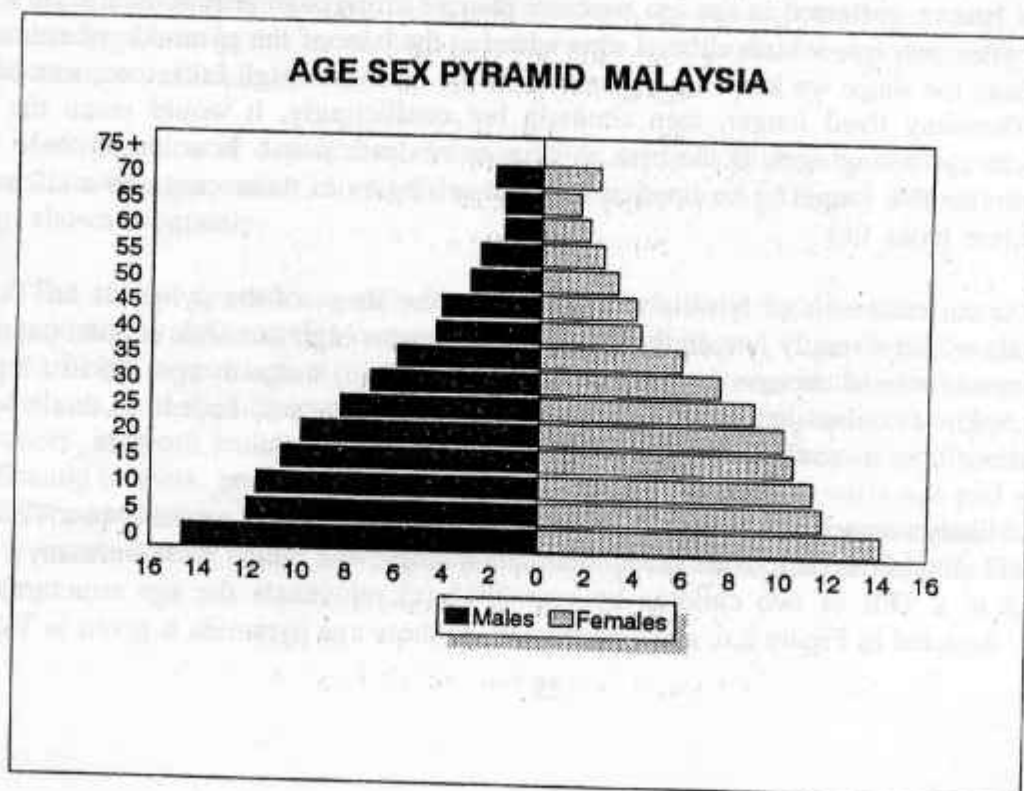
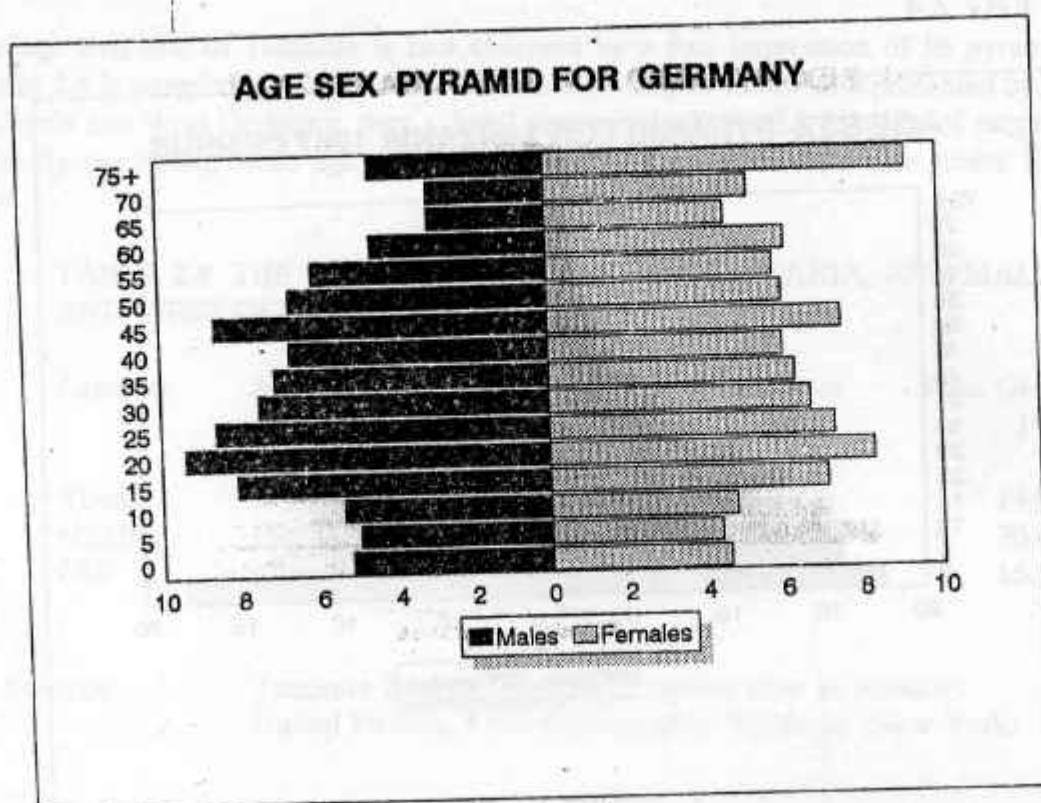




FIG 2.4



Now West Germany: it has contrastingly "disproportionately" higher proportions at old ages, not because people there live longer, even if in fact they do — that is the drama indicated above — but it is because of protracted fertility decline for the last hundred years, from a TFR of about 5 to the current (1986) 1.38, with only an interlude of post World War II baby boom of 1960's; the latter is reflected in the age structure (Figure 1.5) at age groups 20's to 30's. This meant year after year lower birth cohorts were added at the base of the pyramid — of course then departing from the shape we know as a pyramid. If the reason, though fallacious, was because people in Germany lived longer, then similarly but conflictingly, it would mean the lower proportions at the young ages, at the base, is because of death there: how would these on the average come to live longer? An implicit question arising from these contrasts and causes is what the future looks like.

If the current levels of fertility would continue the shape of the pyramids for Tanzania and Malaysia would virtually remain the same, with of course high increases in total population; that of Germany would become "worse" as the current (1986) bulge at ages 15 to 50 go into older ages, with of course significant declines in the total population. Instead of this "if current trends continue", let us consider the likely scenario.

The likely scenario would be, for Tanzania a decline in fertility probably to a TFR of 3.5 by year 2043, and Malaysia to fluctuate within the 3-4 range; we "give" West Germany a chance to go back to a TFR of two children by year 2041 (to rejuvenate the age structure). This scenario is depicted in Figure 2.6, and the summary of these age pyramids is given in Table 2.9.

TABLE 2.9 THE FUTURE AGE STRUCTURE OF TANZANIA IN 2048, MALAYSIA 2047 AND WEST GERMANY 2046

Category	Age-group	Tanzania 1988	Malaysia 1987	West Germany 1986
Young:	0 - 14	32.8	28.7	16.2
Middle:	15 - 64	61.9	61.6	57.2
Old:	65 and over	5.3	9.7	26.6

Tanzania's age structure would now look like that of Malaysia today, and then, as its fertility level would remain virtually the same \_a beehive compared to today's "spread-out" at the base. Germany would remain a sharp contrast like today, even if its fertility came back to replacement level: an old population with even much more proportions, almost 27 percent, at ages 65 and above; and if current ow fertility of 1.38 TFR continue its population would have also declined in numbers from the present 61 million to just 41 million in year 2041, down to 22 million 110 years from now (1986). These situations both of today and in the future present interesting social and economic implications.

In Table 2.9 are shown (age) dependency ratios that indicate the number of people supported by one hundred in the working ages: this number is "dependants" at the young ages below age 15 and 65 and above; the supporting, working ages are from age 15 to 64. In addition to census years, the dependency ratios are projected into the future, based on the assumptions given above on the future age structures.

Dependency ratios are normally calculated for the two dependency groups together; in this table separate estimates are also given to show the contribution of each for the future fertility trend scenarios outlined above.

Interpretation of dependency ratios in Table 2.9 is facilitated by their graphical form in Figure 2.7 with ages under 15 and 65 and over together, and in Figure 2.8 with the two age-groups shown separately.

The current dependency ratio for Tanzania is relatively high for more than 100 persons being supported by 100 workers compared to 60 in Malaysia and 43 in West Germany. This is because of high proportions at young ages in Tanzania, and lower in the other two countries as shown above, and it is clearly seen in Figure 1.8. However one has to take into account of differences in work cultures. In a developing country like Tanzania children contribute significantly to work, both economic and domestic activities from an early age and almost none in developed societies. That has been the drawback of the dependency ratio measure. The likely fertility trends shown above however has dramatic implications for particularly Tanzania and Germany.



As is clearly seen in Figure 2.7 Tanzania's dependency ratio will decline steadily and fall below that of Germany as early as year 2028 and become stable like that of Malaysia at 56-58 level. That of Germany would be increasing from the current (1986) 43 to 60 as early as year 2021, reaching alarming level maxima of 74 in the 2026-46 period, and stay above 60 thereafter. Alarming for Germany because the dependency ratio will mainly be coming equally from the high proportions at older ages as young ages (see Figure 1.8); it is thought taking care of old people is more difficult and expensive than the young.

## 2.5 CONCLUSION

Age reporting in Tanzania has not improved over the last 1978/88 inter-censal period particularly among females. Nothing more can be said about this except that as the minimum errors observed at the youngest ages indicate improvement would be expected with time as more and more educated cohorts enter older ages. Still age misreporting is not a handicap, as corrections can be made, to enable analysis at least of the age structure, and implications.

The current young age structure of Tanzania depicts on the surface a high dependency burden compared to Malaysia and West Germany. However given that the age structure is determined by trends in fertility the experience of West Germany even with its current low dependency burden is not to be emulated. This is because with a past of decline of fertility to below replacement the future of Germany is not only a rise in the dependency burden, but even its population will decline to insignificant levels.

Rather leaving the issue hanging, it is that desirable is steady decline of fertility, that is a long period of over 70 years for it to fall from the current total fertility rate of 6-7 to 2-3. This trend will ensure a smooth change of the age structure from a young to old but still maintaining some "youthfulness", and accompanying steady decline of the dependency burden that would stabilise at a reasonably low level of 56-58 from year 2063.

## **CHAPTER 3**

### **POPULATION GROWTH, DISTRIBUTION AND DENSITY**

By E. Maduhu

#### **3.1 INTRODUCTION**

The populations of many developing countries have been growing at rapid rates often exceeding 2.0 percent. In most cases, the increase in population has occurred at the expense of resource conservation and their effective utilization. As a result, rapid degradation of the environment has been evident in many areas in the form of deforestation, pollution and soil erosion. Both population growth and environmental degradation have become global problems. The physical link between population growth, distribution and resource utilization is well documented. Man has been identified to be a major agent of resource depletion and the resultant environmental degradation. It is man's actions that have degraded the land through misuse and overuse, as he seeks essential requirements for his livelihood. It is therefore evident that the continuance of rapid population growth leads to further environmental problems.

The population of the country is the very objective of development. Population growth affects resource base in many ways. Firstly, increased number of people cause increased demand for food, water, arable land and other essential materials from the natural resource pool. Secondly, expanded agricultural activities encourage deforestation. Many forests have already been destructed to give way to agricultural expansion. This expansion have intensified the existing landuse conflicts in many areas. Thirdly, growth of the population leads to increased demand for fuelwood. Fuelwood meets the energy needs of virtually all the rural population and a high proportion of the urban residents. Over-exploitation of resources from the natural environment results from excess demand from the expanding population. The growth and distribution of the population determines the demand for essential social services (eg. education, health, water, transport, housing, etc.). The influence of population on both the natural resources and social services make it important to examine the trends in its growth and distribution. This is particularly important in the planning and implementation of development programmes.

The above discussion suggest that no assessment of resource potentials and prospects for effective utilization is complete without understanding the population growth and its distribution. Man is the prospective end user of those resources. The higher the population increase, the higher the exploitation of natural resources. In this chapter therefore, attempt is made to analyse the population growth, distribution and density. Comparison of the population data is made between the 1967, 1978 and 1988 censuses.



### 3.2 TYPE OF DATA

The data which have been used in this analysis was derived from the 1988 census tabulations on overall numbers by region and district. To compute the population growth, the population data for each region from the 1978 and 1988 censuses are compared and growth rates calculated on the assumptions of continuous exponential growth. The growth rates obtained have been compared to those of the 1967/78 period.

In the analysis of population distribution and density, two types of data were required. These are land areas for the regions and districts, and the population figures for the same areal coverage. The ratio of the population to the land area gives the population density of an area. These were compared to that of 1967/78 as well. Population data by type of residence was used to show the rural/urban population distribution.

### 3.3 POPULATION GROWTH

Analysis of population growth requires periodic and systematic information on population totals, regular collection of births and deaths records, and data on migratory movements (Mbaruku, 1983). But due to lack of these valuable data, census data alone have often been used to estimate the population growth. The population growth rates for the 1988 census are hereby compared to those of 1967 and 1978.

The total population of Tanzania has almost doubled between 1967 and 1988. During the 1988 census, Tanzania's population was 23,174,336. Comparable figures for the 1967 and 1978 censuses were 12,313,469 and 17,512,610 persons respectively. The population grew by 5,199,141 between 1967 and 1978 and by 5,661,726 between 1978 and 1988. This represents an increase of 42.2% for the 1967/78 and 32.1% for 1978/88 period. Compared to the land area of the country, Tanzania's population can be described as small. However, its growth rate is high and thus there is rapid increase in the size and density of the population.

Table 3.1 shows the population size (in millions), the percent change and annual rates of growth between 1967 and 1988. It is observed that the population has been increasing in terms of absolute numbers. However, the intercensal population growth declined in the mainland and in the whole of Tanzania from 3.2% in 1967/78 to 2.8% in 1978/88. An increase in the growth rate from 2.7% to 3.0% is observed in Zanzibar between the two censuses. The past trends in Tanzania shows that the annual growth rates increased from 1.8% to 3.0% in 1948/57 and 1957/67 respectively. For Zanzibar, the growth rates were 1.3% for 1948/57 and 1.8% for 1957/67. The former rates 1948/57 are said to have been affected by under-enumeration in the 1957 census (Egero and Henin, 1973:212). Although there is a marked decline in the growth rate between the two periods, the increase of population in absolute numbers give the numbers higher in 1988 than in 1978. This is due to the larger base size of the population in 1978 than 1967.



**Table 3.1: Intercensal Population Growth and Population Change**

Area	Population			Percentage Change		Annual Growth Rates	
	1967	1978	1988	67/78	78/88	67/78	78/88
Mainland	11958654	17036499	22533758	42.5	31.8	3.2	2.8
Zanzibar	354815	476111	640685	34.2	34.6	2.7	3.0
TANZANIA	12313469	17512610	23174443	42.2	31.9	3.2	2.8

Table 3.2 shows the differential rates of population growth which exist between regions. As was the case in 1967/78, Dar es Salaam continued to have the highest population growth (4.7%). This is basically because the region is predominantly urban and hence its growth is influenced by rapid urbanization. Other regions with higher growth rates above 3.0% are: Rukwa (4.3%), Arusha (3.8%), Ruvuma (3.3%) and Mbeya (3.1%). The region which has the lowest growth rate is Mtwara (1.4%). It is further observed from Table 2 that, with the exception of Iringa, Mara and Coast regions, the growth rates of almost all other regions declined in 1978/88 when compared to that of 1967/78.

The rank order of the regions by growth rates in 1967/78 shows that Dar es Salaam (7.8%) was ranked number one, followed by Rukwa (4.5%), Tabora (4.4%), Kagera (3.9%) and Arusha (3.8%). Coast (1.7%), Mtwara (2.0%), Lindi (2.1%), Mara (2.6%) and Singida (2.7%) occupied the last five positions in ascending order. During the 1978/88 period, Dar es Salaam (4.7%) continued to have the highest growth rate followed by Rukwa region (4.2%). However, Arusha (3.3%) which was ranked number five in 1978 became number three in 1988. Other regions which entered into the first five group were Ruvuma (3.3%) and Mbeya (3.1%). The regions which had the lowest growth rates in 1988 were Mtwara (1.4%), Lindi (2.0%), Coast (2.1%), Tanga (2.1%) and Kilimanjaro (2.1%).

The district growth rates are given in Appendix 1. It is observed that even at regional level there are differential rates of growth. For example, Kinondoni district in Dar es salaam region had a growth rate of 5.0% as compared to Temeke (4.3%) and Ilala (4.1%). In Mwanza region, Geita (3.5%) had the highest growth rate and Magu (1.9%) had the lowest. Similar differences are observed in many regions. In most cases, the districts which include the urban centers had higher growth rates suggesting a rural to urban migration and high rates of urbanization.

Possible factors for these differences in growth rates include variations in the rates of natural increase, varying intensity of internal and international migration. Variation in climatic conditions and resource availability act as pull-factors in determining population movement (Tanzania, 1983:115). Rukwa and Tabora regions are good examples of regions which are affected by both internal and international migration. These factors were also dominant during the 1978 census (Mbaruku, 1983:115).



**Table 3.2 Population Growth by Regions (1978/88)**

Regions	Population		Annual Growth Rates	
	1978	1988	1967/78	1978/88
Dar es Salaam	843,090	1,360,850	7.8	4.7
Rukwa	451,897	704,050	4.5	4.2
Tabora	817,907	1,042,622	4.4	2.4
Kagera	1,009,767	1,313,639	3.9	2.7
Arusha	926,223	1,352,225	3.8	3.7
Shinyanga	1,323,535	1,763,960	3.5	2.9
Mbeya	1,079,864	1,476,261	3.3	3.1
Ruvuma	561,575	779,868	3.2	3.3
Dodoma	972,005	1,235,277	2.9	2.4
Kilimanjaro	902,437	1,106,068	2.9	2.1
Morogoro	939,264	1,279,931	2.9	2.6
Kigoma	648,941	853,263	2.9	2.7
Mwanza	1,443,379	1,876,776	2.8	2.6
Tanga	1,037,767	1,280,262	2.7	2.1
Iringa	925,044	1,193,074	2.7	2.7
Singida	613,949	793,887	2.7	2.5
Mara	723,827	952,616	2.6	2.9
Lindi	527,624	642,364	2.1	2.0
Mtwara	771,818	887,583	2.0	1.4
Coast	516,586	639,182	1.7	2.1
<b>TANZANIA</b>	<b>17,036,499</b>	<b>22,533,758</b>	<b>3.2</b>	<b>2.8</b>
<b>MAINLAND</b>				

Source: Tanzania (1983:93), (1989:21).

### 3.4 POPULATION DISTRIBUTION

Population distribution shows the spatial spread of people within the area available to them for exploitation. The 23,174,336 people living in Tanzania in 1988 occupied a total land area of 885,987 km<sup>2</sup>. Zanzibar and Pemba had 640,685 people on 2,460 km<sup>2</sup> of land. The population of the islands was almost 2.8% of the national population in 1988. Table 3.3 shows how the population of Tanzania is unevenly distributed over the national land area.

**Table 3.3 Population Distribution and Density by Regions**

Regions	Land Area (km <sup>2</sup> )	Cummul. Percent	Population	Cummul. Percent	Density
D'Salaam	1,393	0.2	1,360,850	5.9	976.9
Zanzibar	2,460	0.5	640,685	8.7	260.4
Mwanza	19,683	2.7	1,876,776	16.8	95.8
K'njaro	13,250	4.2	1,106,068	21.6	83.7
Mtwara	16,710	6.1	887,583	25.6	53.2
Tanga	26,677	9.1	1,280,262	30.9	48.1
Kagera	28,456	12.3	1,313,639	36.6	46.6
Mara	21,760	14.8	952,616	40.8	43.7
S'nyanga	50,760	20.5	1,763,960	48.4	34.9
Dodoma	41,311	25.2	1,235,277	53.7	30.0
Mbeya	60,350	32.0	1,476,261	60.1	24.5
Kigoma	37,040	36.2	853,263	63.8	23.1
Iringa	56,850	42.6	1,193,074	69.0	21.3
Coast	32,517	46.3	639,182	71.8	19.6
Morogoro	70,624	54.3	1,279,931	77.1	17.2
Arusha	82,098	63.6	1,352,225	82.9	16.5
Singida	49,340	69.2	793,887	86.3	16.0
Tabora	76,150	77.8	1,042,622	90.8	13.6
Ruvuma	63,699	85.0	779,868	94.2	12.3
Rukwa	68,635	92.6	704,050	97.2	10.1
Lindi	66,040	100.0	642,364	100.0	9.8
TANZANIA	885,987		23,174,443		26.1

Source: Tanzania (1983:93), (1989:21).

It is observed that about 54% of the total population was occupying only 25% of the total land area. Twelve regions had over a million people each. The regions include Mwanza, Shinyanga, Mbeya, Dar es Salaam, Arusha, Kagera, Tanga, Kilimanjaro, Iringa, Morogoro, Tabora and Dodoma. Whereas these regions cover about 60% of the national land area, they accommodate almost 70% of the total population. In 1978, about 64% of the population occupied 36% of the land area (Tanzania, 1983:94). These data suggest a more spread population distribution was realized in 1988 as compared to that of 1978.

Maro(1983) observed more marked variations at district and ward levels with a higher concentration of people in some districts and wards than others. A similar generalization can be made for the 1988 census data as illustrated in Appendix 1. The 1978 district data shows that, about 65% of the total population occupied only 29% of the land area (Tanzania, 1983: 107-9). This means that certain district were favoured than others. These observations suggests that even the resource depletion is area specific. Regions which have high concentration of population seem to have large resources consumption as well.



Figure 3.1 compares the Lorenz Curves for the regions in 1978 and 1988. The Lorenz curve shows a graphical relationship of the cumulative percent contribution of the regions to the total area and the cumulative percent contribution to the total population. The further the curve deviates from the diagonal line A-C, the higher the unevenness of population distribution. It is observed that although the 1978 and 1988 Lorenz Curves look similar, there was a slight flattening of the curve towards line A-C in 1988 than in 1978, suggesting that there were more variations in population distribution in 1978 than in 1988.

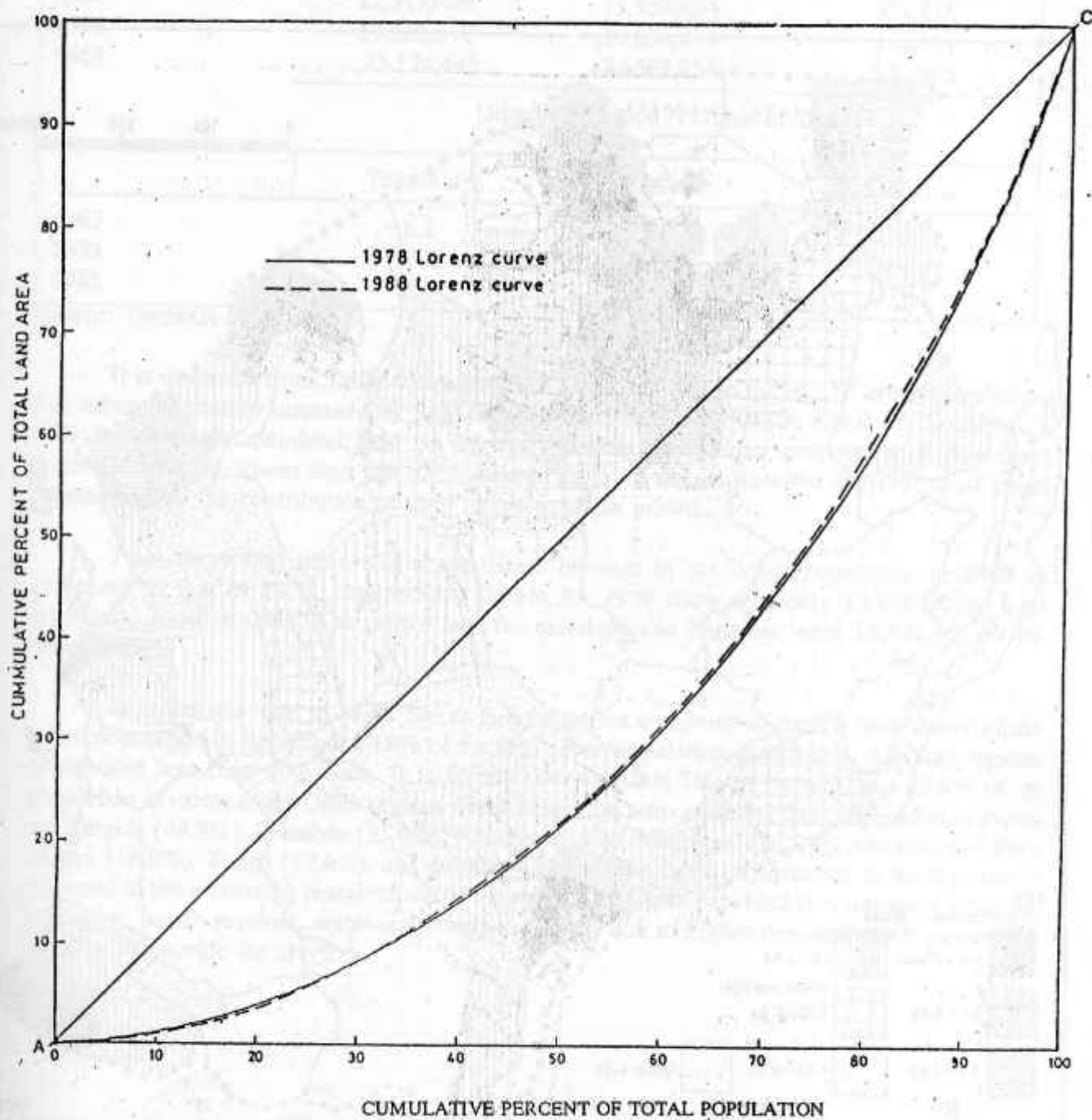
Maro(1983) also used a distribution index of two years to show the changes in population distribution. This index is obtained by dividing the population density of the district by the national average density. When the index is equal to 1.0 the proportion of the total population living in that district is equal to the proportion of the total area occupied by the district. Values above or below 1.0 indicates a proportion of the total population exceeding or less than the proportion of the total area respectively. The index of population distribution is used in this analysis for the 1988 census as well.

Map 1 shows clearly that there were population concentrations in the same areas which had high concentration in the 1978 census. These areas include the Lake Victoria zone, the northern highlands, and the southern highlands. Most of the districts in this category has high agricultural potential and/or are linked to major urban centers. Similar patterns were observed in both the 1967 and 1978 censuses (Moore,1973; Maro, 1983). Areas which had sparse population distribution in 1978, continued to show sparse distribution in 1988. They had indices less than 0.5.

### 3.5 RURAL-URBAN POPULATION DISTRIBUTION

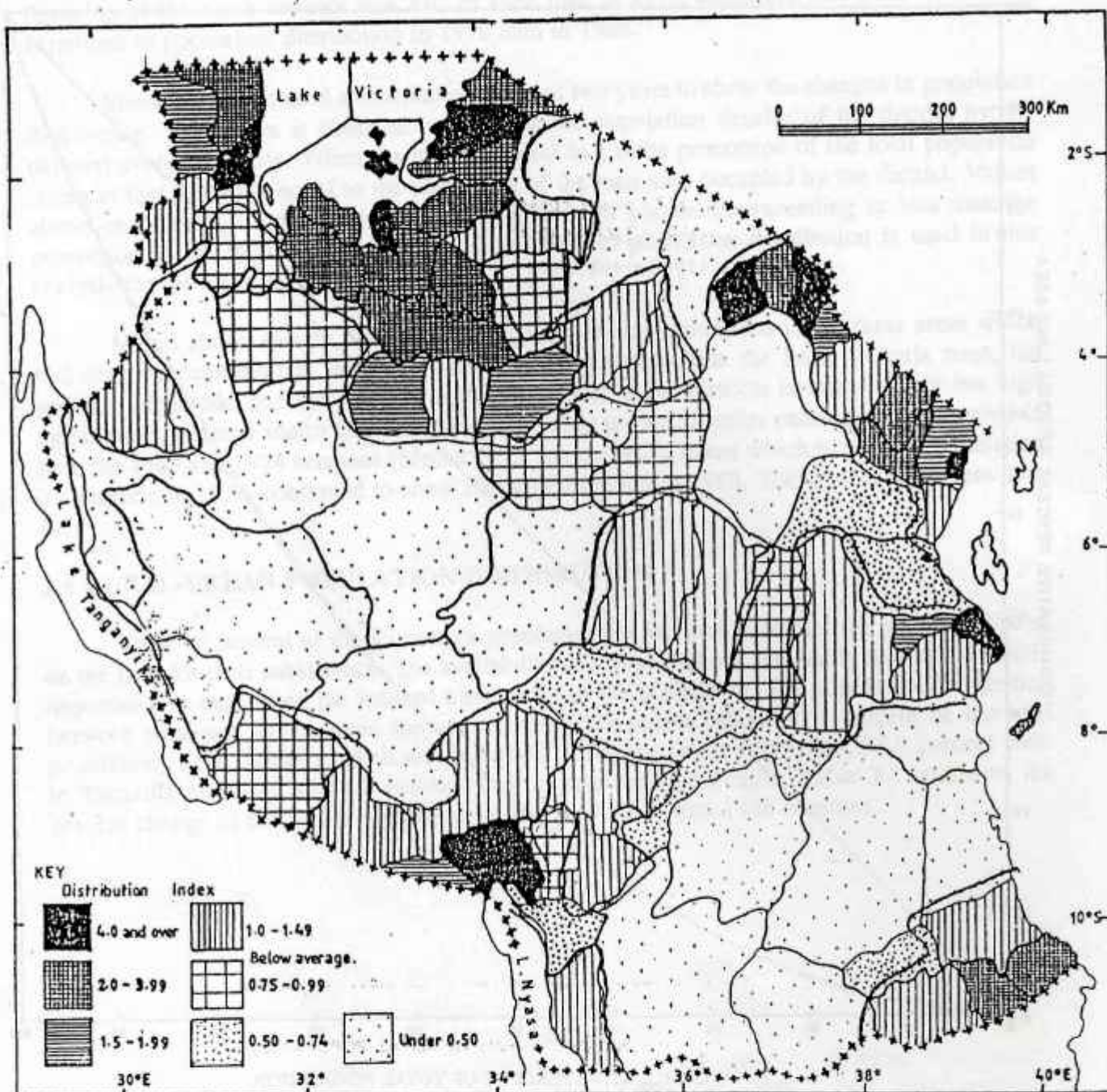
Over 80 percent of the Tanzania's population live in rural areas and the majority depend on the land for their subsistence. The availability of arable land and its quality is of considerable importance in explaining the internal distribution of the population. The population distribution between rural and urban areas shows that 4,893,589 people (about 21.1 percent of the total population) were living in urban areas in 1988. Among the urban population, 95.8 percent were in Tanzania mainland and 4.2 percent were in Zanzibar and Pemba. Table 3.4 compares the percent change of the urban population for the 1967, 1978 and 1988 censuses.

**FIGURE 3.1: LORENZ CURVE OF THE POPULATION DISTRIBUTION AND LAND.**





**MAP 1: RELATIVE DISTRIBUTION OF RURAL POPULATION  
BY DISTRICT**



**Table 3.4 Distribution of the Urban Population in 1988**

Years	Tanzania	Mainland	Zanzibar
1967	12,313,469	11,958,654	354,815
1978	17,512,610	17,036,499	476,111
1988	23,174,443	22,533,758	640,685
Urban Population (Percent of Total)			
	Tanzania	Mainland	Zanzibar
1967	6.2	5.7	23.5
1978	13.8	13.3	29.4
1988	21.1	20.9	31.8

Source: Tanzania (1969; 1983).

It is observed from Table 4 that there is a rapid increase in the size of urban population. The urban population increased by 53% between 1978 and 1988 for the whole of Tanzania; by 57% for Tanzania mainland; and by 8% for Zanzibar. A larger proportion of the island population lives in towns than that of Mainland. Table 3.5 summarizes the distribution of urban population and the contribution of each region to urban growth.

This shows that there was a significant increase in the urban population in 1988 as compared to that of 1978. Comparative figures for 1978 show that only 13.8% of the total population lived in town. The proportions for mainland and Zanzibar were 13.3% and 29.4% respectively.

As it was the case in 1978, Dar es Salaam region continued to have a lion's share of the urban population. It had about 24.6% of the total urban population in Tanzania. All other regions contributed less than 10% each. It is further observed that Dar es Salaam had 88.6% of its population in urban areas. Other regions which have high proportions of their population in towns are Singida (44.8%), Zanzibar (31.8%), Kagera (30.9%), Morogoro (22.0%), Mwanza (18.1%), Mbeya (18.0%), Tanga (17.6%), and Arusha (17.2%). The rapid urbanization in most towns is reflected in the increasing deterioration of the essential services provided (i.e. transport, housing, education, health services, water and sewage systems) due to higher demand which exceed the capacity to provide the services.



**Table 3.5 Distribution of Urban Population by Regions (1988)**

Regions	Total Population	Total Urban Population	Percent of Regional Population	Percent of National Urban Popn.
Dar es Salaam	1,360,850	1,205,443	89.6	29.8
Zanzibar	640,685	203,588	31.8	4.2
Mwanza	1,876,776	348,995	18.6	8.6
K'njaro	1,106,068	168,619	15.2	4.2
Mtwara	887,583	124,466	14.0	3.1
Tanga	1,280,262	224,912	17.6	5.6
Kagera	1,313,639	72,457	5.5	1.8
Mara	952,616	99,763	10.5	2.5
S'nyanga	1,763,960	119,090	6.8	2.9
Dodoma	1,235,277	138,162	11.2	3.4
Mbeya	1,476,261	268,012	18.2	6.6
Kigoma	853,263	108,867	12.8	2.7
Iringa	1,193,074	119,625	10.0	3.0
Coast	639,182	98,221	15.4	2.4
Morogoro	1,279,931	269,801	21.1	6.7
Arusha	1,352,225	167,730	12.4	4.1
Singida	793,887	69,536	8.8	1.7
Tabora	1,042,622	148,848	14.3	3.7
Ruvuma	779,868	93,173	11.9	2.3
Rukwa	704,050	99,847	14.2	2.5
Lindi	642,364	98,117	15.3	2.4
<b>TANZANIA</b>	<b>23,174,443</b>	<b>4,247,292</b>	<b>18.3</b>	<b>100.0</b>

Source: Tanzania (1983), (1992).

### 3.6 POPULATION DENSITY

Population density refers to the ratio of a given number of people to a given land area (Maro, 1983:91). Density, which is widely used to measure of population concentration, expresses the spatial spread of people. It illustrates the link between population and resource distribution at different levels of analysis. Differences in density reflect the areal variation of people and resources over the land area. However, density as a measure of population concentration is limited in the sense that it masks many considerable disparities and tend to treat all land equal. It gives an impression that people are evenly distributed over a given area. But reality suggests that people are very selective when comes to the question of different land uses.

**Table 3.6 Population Density and Percent Increase (1978/1988)**

Regions	Densities per Km <sup>2</sup>				Percent Increase (1978/88)
	1978		1988		
	Density	Rank	Density	Rank	
Mjini-Magharibi	617.6	1	905.8	2	37
Dar es Salaam	553.2	2	976.9	1	77
Kusini-Pemba	298.2	3	384.5	3	29
Kaskazini-Pemba	185.2	4	239.2	4	29
Kaskazini-Unguja	163.9	5	206.4	5	26
Mwanza	73.3	6	95.4	6	31
Kilimanjaro	68.1	7	83.7	7	22
Kusini-Unguja	60.6	8	82.2	8	36
Mtwara	46.2	9	53.2	9	15
Tanga	38.9	10	48.1	10	23
Kagera	35.5	11	46.6	11	32
Mara	33.2	12	43.7	12	49
Shinyanga	26.1	13	34.9	13	34
Dodoma	23.5	14	30.0	14	28
Mbeya	17.9	15	24.5	15	37
Kigoma	17.5	16	23.1	16	32
Iringa	16.2	17	21.3	17	31
Coast	15.9	18	19.6	18	24
Morogoro	13.3	19	17.3	19	30
Arusha	12.4	20	16.5	20	29
Singida	11.3	21	16.0	21	45
Tabora	10.7	22	13.6	22	27
Ruvuma	8.9	23	12.3	23	38
Rukwa	8.0	24	10.1	24	23
Lindi	6.6	25	9.8	25	53
TANZANIA	19.8		26.2		32

Table 3.6 compares the population densities of the regions in both 1978 and 1988 censuses. It also shows the percent increase in the densities between the two censuses. The population density of Tanzania increased from 19.8 persons per sq.km in 1978 to 26.2 persons per sq.km in 1988. This represents an increase of 32% between 1978 and 1988 censuses. The increase in density may be a result of both natural increase and interregional migration. The population density of 26.2 persons per sq.km seem to be very low by international comparison (Mbaruku, 1983). However, these figures are just averages which does not show the actual internal differences as far as population density and distribution are concerned.



The information in Table 3.6 also illustrates that while Dar es Salaam was ranked number 2 in 1978, it was ranked number 1 in 1988. This reflects the rapid growth of the primate city in the country. With the exception of Dar es Salaam, the regions from Zanzibar and Pemba had higher population densities than the mainland regions. Four out of five regions in the islands had densities above 200 persons per sq.km in the 1988 census. Only one region (Dar es Salaam) had population density of 976.9 persons per sq.km in the mainland. All other mainland regions had densities below 100 persons per sq.km.

Comparing the regional population densities to the national average density, it is observed that about 54 percent of the total population lived in regions with density higher than the national average. It is also observed that the highest percent increase in density at regional level was in Dar es Salaam (77), followed by Rukwa (53), Lindi (53), Mara (49) and Arusha (45).

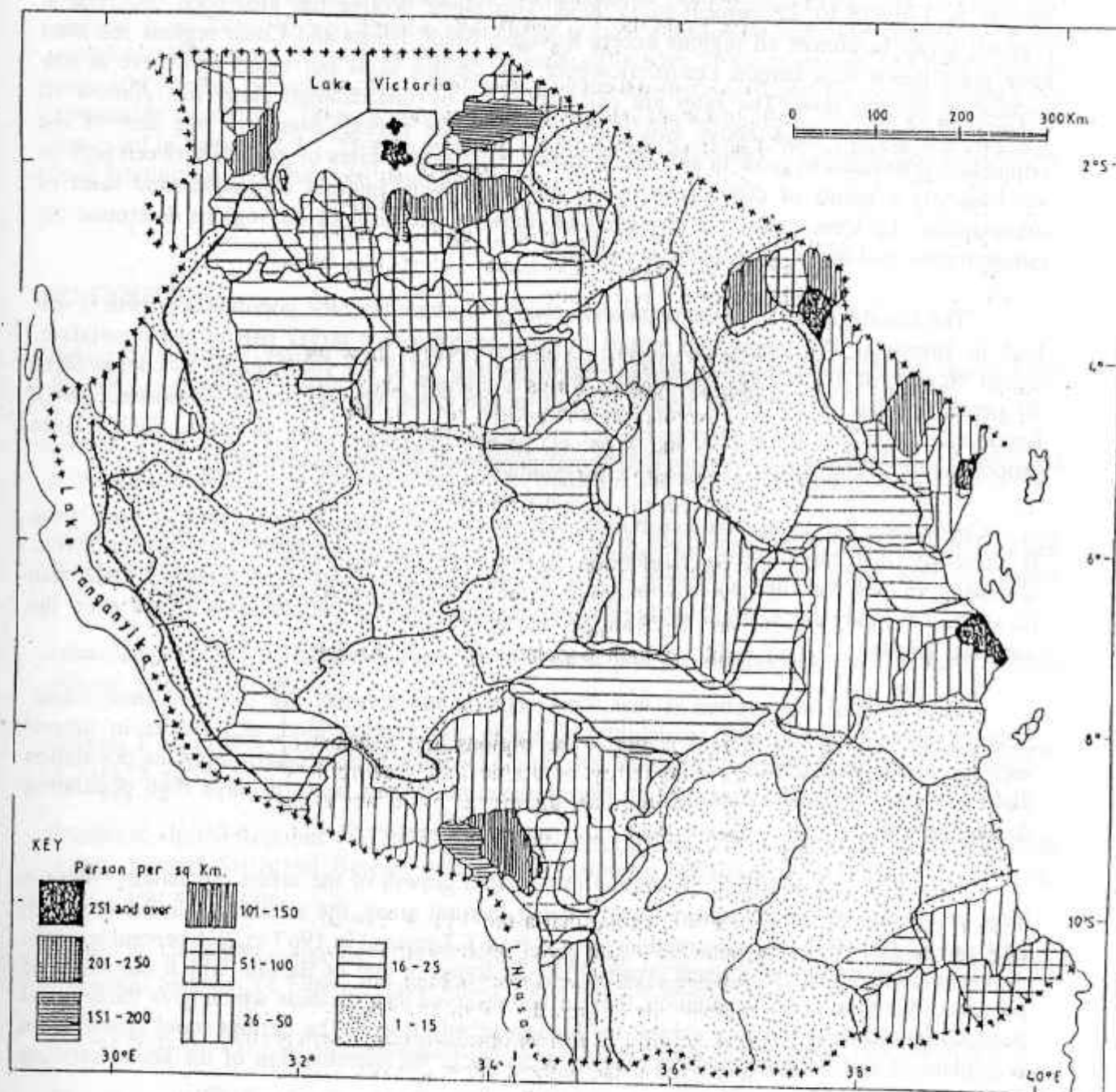
Although the population density data for Tanzania and for the regions give an impression that Tanzania is sparsely populated, it is important to note that the population is unevenly distributed. Map 2 illustrates the district density variations in Tanzania in 1988 (See also Table 3.2 and Appendix 3.1). There is much concentration of people in regions which have favourable climatic conditions, good soils, and adequate and reliable sources of water. The actual amount of land available to the people is reduced if the forest reserves, water areas, national parks, mountainous areas, and any other land which is not suitable or not at the people's disposal are removed. In most cases, this land under other uses is included in the computation of population density.

The situation is even worse at district level. The population density differs between districts, wards and villages. Considering the distribution of population by districts, about 65 percent of the total population occupied only 28 percent of the total land area in 1978 (Tanzania, 1983). Concentration of the population to specific areas was even greater at division, ward and village levels.

The general observation is that population density has been on an increase in all regions. Although the magnitude of the increase differs from one region to another, the consequences of the increase may be similar. While the population increases, the land area available for human use remains the same and in other areas has even declined due to degradation and introduction of new landuses. It is a common practice that areas which have high concentration of people are characterised by high rates of resource depletion, landuse conflicts and increasing environmental decay.



MAP 2: RURAL POPULATION DENSITY BY DISTRICTS,  
1988 POPULATION CENSUS





### 3.7 CONCLUSION

The analysis in this chapter has concentrated on the population growth, distribution and density. It is generally observed that the national population growth declined slightly from 3.0 percent in 1967/78 to 2.8 percent in 1978/88. This slight decline has also been observed at regional level. In almost all regions except Ruvuma, Mara, Iringa and Coast regions the rates have gone down to a certain extent. However, the decline does not mean that there is low population growth now. The rates are still very high by international standards. Almost all regions had growth rates above two percent in 1978/88 period. Similarly, the size of the population continued to grow in absolute numbers. Differential rates of growth between regions are basically a result of differences in the natural growth, internal migration, and rates of urbanization. To some extent the physical and climatic conditions of the regions determine the concentration and distribution of the population.

The age distribution of the population clearly illustrates how the population growth is still high in Tanzania. The young age groups form a proportionally larger part of the population. About 46 percent of the total population was under age 15 in the 1988 census as compared to 50 percent in age group 15-64 and 4 percent in age group 65 and above (Tanzania, 1991). Essentially, high fertility is responsible for producing this type of age structure. Such a large proportion of young people creates an internal population growth momentum.

Concerning the population distribution, there is every evidence showing that the population is unevenly distributed. The distribution is much varied at regional and district levels. Comparative data for 1988 and 1978 suggest that the population was more spread in 1988 than in 1978. This may be a result of high population growth that people have to use even the marginal lands.

The general observation is that some regions and districts are favoured than others. Suitable climatic conditions, availability of arable and grazing land, differences in natural increase, and natural physical conditions are among the basic factors determining the population distribution in Tanzania. Areas which have favourable climate seem to have high population density as well.

There is also evidence illustrating that a rapid growth of the urban population. While a large proportion of the population is still living in rural areas, the urban population has been increasing since 1967. The observed increase is from 6.2 percent in 1967 to 21.1 percent in 1988. At the regional level, the highest urban growth is found in Dar es Salaam which has about 25 percent of the total urban population. It is further observed that, districts which have the regional headquarters in their territory exhibit the highest urban growth. The current rapid urbanization is unplanned and its consequences may be reflected in the deterioration of the social services available.

Due to the observed uneven population distribution, there is also a marked variation in population density. At the national level, the population density increased from 19.8 persons per sq.km in 1978 to about 26.2 persons per sq.km in 1988. At regional level, it is observed that regions from Zanzibar and Pemba had higher population density than the regions from the mainland. With the exception of Dar es Salaam, all regions in the mainland had densities less than 100 persons per sq.km. Again, high population density was found in regions which have favourable conditions. There is also variation in densities between districts of the same region as indicated in Appendix 3.1. The consequence of increasing densities is increasing pressure on the land leading to environmental degradation.

## REFERENCES

- Egero, B. and R.A. Henin, (eds), (1973), The Population of Tanzania: An Analysis of the 1967 Population Census, Census Vol.6, BRALUP and Bureau of Statistics, Dar es Salaam.
- Henin, R. A. (ed), (1973), The Demography of Tanzania: An Analysis of the 1973 National Demographic Survey of Tanzania, Bureau of Statistics and BRALUP, Dar es Salaam.
- Maro, P. (1983), *Population Distribution and Density*, in Tanzania, Population of Tanzania: 1978 Population Census, Vol.VIII, Bureau of Statistics, Ministry of Planning and Economic Affairs, Dar es Salaam, (Chapt. 4, pp 91-109).
- Mbaruku, H. (1983), *Regional Population Growth and Its components*, in Tanzania, op.cit. (Chapt. 5, pp 111-124).
- Moore, J. E. (1973), *Population Distribution and Density*, in B. Egero and R.A. Henin, op.cit. (Chapt. 3, pp 38-55).
- Tanzania, United Republic of, (1969), 1967 Population census, Vol.1: Statistics For Enumeration Areas, Central Statistical Bureau, Ministry of Economic Affairs and Development Planning, Dar es Salaam.
- Tanzania, United Republic of, (1983), 1988 Population Census: Preliminary Report, Bureau of Statistics, Ministry of Finance, Economic Affairs and Planning, Dar es Salaam.
- United Nations, (1975), The population Debate: Dimensions and Prospects, (Papers of the World Population Conference, Bucharest, 1974), United Nations New York.



Appendix 3.1 Population, Growth rates and Density by District

Districts	Population		Pop. Growth Rates		Land Area (sq. km)	Popul. Density	
	1978	1988	1987/78	1978/88		1978	1988
Tanzibar Town	110,506	156,917	4.7	3.5	13	8500.0	12070.5
Ijala	218,426	331,670	4.5	4.1	210	975.1	1579.4
Kinondoni	366,159	611,872	9.9	5.0	527	708.2	1160.7
Tanga	143,868	184,849	4.2	2.6	209	688.4	894.0
Tonoka	258,505	401,776	8.6	4.3	454	369.2	812.5
Chakechake	47,208	60,151	—	2.4	157	300.7	383.0
Mkoani (Pemba)	51,808	67,508	—	2.4	175	296.0	385.8
Moshi	364,087	439,541	7.3	1.9	1,558	233.6	282.1
Ukarewe	138,729	172,946	2.2	2.2	640	214.8	270.2
North 'A'	48,124	59,843	—	2.2	240	200.5	249.3
Mwanza	189,827	221,209	5.0	2.6	595	187.1	237.9
Wete	58,923	74,950	—	2.4	315	182.9	232.7
Kanda (North Pemba)	47,367	60,270	—	2.4	217	165.3	204.6
West (Zanzibar)	51,535	44,400	—	—	791	144.8	170.8
Kyela	114,553	135,091	2.7	1.6	1,957	134.5	161.8
Musoma	263,129	318,432	2.0	2.5	230	125.6	160.8
North 'B'	28,893	34,991	—	3.0	2,889	109.0	111.0
Aromoru	238,020	321,098	3.2	2.4	1,482	106.4	135.6
Rombo	157,715	200,889	2.9	1.4	2,454	95.9	110.6
Rungwa	235,314	271,516	0.9	1.4	2,499	87.0	109.4
Muloba	217,493	273,345	3.6	2.3	3,095	83.6	100.8
Nagu	258,777	311,835	2.9	1.9	3,497	81.8	102.2
Lushoto	286,049	357,531	2.8	2.2	3,028	80.5	100.4
Sungusungu	243,630	303,897	2.8	2.2	2,369	74.0	83.1
Rai	172,444	196,901	3.5	1.3	3,885	55.1	85.9
Tarimo	253,010	333,888	2.7	2.8	4,462	64.5	94.3
Central (Zanzibar)	29,797	44,493	—	4.0	5,530	60.4	70.0
Dukoba	333,788	387,311	3.3	1.5	5,546	55.7	77.1
Kwimba	325,285	427,726	1.3	2.7	2,782	56.3	68.4
Munda	156,699	190,386	2.0	1.9	392	56.0	83.9
South (Zanzibar)	21,952	25,066	—	1.3	3,756	51.2	65.4
Mkara	192,524	245,719	2.3	1.3	3,756	50.9	58.3
Korogwe	191,178	218,810	2.8	0.01	4,015	48.1	68.7
Kovale	107,355	107,715	1.1	3.5	6,388	48.1	51.3
Geita	107,421	439,022	2.6	1.4	9,454	45.4	83.9
Shinyanga	430,903	504,138	2.2	3.4	515	42.2	48.4
Mafia	23,105	33,107	2.9	1.4	4,732	37.9	45.2
Mabeya	199,737	229,104	1.5	1.9	1,812	36.0	45.7
Kibaha	68,722	81,946	—	2.2	1,935	32.3	42.5
Illovo	71,228	88,562	2.2	2.7	6,961	30.6	47.1
Mtanga	225,001	296,082	2.9	4.2	9,777	30.4	38.9
Irumbi	242,040	371,919	3.2	1.9	8,936	30.4	36.9
Naradhi	296,931	380,618	2.2	1.7	9,454	28.8	34.1
Makindu	271,909	330,149	0.7	0.7	6,788	27.9	30.0
Liuli	272,295	322,273	2.9	4.7	2,170	27.7	44.7
Epungu	189,104	60,248	—	2.2	9,324	27.7	34.2
Mwanza	255,649	319,735	1.9	2.4	4,428	27.4	40.6
Kamili	107,910	159,542	0.8	4.2	6,993	26.5	33.5
Ngara	185,016	284,136	5.8	2.4	10,576	26.2	30.6
Karaga	435,213	555,529	2.1	3.2	2,736	25.8	29.6
Uruwaa	304,079	220,499	2.0	1.4	5,739	25.5	12.6
Morogoro	147,942	169,733	5.4	3.4	9,886	24.6	34.6
Mtoto	229,063	113,286	4.3	2.8	7,123	24.3	32.2
Mtindi	173,782	229,259	3.8	1.2	1,425	23.4	26.4
Pungu	33,340	37,469	1.4	3.2	8,417	23.3	32.1
Mtanga	196,141	270,129	2.8	2.6	11,526	22.6	29.5
Mwanga	261,514	339,516	3.6	2.3	6,896	22.3	28.0
Kibaha	153,450	193,274	1.7	2.8	10,658	22.1	29.4
Kibaha	326,491	513,991	2.0	1.2	4,128	22.0	24.9
Kibaha	91,220	102,614	—	3.2	31,653	21.7	11.0
Kibaha	253,301	349,393	1.8	2.7	19,294	21.7	28.4
Kibaha	418,033	547,803	2.7	0.6	12,821	20.9	25.8
Kibaha	269,623	286,563	2.4	2.1	13,209	19.3	24.3
Kibaha	275,278	340,232	3.2	2.3	14,245	18.0	26.2
Kibaha	274,544	346,526	4.2	3.7	18,519	17.5	23.4
Kibaha	333,966	484,983	2.5	3.9	13,417	16.7	24.7
Kibaha	165,580	209,205	2.5	1.4	6,115	15.6	19.2
Kibaha	223,545	331,589	5.9	—	9,385	14.6	25.0
Kibaha	102,051	117,478	6.2	3.0	13,209	14.0	18.9
Kibaha	146,322	108,215	3.0	2.4	9,842	13.8	17.7
Kibaha	291,622	499,439	1.5	9.8	7,070	12.1	15.6
Kibaha	184,595	250,263	2.3	2.5	28,620	11.9	15.0
Kibaha	135,967	173,885	1.5	1.3	6,325	10.1	11.5
Kibaha	93,767	267,670	2.3	1.3	13,339	9.8	13.8
Kibaha	347,661	446,997	3.0	2.3	16,058	8.7	10.5
Kibaha	75,690	100,216	1.0	1.8	13,857	8.2	10.9
Kibaha	135,542	193,950	5.6	3.4	18,778	7.2	9.1
Kibaha	133,013	187,593	0.2	2.2	21,299	7.0	8.8
Kibaha	139,991	175,604	1.4	3.8	36,303	6.3	9.3
Kibaha	113,972	150,392	3.0	5.3	41,103	6.2	8.6
Kibaha	135,535	170,320	1.1	2.0	23,581	4.8	5.9
Kibaha	149,104	186,781	2.9	7.5	10,942	4.7	10.2
Kibaha	229,876	339,163	4.7	4.1	16,291	3.6	4.7
Kibaha	254,327	354,418	2.2	2.8	28,620	3.3	6.1
Kibaha	113,510	138,642	4.6	3.8	27,005	3.2	4.8
Kibaha	50,889	111,710	8.0	10.5	45,843	1.8	5.7
Kibaha	71,745	109,006	4.9	7.2	32,480	1.8	3.9
Kibaha	102,266	135,405	3.4	2.8	36,620	1.4	1.4
Kibaha	89,409	144,493	—	—	—	—	—
Kibaha	47,031	69,107	—	—	—	—	—
Kibaha	82,010	263,285	—	—	—	—	—
Kibaha	59,790	127,358	—	—	—	—	—
Kibaha	19,406	62,121	—	—	—	—	—
Kibaha	—	207,343	—	—	—	—	—
TANZANIA	17512610	23174443	3.2	2.8	885,987	19.8	26.2

Source: Tanzania (1991:23), (1989:21).

Appendix 2: Index of Distribution by Districts:1988 Census.

Districts	Index of Distribution	
	1978	1988
Zanzibar Town	430.03	460.71
Ilala	49.33	60.28
Kinondoni	35.83	44.30
Tanga	34.42	34.12
Temeke	18.68	23.38
Chakechake	15.21	14.62
Mkoani (Pemba)	14.98	14.76
Moshi	11.82	10.77
Ukerewe	10.97	10.31
North 'A'	10.14	9.52
Mwanza	9.58	9.44
Wete	9.47	9.08
Konde (North Pemba)	9.25	8.88
West (Zanzibar)	7.35	7.81
Kyela	7.33	6.52
Musoma	6.80	6.18
North 'B'	6.35	6.14
Arumeru	5.51	4.24
Rombo	5.38	5.18
Rungwe	4.85	4.22
Muleba	4.40	4.18
Magu	4.23	3.85
Lushoto	4.14	3.90
Sengerema	4.07	3.83
Hai	3.84	3.17
Tarime	3.29	3.28
Central (Zanzibar)	3.26	3.68
Bukoba	3.06	2.67
Kwimba	2.97	2.94
Bunda	2.85	2.61
South (Zanzibar)	2.83	2.44
Mtwara	2.60	2.50
Korogwe	2.58	2.23
Newala	2.43	2.92
Geita	2.43	2.62
Shinyanga	2.31	2.03
Mafia	2.26	2.44
Muheza	2.13	1.85
Kibaha	1.92	1.73
Ileje	1.86	1.74
Nzega	1.63	1.62
Iramba	1.55	1.80
Bariadi	1.54	1.48
Masasi	1.54	1.41
Lindi	1.46	1.30



Igunga	1.41	1.15
Mwanga	1.40	1.71
Kasulu	1.40	1.31
Ngara	1.39	1.37
Karagwe	1.34	1.55
Dodoma	1.33	1.28
Maswa	1.33	3.08
Same	1.31	1.13
Hanang	1.29	0.48
Mbozi	1.24	1.32
Mufindi	1.23	1.23
Pangani	1.18	1.01
Mbinga	1.18	1.23
Mpwapwa	1.14	1.13
Kisarawe	1.13	1.07
Njombe	1.12	1.12
Makete	1.11	0.95
Kigoma	1.10	0.42
Morogoro	1.10	1.08
Singida	1.06	0.85
Kondoa	1.05	0.98
Kilosa	0.98	0.93
Mbeya	0.91	1.00
Biharamulo	0.89	0.89
Sumbawanga	0.84	0.94
Nachingwea	0.84	0.73
Nkansi	0.79	0.44
Kahama	0.74	0.95
Handeni	0.71	0.72
Bagamoyo	0.70	0.68
Mbulu	0.67	1.45
Iringa	0.61	0.60
Ludewa	0.60	0.60
Rufiji	0.51	0.44
Kilombero	0.50	0.53
Kibondo	0.44	0.42
Kilwa	0.41	0.42
Tunduru	0.36	0.35
Urambo	0.35	0.34
Songea	0.32	0.35
Tabora	0.31	0.33
Mahenge (Ulanga)	0.24	0.23
Serengeti	0.24	0.39
Monduli	0.22	0.26
Manyoni	0.18	0.18
Chunya	0.17	0.23
Ngorongoro	0.16	0.18
Mpanda	0.09	0.22
Kiteto	0.09	0.15
Liwale	0.05	0.05
Babati	-	-

## CHAPTER 4 MIGRATION

by S.M. Aboud

### 4.1 INTRODUCTION

Factors affecting change in the population of an area are births, deaths and migration. Migration is one of the most complex of the demographic variables, like death it can occur at any time. Migration can affect the growth and decline of populations directly, and by influencing fertility and mortality of the areas of origin and destination. The importance of migration in affecting the growth and decline of populations and in modifying the demographic characteristics of the areas of origin and areas of destination has long been recognised. The measurement and analysis of migration are important in the preparation of population estimates and projections for a nation or parts of a nation.

Migration is a form of geographic or spatial mobility involving a change of usual residence between clearly defined geographic units (Shyrock, H.S and Siegel, J.S).

The 1972 Immigration Regulation<sup>1</sup> Act made it possible to collect data on International Migration in Tanzania. However very little can be said about domestic (internal) migration statistics. Population Censuses are the main sources of data which provide Domestic and International Migration data. So far migration data were collected in the 1948, 1957/58 and 1967, but the 1978 census was a milestone in migration study in Tanzania in that for the first time it was possible to use the place of birth data to identify specific interregional flows and migration patterns for each administrative region. More information was collected in the 1988 census.

It was possible from the 1948 and 1957/58 censuses to calculate the emigration rates for males and females for each tribe in Tanzania<sup>1</sup> and to estimate the extent of dispersion or migration of the different tribes from their assumed area of origin.<sup>2</sup> The 1988 census had three questions to determine migration which were collected on sample basis, namely:

1. Place of birth
2. Usual place of residence and
3. Place of residence in 1978.

The third question refers to a place where a respondent spent the longest time in 1978 and not where he/she was enumerated.

---

<sup>1</sup> A.W. Southall, *Population Movements in East Africa* in K.M. and R.M. Prothers (eds.), *Essays in African Population*, (London Routledge Keagan, 1961).

<sup>2</sup> M.A.Hirst, *Tribal Migration in East Africa: A Review and Analysis*, *Geografiska Annaler*, 52 B, 1970.



## 4.2 INTERREGIONAL MIGRATION: TANZANIA MAINLAND

### Lifetime Migration

Migration can affect the age and sex composition of the population in a number of ways. First, its effect on age distribution depends on the magnitude, direction and duration of migration and on the age structure of migrations. Migrants change the prevailing age composition, plus their own natural increase may differ from that of general population. In-migrants tend to be relatively young on arrival and to have a relatively high natural increase; hence, the usual short term effect of in-migration is to reduce the proportion of older adults and aged persons in the population. This tendency of migrants to be concentrated in younger age groups may cause the age composition of the receiving population to have markedly young age distribution and the sending population to become relatively older. The sex ratio among migrants is often different from that of the total population.

Table 4.1 below shows lifetime migration by region in Tanzania Mainland and Zanzibar. Dar es Salaam shows the highest gain followed by Arusha, Tabora, Mbeya and Morogoro. Dar es Salaam has the highest number of in-migrants mainly because it is a city to which people from other regions come in to look for employment. Population pyramid for the region is shown in figure 1. The age pyramid for Dar es Salaam region clearly shows the broad base which tells us that the region is characterised by a growing population. Bulging of the pyramid at age group 15 - 19 is a result of primary school leavers who after completing primary education tend to migrate to Dar es Salaam to look for employment. The concentration of migrants in the younger economically active ages; 15 - 39, which are also ages of peak fertility, has the added effect of increasing the number of births in this region, in spite of its relatively low fertility rate. Arusha Region has the second highest gain after Dar es Salaam. The region is well developed with modern industries, famous as a tourist center, has extensive arable land and favourable weather which attract people from other regions.

Figure 1: Population Pyramid  
Dar es Salaam Region

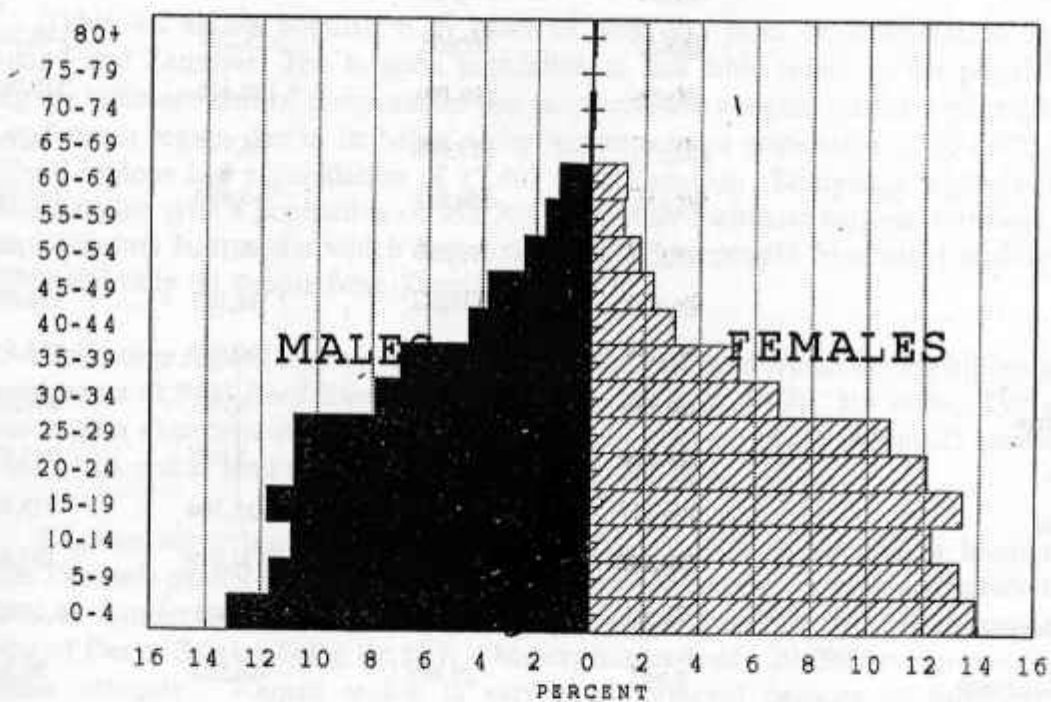




TABLE 4.1 LIFETIME MIGRATION BY REGION, TANZANIA

Region	Lifetime In-migration	Lifetime Out-migration	Net Lifetime Migration	Gross Migration
Dodoma	89,900	190,985	-101,085	280,885
Arusha	218,427	76,703	141,724	295,130
Kilimanjaro	93,040	217,423	-124,383	310,463
Tanga	98,747	150,915	-52,168	249,662
Morogoro	172,393	141,956	30,437	314,349
Coast	103,804	207,716	-103,912	311,520
Dar es Salaam	651,246	150,625	500,621	801,871
Lindi	95,200	145,031	-49,831	240,231
Mtwara	46,299	144,988	-98,689	191,287
Ruvuma	66,442	81,661	-15,219	148,103
Tanga	49,282	169,480	-120,198	218,762
Mbeya	160,377	113,378	46,999	273,755
Singida	86,651	150,531	-63,880	237,182
Tabora	241,729	175,359	66,370	417,088
Rukwa	87,599	49,294	38,305	136,893
Kigoma	26,795	129,718	-102,923	156,513
Shinyanga	288,210	281,447	6,763	569,657
Kagera	103,713	109,693	-5,980	213,406
Mwanza	270,142	303,646	-33,504	573,788
Mara	75,987	115,865	-39,878	191,852
Total Mainland	3,025,983	3,106,414	-80,431	6,132,397
Zanzibar North	8,895	27,448	-18,553	36,343
Zanzibar Central/South	12,952	22,390	-9,464	35,342
Z'bar Town/West	79,754	18,775	60,979	98,529
Pemba North	10,812	24,097	-13,285	34,909
Pemba south	11,768	31,445	-19,677	43,213
Total Zanzibar	124,181	124,155	0	248,336

Zanzibar Town/West region is the only region in the Islands which shows gain in lifetime migration, this gain is mainly because of its being urban. The rest of the regions for both Unguja and Pemba show loss in lifetime migration. Pemba South region show the highest loss in lifetime migration followed by Zanzibar North region. Gross migration is the highest in Zanzibar Town/West. Gain in lifetime migration for Zanzibar Town/West suggests that movement of part of the population from other regions is towards this region.

The place of birth by place of enumeration statistics have become one of the most important sources of data for measuring internal migration in most developing countries. From this two-way classification, estimates of in-migration, out-migration, net and gross-migration rates and inter-regional migration rates can be made for the country and compared with other estimates. The main arguments raised against the use of place of birth data in estimating the volume of migration is that it does not give any idea about the data or arrival or length of stay or previous migration movements.

Table 4.2 shows population by place of birth and place of enumeration for Tanzania Mainland and Zanzibar. The migrant population in this table refers to the population which during the reference date of enumeration was enumerated in a region outside their region of birth. Dar es Salaam region due to its being a city has attracted a population of 654,837 from other Mainland regions and a population of 17,401 from Zanzibar. Shinyanga region is the second receiving region with a population of 291,304 from other mainland regions, followed by Tabora region. Kigoma is a region which has attracted very few people from other mainland regions (31,390) and only 54 people from Zanzibar island.

Shinyanga region, the only inland region in the mainland which has the highest population of immigrants (1,548) from Zanzibar, followed by Mwanza (917). Excluding Dar es Salaam, Tabora region experienced the highest percentage of total migrants (about 25 percent) mainly because of its arable land and vast land area for grazing.

Regions bordering the country have experienced a good number of immigrants from outside Tanzania except Kilimanjaro and Arusha regions. Kagera region has recorded the highest number of immigrants (81,986) from outside Tanzania followed by Rukwa region (33,854). Despite of Dar es Salaam being the city, it has experienced only 29,098 immigrants from outside Tanzania category. Kagera region is very much affected because of migrants from the neighbouring Rwanda, Burundi and Uganda. Regions which are in the middle of the country like Dodoma, Morogoro, Iringa, Singida and Shinyanga have experienced very few immigrants from outside Tanzania.

In Table 4.3, the Place of Birth by Place of Enumeration for Zanzibar, it can be observed that Zanzibar Town/West region due to its being urban has around 48 percent immigrants most of them are from other regions of Zanzibar and around 9 percent (17,872) from Tanzania mainland. The region also experienced the highest (1,739) from outside Tanzania. Zanzibar Central/South region has the second highest immigrants of 25 percent. Excluding Zanzibar Town/West, the rest of the regions experienced very few immigrants from outside Tanzania.



TABLE 4.2 MAINLAND POPULATION BY PLACE OF BIRTH AND PLACE OF NUMERATION, 1988.

Region of Enumeration	Total Population	Place of Birth (Numbers)				Total Migrant (in Percentage)
		Same Region	Other Region	Zanzibar	Outside Tanzania	
Dodoma	1,233,835	1,140,651	91,343	45	1,390	8
Arusha	1,344,001	1,114,572	222,706	426	6,297	17
Kilimanjaro	1,102,934	1,000,162	94,741	432	7,599	9
Tanga	1,278,995	1,163,592	100,021	3,788	11,594	9
Morogoro	1,212,659	1,027,086	180,391	686	4,496	15
Coast	633,352	518,419	106,621	1,767	6,545	18
Dar es Salaam	1,357,248	655,912	654,837	17,401	29,098	52
Lindi	644,851	538,948	96,841	429	8,633	16
Mtwara	884,745	807,489	50,696	409	26,151	9
Ruvuma	777,486	693,244	68,821	401	15,020	11
Iringa <sup>1</sup>	1,183,484	1,123,229	58,893	137	1,225	5
Mbeya	1,471,784	1,285,062	164,805	455	21,462	13
Singida	860,141	771,258	87,522	522	839	10
Tabora	1,034,391	776,366	243,476	917	13,632	25
Rukwa	696,206	571,975	90,114	263	33,854	18
Kigoma	848,562	793,002	31,390	54	24,116	7
Shinyanga	1,760,869	1,464,721	291,304	1,548	3,296	17
Kagera	1,304,459	1,109,418	112,894	161	81,986	15
Mwanza	1,820,728	1,578,780	232,478	792	8,678	13
Mara	942,765	848,129	79,665	104	14,867	10

TABLE 4.3 ZANZIBAR POPULATION BY PLACE OF BIRTH AND PLACE OF ENUMERATION, 1988

Region Of Enumeration	Total Popul- ation	Place of Birth				Total Migrant (in percentage)
		Same Region	Other Zanzibar Regions	Main land	Out-side Tanzania	
Zanzibar North	97,047	85,545	8,895	2,241	166	11.9
Zanzibar Central/South	70,269	52,679	12,926	4,162	502	25.0
Zanzibar Town/West	208,389	109,024	79,754	17,872	1,739	47.7
Pemba North	137,086	123,428	10,812	2,444	402	10.0
Pemba South	127,185	112,650	11,768	2,502	265	11.4

Table 4.4 shows the population by place of usual residence and place of birth. The migrant population in this table refers to the population which during enumeration reported their regions of residence different to the region of birth. Pwani region which borders Dar es Salaam region has experienced the highest percentage (28.44 percent) of emigrants to other regions of the mainland. It is second to Dar es Salaam among the mainland regions for its population to migrate to Zanzibar (0.45 percent). Lindi region is second to Pwani with 20.60 percent of its population emigrating to other regions of the mainland followed by Tabora with 17.85 percent and Kilimanjaro region with 17.37 percent.

It is interesting to note that about 50 percent of the population in each of the regions in Zanzibar emigrated to other regions within the Islands. The percentage remaining in their respective regions in the Island ranges between 34.82 for Zanzibar Central/South region and 42.27 for Zanzibar Town/West, while those of the mainland ranges between 71.11 for Pwani region and 94.01 for Arusha region.



TABLE 4.4 POPULATION BY PLACE OF USUAL RESIDENCE AND PLACE OF BIRTH, 1988

Region of Birth	Total born in Region	Region of Usual Residence			Percentage Remaining in Region	Percentage of Emigrants	
		Same Region	Mainland	Zanzibar		Main land	Zanзи bar
Dodoma	1,330,921	1,150,323	180,289	309	86.43	13.55	0.02
Arusha	1,190,421	1,119,131	71,099	191	94.01	5.97	0.02
Kilimanjaro	1,215,636	1,004,063	211,178	395	82.60	17.37	0.03
Tanga	1,318,731	1,168,093	148,240	2,398	88.58	11.24	0.18
Morogoro	1,172,008	1,031,188	139,117	1,703	87.98	11.87	0.15
Pwani	732,446	520,818	208,341	3,287	71.11	28.44	0.45
Dar es Salaam	817,983	674,341	137,856	5,786	82.44	16.85	0.71
Lindi	685,722	543,439	141,283	1,000	79.25	20.60	0.15
Mtwara	953,610	810,721	142,104	785	85.02	14.90	0.08
Ruvuma	775,555	695,463	79,598	494	89.67	10.26	0.06
Iringa	1,293,014	1,133,060	159,561	393	87.63	12.34	0.03
Mbeya	1,397,798	1,285,242	112,221	335	91.95	8.03	0.02
Singida	863,005	717,651	144,980	374	83.16	16.80	0.04
Tabora	958,040	783,510	170,984	3,546	81.78	17.85	0.37
Rukwa	669,126	620,909	48,026	191	92.79	7.18	0.03
Kigoma	922,873	799,350	123,120	403	86.62	13.34	0.04
Shinyanga	1,755,632	1,478,953	271,696	4,983	84.24	15.48	0.28
Kagera	1,218,693	1,112,958	105,499	236	91.32	8.66	0.02
Mwanza	1,884,716	1,588,513	294,832	1,371	84.28	15.64	0.07
Mara	963,754	854,891	108,553	310	88.70	11.26	0.03
Z'bar North	233,846	88,531	31,118	11,419	37.86	13.31	48.83
Z'bar South	152,805	53,206	24,299	75,300	34.82	15.90	49.28
Z'bar Town/West	263,745	111,564	24,202	12,7979	42.30	9.18	48.52
Pemba North	305,842	126,235	31,167	14,8440	41.27	10.19	48.53
Pemba South	291,719	112,769	35,080	14,3870	38.66	12.03	49.32

### 4.3 MIGRATION DURING A SPECIFIED PERIOD

Table 4.5 is a cross tabulation of region of enumeration during the 1988 census, and place of residence in 1978. The place of residence refers to the place in which the person enumerated spent most of his time and not the place of residence. The migrant in this case is defined as a person whose residence at the time of the 1988 census reference date differs from the place where he or she spent most of his or her time during 1978. The information excludes all those born within the period of ten years i.e. it excludes all those born after 1978. It also ignores those who moved and returned to the same region within the interval.

Dar es Salaam region recorded the highest immigrants of about 31 percent of which about 29 percent are from other mainland regions while about 1 percent are from Zanzibar and 1 percent from outside mainland. Pwani is the second to Dar es Salaam with 16 percent from other mainland regions and 0.26 percent from Zanzibar and 0.38 from outside Tanzania. Kagera region recorded the highest immigrants from outside Tanzania (3.47 percent) followed by Mbeya having 2 percent. Kagera region recorded the highest international immigrants mainly because the 1978 is the period which the neighbouring Uganda was at war so the possibility that many immigrants at that particular period for the bordering region to be high is evident. Mbeya region is very much affected by immigrants from Malawi and Zambia.

As for Zanzibar (as shown in Table 4.6), it recorded a very small percentage of less than 1 percent for the outside Tanzania category, this clearly shows that immigration in Zanzibar from outside Tanzania is very small. Migration during a specified time is between 2 and around 7 percent with Tanzania mainland. Migration within the regions in Zanzibar is very high with Zanzibar Town/West leading (around 17 percent).



TABLE 4.5 MAINLAND POPULATION BY PLACE OF RESIDENCE AND PLACE OF ENUMERATION, 1978 (In Percentage)

Region of Enumeration	Place of Residence in 1978				Total Migrant
	Same Region	Other Region	Zanzibar	Outside Tanzania	
Dodoma	92.45	7.42	0.03	0.11	7.55
Arusha	86.28	13.33	0.02	0.37	13.72
Kilimanjaro	89.99	9.37	0.03	0.61	10.01
Tanga	91.72	77.58	0.20	0.50	8.28
Morogoro	86.98	12.76	0.05	0.21	13.02
Pwani	83.15	16.21	0.26	0.38	16.85
Dar es Salaam	69.15	28.94	0.92	0.99	30.85
Lindi	87.45	12.00	0.06	0.48	12.55
Mtwara	92.33	6.66	0.04	0.97	7.67
Ruvuma	89.49	9.82	0.05	0.65	10.51
Iringa	92.88	6.96	0.01	0.15	7.12
Mbeya	87.58	10.37	0.03	2.03	12.42
Singida	89.91	9.90	0.04	0.15	10.09
Tabora	84.57	15.19	0.08	0.16	15.43
Rukwa	84.46	14.62	0.02	0.90	15.54
Kigoma	93.77	5.56	0.00	0.66	6.23
Shinyanga	87.58	12.20	0.09	0.13	12.42
Kagera	90.30	6.22	0.01	3.47	9.70
Mwanza	85.62	14.06	0.03	0.29	14.38
Mara	90.16	9.13	0.01	0.71	9.84

TABLE 4.6 ZANZIBAR POPULATION BY PLACE OF RESIDENCE AND PLACE OF ENUMERATION, 1978

Region of Enumeration	Total Population	Place of Residence in 1978 (in Percentage)				Total Migrant
		Same Region	Other Zanzibar Region	Mainland	Outside Tanzania	
Zanzibar North	61,310	90.6	6.8	2.3	0.2	9.4
Zanzibar Central/South	47,102	83.2	12.0	4.6	0.3	16.8
Zanzibar Town/West	146,799	75.4	16.9	6.9	0.8	24.6
Pemba North	83,853	90.0	7.4	2.3	0.3	10.0
Pemba South	81,266	86.8	10.2	2.6	0.3	13.2

#### 4.4 INTERNATIONAL MIGRATION

Data on the foreign born are valuable for measuring migration when "frontier-control" data on migration are lacking, are of poor or questionable quality, or are irregularly compiled. Some important kinds of classifications may not be available in the "regular" immigration tabulations, but may appear in the census data. Hence, measurement of the volume of certain groups or of certain characteristics of immigrants may be possible only from census data. Where similar material is available from both sources, the census data may aid in validating the indications of the "regular" immigration data in spite of the difficulties of the comparison.

Census data provide only one side of the coin, namely the stream into the country. We are not able to obtain the information of out migration through census data unless we go to other sources.

Table 4.7 above refers to international immigrants of selected countries. There were around 320,418 foreign born population during the 1988 census. Immigrants are mainly from the neighbouring countries, these are partly individuals looking for work, partly individuals, families or groups having the intention to settle more permanently to Tanzania due to civil wars in their respective countries and partly refugees.

The neighbouring Burundi and Mozambique contribute the highest percentage of immigrants (24 percent each) followed by Rwanda (16 percent). A total of 48 percent of total international immigrants is contributed by Burundi and Mozambique. Almost half of the total international immigrants according to the census data is contributed by these two neighbouring countries.



TABLE 4.7 SEX COMPOSITION OF IMMIGRANTS FROM SELECTED COUNTRIES OF BIRTH

Country of Birth	Male	Female	Total	Percent	Sex Ratio
Burundi	41,221	36,854	78,075	24	112
Kenya	14,519	19,369	33,888	11	75
Malawi	3,844	3,339	7,183	2	115
Mozambique	40,301	37,911	78,212	24	106
Rwanda	27,331	24,753	52,084	16	110
Uganda	10,739	10,643	21,382	7	101
Zaire	4,677	4,743	9,420	3	99
Zambia	9,950	11,728	21,678	7	85
Other African Countries	2,247	1,571	3,818	1	143
Outside Africa	8,353	6,325	14,678	5	132
Total	163,182	157,236	320,418	100	103

Of the selected African countries, Malawi has the highest sex ratio of 115 per 100 females followed by Burundi (111 per 100 females) and Rwanda (110 per 100 females). The Outside Africa category contribute only 5 percent of the total International immigrants for Tanzania. It has the highest sex ratio of 132 per 100 females. This is due to the contracted expatriates who tend to be males.

Table 4.8 clearly show that the highest sex ratio is at age group 60 and above (141 per 100 females) which suggests that these immigrants are not labour migrants but the migrants which entered the country more than 20 years back and now have settled such that they find it difficult to go back.

TABLE 4.8 SEX COMPOSITION OF IMMIGRANTS BY BROAD AGE GROUPS

Age Group	Born Outside Tanzania			Sex Ratio
	Male	Female	Total	
< 15	21,229	21,449	42,678	98.97
15 - 29	41,171	48,370	89,541	85.12
30 - 44	42,336	41,249	83,585	102.64
45 - 59	30,210	26,170	56,380	115.44
60 +	28,236	19,998	48,234	141.19
Total	163,182	157,236	320,418	104

Table 4.9 shows the receiving regions of international immigrants. Kagera region is the highest receiver with 25 percent of total immigrants followed by Rukwa region (11 percent). The bordering regions Mtwara, Mbeya, Rukwa, Kigoma and Kagera have the higher percentage of immigrants, ranges between 7 and 11 percent. Dar es Salaam region being a city has 9 percent of total immigrants. It has the highest sex ratio of 113 per 100 females followed by Tabora with sex ratio of 109 per 100 females. Mbeya and Rukwa regions have sex ratio less than 100 implying that more females compared to males enter Tanzania through these regions. Female dominated migration for Mbeya and Rukwa regions is caused by small scale trading which is dominated by females from the neighbouring Zambia.

TABLE 4.9 MIGRANT POPULATION IN THE RECEIVING REGIONS

Region	Total Immigrants				Sex Ratio
	Male	Female	Total	Percentage	
Dar es Salaam	15,404	13,715	29,119	9	112
Mtwara	13,032	13,145	26,177	8	99
Mbeya	9,367	12,129	21,496	7	77
Tabora	7,080	6,564	13,644	4	108
Rukwa	15,989	17,908	33,897	11	89
Kigoma	12,360	11,777	24,137	8	105
Kagera	42,002	40,056	82,058	25	105
Other Regions	47,948	41,942	89,890	28	114
Total	163,182	157,236	320,418	100	104



## 4.5 CONCLUSION

It has been observed that international migration to Tanzania is mainly from neighbouring countries. Mozambique and Burundi are the leading countries with 24 percent each of the total international migration. The two countries contribute almost half of the total international immigrants.

It was not possible to analyse rural urban migration with the available information because of changes of boundaries between the 1978 census and 1988 census. Many new urban areas were classified as rural in 1978 census and urban in 1988 which has caused changes of residence status for people who have not physically moved. However, we have seen that Dar es Salaam city is very much affected by immigration especially of primary school leavers most of whom come from regions which are predominantly rural. Likewise Zanzibar Town/West due to its being urbanised has almost 50 percent of people enumerated born outside the region. This clearly shows that Tanzania is not very much different with other countries in which people have a tendency to move to urban areas to look for employment.

### References:

- Aderanti Adepoju (1986), *Rural Migration and Development in Nigeria*, (Department of Demography and Social Statistics, University of Ife, Ile-Ife, Nigeria)
- Egero, B and Henin, R.A. (1973), The Population of Tanzania: An Analysis of the 1967 Population Census, Census volume 6, (Dar es Salaam: BRALUP and Bureau of Statistics).
- Hirst, M.A., Tribal Migration in East Africa: A Review and Analysis, *Geografiska Annaler*, 52 B, 1970.
- Kpedekpo, G.M.K. (1982), Essentials of Demographic Analysis for Africa, (Nairobi).
- Shyrock, H.S., Siegel, J.S. (1973), The Methods and Materials of Demography, (Washington, D.C.).
- Southall, A.W. *Population Movements in East Africa* in K.M. and R.M. Prothers (eds.), Essays in African Population, (London Routledge Keagan, 1961).
- Bureau of Statistics (1983), 1978 Population Census Volume VIII, (Dar es Salaam).
- United Nations (1970), Methods of Measuring Internal Migration. Manual VI ST/SOA, Series A/47 (New York).

## **CHAPTER 5**

### **LITERACY AND EDUCATION**

**By Damas Kapinga and Ireneus Ruyobya**

#### **5.1 INTRODUCTION**

The socio - economic development of any country depends much on the level of literacy of the population. On the other hand, the level of literacy is dictated by the education attained formally and informally.

Tanzania has since independence (1961) embarked on a program to eradicate illiteracy by expanding primary and secondary education. Efforts have also been made to establish and strengthen adult education classes throughout the country. In the 1970s primary school were earmarked as centres of adult education and headteachers of such schools were put in charge of the adult education campaign around their schools.

The Ministry of National Education, as it was known by then, established easy communication with the regions by appointing Regional and District Adult Education Officers and establishing advisory committees on adult education at all levels.

Census data help the country to assess any achievement made in her endeavor to eradicate illiteracy. It a basis for comparison with data from other sources.

#### **5.2 DEFINITION OF LITERACY**

According to the 1988, like 1978 Census, literacy was referred to as ability to read and write in Kiswahili. In the 1988 census the question on literacy was " Can you read and write in Kiswahili? ". There was no question on numeracy. The respondents were required to answer yes if they considered themselves capable of writing and reading Kiswahili.

This definition differs substantially from that provided by the Ministry of National Education in 1974. According to the ministry's definition:

- (a) A person is literate if he/she is able to read and write a letter, is able to locate streets, observe danger warning in the streets and at work, read newspaper, keep record etc.
- (b) An individual is literate when he/she has acquired the essential knowledge which enable him/her to engage in all those activities in which literacy is required for effective functioning in his/her community and whose attainment in reading, writing and arithmetic makes it possible for him/her to continue to use those skills towards their community.



At regional level, the 1988 Census shows that Kilimanjaro has the highest literacy rate of 80.8 percent followed by Dar es Salaam, 80.7 percent, while the lowest literacy rate is recorded in Lindi region (53.8 percent). For Zanzibar, Zanzibar West has the highest literacy rate of 73.2 percent and Zanzibar North has the lowest rate of 40.9 percent. In the 1978 Census, the highest literacy rate of 74.1 percent was also observed in Kilimanjaro region and the lowest in Tanzania Mainland was recorded in Shinyanga (33.2 percent). Zanzibar North had the lowest rate of 30.8 percent. From these findings, it is obvious that a remarkable improvement on literacy level has been recorded during the 1978/88 intercensal period. It is an indication that mass literacy campaign has been a great success. Tanzania Mainland literate population aged 10 years and above has steadily increased from 31 percent in 1967 to 51.6 percent in 1978 and to 61.2 percent in 1988. In Zanzibar too, there has been a remarkable improvement in literacy level. Literacy has risen from 39 in 1967 to 46.3 in 1978 and to 58.8 percent in 1988.

Table 5.2 above shows an increase in the literacy rate in all regions. For instance, in Tanzania Mainland, even regions like Shinyanga, Arusha and Kigoma had raised their literacy rates significantly though they remain among the regions with lowest literacy rates. It is worth noting that all these regions with the exception of Kigoma have animal husbandry as the main occupation of their inhabitants. The population in these regions tend to be migratory in search of pastures. This may explain the difficulties in implementing the literacy campaign programs in these regions.

## 5.5 REGIONAL DIFFERENTIALS

Although the 1988 census data show a rise in literacy rates, there are variations among regions and between 1978 and 1988 censuses. The data reveal that variations in literacy rates between 1978 and 1988 are not very sharp if we compare with the 1967 and 1978 censuses. In the 1988 Census, Kilimanjaro region recorded the highest literacy rate of 80.8 percent compared to 74.1 percent recorded in the 1978 Census. This represents an increase of only 6.7 percent, while the variation between 1967 and 1978 for this region was 18 percent. Shinyanga which maintains the lowest position in literacy rate had literacy rate of 48.3 percent in the 1988 Census compared to 33.2 percent recorded in 1978, thus experiencing an increase of 15.1 percent. The change between 1967 and 1978 censuses for this region was 17.2 percent. The recorded levels of literacy for Tanzania Mainland in 1988 and 1978 were 61.2 and 51.5 percent respectively. For Zanzibar, Zanzibar West continued to lead in literacy rate with 78.2 percent experiencing an increase of 15 percent over the 1978 record. Zanzibar North had the lowest literacy rate for both Zanzibar and Tanzania as a whole with 40.9 percent although it had, by itself, increased by 10.1 percent over the 1978 Census. The launching and implementation of literacy campaigns in the 1970s for Tanzania Mainland and in 1980s for Zanzibar had given a positive impact on literacy level in both Tanzania Mainland and Zanzibar.



The 1988 census regional differentials can be explained by several factors. One of the possible factors is the differences in efforts exerted by different regions in the campaign against illiteracy. Regions with higher literacy rates are those where greater effort is put and vice versa. Such regions include Kilimanjaro, Ruvuma, Tanga, Mara and Iringa. Some regions however, record high rates of literacy due to migration of literate people who are in search of employment opportunities. Such regions include Dar es Salaam and Zanzibar West. Dar es Salaam is also advantaged by having an appropriate socio-economic environment which is attractive for learning.

## **5.6 RURAL/URBAN SEX DIFFERENTIALS**

The 1988 census show an general trend for an increase in literacy rate for both rural and urban populations. This trend is seen in both Zanzibar and Tanzania Mainland. The data however, show some significant differentials in literacy rate between the rural and urban population.

The literacy rate is higher among the urban population. This can be explained by the fact that there are more educated and semieducated people in the urban centres than in the rural areas. This is because more of such people migrate to urban settlements for employment opportunities and bright light facilities. Furthermore there are more better equipped schools built in the urban centres than in rural areas, attendance rate tend to be higher among students in the urban centres than in the rural areas where students may be engaged in economic activity during school hours.

Between sexes the literacy rates are higher for the male population than for the female population in both rural and urban areas. For both males and females the literacy rate is higher among the urban population than the rural population. This can be explained by the fact that urban population is constantly exposed to literature like newspaper and are engaged in work experiences which require some book knowledge. The rural population seem to be disadvantaged. Most of their time is spent in farm or animal husbandry which require little or no book knowledge for their employment. Lack of rural libraries deprive the rural population the access to literature thus making the less literate as years go by.

Tables 5.3 and 5.4 show literacy rate for population aged 10 years and above in rural and urban areas by sex for 1978 and 1988 respectively. The sex differentials in literacy rates for both rural and urban population can perhaps be explained by the gender problems. Historically female population have tended to be disadvantaged. The social cultural setting tended to deprive the female population of their basic needs and right to attend school. The 1988 census data show that Arusha had the highest male literacy rate of 91.8 percent followed by Kilimanjaro with 90.3 percent and Dar es Salaam with 90 percent among the urban population. For the rural population Kilimanjaro had the highest male literacy rate of 84.5 percent followed by Iringa with 80.1 percent and Ruvuma with 77.7 percent for Tanzania Mainland.



In Zanzibar, Zanzibar West had the highest urban male literacy rate of 86.6 percent followed by Zanzibar Central with 79.2 percent and Pemba South with 77.6 percent. Among the rural male population, Zanzibar West recorded 80.9 percent literacy rate followed Zanzibar

Central with 74.4 percent and Pemba South with 56 percent. The lowest urban male literacy rate for Tanzania Mainland was recorded in Lindi region with 75.9 percent. Zanzibar North recorded lowest urban literacy rate of 52.6 percent

For the rural male population, the lowest male literacy rate was recorded in Shinyanga with 57.9 percent for Tanzania Mainland and Zanzibar North recorded the lowest male rural literacy rate of 49 percent in Zanzibar. Among the female population, the highest urban female literacy rate was recorded in Kilimanjaro (83.6 percent) followed by Arusha (82.8 percent), and Dar es Salaam ranked third (77.7 percent). The lowest urban female literacy rate was recorded in Lindi (60.2 percent). As for Zanzibar, the highest urban female literacy rate was recorded in Zanzibar West (73.6 percent), followed by Zanzibar Central (62.6 percent) and Pemba South (61.6 percent).

Regarding the rural female population the highest literacy rate was recorded in Kilimanjaro (75.7 percent), followed by Ruvuma (61.4 percent) and Iringa (57.2 percent). In Zanzibar, the highest rural female literacy rate was recorded in Zanzibar West region (65.1 percent), followed by Zanzibar Central (59.2 percent) and Pemba North (38.8 percent).

The lowest recorded rural female literacy rate for Tanzania Mainland was recorded in Shinyanga (36.2 percent). Pemba South had the lowest rural female literacy rate of 27.1 percent. These regions seem to lack motivation to eradicate illiteracy among the female population.

The general trend of rising literacy rate both in Tanzania Mainland and Zanzibar is most likely the result of effective campaign of eradicating illiteracy and expansion of primary and secondary education. The implementation of UPE has a positive influence on literacy campaign. The higher male literacy rate among both rural and urban populations is the result of greater male participation in literacy programs as well as higher achievement in formal education. Kilimanjaro region has continued to record highest literacy rate among its population for both sexes due to the fact that it is still the leading region with the largest expansion of formal education.

TABLE 5.3 LITERACY RATES FOR POPULATION 10 YEARS AND OVER IN RURAL AND URBAN AREAS: 1978

Region	Males			Females		
	Rural	Urban	Total	Rural	Urban	Total
Dodoma	59.7	83.5	62.2	35.4	64.1	37.8
Arusha	47.2	87.3	51.0	29.1	69.4	32.2
Kilimanjaro	80.5	90.5	81.5	66.7	75.6	67.3
Tanga	71.5	87.5	73.6	44.7	65.5	47.6
Morogoro	69.3	83.5	71.5	43.4	57.8	45.5
Coast	58.2	76.1	59.6	27.9	46.6	29.2
Dar es Salaam	54.5	86.6	83.9	26.6	63.5	60.1
Lindi	62.2	77.6	63.9	31.9	50.6	33.8
Mtwara	63.1	75.4	64.6	38.2	47.6	39.3
Ruvuma	78.3	83.2	78.7	54.5	61.2	55.0
Iringa	67.7	87.3	70.0	38.9	60.5	40.7
Mbeya	62.8	84.4	64.9	32.9	58.1	35.1
Singida	57.9	74.6	59.5	33.8	50.7	35.4
Tabora	49.7	83.2	54.4	22.7	53.7	26.9
Rukwa	64.4	80.3	66.4	28.9	48.7	31.2
Kigoma	57.7	75.6	59.6	28.2	48.0	30.1
Shinyanga	45.2	86.0	47.2	18.3	60.8	20.0
Kagera	65.2	85.2	66.0	41.4	66.5	42.2
Mwanza	55.3	83.5	58.7	26.7	56.9	29.7
Mara	71.8	87.0	73.0	40.9	58.7	42.1
Zanzibar North	41.1	46.7	41.5	19.7	23.8	20.0
Zanzibar Central	61.3	67.6	61.7	41.0	45.1	41.3
Zanzibar West	67.2	75.6	73.5	42.9	55.2	52.7
Pemba North	44.3	66.4	48.7	17.6	42.7	22.6
Pemba South	49.9	70.4	53.2	23.8	47.1	27.7
Total Mainland	61.3	83.9	64.9	35.4	59.3	38.6
Total Zanzibar	50.5	72.7	57.9	25.8	51.6	34.8

Source: 1978 Population Census Vol. VIII. Bureau of Statistics. Ministry of Planning and Economic Affairs. Dar es Salaam, 1983.



## 5.9 ATTENDANCE STATUS BY AGE AND SEX

Table 5.8 in the national summary volume shows that in terms of absolute numbers, more females than males one enrolled in school at all ages below 12. This is reflected also in the percentage distributions of the school population.

For the Tanzania Mainland, data indicate that more percentage of female population aged between 5 and 13 years attend school than male population. Between age 14 and 22 more percentage of male population attend school than female population as shown in table 8 below. This may be due to the fact that between ages 14 and 22 most of those attending school are in secondary schools where more male population get places than female population. This trend is also observed in Zanzibar. It is furthermore, worth noting that in Zanzibar higher percentage of population aged between 5 and 10 years attend school than Tanzania Mainland. The small percentage of population aged between 20 and 24 not attending school is a reflection of the fact that only a few people are enrolled past ordinary level secondary education due to slow expansion of post secondary education.

TABLE 5.7 PERCENTAGE DISTRIBUTION OF POPULATION ATTENDING SCHOOL BY AGE AND SEX: Mainland and Zanzibar, 1978 Census

Age	Mainland			Zanzibar		
	Male	Female	Total	Male	Female	Total
5	0.55	0.55	0.55	8.86	7.49	8.15
6	2.98	2.97	2.98	34.71	32.23	33.46
7	18.06	17.57	17.82	66.91	63.18	65.03
8	38.26	39.27	38.78	76.31	71.70	73.93
9	58.47	59.92	59.21	84.24	73.63	78.58
10	73.77	72.46	73.15	82.36	75.00	78.82
11	82.96	82.80	82.89	90.33	81.51	85.85
12	85.53	82.47	84.08	84.63	73.70	79.61
13	88.06	81.44	84.90	87.97	73.91	81.42
14	85.62	73.84	80.09	83.11	54.21	75.28
15	77.08	60.73	70.03	70.83	42.97	63.39
16	67.30	43.45	57.55	66.65	27.82	54.99
17	50.90	25.16	41.27	58.80	9.85	42.95
18	32.17	10.11	23.67	37.71	6.79	22.00
19	21.18	4.02	15.82	25.00	1.42	14.62
20	8.30	1.21	6.84	12.13	1.96	25.59
21	5.19	0.96	6.12	8.71	0.63	5.46
22	1.99	0.43	3.02	3.36	0.22	1.94
23	0.34	0.26	1.99	1.89	0.00	1.02
24	0.25	0.18	1.39	0.58	0.00	0.28
Total						
Number	1637331	1360428	2997759	59510	47427	106937

The 1988 census data, however, show some small increase in percentage of population attending school at ages between 19 and 24 for both Tanzania Mainland and Zanzibar. This suggests that more institution had been built between the intercensal period thus enabling more students to be enrolled in post secondary education system. Table 5.7 gives comparative data for the 1978 census

TABLE 5.8 PERCENTAGE DISTRIBUTION OF POPULATION ATTENDING SCHOOL BY AGE AND SEX Mainland and Zanzibar, 1988 Census

Age	Mainland			Zanzibar		
	Male	Female	Total	Male	Female	Total
5	0.05	0.60	0.57	1.06	1.23	1.15
6	0.15	1.83	1.69	6.13	6.38	6.26
7	6.98	8.42	7.70	21.70	22.87	22.30
8	16.74	20.98	18.88	44.47	44.55	44.51
9	32.28	40.11	36.13	62.83	59.80	61.28
10	51.65	59.45	55.51	65.83	65.87	65.85
11	68.81	75.04	71.89	78.40	79.45	78.92
12	74.13	76.64	75.38	69.42	70.69	70.05
13	78.58	78.74	78.66	72.83	72.82	72.82
14	74.02	70.95	72.47	65.57	67.48	67.53
15	59.18	52.94	56.12	52.37	52.07	52.22
16	43.67	33.41	38.48	50.65	45.00	47.64
17	26.55	17.66	22.17	46.17	32.85	38.97
18	15.07	8.23	11.41	28.23	16.74	22.05
19	11.20	4.90	7.70	21.32	10.73	15.21
20	5.93	2.08	3.71	9.87	2.50	5.46
21	4.81	1.58	3.03	6.06	3.22	4.54
22	2.70	1.12	1.82	4.06	1.00	2.33
23	1.73	0.78	1.21	3.04	1.31	2.07
24	1.33	0.65	0.96	2.04	0.92	1.46
25+	0.39	0.26	0.32	1.28	0.60	0.93
Total Number	1662485	1630299	3292884	57345	53734	111079



TABLE 5.9 PERCENTAGE DISTRIBUTION OF POPULATION 10 YEARS AND ABOVE BY REGION,SEX AND SCHOOL ATTENDANCE STATUS: 1978 Census

Region	Attending	Having Attended	Never Attended	Total Population
Dodoma	23.2	20.5	56.4	639548
Arusha	19.1	25.5	55.4	599235
Kilimanjaro	31.6	43.9	24.5	590677
Tanga	23.5	37.2	39.3	679874
Morogoro	21.0	36.9	42.1	635265
Coast	18.0	21.0	61.0	347905
Dar es Salaam	17.9	53.7	28.4	591334
Lindi	18.4	28.1	53.5	362615
Mtwara	20.4	30.4	49.2	532752
Ruvuma	28.2	41.0	33.8	370654
Iringa	25.7	26.0	48.3	590336
Mbeya	25.0	24.6	50.4	710285
Singida	22.6	24.4	53.0	411696
Tabora	16.6	23.4	60.0	542622
Rukwa	22.5	26.8	50.7	289564
Kigoma	21.5	20.5	58.0	415136
Shinyanga	16.7	17.7	65.6	850540
Kagera	20.8	37.2	42.0	671277
Mwanza	19.3	28.5	52.2	937878
Mara	27.0	29.7	43.3	462450
Zanzibar-North	16.9	12.2	70.9	47362
Zanzibar Central	25.2	23.4	51.4	33822
Zanzibar West	23.2	36.5	40.2	95099
Pemba North	19.3	11.6	69.0	62903
Pemba South	22.1	13.8	64.1	50418

TABLE 5.10 PERCENTAGE DISTRIBUTION OF POPULATION 10 YEARS AND ABOVE BY REGION, SEX AND SCHOOL ATTENDANCE STATUS: 1988 Census

Region	Attending	Having Attended	Never Attended	Total Population
Dodoma	18.8	37.0	46.1	824386
Arusha	17.2	31.7	40.9	886384
Kilimanjaro	25.4	44.1	30.4	751226
Tanga	19.3	46.7	33.7	862756
Morogoro	16.7	44.5	38.1	827660
Coast	15.1	34.8	50.2	435177
Dar es Salaam	19.2	58.3	22.0	992918
Lindi	34.7	43.4	22.0	448712
Mtwara	14.4	44.7	40.6	636283
Ruvuma	19.7	51.7	28.4	503330
Iringa	23.0	42.6	34.2	794766
Mbeya	20.3	41.3	38.2	995805
Singida	19.3	38.0	42.4	533002
Tabora	15.2	34.8	50.0	686865
Rukwa	17.9	40.3	45.7	448994
Kigoma	18.6	36.4	49.8	543793
Shinyanga	17.7	32.9	37.7	1161632
Kagera	19.6	41.6	40.9	868230
Mwanza	19.2	41.8	40.5	1253694
Mara	21.4	42.5	36.3	611576
Zanzibar North	19.3	30.8	59.9	54458
Zanzibar Central	13.9	40.9	45.1	46981
Zanzibar West	20.5	48.5	30.9	146892
Pemba North	14.8	24.3	61.3	82562
pemba South	13.3	33.2	53.3	79926
Total Mainland	18.9	42.7	38.2	12375923
Total Zanzibar	20.2	36.7	42.8	417576

## 5.10 SCHOOL ATTENDANCE STATUS BY REGION

Tables 5.9 and 5.10 give the comparative regional differentials in school attendance as depicted by the 1978 and 1988 censuses for population aged 10 years and over. As Table 5.9 shows, the 1978 Census reveals that Kilimanjaro region had the highest percentage of population aged 10 years and above attending school during the census period (31.6 percent). 43.9 percent have already attended school and 39.3 percent had never attended. The lowest percentage of population aged 10 years and above attending school of 16.6 percent was recorded in Tabora, 23.4 percent reported to have attended school and 60 percent had never attended school. On the other hand, Zanzibar North had the highest percentage of population aged 10 years and above who never attended school (70.9 percent).



The 1988 census, however, shows some improvement in school attendance. The percentage of population aged 10 years and above who never attended school dropped significantly as shown in Table 5.10. Thus for instance Tabora showed a drop from 60 in 1978 to 50 in 1988, Dodoma from 56.4 to 46.1 percent, Lindi from 53.5 to 22.0 percent, Mbeya from 50.4 in 1978 to 38.2 percent in 1988, Pemba North from 69 to 61.3 percent, Pemba South from 64.1 in 1978 to 53.3 percent in 1988. Likewise, in Zanzibar North, there was a gain from 70.9 in 1978 to 59.9 percent in 1988.

## 5.11 EDUCATION ATTAINMENT

The 1988 census data show that over 50 percent of population aged 10 years and above had completed standard 5-8 in Tanzania Mainland as depicted in Table 11. Dar es Salaam region had the highest percentage (12.9 percent) aged 10 years and above who had completed classes 9-12. This shows that there were more students enrolled in schools in Dar es Salaam region than any other region a reflection of the existence of more schools. Kilimanjaro region ranks second to Dar es Salaam with 5.2 percent, Arusha 4.7 percent and Mbeya 3.8 percent. Lindi and Mtwara regions have very low percentage of only 1.6 percent with secondary education(9-12). In general only two regions (Dar es Salaam and Kilimanjaro) had more than 5 percent of their population aged 10 years and above who had completed standard 9-12.

Zanzibar as whole had a high percentage of her population aged 10 and above who had completed standard 9-12. For instance Zanzibar West had 46.4 percent and Pemba South had 37.1 percent. Zanzibar had a high proportion of population aged 10 years and above who had completed standard 9-12 because there is compulsory secondary education up to class 11. The high educational attainment in Zanzibar may also reflect the relatively easy access to school on the Island because of the concentration of the population, children do not have to travel to get to a nearby school.

Apart from Dar es Salaam region all the regions on Mainland and Zanzibar have less than 1 percent of their population aged 10 years and above who have completed classes 13-14. Dar es Salaam region had the highest percentage of 1.5 percent. This can be explained by the fact that Dar es Salaam being the most commercialized and industrialized region attracts most of the educated people in search of job opportunities. This may also be true with the university graduates. 1.6 percent of the Dar es Salaam population aged 10 years and above have completed university education compared to less than 0.5 percent in other regions of Tanzania Mainland and Zanzibar.

All in all, Zanzibar is better off in secondary education attainment with 42.2% of her population aged 10 and above having completed standard 9-12. Dar es Salaam continued to be the leading region with over 83 percent of the population aged 10 and above having at least completed standard 5. Table 5.11 below gives a picture of regional distribution of population aged 10 and above by education attainment.

Table 5.11 PERCENT DISTRIBUTION OF POPULATION 10 YEARS AND OVER BY EDUCATIONAL ATTAINMENT: 1988 Census

Region	Class 1-4	Class 5-8	Class 9-12	Class 13-14	University	Course After Pr.School	Course after Secondary School
Dodoma	19.3	76.0	3.1	0.2	0.2	0.4	0.5
Arusha	18.5	73.0	4.7	0.4	0.4	1.6	1.2
Kilimanjaro	25.1	67.3	5.2	0.5	0.2	0.8	0.5
Tanga	26.1	67.9	3.5	0.2	0.1	1.0	0.9
Morogoro	27.4	66.2	3.2	0.2	0.3	1.2	1.1
Coast	23.8	71.6	2.4	1.0	0.1	1.0	0.7
Dar es Salaam	12.7	68.4	12.9	1.5	1.6	1.0	1.5
Lindi	30.8	64.6	1.6	0.1	0.1	1.3	1.0
Mtwara	31.0	64.6	1.6	0.1	0.1	1.5	0.9
Ruvuma	30.5	64.5	2.0	0.1	0.1	1.7	0.8
Iringa	28.3	67.9	2.0	0.1	0.1	0.8	0.5
Mbeya	24.7	70.3	3.8	0.3	0.1	0.3	0.3
Singida	24.0	72.5	2.2	0.1	0.1	0.4	0.3
Tabora	29.3	65.8	3.7	0.3	0.1	0.2	0.2
Rukwa	26.0	68.6	2.6	0.2	0.1	1.3	1.0
Kigoma	23.7	73.4	2.1	0.1	0.1	0.2	0.1
Shinyanga	22.9	72.9	2.0	0.1	0.1	0.9	0.7
Kagera	31.2	62.6	2.7	1.3	0.1	1.7	1.2
Mwanza	23.7	71.4	3.6	0.3	0.1	0.3	0.3
Mara	21.2	73.5	3.7	0.2	0.1	0.5	0.4
Zanzibar North	16.5	42.5	39.7	0.2	0.1	0.0	0.6
Zanzibar Central	15.2	43.5	39.9	0.2	0.1	0.1	0.8
Zanzibar West	10.2	38.9	46.4	1.0	0.8	0.5	1.9
Pemba North	21.3	38.1	37.1	0.5	0.2	0.2	2.3
Pemba South	19.1	40.7	37.1	0.5	0.2	0.3	1.9
Total Mainland	24.3	69.1	4.0	0.3	0.3	0.9	0.7
Total Zanzibar	14.3	40.0	42.2	0.7	0.5	0.3	1.7

The low percentage of population aged 10 years and above who had completed class 9 and above in all the regions of Tanzania Mainland except Dar es Salaam and Kilimanjaro is a reflection of limited opportunity of education beyond standard 8 in these regions. Arusha, Tanga, Morogoro, Dar es Salaam, Lindi, Mtwara, Ruvuma, Rukwa, Coast and Kagera had percentages ranging from 1 to 1.7 of their population 10 years above having completed a course after primary school. The rest of the regions and Zanzibar had less than 1 percent. Furthermore, Arusha, Morogoro, Dar es Salaam Lindi, Rukwa and Kagera had between 1.0 and 1.5 percent of their population aged 10 years and above who had completed course after secondary school. The rest of the regions in Tanzania Mainland had less than 1 percent, while Zanzibar had more than 2 percent. The age distribution according to school attendance status as show in table 5.12 elaborates on the pattern of school attendance.



TABLE 5.12 PERCENTAGE DISTRIBUTION OF POPULATION 5 YEARS AND OVER BY AGE GROUP AND SCHOOL ATTENDANCE: 1988 Census

Area	Age Group	Attending School	Having Attended School	Never Attended School	Total
Tanzania	5 - 9	12.60	0.14	87.25	100
	10-14	70.42	4.60	24.93	100
	15-19	28.94	55.77	15.08	100
	20+	0.72	51.08	47.11	100
	Total	17.83	34.84	47.33	100
Mainland	5 - 9	11.93	0.13	85.56	100
	10-14	71.98	4.55	24.15	100
	15-19	29.64	56.19	15.00	100
	20+	0.75	51.02	48.12	100
	Total	18.13	34.76	47.11	100
Zanzibar	5 - 9	25.31	40.50	74.17	100
	10-14	70.43	7.00	22.47	100
	15-19	36.35	40.68	22.95	100
	20+	1.40	44.60	53.95	100
	Total	21.30	30.97	49.05	100

The Census data indicate that 12.60 percent of the total Tanzania Population aged 5-9 years were attending school, 0.14 percent had already attended school and 87.25 percent had never attended. High proportion of never attended group is due to the fact that most of them had not reached enrollment age of 7 years. 70.42 percent of population aged 10-14 were attending school, 4.6 percent had attended and 24.93 had never attended. This is a compulsory primary school age group. For age group 15-19 only 28.94 percent were attending, 55.77 percent had already attended and 15.08 had never attended. This is secondary education level age group. Because of limited places in secondary school only a small proportion of the secondary school age group could be enrolled. At age 20 and above a small proportion of the population in this age group (0.72 percent) were attending school, 51.08 percent had attended while 47.32 had never attended school. At this age group the small proportion of population attending school is an indication of very few place at higher institution, while high proportion of population who had never attended school is an indicator for education planners that this proportion of population need attention. Adult education programmers need to be launched to reach these people.

If comparison is made between Tanzania Mainland and Zanzibar we note that higher proportion of population aged 5-9 were attending school in Zanzibar (25.31 percent) than in Tanzania Mainland with only 11.93 percent. Also at age group 15-19 Zanzibar had higher proportion (36.35 percent) attending school (Secondary level) than Tanzania Mainland (29.64). The proportion of population in Zanzibar who had never attended school was 49.05 compared

to 47.1 percent for Tanzania Mainland. It is therefore important to continue with vigor the program of literacy campaign so that those who have never been exposed to formal education can benefit too.

It is somewhat worrying that on the mainland a higher proportion of 10-14 year olds (nearly 25 percent) are shown as 'never attended' school compared with 15-19 year olds (15 percent). Unless there is substantial late enrollment after age 10, this might indicate that the recent impressive advances in education enrollment are not continuing.

Table 5.13 gives the percentage distribution of population aged 10 years attending school for rural and urban area for 1978 and 1988. The 1988 census data show for Tanzania Mainland that 25.27 percent of male population aged 10 were attending school in the rural areas and 30.45 percent in urban. For the female population 28.21 percent of those aged 10 years were attending school in the rural areas as compared to 35.49 in urban. For both sexes, 53.48 percent of the population aged 10 years were attending school in the rural areas as compared to 65.9 in urban. The total mainland population show that 54.52 of the population age 10 were attending school. Zanzibar shows a slightly higher proportion (65.86 percent) of the population age 10 were attending school. The census, however shows a rural - urban differential in the proportion of population aged 10 who were attending school. For the Zanzibar rural, 31.53 percent of male population aged 10 were attending school as compared to 41.04 percent in urban. For the female population 26.48 percent of the population aged 10 years were attending school in the rural areas as compared to 40.53 percent in urban. Total Zanzibar population had 34.7 percent of the male population age 10 who were attending school as compared to 31.16 percent of the female of the same age.

TABLE 5.13 PROPORTION OF POPULATION AGED 10 YEARS ATTENDING SCHOOL FOR RURAL AND URBAN AREAS: Mainland and Zanzibar 1978 - 1988 Census

Area	1978 Population Census			1988 population Census		
	Males	Females	Both Sexes	Males	Females	Both Sexes
Mainland Rural	36.75	35.22	71.97	25.27	28.21	53.48
Mainland Urban	39.60	43.12	82.72	30.45	35.49	65.94
Total Mainland	37.06	36.08	73.15	26.08	29.43	54.52
Zanzibar Rural	42.39	31.10	73.49	31.53	26.48	58.01
Zanzibar Urban	48.43	41.17	89.60	41.04	40.53	81.57
Total Zanzibar	42.78	36.04	78.82	34.70	31.16	65.86

It is noted from the 1988 census data that there has been a drop in the proportion of population aged 10 years who were attending school in 1978, 73.15 percent of the Tanzania Mainland population aged 10 (both sexes) were attending school at the time of census taking as compared to 54.52 percent in 1988. Total Zanzibar population aged 10 years in 1978 had 78.82 percent who were attending school as compared to 65.86 in 1988.



The high proportion of the population aged 10 years attending school in 1978 may be explained by the universal primary education (UPE) program which tried to enrol almost every child of school going age. The drop of proportion of population aged 10 years who are attending school may be an indication slackness in enrolment of population of school going age. More efforts need be directed to strengthen enrolment of population of school going age.

## 5.12 CONCLUSION

The purpose of collecting data on education during the census is to assess the success of the education achievement over a certain period. It helps also to indicate areas where attention can be put by the education planners. Often such data can be used to assess data on education from other sources. The reliability of data however depends of the coverage of the data collection the type of questionnaires used to collect it.

The 1988 census data has no doubt given some important information. From what has been discussed it is noted that there has been some significant improvement in education attainment since the 1978 census. Literacy rate has increased at regional and national level. Increasing members of student are enrolled in school at different levels and the proportion of people who have never attended school had dropped at regional and national level. It has also been noted that Dar es Salaam and Kilimanjaro region continue to lead in attracting more literate population.

Zanzibar too has shown significant improvement in education development. Although Pemba North and Zanzibar North have the highest proportion of illiterates 41.50 percent and 40.90% respectively. Zanzibar shows higher proportion of population of aged 15-19 attending secondary school. This is due their policy of compulsory education up to standard eleven.

## **CHAPTER 6**

### **ECONOMIC CHARACTERISTICS**

**By Mr. G.K. Ngoi**

#### **6.1 INTRODUCTION**

Population Censuses are usually a good and an important source of information on the economic characteristics of the population. But owing to competing needs which are invariably more than what the census questionnaire can reasonably take, only areas considered to be of major policy interest are given adequate coverage. For Tanzania these areas can be said to include demographic characteristics, migration, education and housing conditions. Unfortunately while information on economic activity is recognised as of major policy interest it is usually not given sufficient coverage in the censuses in Tanzania, both in data collection and analysis. For the 1988 population census however some commendable efforts were made to ensure the minimum availability of the economic data from the census. Three questions on economic activity were included in the long questionnaire to provide information on the usual activity, employment status and main occupation. Even though not all the data requirements were met by the Census Office this resulted in the improved availability of economic data on the population.

This chapter provides a broad summary at national level of the economic characteristics of the population from the 1988 population census data made available to the Labour Department. The main components of this information comprise: persons economic activity, employment status and main occupation with limited cross-classification by age, sex and education. Economic participation and unemployment rates can thus be calculated by age and sex. The only geographical domains used for cross tabulation for this report are total Mainland Tanzania, Rural and Urban. An attempt is made to highlight the main economic characteristics of the human resources which are of major interest not to the Labour Department but also to other planners and policy makers. This information can be compared with the results of the Labour Force Survey of 1991. More useful information remains unprocessed and it is hoped that the Census Office will be able to meet the particular data needs of the users from its research sample.

Some tables provided in the following sections repeat numeric details for the purpose of providing some basic economic data to those readers who do not have the access to the relevant census publication. It will also be observed that some totals show small differences and this, according to the census authorities, is due to the rounding after compensating for sampling fraction.



## 6.2 ECONOMICALLY ACTIVE POPULATION

The total population of age ten years and above by the 1988 Population Census was 15.2 million. The economically active population, which comprises all persons whose usual economic status was working or looking for work during the 12 month reference period was 10.6 million. The number of persons who usually did no work but were looking for work was close to 100 thousand (95,072). Because of the census questionnaire design persons who neither worked nor looked for work but might have been available for work during the most of the reference period were not counted as economically active. This is an important factor to take into account when comparison of the data on usually unemployed is made with those from the LFS results. Labour Force Survey identified and defined such persons who are in other places referred as discouraged workers, as unemployed. The information is given separately for two reference periods: over twelve months (usual) and for the previous week (current). Table 6.1 below gives the economically active population by sex and rural/urban residence. It shows that the urban population which is 19 percent of the total Tanzania Mainland population contributes about seventeen percent to the total economically active population.

TABLE 6.1 ECONOMICALLY ACTIVE POPULATION BY SEX AND GEOGRAPHICAL AREA

Geographic Area	Population 10 years +	Economically active population		
		Total	Males	Females
Mainland Tanzania				
Total	15,212,161	10,615,932	5,228,078	5,387,854
Rural	12,303,146	8,804,910	4,175,610	4,629,300
Urban	2,909,015	1,811,022	1,052,468	758,554
Zanzibar				
Total	419,172	242,592	137,730	105,519
Rural	263,360	168,597	88,422	80,832
Urban	155,812	73,995	49,308	24,687

## 6.3 PARTICIPATION RATE

The distinction of various segments of the population by their economic status allows for computation of the participation rates which show as a percentage, the number of persons participating or able and willing to participate in one way or another in the production of goods and services relative to the corresponding defined populations in those segments. These no doubt are important economic measures particularly for the Labour Department one of whose major roles is to promote the full utilization of the available human resources under the requirements of the Human Resources Deployment Act of 1983. Table 6.2 shows the participation rates of population ten years and above by five-year age groups and sex.

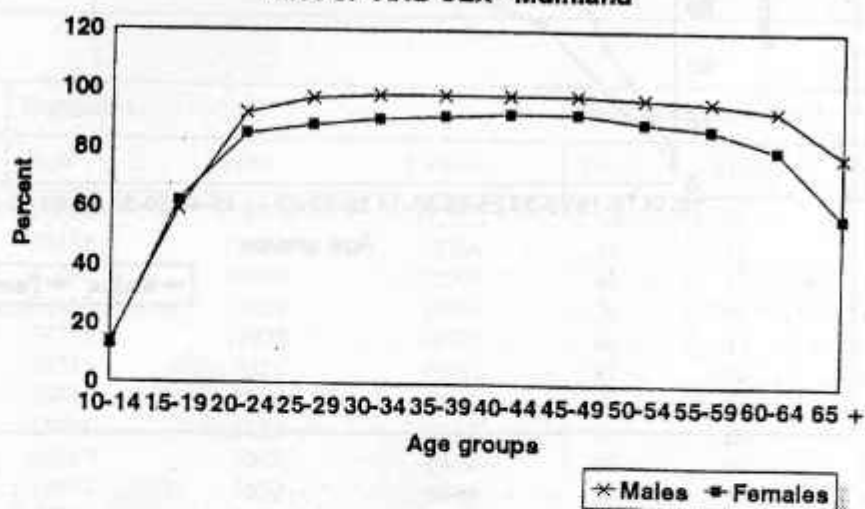
TABLE 6.2: PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE  
BY AGE GROUPS AND SEX

MAINLAND

Age Group	Population			Participation rates		
	Total	Males	Females	Total	Males	Females
TOTAL	15212161	7281650	7930511	70	72	68
10-14	2984228	1495155	1489073	14	14	13
15-19	2461681	1196418	1265263	61	59	62
20-24	1826027	803905	1022122	88	92	85
25-29	1707261	779332	927929	92	97	88
30-34	1204376	566802	637574	94	98	90
35-39	1055605	506068	549537	94	98	91
40-44	770188	359689	410499	94	98	92
45-49	705080	346714	358366	95	98	92
50-54	599824	279483	320341	93	97	89
55-59	455070	233832	221238	92	96	87
60-64	424716	198144	226572	86	93	80
65 +	959087	494352	464735	68	78	57
Not State	59018	21756	37262	57	63	54

Chart 6.1

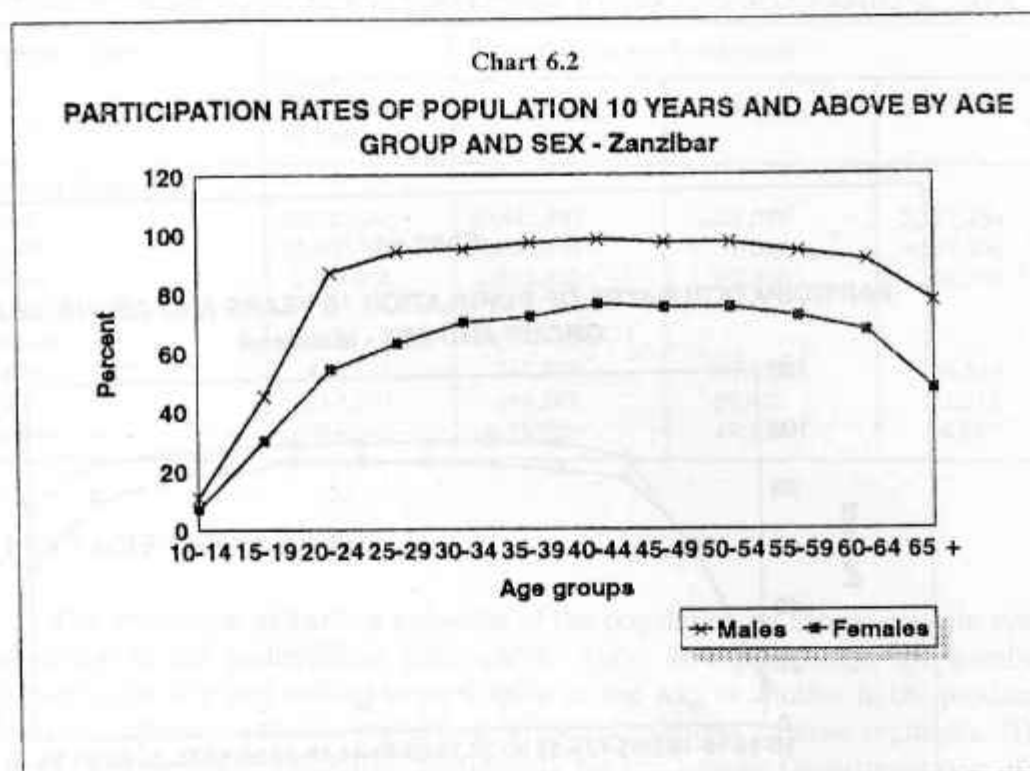
PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE  
GROUP AND SEX - Mainland





# ZANZIBAR

Age Group	Population			Participation rates		
	Total	Males	Females	Total	Males	Females
TOTAL	419172	201575	217597	58	68	48
10-14	79684	40612	39072	9	11	7
15-19	68850	32431	36419	37	45	30
20-24	51968	22577	29391	68	87	54
25-29	49695	23105	26590	78	94	63
30-34	32838	15563	17275	82	95	70
35-39	27663	13439	14224	84	97	72
40-44	21983	9652	12331	86	98	76
45-49	17496	9114	8382	87	97	75
50-54	17906	8377	9529	85	97	75
55-59	10440	6024	4416	85	94	72
60-64	14554	7453	7101	79	91	67
65 +	25447	12998	12449	62	77	47
Not Stated	648	230	418	49	45	52



The participation rates are shown to be highest for rural population and particularly for males. The overall low rates of participation of females is due to the remarkably low rates of urban females. The total participation rate of urban females is 52 percent compared to 72 percent for their rural counterparts. In the absence of further information on the part of the population not economically active from the census it is difficult to draw useful conclusion on these rates, particularly for urban female population. Nevertheless the indications suggest that there is a sizeable amount of human resources which is yet to be activated economically to achieve the full utilization of the resources especially in urban areas.

TABLE 6.3 PARTICIPATION RATES OF RURAL POPULATION 10 YEARS AND ABOVE BY AGE GROUPS AND SEX

MAINLAND

Age Group	Population			Participation rates		
	Total	Males	Females	Total	Males	Females
TOTAL	12303146	5829646	6473500	72	72	72
10-14	2493244	1258587	1234657	15	15	15
15-19	1970063	965228	1004835	64	61	67
20-24	1397942	607063	790879	93	93	92
25-29	1302587	580867	721720	95	97	94
30-34	925894	420067	505827	96	98	94
35-39	826930	380691	446239	96	98	95
40-44	622950	276506	346444	96	98	95
45-49	584779	276917	307862	96	98	95
50-54	510697	229976	280721	94	97	92
55-59	391524	197836	193688	93	97	89
60-64	371749	173073	198676	88	94	82
65 +	854262	444452	409810	69	79	58
Not Stated	50525	18383	32142	59	63	56

ZANZIBAR

Age Group	Population			Participation rates		
	Total	Males	Females	Total	Males	Females
TOTAL	263360	126107	137253	64	70	59
10-14	50122	26356	23766	12	13	10
15-19	42163	19855	22308	45	51	40
20-24	31117	13033	18084	76	89	67
25-29	30755	13978	16777	84	94	76
30-34	20233	9351	10882	87	95	81
35-39	16810	7998	8812	90	97	83
40-44	13986	5823	8163	92	98	87
45-49	10837	5387	5450	93	97	87
50-54	12076	5530	6546	91	98	86
55-59	6763	3876	2887	91	96	85
60-64	9978	5274	4704	87	91	78
65 +	18042	9474	8568	67	77	55
Not Stated	478	172	306	50	45	54



Chart 6.3

**PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE GROUPS AND SEX - Mainland Rural**

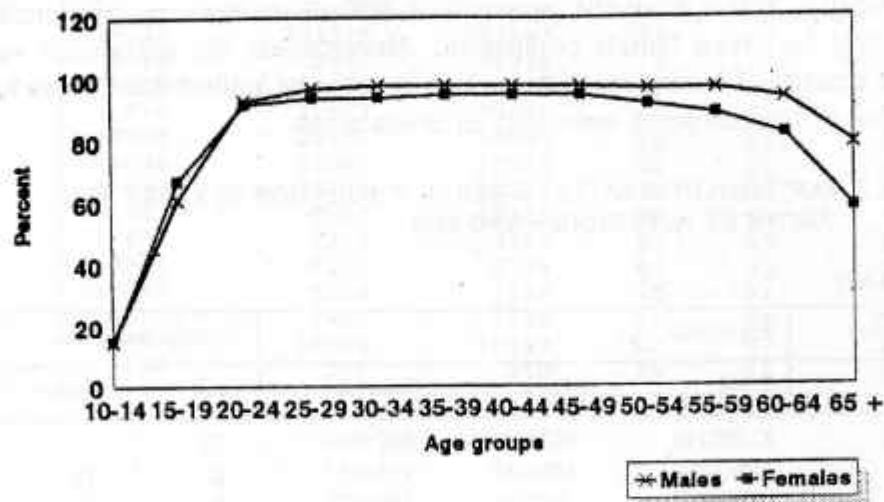


Chart 6.4

**PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE GROUPS AND SEX - Zanzibar Rural**

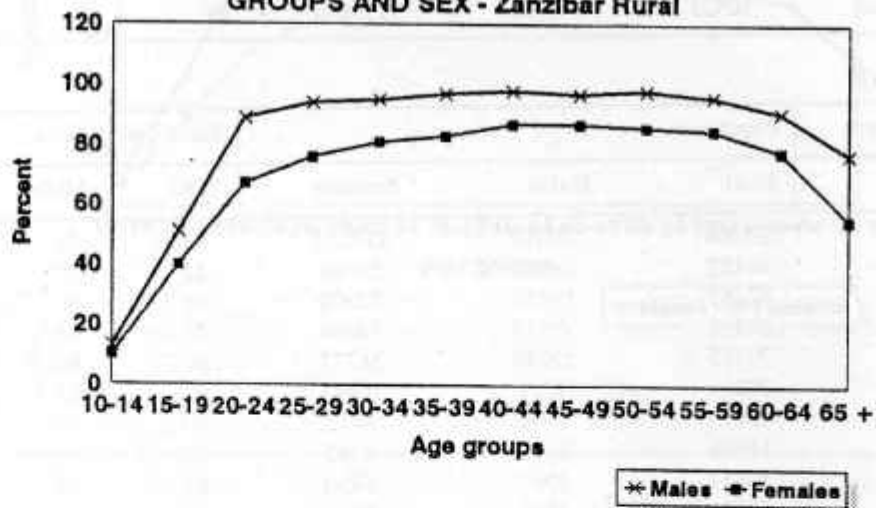


TABLE 6.4 PARTICIPATION RATES OF URBAN POPULATION 10 YEARS AND ABOVE  
BY AGE GROUPS AND SEX

MAINLAND

Age Group	Population			Participation rates		
	Total	Males	Females	Total	Males	Females
TOTAL	2909015	1452004	1457011	62	72	52
10-14	490984	236568	254416	7	7	7
15-19	491618	231190	260428	47	53	42
20-24	428085	196842	231243	73	87	62
25-29	404674	198465	206209	81	95	67
30-34	278482	146735	131747	85	97	72
35-39	228673	125377	103298	86	97	73
40-44	147238	83183	64055	87	97	75
45-49	120301	69797	50504	88	97	75
50-54	89127	49507	39620	85	95	73
55-59	63546	35996	27550	82	91	71
60-64	52967	25071	27896	75	87	64
65 +	104825	49900	54925	59	73	46
Not Stated	8493	3373	5120	51	62	44

ZANZIBAR

Age Group	Population			Participation rates		
	Total	Males	Females	Total	Males	Females
TOTAL	155812	75468	80344	47	65	31
10-14	29562	14256	15306	4	5	2
15-19	26687	12576	14111	24	36	14
20-24	20851	9544	11307	57	84	34
25-29	18940	9127	9813	67	94	42
30-34	12605	6212	6393	73	96	51
35-39	10853	5441	5412	75	97	54
40-44	7997	3829	4168	75	97	56
45-49	6659	3727	2932	77	96	53
50-54	5830	2847	2983	73	94	53
55-59	3677	2148	1529	73	92	48
60-64	4576	2179	2397	63	83	44
65 +	7405	3524	3881	48	71	28
Not Stated	170	58	112	45	43	46



Chart 6.5

**PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE GROUP AND SEX - Mainland Urban**

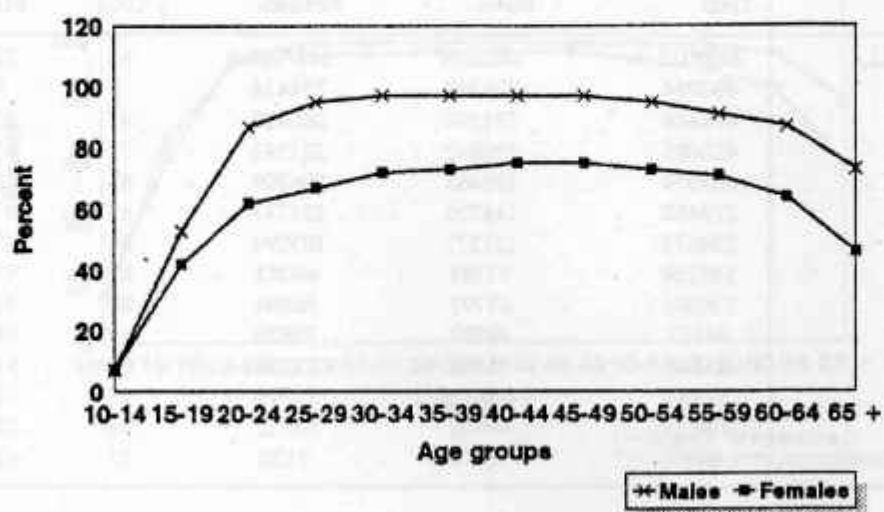
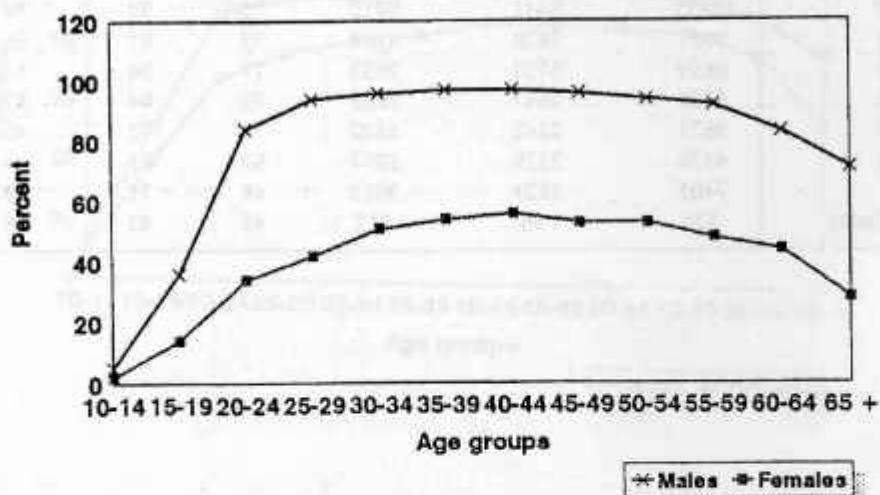


Chart 6.6

**PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE GROUP AND SEX - Zanzibar Urban**



According to the 1990/91 Labour Force Survey one fifth of the economically inactive population in urban areas is engaged in non-economic house work, mostly involving women. House work absorbs close to one third of the urban inactive female population and thus is a sizeable able-bodied population lowering the participation of women in economic activities in general. Attending school forms a large component of the inactive population in both urban and rural areas (64 and 69 per cent respectively).

TABLE 6.5 PERCENTAGE DISTRIBUTION OF POPULATION NOT ECONOMICALLY ACTIVE BY ARE AND SEX: Mainland Tanzania

Area	Classification						
	Total	Household worker	Student	Too old	Sick	Disabled	Other
<b>TOTAL</b>							
Total	100.0	11.8	67.6	7.0	8.8	1.8	2.9
Male	45.9	3.3	35.1	2.1	3.2	1.0	1.2
Female	54.1	8.5	32.5	4.9	5.5	0.9	1.7
<b>RURAL</b>							
Total	100.0	20.0	64.1	3.8	6.1	1.0	2.9
Male	38.5	1.3	32.0	1.2	2.0	0.4	1.6
Female	61.5	18.7	32.2	4.6	4.1	0.7	1.3
<b>URBAN</b>							
Total	100.0	9.5	68.6	7.4	9.5	2.0	2.9
Male	48.1	3.9	36.0	2.4	3.6	1.1	1.1
Female	51.9	5.6	32.6	5.0	6.0	0.9	1.8

Source: 1990/91 Labour Force Survey, Table 8.2.1

TABLE 6.6 PERCENTAGE DISTRIBUTION OF POPULATION NOT ECONOMICALLY ACTIVE BY AGE: Mainland Tanzania

Age	Classification						
	Total	Household worker	Student	Too old	Sick	Disabled	Other
<b>TOTAL</b>		11.8	67.6	7.0	8.8	1.8	2.9
10-14	100	9.0	86.8	0.0	1.4	0.9	1.9
15-19	100	8.5	83.0	0.0	4.9	0.5	3.1
20-24	100	38.2	26.9	0.0	22.9	3.4	8.7
25-34	100	39.4	3.1	0.0	41.4	6.0	10.2
35-54	100	27.6	0.1	3.3	53.6	7.3	8.1
55 +	100	4.4	0.0	70.6	19.4	5.0	0.5

Source: 1990/91 Labour Force Survey, Table 8.3.2



As Table 6.7 shows, education enhances the chances of individuals participation in economic activities. The participation rates of both sexes generally tend to rise with the level of education but this relationship is shown best by the urban population and particularly the female population (Table 2.3). Training after completing school, regardless of the level completed, promotes further the individuals participation over and above effects of the level of education. The female differential participation rates in rural and urban areas persist across all education groups, but for males it is only those with low education levels (primary or less) who have to lower participation rates in urban areas.

TABLE 6.7 POPULATION AND PARTICIPATION RATES OF PERSONS 10 YEARS AND ABOVE BY EDUCATION LEVEL AND SEX - Mainland Total

Education level	Population			Labour force			Participation rate		
	Total	Male	Female	Total	Male	Female	Total	Male	Fem.
TOTAL	15164854	7259292	7905562	10582861	5211469	5371392	70	72	68
Never to sch.	5801038	2124268	3676770	4690030	1713518	2976512	31	81	81
Prim. not compl.	2081969	1223822	858147	1898096	1157396	740700	91	95	86
Primary completed	3971086	2139767	1831319	3552022	2033369	1518653	89	95	83
Form 4 not compl.	66814	45812	21002	56842	42604	14238	85	93	68
Form 4 completed	198423	131511	66912	179948	125364	54584	91	95	82
Form 6 not compl.	1133	837	296	964	722	242	85	86	82
Form 6 completed	22882	18578	4304	21030	17458	3572	92	94	83
University/ other	21136	17449	3687	19933	16759	3174	94	96	86
Course after Prim.	62202	38987	23215	58322	36862	21460	94	95	92
Course after Sec.	51508	37949	13559	49643	36869	12774	96	97	94
Attending school	2867068	1470458	1396610	55900	30450	25450	2	2	2
Not stated	19595	9854	9741	131	98	33	1	1	0

TABLE 6.8 POPULATION AND PARTICIPATION RATES OF PERSONS 10 YEARS AND ABOVE BY EDUCATION LEVEL AND SEX - Mainland Rural

Education level	Population			Labour force			Participation rate		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
TOTAL	12284660	5821091	6463569	8792008	4169681	4622327	72	72	72
Never to school	5196724	1921084	3275640	4291638	1565141	2726517	83	81	83
Primary not compl.	1710635	1023228	687407	1602339	974061	628278	94	95	91
Primary completed	2892748	1563076	1329672	2703383	1495527	1207856	93	96	91
Form 4 not compl.	27675	20142	7533	25339	18917	6422	92	94	85
Form 4 completed	60593	45085	15508	57481	43524	13957	95	97	90
Form 6 not compl.	409	335	74	379	313	66	93	93	89
Form 6 completed	4586	3867	719	4273	3644	629	93	94	87
University/other	3589	3141	448	3412	3007	405	95	96	90
Course after Pr.	37377	24452	12925	35797	23426	12371	96	96	96
Course after Sec.	21657	17317	4340	21005	16821	4184	97	97	96
Attending school	2313530	1193537	1120002	46821	25211	21610	2	2	2
Not stated	13128	5827	7301	121	89	32	1	2	0

TABLE 6.9 POPULATION AND PARTICIPATION RATES OF PERSONS 10 YEARS AND ABOVE BY EDUCATION LEVEL AND SEX - Mainland Urban

Education level	Population			Labour force			Participation rate		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
TOTAL	2880194	1438201	1441993	1790853	1041788	749065	62	72	52
Never to school	604314	203184	401130	398372	148377	249995	66	73	62
Primary not compl.	371334	200594	170740	295757	183335	112422	80	91	66
Primary completed	1078338	576691	501647	848639	537842	310797	79	93	62
Form 4 not compl.	39139	25670	13469	31503	23687	7816	80	92	58
Form 4 completed	137830	86426	51404	122467	81840	40627	89	95	79
Form 6 not compl.	724	502	222	585	409	176	81	81	79
Form 6 completed	18296	14711	3585	16757	13814	2943	92	94	82
University/other	17547	14305	3239	16521	13752	2769	94	96	85
Course after Pm.	24825	14535	10290	22525	13436	9089	91	92	88
Course after Sec.	29851	20632	9219	28638	20048	8590	96	97	93
Attending school	551529	276921	274608	9079	5239	3840	2	2	1
Not stated	6467	4027	2440	10	9	1	0	0	0

The comparison of the participation rates from the 1978 and 1988 population censuses shows a remarkable shift. First there is a big rise in the participation of the young population under 25 years. Above this age however there is a gradual decline in the overall participation rates resulting from falls in participation rates for both sexes but steeper for females. The rise in participation rate of the younger population may be attributed to the growth of the informal sector but the fast growing urban population does seem to have a diminishing effect not only in the participation of women but also in the overall participation of the total population (See Charts below) due to a lack of employment opportunities. In 1967 the urban population was 6.76 percent and increased to 13.25 and 19.1 percent of the total Tanzania mainland population of 1978 and 1988 respectively.

TABLE 6.10 PERCENTAGE DISTRIBUTION OF PARTICIPATION RATES FROM 1978 AND 1988 POPULATION CENSUSES

Age	Population		Males		Females	
	1978	1988	1978	1988	1978	1988
10-14	3	14	2	14	5	13
15-19	44	61	33	59	54	62
20-24	85	88	85	92	87	85
25-29	93	92	96	97	91	88
30-34	96	94	98	98	94	90
35-39	97	94	99	98	95	91
40-44	97	94	99	98	96	92
45-49	97	95	99	98	95	92
50-54	96	93	98	97	94	89
55-59	95	92	98	96	91	87
60-64	91	86	96	93	85	80



Chart 6.7

**PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE GROUPS  
AND SEX - Mainland (Rural/Urban)**

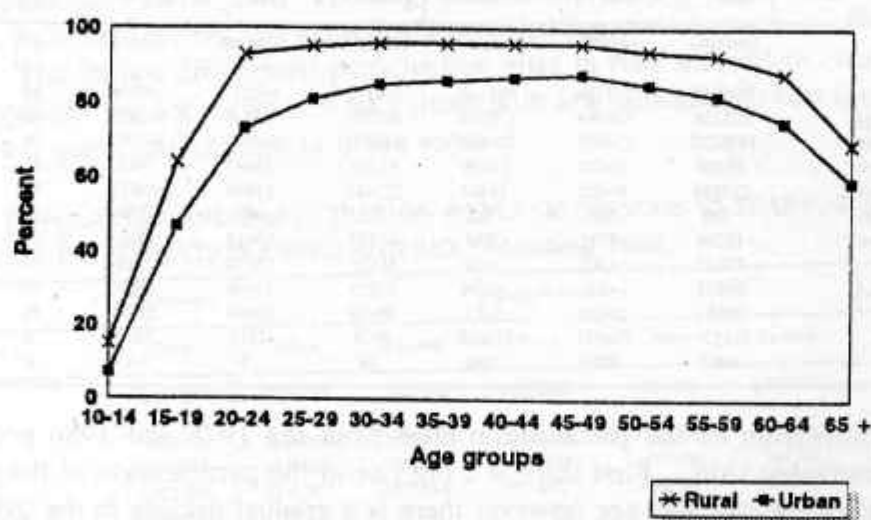
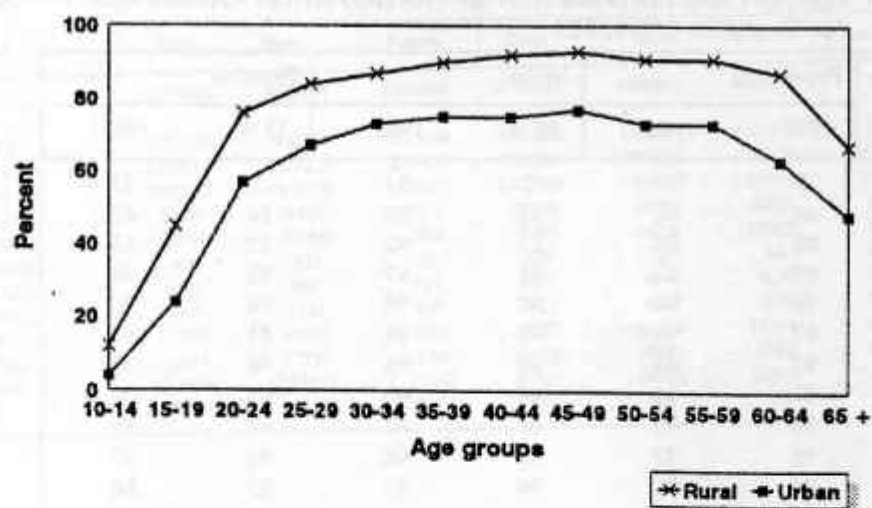


Chart 6.8

**PARTICIPATION RATES OF POPULATION 10 YEARS AND ABOVE BY AGE GROUPS  
AND SEX - Zanzibar (Rural/Urban)**



## 6.4 UNEMPLOYMENT

All persons aged 10 years and above who were without work (paid or self), were available for work and seeking work, were classified as unemployed. The rate of unemployment is obtained by dividing the number of persons looking for work by the total Labour Force. The 1988 Census shows the overall unemployment rate (of the usually unemployed) is insignificant at 1 percent, 3 percent for the urban usually economically active population. But detailed examination of the problem shows that there are sharp age specific and gender specific differences. The unemployment rate is significantly high for the urban youth particularly those less than 25 years of age (Table 3.1). For example where as the overall unemployment rate for 15 - 19 years old is 3 per cent the corresponding rate for urban areas is 10 percent. Females are shown to have higher rates of unemployment for education levels above primary (Table 3.3 also Chart 5).

The general low unemployment rates from census data are not surprising for two reasons. The long reference period (Last 12 Months) eliminated individuals who experienced short spell unemployment which from the 1990/91 Labour Force Survey has been shown to be high among the employed (26% - LFS Summary: Section 6.5). Short spell unemployment is particularly strong in rural areas where it is highly correlated with on-and-off season patterns. Also as mentioned earlier the strict definition of unemployment used in the census might have caused further underenumeration of the unemployed since not all individuals who are able and willing to work take active steps of looking for work for a number of reasons, one being not knowing how and where to get a job/employment. By using a broader definition of unemployment which includes also individuals who did not work but were available for work during the reference period, the 1990/91 Labour Force Survey provides a higher overall unemployment rate of 3% for the same reference period (last 12 months).

Low unemployment rates from the two sources are difficult to reconcile with the existence of and the growing number of small groups of youths seen roaming about in the streets or sitting idle in places commonly known as jobless corner, the situation which lures them to engage themselves in drug pushing and other antisocial behaviour. These results tend to suggest that there is still a need for identifying appropriate definition of unemployment and a set of rules to be applied in order to come up with a reasonable measure. By using the International definition of unemployment and relaxing the rule "to be looking for work", the 1990/91 Labour Force Survey came out with an estimate of 1.2 million employed people who during the reference week did not do any work (absent from work). Nearly half a million (LFS Technical Report Pg. 41) of them said "can't find more work" or "No suitable land" as a reason for not working. It does seem much of this group may have been actually unemployed but by the existing rules were classified as employed.



TABLE 6.11 UNEMPLOYMENT RATES OF PERSONS 10 YEARS AND ABOVE BY FIVE YEAR AGE GROUP BY RURAL AND URBAN - BOTH SEXES

Age Group	Usually economically active			Unemployment rates		
	Total	Rural	Urban	Total	Rural	Urban
TOTAL	10615932	8804910	1811022	1	1	3
10-14	406320	371586	34734	3	2	9
15-19	1492135	1259937	232198	3	2	10
20-24	1607792	1293818	313974	1	1	5
25-29	1569215	1241012	328203	1	0	2
30-34	1126403	889634	236769	0	0	1
35-39	994056	797319	196737	0	0	1
40-44	727353	598657	128696	0	0	1
45 +	2658763	2323386	335377	0	0	0
Not stated	33895	29561	4334	0	0	1

TABLE 6.12 UNEMPLOYMENT RATES OF PERSONS 10 YEARS AND ABOVE BY FIVE YEAR AGE GROUPS AND SEX

Age Group	Males			Females		
	Usually economically active	Looking for work	Unemployment rate	Usually economically active	looking for work	Unemployment rate
TOTAL	5228078	61601	1	5387854	33471	1
10-14	207697	6413	3	198623	4535	2
15-19	708166	27088	4	783969	15337	2
20-24	737437	15583	2	870355	8352	2
25-29	754009	6284	1	815206	2559	1
30-34	554156	2047	0	572247	918	0
35-39	496076	1257	0	497980	546	0
40-44	351574	1130	0	375779	382	0
45 +	1405363	1762	0	1253398	793	0
Not stated	13598	37	0	20297	49	0

TABLE 6.13 POPULATION AND PARTICIPATION RATES OF PERSONS 10 YEARS AND ABOVE BY EDUCATION LEVEL AND SEX - Mainland Urban

Education level	UNEMPLOYMENT RATE								
	TOTAL			RURAL			URBAN		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
TOTAL	1	1	1	1	1	0	3	3	2
Never attended school	0	1	0	0	0	0	1	2	1
Primary not completed	0	1	0	0	0	0	1	2	1
Primary completed	2	2	1	1	1	1	4	4	4
Form 4 not completed	2	1	4	2	1	3	2	1	4
Form 4 completed	5	3	7	5	4	9	4	3	7
Form 6 not completed	2	1	4	1	2	0	2	1	6
Form 6 completed	4	3	5	5	4	6	3	3	5
University and other	1	1	1	1	1	2	1	1	0
Course after Primary	2	1	2	1	1	1	3	2	3
Course after Secondary	1	1	1	1	1	0	1	1	1
Attending school	5	5	5	4	4	4	12	10	15
Not stated	0	0	0	0	0	0	0	0	0

## 6.5 USUALLY EMPLOYED POPULATION

Table 6.14 and Table 6.15 show the distribution of usually employed population 10 years and above by occupation and status of employment respectively. Cultivators predominate, involving 78 percent of the total working population. They represent the strength behind the base of the economy as a whole, an area providing a widespread impetus for social and economic development. Occupational pattern of males and females differ remarkably with males predominating in all occupations except in traditional agriculture and clerical jobs where females are fairly represented.

TABLE 6.14 POPULATION 10 YEARS AND ABOVE BY MAIN OCCUPATION AND SEX

Occupation	Total	Colum % of total	Male	Female	% of females to total
Total	15211353	100.0	7281132	7930221	52
Legislators, admins. & managers	41499	0.3	35980	5519	13
Proffs, techns. & teachers	331978	2.2	243735	88243	27
Clerks	105657	0.7	58340	47317	45
Service and shop sales workers	269617	1.8	163950	105667	39
Cultivators	8246841	54.2	3656216	4590625	56
Mixed farming	760676	5.0	425069	335607	44
Agricultural workers	36669	0.2	29505	7164	20
Craftsman and machine operators	227716	1.5	205934	21782	10
Smallscale traders and labrs.	379517	2.5	275939	103578	27
Other workers	99780	0.7	61544	38236	38
Not employed	4637635	30.5	2085224	2552411	55
Not stated	73768	0.5	39696	34072	46



As Table 6.15 shows the most common status of employment of both males and females is own account worker (86 percent). Employees are the second largest group but account for only 9 percent of the total working population. Females in own-account and unpaid family workers categories exceed males but are far less represented in other economic status categories.

TABLE 6.15 POPULATION 10 YEARS AND ABOVE BY EMPLOYMENT STATUS AND SEX

Employment status	Total	Male	Female	% of Female of total
Total	15212181	7281644	7930537	52
Employer	53175	38399	14776	28
Employee	955220	718689	236531	25
Own account	9091552	4233025	4858527	53
Unpaid family worker	326463	203603	203603	62
Other	40528	12570	12570	31
Not stated	4745243	2604530	2604530	55

Overall, Tanzania workforce is young with over 50 percent less than thirty years. The age distribution is similar among the different employment status groups though employers and own account workers groups have relatively a higher proportion of workers of older ages. Table 6.16 shows the age structure of workers in each employment status group.

TABLE 6.16 PERCENTAGE DISTRIBUTION OF POPULATION 10 YEARS AND ABOVE BY FIVE YEAR AGE GROUPS AND EMPLOYMENT STATUS

Age Group	Total	Employer	Employee	Own account	Unpaid family worker	Other	not state
Population	15212181	53175	935220	9091552	326463	40528	4745243
Total	100	100	100	100	100	100	100
10-14	20	2	1	3	23	8	55
15-19	16	9	8	14	30	18	22
20-24	12	16	15	15	16	18	5
25-29	11	18	21	14	10	17	3
30-34	8	14	18	10	5	10	2
35-39	7	13	14	9	4	8	1
40-44	5	8	5	7	3	5	1
45-49	5	6	7	7	2	5	1
50-54	4	5	4	6	2	3	1
55-59	3	4	2	4	1	3	1
60-64	3	2	1	4	1	2	1
65 +	6	4	1	7	2	4	7
Not stated	0	0	0	0	0	0	1

## 6.6 SCHOOL ATTENDANCE

Tables 6.17 and 6.18 show occupational pattern and employment status respectively of the population 10 years and over by sex and school attendance. Of the total working population 45 percent has never attended school, three out of five of these workers being females. Only five percent of this groups are engaged in non-agricultural occupations.

As Table 6.18 shows attending school broadens the individuals choice for the preferred status in economic participation. Individuals who have never attended school are restricted to work as own account or unpaid family workers mostly in agriculture. This has a bearing in the design of any employment policy that will effect progress for the cross section of the population e.g. promotion of employment in the informal sector.

TABLE 6.17 POPULATION 10 YEARS AND OVER BY SEX SCHOOL ATTENDANCE AND MAIN OCCUPATION: Mainland

SEX AND SCHOOL ATTENDED	OCCUPATION												
	LEGIS. PROFS.				SERV.			CRAFTS/SCALE					NOT STAT.
	TOTAL	ADMIN.	TECHN.		& SHOP	CULTI-	MIXED	AGRIC.	& MCH.	TRDRS&	OTHER		
		MNGRS	TCHRS	CLERKS	SALES	VATOR	FARM.	WKRS	OPERS	LABORS	WKRS		
<b><u>BOTH SEXES</u></b>	10487880	41319	330086	104996	267852	8228199	756824	36531	225853	376905	99667	19648	
COLUMN %	100	100	100	100	100	100	100	100	100	100	100	100	
NEVER ATTEND.	45	4	3	3	18	49	59	15	9	19	27	39	
ATTENDING	1	0	0	1	0	0	1	0	0	0	1	22	
LEFT	55	95	97	96	81	51	41	84	91	81	72	39	
ATTE. N/S	0	0	0	0	0	0	0	0	0	0	0	0	
<b><u>MALES</u></b>	5149915	35811	24508	58051	163127	3648989	423052	29419	204202	273794	61476	9486	
COLUMN %	100	100	100	100	100	100	100	100	100	100	100	100	
NEVER ATTEND.	33	4	4	3	14	38	51	13	8	15	23	35	
ATTENDING	1	0	0	1	0	1	1	0	0	0	1	24	
LEFT	66	96	96	96	85	62	49	87	91	85	76	41	
ATTE. N/S	0	0	0	0	0	0	0	0	0	0	0	0	
<b><u>FEMALES</u></b>	5337965	5508	87578	46945	104725	4579210	333772	7112	21651	103111	38191	10162	
COLUMN %	100	100	100	100	100	100	100	100	100	100	100	100	
NEVER ATTEND.	56	8	2	4	24	58	70	26	13	30	33	43	
ATTENDING	0	1	0	1	0	0	0	0	0	0	1	20	
LEFT	44	91	98	95	75	42	30	74	86	70	67	37	
ATTE. N/S	0	0	0	0	0	0	0	0	0	0	0	0	



TABLE 6.18 POPULATION 10 YEARS AND ABOVE BY SEX, SCHOOL ATTENDANCE  
AND EMPLOYMENT STATUS

Sex and school attendance	Total	Percent total	Employment status					
			Employer	Employee	Own account	Unpaid family worker	Other	Not stated
<b>Both sexes</b>	10488027	100	1	9	86	3	0	1
Never attended	4676198	100	0	2	94	3	0	0
Attending	52980	100	0	6	75	8	0	10
Left school	5758721	100	1	15	81	3	0	0
Not stated	128	100	3	0	85	12	0	0
<b>Males</b>	5149967	100	1	14	82	2	0	0
Never attended	1704785	100	0	4	92	3	0	1
Attending	28883	100	1	8	73	7	0	11
Left school	3416204	100	1	19	77	2	0	0
Not stated	95	100	4	0	96	0	0	0
<b>Females</b>	5338060	100	0	4	91	4	0	1
Never attended	2971413	100	0	1	95	4	0	0
Attending	24097	100	0	4	77	8	0	10
Left school	2342517	100	0	9	85	4	0	1
Not stated	33	100	0	0	55	45	0	0

## **CHAPTER 7**

### **MORTALITY LEVELS AND DIFFERENTIALS**

by Akim J. Mturi<sup>1</sup> and Josibert J. Rubona<sup>2</sup>

#### **7.1 INTRODUCTION**

The application of indirect techniques has been a powerful tool in the estimation of mortality levels and differentials in developing countries. This is basically due to the fact that unreliable registration systems make census and surveys the richest source of mortality Statistics in these Countries. Tanzania is no exception. Retrospective questions included in census questionnaires have made population censuses the main source of mortality statistics in Tanzania.

Three types of mortality data were collected during the 1988 population census of Tanzania. The first set of data is the information reported by females on children surviving of those ever born alive. This information is used to derive the estimates of infant and child mortality. The second is deaths reported in the house-hold during twelve months prior to the census. This information on recent mortality can be used in obtaining estimates of adult mortality. The last set of mortality information was obtained through the question "is your mother still alive?", and this information can be used to yield estimates of adult female mortality.

It should be noted that there are various differences between mortality data collected during the 1988 population census as compared to that of the 1978 population census. Information on deaths during the previous twelve months was not collected during the 1978 population census (Sembwaje, 1983) whereas during 1988 population census, the question on the survival status of the spouse (widowhood data) was excluded. The differences are of much interest especially when comparing the final estimates derived for the two censuses.

#### **7.2 CHILD MORTALITY ESTIMATES**

The responses to the retrospective mortality questions discussed in the introductory part of this chapter are known to be affected by a number of problems. In reporting the number of children ever born and children surviving, women especially older ones, tend to omit some of their live born children particularly those who died a long time ago. This problem however is minimised by asking four questions which assist both the women to recall some of the children who would have been forgotten and the interviewer to check for the consistency of the information given. The eligible women are asked to report separately: Children ever born, children living at home, children living away from home and children dead. The distribution of the number of children ever born by five year age groups of women for the whole Tanzania indicates that generally the omission of children ever born is not a very serious problem since children ever born increase as the age of women increases (refer to fertility chapter of this

<sup>1</sup>Lecturer, University of Dar es Salaam <sup>2</sup>Statistician/Demographer, Ministry of Health



volume). This remains true even at older ages where omission of live births is supposed to be at a maximum. However, some minor omissions may have occurred which cannot be detected in standard comparisons, so that the results derived for earlier time periods, based on older women's reports, may be slightly biased downwards.

### Computational procedures

The indirect technique used to give estimates of infant and child mortality is that developed by Brass (1975). Trussell's coefficients (Trussell, 1975) are used for the computation of multipliers which are consequently used for converting the proportion of children dead as reported by mothers of different ages into probabilities of dying for specific ages of children. Trussell's version is selected because it allows for more freedom in the fertility schedule specification. Evidence from the 1967 census and National Demographic Survey indicates that the North Family of the Coale and Demeny Model life tables has a mortality pattern which is similar to that of Tanzania.

The details of the computational procedure can be obtained from the United Nations manual X (U.N.; 1983). As an example see appendix 1. First step, the average parities,  $p(i)$ , are computed by dividing the number of children ever born by the number of women in each age group, whereas the proportions children dead,  $D(i)$ , are obtained by dividing the reported children dead by reported children ever born. The Trussell's multipliers,  $k(i)$ , which convert proportion of children dead to the probabilities of dying are calculated by using the following equation:-

$$k(i) = a(i) + b(i) \cdot P(1)/P(2) + c(i) \cdot P(2)/P(3)$$

where  $(i)$  represents the age group of women which ranges from 1 to 7 for age group 15-19, 20-24; :: ::, 45-49,  $a$ ,  $b$  and  $c$  are coefficients provided for each four different families of model life tables in the Coale and Demeny System and  $P(1)$ ,  $P(2)$  and  $P(3)$  are average parities for women in age group 15-19, 20-24 and 25-29 respectively. The product of each multiplier with the corresponding proportion children dead give the probability of dying.

$$q(x) = K(i) \cdot D(i)$$

where  $x$  is the average age of the children of women in age group  $(i)$ . An estimate of the number of years,  $t(x)$ , before the survey date to which the infant and child mortality estimates refer is given by the equation:

$$t(x) = A(i) + B(i) \cdot P(1)/P(2) + C(i) \cdot P(2)/P(3)$$

where  $A$ ,  $B$ , and  $C$  are coefficients estimated from a simulated cases by using a linear regression (Trussell, 1975) and these are given according to different families of Coale and Demeny Model life tables. Appendix 7.1 shows the sets of coefficients  $a$ ,  $b$ ,  $c$ , and  $A$ ,  $B$ ,  $C$  used in the fitting procedures. Appendix 7.1 also shows the mean parities  $P(i)$  and reported proportions dead from

in the census output at national level, used as input into these calculations and the resulting national level estimates of  $q(x)$  and  $t(x)$  together with corresponding values IMR and U5MR implied by comparison to tabulated model life tables.

The final mortality estimates are based on the reports of women aged between 25 to 34 years, which are considered to be the most reliable. The estimates for these women refer on the average to three years prior the census date. Estimates were made in the same way for each region though the details are not shown here. Table 5 gives the estimates of infant

mortality rate (IMR) and under five mortality rate (U5MR) for all regions in Tanzania. IMR are deaths under one year of age and U5MR are deaths under five year of age both given per 1000 live births.

The result obtained suggests that out of 1000 new born babies in Tanzania, 115 die before celebrating their first day whereas 192 die before celebrating their fifth birth day.

### **7.3 ADULT MORTALITY ESTIMATES**

In estimating adult mortality all three sets of information on mortality have been used, and the results have been compared in order to get the best estimates. Detailed analysis on three sources of information is provided in the following sub-headings:-

- (a) One parameter model life table
- (b) Two parameter relational life table and
- (c) Adult estimation using orphanhood data

#### **(a) One parameter model life table**

Estimation of life expectancy at birth have been computed with the application of IMR and U5MR results. Methodological procedure is to perform an extrapolation on that results. In this case, a fixed pattern of one parameter model life table levels has been applied and making a use of the north family of Coale and Demeny with the assumption that, sex ratio for the population in Tanzania is 103 males per 100 females.

The results for Tanzania indicate that the life table level is 13.1 which gives life expectancy at birth for both sexes combined of 49 years. This implies that a new born baby will live on average of 49 years.

#### **(b) Two parameter relational model life table**

The information of the number of deaths during the twelve months prior to the census reported by the head of the household, have to be treated more carefully in the analysis of adult mortality, as it is affected by several problems including reluctance of respondents to talk about



recent dead relatives, inability to remember dates of deaths, mis-interpretation of the past one year to be the same calendar year, and the break-up of a household as a result of an adult death. These are among the serious problems which cause under-reporting of deaths. The degree of completeness in reporting deaths beyond age five however, can be adjusted by using the growth balance method (Brass, 1975).

### Growth balance technique

The input data are shown in Appendix 2 for both males and females. The first two columns: the distribution of the census population reported deaths by age group. The cummulants population and deaths are shown in columns three and four, the population entering a given age group as a result of attaining the age which constitutes its lower bound shown in columns five, is computed by calculating the fifth of the average size of the age groups adjacent to the boundary age. The death rates and "birthday" rates for the open age groups are then found by dividing the cumulated deaths and the population entering respectively by cumulated population in the open age group. These rates are shown in columns six and seven. Theoretical considerations indicate that for those open age groups in which the population is stable, and amongst which the extent of under-reporting does not vary with age, and which are not affected by age mis-reporting the relationship between "birthday" rates and death rates should be linear, with slope equal to the reciprocal of the fraction of deaths which are reported; and intercept equal to the stable growth rate (refer to Figure 7.1).

For Tanzania population males linearity occurs for the open age groups 25+ to 65+ and it is shown in figure 7.1. The slope of the regression line through those points is 1.03 indicating that 97% of male deaths in this age range have been reported. The implied stable growth rate is 0.026. For females, Figure 7.2 shows that the linear age range is from 25+ to 70+ while the slope and intercept of the regression line is 1.16 and 0.030 respectively; indicating that 86% of female deaths in this age range are reported. The average of the male and female growth rate estimates, 0.0277, which is the same as the observed intercensal growth rate of 2.8% for the entire population. The correlations between birthday rates and death rates for the selected age ranges for both males and females are very high around 0.99.

The consistency of the results between the sexes is encouraging; the fact that different age ranges had to be chosen to find a set of data points which yielded a linear relationship is not surprising since there is evidence that age mis-reporting is different for males and females, and there are differences in the age distributions of males and females heading single-person households whose deaths cannot be reported. It is common characteristics of Growth Balance that data points for young age groups under 25 years display considerable non-linearity. This may be caused by de-stabilisation of this part of the population due to migration, and differential under-reporting of deaths of young persons. However, as shown in Appendix 7.3, some of the regions seem to have not affected by the above mentioned reasons as linearity had occurred below 25 years of age.



Correction factors of 1.03 and 1.16 respectively were applied to the reported male and female deaths in each age group enabling the calculation of adjusted age specific mortality rates for Tanzania. Adjustment factors for regions are shown in Appendix 7.4 which were used to derive implied Crude Death Rates (CDRs). Appendix 7.5 shows both the reported and implied CDRs for the regions and Tanzania total for both males and females.

The reported and implied CDRs are around 15 and 16 per 1000 respectively. The difference is marginal though substantial differences are noted in some of the regions.

### Computational procedures of two parameter logit system

Life table for males and females were constructed from the adjusted death rates in the analysis of Growth Balance. Life tables were smoothed by fitting a two - parameter model based on Coale and Demeny North life table, using usual logit fitting procedures. The Brass relational two parameter logit system postulates linear relationship between the logit transformation of survivorship values in life tables. The logit of proportion is defined as

$$Y(x) = \text{logit } \{l(x)\} = 0.5 \log_e \frac{1-l(x)}{l(x)}$$

The line or relationship can be expressed as follows:-

$$Y_m(x) = L + BY_s(x)$$

Where  $Y_m$  and  $Y_s$  define model and standard logits respectively. Thus from any one "standard" life table it is possible to generate a whole series of other related life tables by varying  $L$  and  $B$ . Displaying the equation graphically  $L$  is the intercept with  $Y$ - axis and  $B$  is the slope or gradient of the line. Varying  $L$  raises or lowers the line, while varying  $B$  makes the line more or less 'steep'. Therefore altering  $L$  affects the level of mortality, while altering  $B$  affects the relationship between childhood and adult mortality.

The line is fitted using ordinary regression techniques. Reasonable values for  $L$  lies between - 1.5 to 0.8. High positive value indicates high mortality relative to the standard. For  $B$  a reasonable range of values is between from 0.7 to 1.4. A low value gives a line with a gentle gradient and thus indicates high infant and child mortality and low adult mortality relative to the standard. A high value, on the other hand, gives a steep slope, implying low infant and child mortality and high adult mortality relative to the standard. Model survivorship values can be derived from model logits using the reverse logit transformation.

$$L_m(x) = \frac{1}{1 + e^{0.5Y_m(x)}}$$

The fitting parameters for both sex alpha ( $\alpha$ ) for Tanzania is -0.1012 implying that mortality level is generally low compared to Coale and Demeny North life table, while beta ( $\beta$ ) is 0.8605 which indicate high infant and child mortality and low adult mortality relative to Coale and Demeny



North life table. From  $\alpha$  and  $\beta$  life expectancy at birth is estimated to be on average of 51 years. See working sheet on appendix 6. The difference of this result and that from one parameter model is marginal.

### Adult estimation using orphanhood technique

Although data on the survival of the mother are easy to collect, this type of information is affected by various problems. The major problems include over-representation of parents with several surviving children and the adoption effect which arises when a child is orphaned at a very young and adopted by relatives. These children tend to regard these relatives as their true parents. Also, mortality experiences of women who never had children they cannot be taken into account in the estimation of mortality.

The indirect technique usually referred to as the orphanhood method uses the maternal (paternal) orphanhood data to provide the probability of a female surviving from age 25 to 45 and above. The method was developed by Brass and later modified by Hill and Trussell (U.N., 1983) who give an equation for the calculation of adult female mortality

$$1(25+n)/(25 = a(n) + b(n) \cdot m + c(n) \cdot s(n-5)$$

where  $a(n)$ ,  $b(n)$  and  $c(n)$  are regression coefficients whose values for each  $n$  are standard and provided in special tables according to each of the four families of the Coale and Demeny Model Life tables.  $1(25 + n)/1(25)$  is the probability of a female Surviving from age 25 to 25 +  $n$ .  $M$  represents the average female age at childbearing. This was calculated from the information on births in the last twelve months tabulated by age of mother for Tanzania as a whole,  $M = 27.38$  years.  $S(n-5)$  represents the proportion of respondents with a surviving mother in the five year age group preceding.

Likewise for one and two parameter models orphanhood analysis is best fitted by the Coale and Demeny North Model, for which the regression Coefficients are shown in table 1, along with reported proportions of children orphaned. Table 7.2 shows the probability of a female surviving from age 25 to 25 +  $n$  years.

TABLE 7.1 ORPHANHOOD COEFFICIENTS

Age Group	Proportions orphaned	Regression Coefficients			Proportion Survival from 25 to 25+n
		a(n)	b(n)	c(n)	
5-9	0.0204	-0.2894	0.00125	1.2559	0.9751
10-14	0.0346	-0.1718	0.00222	1.1123	0.9628
15-19	0.0615	-0.1513	0.00372	1.0525	0.9384
20-29	0.0982	-0.1808	0.00586	1.0267	0.9056
30-34	0.1477	-0.2511	0.00885	1.0219	0.8622
35-39	0.2211	-0.3644	0.01287	1.0380	0.7965
40-44	0.3089	-0.5181	0.01795	1.0753	0.7166
45-49	0.4383	-0.6880	0.02342	1.1276	0.5867

Extrapolating proportion of woman surviving from age 25+ to 25 + n, gives an average of life table level of 16.8. Part of extrapolated result is shown in Table 7.2 and it gives life expectancy at birth 57 years.

TABLE 7.2 PROBABILITY OF SURVIVING FROM AGE 25 COAL AND DEMENY NORTH TABLES

Age	Level						Interpolated level
	14	15	16	17	18	19	
30	0.8380	0.8575	0.8760	0.8934	0.9098	0.9253	0.9751
35	0.8113	0.8343	0.8560	0.8767	0.8959	0.9142	0.9628
40	0.7967	0.8213	0.8446	0.8666	0.8874	0.9072	0.9384
45	0.7807	0.8067	0.8314	0.8549	0.8772	0.8985	0.9056
50	0.7620	0.7894	0.8156	0.8406	0.8645	0.8874	0.8622
55	0.7409	0.7698	0.7977	0.8244	0.8500	0.8746	0.7965
60	0.7173	0.7479	0.7776	0.8063	0.8339	0.8605	0.7166
65	0.6911	0.7235	0.7551	0.7858	0.8156	0.8444	0.5867
70	0.6623	0.6961	0.7293	0.7618	0.7935	0.8244	0.4824
Average							16.85

### Comparison of results from three techniques

The question then arises, how well do the three sets of estimates (child survival, growth balance and orphanhood) fit together? Since only maternal orphanhood data was collected, this question can only be addressed for females. Figure 7.3 compares the survivorship estimates ( $l_x$ ) obtained by each of the methods as well as showing a model  $l_x$  curve (from coale and Demeny level 16.8) for comparison. Since Growth balance mortality estimates are only available from age five onwards and orphanhood estimates only from age 25 these series are anchored at the  $l_5$  and  $l_{25}$  points of the model curve respectively

Since the orphanhood and child mortality estimates based on data collected from older respondents refer to time further back in the past when mortality levels were higher a priori considerations would lead us to expect those two sets of points to be displaced progressively downwards for older ages relative to the model curve. This does occur for the child mortality series, but the orphanhood estimates curve the other way, suggesting that orphanhood is under-reported.

The growth balance data however, refer to a single time period, one year before the survey, so we would expect these points to coincide with a model curve chosen to represent a cross-sectional life table. In figure 3 we see that the growth balance points curve away above deaths in the last year are too low possibly as a result of the violation of stability or age constancy assumptions, or the North model life table is not an adequate representation of Tanzania adult mortality. Acceptance of the first explanation would imply that the most reliable estimates of adult mortality could be obtained by ignoring orphanhood and growth balance results



and simply extrapolating the one-parameter Coale and Demeny North. Acceptance of the second explanation would require some adjustment of the Coale and Demeny North Model to bring it into line with the Growth Balance results in adult ages. This can be done by fitting one of the North Model life tables to the combined child mortality and Growth Balance data using the two-parameter logit life table fitting suggested by Brass(1975).

A sample calculation of such a fitting is shown in Appendix 7.8 for national data. which of the two explanations is more plausible could only be determined by comparing the two model curves with adult mortality information for Tanzania from an independent source such as an earlier census. Unfortunately the 1978 census did not collect information on recent deaths and the orphanhood and widowhood estimates obtained were judged unreliable by the analyst(Sembwaje, 1983). In these circumstances, the two options may be viewed as complementary, providing upper and lower bounds for estimates of adult mortality, and hence life expectancy, anchored in a common estimate of child mortality.

Matching these conditional probabilities to tabulated values of the same life table function allows us to extrapolate the mortality estimates to a full life table. These probabilities imply that the life table level for females in Tanzania is 16.8 which gives life expectancy at birth 57 years. The level is very high when compared with the past trends of mortality, and it is also high by comparison with the level obtained using infant and child mortality data, as well as deaths which occurred in the household twelve months prior to the census. This indicates that orphanhood reporting was either seriously affected by the problems discussed above or that the assumptions on which the analytical techniques are based have been violated.

## 7.4 MORTALITY TRENDS

Table 7.3 shows the estimates of IMR and U5MR for 1978 and 1988. Although there was a decline of mortality, between these two censuses, the rates are still very high by world standards. The rate of mortality decline for IMR and U5MR were 1.9 and 1.8 percent respectively as a result rates went down as far as 115 and 192 from 137 and 231 respectively. Between the same period life expectancy had increased by six years, from 44 to 50 years. Similar trend of mortality decline is also observed in CDR which dropped from 19 to 15 per 1000.

TABLE 7.3 MORTALITY TRENDS

Year	Mortality Indicators			
	Infant mortality rate - IMR	Child mortality rate - U5MR	Life expectancy $e_0$	Crude Death Rate
1978	137	231	44	19
1988	115	192	50	15

Age specific mortality rates show a declining trend between 1978 to 1988 across all ages as Table 7.4 reveals the situation. Also Figures 7.4 and 7.5 show similar characteristics for both male and female.

TABLE 7.4 AGE SPECIFIC MORTALITY RATES

Age Group	1978		1988	
	Male	Female	Male	Female
0 - 1	147	129	129	116
1 - 4	110	103	80	76
5 - 9	46	42	33	31
10 - 14	18	17	17	16
15 - 19	31	28	20	20
20 - 24	41	38	26	25
25 - 29	43	38	28	27
30 - 34	45	40	30	30
35 - 39	50	45	34	34
40 - 44	59	52	39	39
45 - 49	73	65	45	45
50 - 54	97	84	57	57
55 - 59	127	111	74	75
60 - 64	180	156	105	107
65 - 69	245	212	155	157
70 - 74	376	304	232	237
74 - 79	480	425	338	248
80+	1000	1000	1000	1000

### AIDS impact on mortality trend

Between 1978 to 1988, it is when AIDS incidence among the population was noted. However, no increase of mortality was recorded in the census due to AIDS epidemic. This is due to the fact that, census estimates are based on retrospective reports and are therefore dated in the mid 80's before any large scale effect of epidemic would have become measurable because AIDS epidemic has build up fairly recently and it could not be detected in the 1988 census.

### 7.5 MORTALITY DIFFERENTIALS

Mortality levels discussed in the first part of this chapter indicate the general mortality for the whole population residing in the country. Further analysis on mortality based on different socioeconomic categories of the population is helpful in the understanding of factors which may help to explain why mortality is higher in one region as compared with another. Many factors both natural and man-made, and their interactions could influence mortality. These might include economic, social, environmental, meteorological and genetic variables, only a few of which can be measured in the census. The section on mortality differentials looks at population groups by sex, rural and urban residence, economic activity, education and marital status.

#### Methodology

Analysis of mortality differentials, considers two areas namely (1) Infant and child mortality (IMR and U5MR) and (2) General mortality. Computational procedures for IMR and U5MR differentials follows the same technique described in the previous section. It is not



possible to derive general mortality differentials for all variables used to cross-classify child mortality, as deaths in the last year cannot be classified by economic activity, education or marital status. It is, therefore, limited to regions, residence and sex.

### Regional and trend differentials

Inter regional child mortality differentials levels are somewhat striking. For instance, the difference of IMR between the lowest rate (67 in Kilimanjaro) and the highest (140 in Lindi) is 73 see Table 7.5 which suggest the wide variation of mortality between the regions.

TABLE 7.5 INFANT AND UNDER FIVE MORTALITY RATES BY REGION (BOTH SEXES)

Region	IMR			USMR		
	1978	1988	diff.	1978	1988	diff.
Arusha	108	75	33	179	119	60
Coast	121	113	8	204	189	15
Dar es Salaam	108	105	3	179	173	6
Dodoma	133	132	1	225	222	3
Iringa	152	130	22	257	220	37
Kagera	133	130	3	225	219	6
Kigoma	163	115	48	269	192	77
Kilimanjaro	76	67	9	119	104	15
Lindi	151	140	11	255	236	19
Mara	140	125	15	236	211	25
Mbeya	161	124	37	267	209	58
Morogoro	140	125	15	236	211	25
Mtwara	161	138	23	267	233	34
Mwanza	139	115	24	233	192	41
Rukwa	170	131	39	283	221	62
Ruvuma	145	113	32	245	188	57
Shinyanga	150	110	40	252	183	69
Singida	137	96	41	231	153	78
Tabora	140	101	39	236	166	70
Tanga	112	106	6	187	176	11
<b>MAINLAND</b>	<b>137</b>	<b>115</b>	<b>22</b>	<b>231</b>	<b>191</b>	<b>40</b>
Pemba North	128	123	5	218	206	12
Pemba South	123	119	4	206	200	6
Unguja North	132	130	2	223	220	3
Unguja South	121	120	1	205	200	5
Zanzibar town	112	113	1	187	188	-1
<b>ZANZIBAR</b>	<b>125</b>	<b>120</b>	<b>5</b>	<b>209</b>	<b>202</b>	<b>7</b>
<b>TANZANIA</b>	<b>137</b>	<b>115</b>	<b>22</b>	<b>231</b>	<b>192</b>	<b>39</b>

The low mortality regions in Tanzania are Kilimanjaro, Arusha and Singida whereas the high mortality regions include Lindi, Mtwara, Dodoma, Rukwa, Iringa, Kagera, Mara, Morogoro, Mbeya and all regions in Zanzibar. The regions not mentioned fall in between. In all regions child mortality have declined in comparison with 1978 census results. However, the decline of rates is relatively rapid for some regions while it is slower for others. Arusha, Singida, Tabora, Kigoma, Shinyanga, Mbeya Rukwa and Ruvuma can be considered to be in the category of rapid change as the difference for U5MR range between 60-80 per 1000. The change in mortality rates in Dar es Salaam, Kagera, Dodoma, Tanga, Lindi, Coast and all regions in Zanzibar is very small. The situation is better for the Mainland compared to that of Zanzibar both in terms of trend and levels. However sometimes this might not be the case as Zanzibar data were drawn from small sample size compared to Mainland.

### Sex differentials

TABLE 7.6 INFANT AND UNDER FIVE MORTALITY BY REGION AND SEX

Region	IMR		U5MR	
	Male	Female	Male	Female
Arusha	79	82	126	131
Coast	118	109	199	180
Dar es Salaam	109	100	181	165
Dodoma	136	127	230	214
Iringa	137	124	231	209
Kagera	133	127	224	213
Kigoma	119	111	200	184
Kilimanjaro	67	67	104	104
Lindi	140	139	237	235
Mara	128	122	216	205
Mbeya	130	118	220	197
Morogoro	133	118	224	197
Mtwara	141	134	238	227
Mwanza	122	108	204	178
Rukwa	137	125	232	211
Ruvuma	115	110	193	183
Shinyanga	114	106	191	175
Singida	98	94	161	152
Tabora	103	99	169	163
Tanga	110	102	183	168
<b>Mainland</b>	<b>119</b>	<b>110</b>	<b>199</b>	<b>183</b>
Pemba North	127	118	214	198
Pemba South	129	110	217	183
Unguja North	132	128	224	217
Unguja South	133	112	223	187
Zanzibar town	125	100	210	164
<b>Zanzibar</b>	<b>128</b>	<b>113</b>	<b>216</b>	<b>188</b>
<b>Tanzania</b>	<b>119</b>	<b>110</b>	<b>199</b>	<b>183</b>



In general females experience lower mortality than males as can be seen in Table 7.6 presented above, except for Arusha region where males have slightly lower mortality which is contrary to what would be expected from typical mortality differentials in human populations. However, the difference is marginal.

### Rural and Urban differentials

From Table 7.7, the general differentials in mortality indicate that, rural areas have high mortality levels compared to the urban areas except for Iringa and Kilimanjaro regions which have lower mortality levels among people residing in rural areas. Mortality is lower in the urban areas because industrial development, public services, financial and commercial activities and political decisions are concentrated in the larger towns and in regional capitals in particular these are generally more advanced in the process of "modernization" and have better living conditions and contain higher proportions of educationally and economically advanced people in urban.

In Iringa region, the result might have been affected by the small sample of the population, which were enumerated using detailed questionnaire in Iringa urban district. In Kilimanjaro region, the index seems to reflect reality, considering that the region has a well established social service which have enabled the region to have higher proportions of literate people than other regions. Another possible factor, is that the region is small in terms of area, hence all people within the region can benefit urban social services without facing transport difficulties. This region has very fertile land which results in high levels of food production as well as cash crops, so that even rural areas are fairly prosperous.

In Zanzibar, rural and urban differentials follow a similar pattern observed in Tanzania Mainland. Nevertheless Zanzibar central south, rural areas have lower mortality than in urban areas. Explanations to this observations might be similar to that given for Kilimanjaro region, though it should be born in mind that Zanzibar regions are so small that sampling errors may render the regional results for less reliable than the aggregate for both islands.

TABLE 7.7 INFANT AND UDER FIVE MORTALITY RATES BY REGION, RURAL AND URBAN

Region	IMR		U5MR	
	Rural	Urban	Rural	Urban
Arusha	76	72	120	114
Coast	115	104	193	172
Dar es Salaam	121	103	203	169
Dodoma	136	94	230	154
Iringa	130	135	219	229
Kagera	130	116	220	193
Kigoma	116	109	194	181
Kilimanjaro	66	73	102	115
Lindi	143	121	241	204
Mara	128	101	216	116
Mbeya	128	107	216	177
Morogoro	134	94	226	153
Mtwara	143	108	241	180
Mwanza	119	97	200	158
Rukwa	134	112	227	186
Ruvuma	114	107	190	177
Shinyanga	112	92	186	150
Singida	99	81	161	129
Tabora	101	103	165	169
Tanga	109	89	182	144
Mainland	118	114	197	190
Pemba North	123	119	207	200
Pemba South	122	103	204	169
Unguja North	147	116	248	194
Unguja South	122	126	205	213
Zanzibar town	113	112	188	187
Zanzibar	123	113	208	189
Tanzania	118	114	197	190

### Education differentials

Table 7.8 and 7.9 show that mothers education as well as head of households education has an inverse relationship with infant and child mortality. Educated and literate mothers as well as head of household have a low mortality compared to those of uneducated or illiterate mothers or head of household.



**TABLE 7.8 INFANT AND UNDER FIVE MORTALITY RATES BY EDUCATION OF WOMEN AND HEAD OF HOUSEHOLD**

Education classifications	Education of women		Education of head of household	
	IMR	U5MR	IMR	U5MR
Total	115	191	115	1.911e+23
None	125	210	125	
Class 1-4	125	210	126	
Class 5-8	98	161	100	
Secondary school	66	102	84	
University/other	24	36	66	
Course after Primary	74	111	86	
Course after Ssecondary	48	70	79	

**TABLE 7.9 INFANT AND UNDER FIVE MORTALITY BY MOTHERS' LITERACY**

Literacy	Infant mortality rate	Under five/child mortality rate
Total	115	192
Literate	102	168
Illiterate	126	212

### Marital Status differentials

Child mortality differentials by marital status need to be interpreted with caution since the mothers marital status may have changed after the death of the children. Mortality rates were highest among divorced mothers followed by widowed, single and married for Tanzania. Mortality is likely to be high among divorced women due to the lack of support which these mothers used to obtain from their former husbands. As expected, married women have mortality rates close to those of the entire population, since they account for most of the burden of childbearing. Indeed it is difficult to explain why single mothers have relatively low mortality rates since these too might be expected to be socially disadvantaged. It is possible that this group is particularly affected by under-reporting of dead children.

**TABLE 7.10 INFANT AND UNDER FIVE MORTALITY RATES BY MARITAL STATUS OF WOMEN**

Marital status	Infant mortality rate IMR	Under five/child mortality rate U5MR
Total	115	191
Never married	105	174
Married	104	171
Divorced	112	186
Widower	111	184

## Economic Activity Differentials

These differentials also are difficult to interpret because economic activity may change after the deaths of children. Economic development generally has a positive impact on mortality decline but this correlation is not always observed in terms of individual economic activity as Table 7.11 shows. The lowest mortality is revealed among home makers and students/pupils. Although it might be expected that working mothers would have the economic capability to take care of their children, which would reduce IMR and U5MR, it has been found (Basu 1991) that working mothers spend a lot of time at their work place while their children are looked after by housegirls, older children, or other members of the family. This might result in lower quality of care for those children and hence raise their mortality rates.

Students/pupils may have low mortality due to strict education regulations which prohibit student/pupils in primary and secondary schools to bear children otherwise they risk instant expulsion. This means there are possibilities of underreporting both births and deaths which occur among students. But students of higher learning institutions: above secondary school, and particularly universities are allowed to bear children. Considering the level of the mother's education, and the fact that university students tend to be married to well off husbands, this could explain the observed low level of mortality. It is worth noting that the total number of mothers in this category is rather low for making reliable estimates.

The highest mortality rates in Tanzania were reported by disabled mothers, followed by mothers classified in other activity. Head of household activity in table 11 shows that student/pupils recorded the highest mortality rates were experienced by those retired or too old followed by those who were not able to work. such trend is expected because it includes groups which are more disadvantaged. It is surprising that students and the unemployed household heads are associated with low mortality levels, but the members in these categories are small, and economic activity of the head may also change over time.

TABLE 7.11 INFANT AND UNDER FIVE MORTALITY RATE BY ECONOMIC ACTIVITY OF WOMEN AND HEAD OF HOUSEHOLD

Economic activity	Women by economic activity		Head of Household by economic activity	
	Infant mortality rate IMR	Under five mortality rate U5MR	Infant mortality rate IMR	Under five mortality rate U5MR
Total	115	192	115	191
Worked	113	189	115	191
Looking for work	105	172	99	162
Student/Pupils	84	134	96	157
Home makers	99	163	101	166
Retired/too old	-	-	118	197
Unable to work	176	296	117	189
Other activity	117	196	113	



## Occupation differentials

Mother occupation follow the same trend as mothers education, with the professionals (highly educated) recording lower levels while agriculture workers (mostly uneducated) recorded the highest level (see Table 7.12). This can also be explained by the fact that, most mothers who are agricultural workers are found in the rural areas, where there is an acute shortage of medical facilities, while the professional mothers are mostly found in urban areas. When examining the head of household's occupation the same results were observed.

Those in agricultural work recorded the highest levels followed by clerical and professionals who recorded the lowest of all. It is worth noting that agricultural workers or a composite category including a relatively small number of plantation employees (who might be fairly well off) and large number of subsistence farmers (who are poorer). Mothers occupations have comparatively more impact on mortality than occupations of head of households.

TABLE 7.12 INFANT AND UNDER FIVE MORTALITY RATES BY OCCUPATION OF WOMEN ANH HEAD OF HOUSEHOLD

Occupational groups	Women by Occupation		Heads of Households by occupation	
	Infant mortality rate IMR	Under five mortality rate USMR	Infant mortality rate IMR	Under five mortality rate USMR
Total	115	191	115	191
Professionals	63	98	90	145
Clerks	82	131	94	152
Agriculture	115	193	119	200
Other	-	-	-	-

## Completeness of adult estimates at regional level

As already noted that the degree of completeness in reporting deaths which occurred in the household twelve month prior the census apparently are known to be understated due to reasons explained in the analysis of adult mortality. However, the problem have been tackled by using Growth Balance technique whereby completeness of reported deaths have been adjusted.

Appendix 3 shows linearity for regions from growth balance analysis range. Most of the ranges lies between 10+ to 70+. Adjusting factors applied for deaths which occurred in the regions is above 1.0 and less than 1.5, which means above 67 percent of deaths in the regions were reported. However, not all growth rates seem to be sensible as there are wide range of disparity from intercensal growth rates. Wide disparity is noted in Coast, Dar es Salaam, Kagera Mtwara and Zanzibar town. Despite such result, it cannot be interpreted that the technique is unreliable.

Using adjusted deaths, life tables for all regions were constructed from were life expectancies at birth were estimated. Results in most of the regions were similar to that estimated by extrapolating child mortality. However, results for Rukwa, Ruvuma and Zanzibar regions except Pemba North region were left out of consideration as (B) values are below 0.7 an indication of being untrustworthy.(refer to Appendix 7.7).

## 7.6 OVERALL LIFE EXPECTANCY

It has been already discussed that three methods were used in the estimation of adult mortality, although not all results were considered to be plausible. This is after proving orphanhood results being inconsistency with other results.

TABLE 7.13 OVERALL LIFE EXPECTANCY

Region	Life expectancy at birth			
	1978	One parameter estimates	Two parameter estimates	1988 overall estimate
Arusha	50	56	59	57
Coast	47	49	48	48
Dar es Salaam	50	51	50	50
Dodoma	45	45	48	46
Iringa	41	45	45	45
Kagera	45	46	44	45
Kigoma	40	48	48	48
Kilimanjaro	58	60	59	59
Lindi	42	45	50	47
Mara	44	46	49	47
Mbeya	41	47	47	47
Morogoro	44	46	47	46
Mtwara	40	44	48	46
Mwanza	44	49	47	48
Rukwa	40	45	-	45
Ruvuma	43	49	-	49
Shinyanga	42	50	50	50
Singida	44	53	57	55
Tabora	44	51	56	53
Tanga	49	50	49	49
Mainland	44	49	51	50
Pemba North	46	45	48	46
Pemba South	47	47	-	47
Unguja North	45	49	-	49
Unguja South	48	47	-	47
Zanzibar town	49	48	-	48
Zanzibar	47	47	-	47
Tanzania	44	49	51	50



Results from one and two parameter models, provide an estimates which have marginal variation. Infact it gives lower and upper boundaries as such by taking averages plausible estimates were reached. However, some of the estimates from two parameter model for some regions were rejected for the reasons already explained. Overall estimates for these regions were drawn from one parameter model by putting into consideration that differences between one and two parameter estimates in most cases are marginal.

## **7.14 LIFE EXPECTANCY DIFFERENTIALS**

### **Regional Differentials**

People in Kilimanjaro region live on average longer than people in other regions, followed by Arusha regions while people in Iringa, Kagera and Rukwa regions live shorter than people in other regions. For Kilimanjaro the level reflects what is expected, on the ground that the region is the most advanced in terms of development compared to other regions. This is substantiated by availability of more abundant social services around the region than other places in the Country. For Arusha region the results seems to be consistent with the results obtained 1978 Census, whereby Arusha and Kilimanjaro continue to have the lowest child mortality. This is due to good nutrition practices, as evidenced by the fact that the people feed on meat and milk which are rich in protein. Addition to this, the region is endowed with the best climate and fertile soils, which allow several crops to be grown that is, both food and cash crops.

Regions like Singida, Tabora, had made a significant improvement for the past ten years. Life expectancy has increased by 11 and 9 years respectively. Other regions which seems to have improved reasonably are Kigoma, Shinyanga, which have increased longevity above national average since 1978. Decline in child mortality seem to have an impact on the life expectancy, where drastic decline in child mortality observed, life expectancy has also taken the similar trend.

### **Male and Female Differentials**

General observations show that females live longer than males. Such results, conform with other findings from different surveys which have revealed that biologically, women can resist diseases better than men almost across all age groups. However, women may have high risk of dying at reproductive ages, due to pregnancy related complications. In Unguja North region, women live on average six years more than their counterpart, followed by women in Coast, Kilimanjaro, Pemba south, and Zanzibar town regions live five years more on average. Other regions the difference range between 0 - 4 years.

### **Rural and Urban Differentials**

Both Tanzania Mainland and Zanzibar, people who live in Urban areas live longer than those who live in Rural areas. In Zanzibar, people in Urban live on average of 48 years and those in Rural areas live on average of 46 years, while in Tanzania Mainland, people in Urban live on average 52 years and those in rural areas live on average of 48 years. Reasons for

dissimilarities between urban and rural areas are given under child mortality differentials in rural and urban.

TABLE 7.14 OVERALL SEX DIFFERENTIAL ESTIMATES

REGION	$e_0$ 1-Par. Males	$e_0$ 1-Par. Female	$e_0$ 2-Par. Male	$e_0$ 1-Par. Female	Overall estimates	
					Male	Female
Arusha	56	57	58	59	57	58
Coast	47	52	46	50	46	51
DSM	49	52	51	49	50	50
Dodoma	44	46	46	49	45	47
Iringa	44	47	43	48	44	47
Kagera	45	47	44	44	44	45
Kigoma	47	50	48	49	47	49
Kilimanjaro	59	62	55	63	57	62
Lindi	43	46	49	50	46	48
Mara	45	47	47	50	46	48
Mbeya	45	48	45	48	45	48
Morogoro	45	48	46	48	45	48
Mtwara	43	45	45	51	44	48
Mwanza	47	51	46	49	46	50
Rukwa	44	47	-	-	44	47
Ruvuma	48	50	-	-	48	50
Shinyanga	48	51	48	52	48	51
Singida	51	54	57	57	54	55
Tabora	51	52	55	57	53	54
Tanga	49	52	48	51	48	51
<b>Mainland</b>	<b>47</b>	<b>50</b>	<b>51</b>	<b>52</b>	<b>49</b>	<b>51</b>
Pemba North	45	46	48	48	46	47
Pemba South	45	50	-	-	45	50
Zanzibar North	46	52	-	-	46	52
Zanzibar South	46	48	-	-	46	48
Zanzibar West	45	50	-	-	45	50
<b>Zanzibar</b>	<b>45</b>	<b>49</b>	<b>-</b>	<b>-</b>	<b>45</b>	<b>49</b>
<b>Tanzania</b>	<b>47</b>	<b>50</b>	<b>51</b>	<b>52</b>	<b>49</b>	<b>51</b>



## References:

- Brass, W. (1965) Methods for estimating Fertility and Mortality from limited and Defective Data, POPLAB, Chapel Hill, USA.
- Bureau of Statistics (1992). Infant and Child Mortality in Tanzania, Regional and District Estimates, United Republic of Tanzania, Dar es Salaam.
- Egero, B. and Henin, R.A. (1973) Mortality in the Population of Tanzania: Analysis of the 1967 population Census, vol. 6, Dar es Salaam.
- Sembwaje, I.S.L. (1983) Mortality Levels in 1978 Population Census of Tanzania, vol. VIII, Dar es Salaam.
- Trussel, J.T. (1975) *A re-estimation of multiplying factors for the Brass technique for determining childhood survival rates*, Population Studies, 29 (1). U.N. (1983).
- United Nations(1983) Indirect Techniques for Demographic Estimation, Manual X, United Nations, New York.

## **CHAPTER 8**

# **FERTILITY LEVELS, PATTERNS, TRENDS AND DIFFERENTIALS**

by A. Chuwa and A. Komba

## **8.1 INTRODUCTION**

One of the major objectives of census undertaking is to estimate fertility levels, trends and differentials. However, despite significant studies taken in recent years to improve the situation, the paucity and the poor quality of basic demographic information constitute a major problem in the analysis of economic and social conditions affecting fertility levels and patterns in Africa.

The available statistical data reveals the existence of substantial variations in the level of fertility. While some of the observed differences are undoubtedly more statistical than real, it appears beyond question that the reproductive behaviour of African populations vary considerably from one region to another and from one ethnic group to another. The levels, patterns and trends of fertility are influenced by a wide variety of factors, many of which are intricately interrelated. Reliable information on these factors has rarely been available for any of the developing countries. Consequently, little is known of ways in which reproductive behaviour in these countries is affected by social, cultural, demographic and other related conditions.

In this chapter, the 1988 population census data is used to measure the levels, patterns and differentials of fertility in Tanzania in relation to the overall socio-economic factors in the country. The socio-economic factors which will be analyzed in relation to fertility include; marital status, level of education, occupation, employment status and the rural/urban residence. The level of fertility will be measured using the Total Fertility Rate (TFR) and the Mean Number of Children Ever Born (CEB).

## **8.2 SOURCES OF FERTILITY DATA AND LIMITATIONS**

Tanzania, like many other developing countries obtain fertility and other demographic data from censuses and demographic sample surveys. Since independence, the country has managed to conduct three decennial censuses (1967, 1978 and 1988) and two national demographic sample surveys (1973 and 1991/92). In all these operations, both current and retrospective data on fertility and other demographic variables were collected.

As far as the retrospective data on fertility was concerned, women aged 15-49 were asked about the number of children born alive to them, sub-divided into those living with her, those living elsewhere and those who had died. Data on the number of children ever born provide us with information on the distribution of mothers by number of children as well as the average family size for those women who have completed their reproductive period.



Although data on children ever born has an advantage of not having a time element attached to it, it is affected by memory lapse on the part of older women who tend to report fewer children as well as age mis-statements, all of which may influence the results. With regard to the current fertility data, women were asked if they had a birth during the 12 month's period prior to the census. Such information is generally referred to, as current fertility. However, this type of data are often incomplete and inaccurate because of inaccuracy in the placement of the last birth or in the reference period so that births are reported for a period on average greater or shorter than the previous year.

The current data on fertility may also be affected by either omission of those who were born alive but died immediately or inclusion of still births. It is important at this point to mention that vital registration statistics in Tanzania are still incomplete, making it difficult to evaluate the completeness of reporting of births in the country. It must be pointed out that no post-enumeration survey was conducted to evaluate the census coverage.

### **8.3 MEASURES OF FERTILITY**

In measuring the levels of fertility in Tanzania during the 1988 population census, two measures of fertility were used; the Crude Birth Rate (defined as the number of births in a year per 1000 mid- year population and the Total Fertility Rate (which is an adjusted measure of fertility which takes account of age detail within the child bearing ages).

#### **Crude Birth Rate**

Although the Crude Birth Rate (CBR) is a crude measure of fertility, it gives an indication of the trend of fertility in a population. Table 8.1 gives the CBRs for Tanzania during the 1988 population census compared to those of 1967 and 1978 censuses. Despite the fact that the CBR is a crude measure of fertility, observation on the table shows that fertility has been declining in almost all regions. This decline in fertility may be the result of omission of births which occurred during the 12 months period prior to the census.

It might also have resulted from the fact that people are more aware of family planning practices and are using them to limit the size of their families. Economic hardship is another factor which might be behind the decline in fertility.

TABLE 8.1 CRUDE BIRTH RATES FOR THE 1967, 1978 and 1988 POPULATION CENSUSES

Region	Crude birth rate				
	1967 Census <sup>1</sup>		1978 Census <sup>2</sup>		1988 Census
	Adjusted	Recorded	Adjusted	Recorded	Recorded
Pemba South	-	-	48	53	51
Pemba North	-	-	53	54	47
Zanzibar North	-	-	46	47	47
Shinyanga	51	65	49	48	47
<b>ZANZIBAR</b>	<b>48</b>	<b>58</b>	<b>48</b>	<b>48</b>	<b>45</b>
Kagera	50	53	49	48	46
Mwanza	49	62	51	48	43
Mara	52	62	53	68	42
Rukwa	-	-	62	56	42
Zanzibar South	-	-	41	39	42
Kigoma	43	54	52	54	42
Singida	45	55	47	40	41
Dodoma	48	61	52	44	40
Arusha	47	56	48	48	40
Zanzibar West	-	-	47	47	40
<b>MAINLAND</b>	<b>47</b>	<b>-</b>	<b>49</b>	<b>46</b>	<b>38</b>
Tabora	40	55	45	43	38
Kilimanjaro	51	57	48	46	38
Mbeya	52	62	55	46	36
Ruvuma	48	62	47	44	35
Tanga	46	58	47	42	35
Iringa	55	58	53	45	35
Mtwara	35	49	47	38	34
Lindi	-	-	43	41	34
Coast	37	48	35	40	34
Morogoro	44	50	45	48	34
Dar es Salaam	33	-	48	42	34

<sup>1</sup>Egero, B. and Roushid, H.A., Fertility in Egero, B. and Roushid, H.A.(eds.), The Population of Tanzania, An Analysis of the 1967 Population Census, Volume 6 (Dar es Salaam: BRALUP and Bureau of Statistics, 1973), p. 195

<sup>2</sup>Ngallaba, S.A.M., Fertility Levels and Patterns, in The 1978 Population Census, Population of Tanzania, Volume VIII (Bureau of Statistics, Dar es Salaam 1983).



## 8.4 TOTAL FERTILITY RATE

Since the age and sex composition of a population has such a strong influence on the levels of its CBR, measures of fertility that are less affected by differences in age-sex composition are more useful analytically. The Total Fertility Rate (TFR) is such a measure. This measure was used to determine the level of fertility for Tanzania using the 1988 population census data. Table 8.2 gives the Total Fertility Rates for Tanzania for the past three censuses.

TABLE 8.2 RECORDED TOTAL FERTILITY RATES FOR 1988 CENSUS AND ADJUSTED AND RECORDED TOTAL FERTILITY RATES FROM 1967 and 1978 CENSUSES

Total fertility rate						
Region	1967 Census <sup>3</sup>		1978 Census <sup>4</sup>		1988 Census	Percent Drop
	Adjusted	Recorded	Adjusted	Recorded	Recorded	
Pemba South	-	-	7.5	8.2	7.6	1.3
Zanzibar North	-	-	7.0	7.1	7.0	0.1
Kagera	7.1	7.5	7.6	7.4	6.9	9.2
Pemba North	-	-	7.8	8.3	6.9	11.1
Zanzibar South	-	-	6.6	6.2	6.5	1.5
Kigoma	5.9	6.6	7.1	7.3	6.5	8.5
<b>ZANZIBAR</b>	<b>6.5</b>	<b>7.3</b>	<b>7.0</b>	<b>7.2</b>	<b>6.4</b>	<b>8.6</b>
Shinyanga	7.5	8.7	7.1	6.9	6.3	11.3
Rukwa	-	-	8.7	8.4	6.2	28.7
Mwanza	6.9	8.1	7.4	7.1	6.1	17.6
Arusha	7.1	7.5	6.9	7.0	6.0	13.0
Mara	7.1	8.0	7.4	7.0	5.9	20.3
Dodoma	6.9	7.6	7.4	6.2	5.9	20.3
Kilimanjaro	7.9	8.9	7.6	7.5	5.8	23.7
Singida	6.1	6.3	6.9	5.9	5.7	17.4
Tabora	5.5	6.7	6.2	6.0	5.4	11.9
<b>MAINLAND</b>	<b>6.6</b>	<b>7.3</b>	<b>6.9</b>	<b>6.4</b>	<b>5.4</b>	<b>21.7</b>
Coast	4.9	5.8	5.3	6.1	5.4	-1.9
Zanzibar West	-	-	6.2	6.1	5.2	16.1
Tanga	6.9	7.7	7.1	6.2	5.1	28.2
Ruvuma	6.7	7.1	6.4	6.1	5.0	21.9
Iringa	8.4	7.8	7.3	6.3	4.9	33.9
Mbeya	7.6	8.1	7.4	6.3	4.7	36.5
Lindi	-	-	5.9	5.4	4.6	22.0
Mtwara	5.0	5.7	6.2	4.5	4.5	27.4
Morogoro	6.0	4.3	6.3	6.5	4.2	33.3
Dar es Salaam	4.3	5.0	5.7	5.4	3.4	40.4

<sup>3</sup>Egero, B. and Henin, R.A. (eds.), *ibid.*

<sup>4</sup>Ngallaba, S.A.M., *ibid.*

As it was the case with the Crude Birth Rates, the Total Fertility Rates also show that there was a moderate decline in fertility in all regions, with the exception of Coast region where fertility increased by 1.9%. However, the decline in fertility is more pronounced on the Mainland regions where the decline is sometimes more than 20 percent. In case of the Islands, the decline in fertility is relatively small compared to that of the Mainland probably due to, among other things, the fact that age at marriage in Zanzibar is lower than on the Mainland (see Table 8.7). The fact that age at marriage in Tanzania is rising as Table 8.7 shows may have also contributed to the overall decline of fertility in the country.

## 8.5 ESTIMATION OF CURRENT FERTILITY

Recorded age-specific fertility rates often under-estimate the true level of fertility owing to omission of events from censuses or surveys or misunderstanding of the length of the reference period in survey questions on births during a previous period. Because of reference period errors, age specific fertility rates calculated from census are also occasionally over estimated. The Brass P/F Gompertz method (Zaba 1981) has been developed for evaluating and adjusting these recorded fertility rates by comparing the recorded rates to data on the average number of CEB tabulated by five-year age group of woman. The P/F approach assumes that fertility has been constant in the past, that the pattern (although, of course, not the level) of the recorded age-specific fertility rates (denoted by ASFR) is correct, and that the level of lifetime fertility for the younger cohorts of women provided by the CEB data are correct. Brass simply cumulated and graduated the recorded ASFR data to be in the form of children ever born data. Under the assumption of constant fertility, these transformed data (denoted by  $F_x$ ) are comparable to the recorded children ever born data ( ${}_{\text{a}}\text{CEB}_x$ ). The ratios of  ${}_{\text{a}}\text{CEB}_x/F_x$  or  $(P_x/F_x)$  for the younger age groups provide possible adjustment factors to be applied to the recorded fertility rates.

Arriaga (1983) later modified the method and extended it to the case of changing fertility. Rather than transforming the recorded ASFR figures to CEB-type figures, he suggested transforming the recorded CEB data into estimates of age-specific fertility. These two sets of age-specific fertility rates are then cumulated by age, and the ratios of these cumulated figures provided possible adjustment factors. According to Arriaga 1983, this modification not only has analytical and diagnostic advantages but also leads to eversion of the method to conditions of changing fertility. If the children ever born (CEB) and fertility pattern data (ASFR) are available from two enumerations, age-specific fertility rates can be estimated for the one-year period following the first enumeration and the one-year period preceding the second enumeration. The estimated age-specific fertility rates can then be compared to the recorded ASFR data to provide adjustment factors in the same way as it is done for the constant fertility (one set of data) approach. Although the procedure can also generate estimates of the mean age of mother at childbearing in the population, it was not used as such because the estimates produced using this procedure was found to be on the lower side. As such the mean age of mother at child bearing for Tanzania during the 1988 census was calculated based on the estimated age-specific fertility rates and the age distribution of the female population.



TABLE 8.3 RECORDED AND ADJUSTED TOTAL FERTILITY RATES: 1988 Census

Region	Rec. TFR	Rec. $P_7$	Adjusted TFR	
			Brass P/F	Arriaga Approach
Dodoma	5.9	6.7	6.7	7.1
Arusha	6.0	7.6	7.8	9.7
Kilimanjaro	5.8	7.4	7.1	7.3
Tanga	5.1	6.5	6.4	6.6
Morogoro	4.2	6.4	6.3	6.5
Coast	5.4	5.3	5.0*	6.1
Dar es Salaam	3.4	5.2	4.6*	5.7
Lindi	4.6	5.6	5.7	6.0
Mtwara	4.5	5.6	5.7	6.0
Ruvuma	5.0	6.8	6.6	6.7
Iringa	4.9	7.2	6.7	6.5
Mbeya	4.7	6.4	6.5	6.8
Singida	5.7	6.1	6.0	6.5
Tabora	5.4	5.7	6.4	6.1
Rukwa	6.3	7.5	7.5	7.5
Kigoma	6.5	6.3	6.9	6.7
Shinyanga	6.3	6.6	7.2*	7.0
Mwanza	6.1	6.9	7.2	7.2
Kagera	5.9	6.8	6.9	7.8
Mara	6.9	7.2	7.5	7.1
<b>MAINLAND</b>	<b>5.4</b>	<b>6.5</b>	<b>6.5</b>	<b>6.7</b>
Zanzibar North	7.0	6.5	6.7	6.7
Zanzibar South	6.5	6.6	6.8	7.3
Zanzibar West	5.2	5.6	6.4*	6.2
Pemba North	6.9	6.9	7.4	6.9
Pemba South	7.6	6.9	7.2	7.1
<b>ZANZIBAR</b>	<b>6.4</b>	<b>6.3</b>	<b>6.9</b>	<b>6.5</b>
<b>TANZANIA</b>	<b>5.5</b>	<b>6.5</b>	<b>6.5</b>	<b>6.3</b>

\* Indicates that this estimate is less reliable

In this chapter, the two methods, (Brass P/F Gompertz ratio method and Arriaga's Approach) were used in estimating current fertility for Tanzania. Table 8.3 gives the Total Fertility Rates for Tanzania using the two methods. Observations on the table show that the TFR estimates from Arriaga's method are improbably high (i.e., TFRs are higher than 7.5).

When Arriaga's estimates are compared to those from the Brass P/F Gompertz ratio method they show some instability; for instance Arriaga's method shows that the TFRs for the country and Mainland are 6.3 and 6.7 whereas the Brass P/F Gompertz ratio method gives a TFR of 6.5 for both, which is the same as the completed family size ( $P_7$ ) for both the Mainland and the country as a whole. The fact that the estimated TFRs using the Brass P/F Gompertz ratio

technique are more stable than those obtained from Arriaga's method imply that the former is more suitable for Tanzania than the latter. The Brass P/F Gompertz ratio technique and Arriaga's Approach worksheets appear in Appendices 8.1 and 8.2 in this chapter.

## 8.6 FERTILITY LEVEL

The level of fertility in a population is important both for demographic and socio-economic analysis. As a demographic variable, it forms an important component of the population growth rate. As a socio-economic variable, it tells us something about family formation in the society. Given the importance of the level of fertility to a society, questions designed specifically to measure current or past fertility have been included in the censuses of many developing countries. As it was mentioned earlier, Tanzania like many other developing countries have been estimating levels of fertility for quite some time. For the 1988 population census the levels of fertility are presented in Table 8.4. The final estimates were arrived at, using the Brass P/F Gompertz ratio technique.

The data attained through censuses and other surveys since independence show that fertility in Tanzania is relatively high. The estimated Total Fertility Rates are between 4.6 and 7.6 live births per woman (see Table 8.4). Despite probable under-statement due to omission of some children, the average number of children ever born reported by women who have completed their child bearing period lies in the neighbourhood of 6 or more children. This high fertility level indicated by the Total Fertility Rates is also reflected in the reported completed family size of 6.5 children.

The country's sub-populations exhibit significantly different fertility levels. The overall fertility level is found to be higher in Zanzibar than on the Mainland (TFR of 6.9 compared to 6.5). The highest fertility level in Zanzibar is found in Pemba North region (TFR of 7.4) followed by Pemba South (TFR of 7.3) and the lowest is found in Zanzibar West region with an estimated TFR of 6.4 children per woman. The higher levels of fertility in Zanzibar compared to those on the Mainland may probably have resulted from the fact that women in Zanzibar marry early compared to those on the Mainland as Table 8.7 shows. In addition, the fact that the population in Zanzibar is small (about 3 percent of the total population according to the 1988 census), makes it easy for the government to provide socio-economic facilities better than on the Mainland.

On the other hand, the highest levels of fertility on the Mainland are found on the Lake Zone (Mara region with TFR of 7.6, while Shinyanga and Kagera each has a TFR of 7.2 and Mwanza with TFR of 7.0). The high fertility levels in these regions are not the result of low ages at first marriage since most ages at first marriage on the Mainland lies between 22 and 24 years of age (see Table 8.7). The high levels of fertility in these regions may be attributed to the fact that most of the people in these regions are cattle keepers and therefore they need children to take care of their cattle. It is therefore logical that the people in these regions should value children very much because of child labour.



**TABLE 8.4 ESTIMATED TOTAL FERTILITY RATES AND CRUDE BIRTH RATES:**  
1988 Population Census

Region	Total Fertility Rate	Crude Birth Rate
Dodoma	6.7	48
Arusha	6.6	46
Kilimanjaro	7.1	47
Tanga	6.4	46
Morogoro	6.3	45
Coast	5.0	33
Dar es Salaam	4.6	38
Lindi	5.7	42
Mtwara	5.7	44
Ruvuma	6.6	46
Iringa	6.7	49
Mbeya	6.5	51
Singida	6.1	46
Tabora	6.4	45
Rukwa	7.5	52
Kigoma	6.9	47
Shinyanga	7.2	51
Kagera	7.2	49
Mwanza	7.0	50
Mara	7.6	53
<b>MAINLAND</b>	<b>6.5</b>	<b>47</b>
Zanzibar North	6.8	44
Zanzibar South	6.9	46
Zanzibar West	6.4	51
Pemba North	7.4	52
Pemba South	7.3	51
<b>ZANZIBAR</b>	<b>6.9</b>	<b>49</b>
<b>TANZANIA</b>	<b>6.5</b>	<b>47</b>

## 8.7 PATTERNS OF FERTILITY

People in population contribute unequally in the reproduction of births. In an ultimate sense, giving birth is limited to female in the reproduction ages, normally considered to be age 15-49. Even within those child bearing years, a females fecundity characteristically peaks within her twenties.

The shape, structure and age pattern of fertility (the distribution of fertility in the child bearing age) are useful in clarifying the different fertility patterns. The shape and structure of the curve are determined by social and biological factors operating within a particular population. These factors also affect the age at which child bearing starts and ends in different populations. Table 5 gives the recorded and the adjusted Age specific Fertility Rates (ASFRs) for Tanzania, Mainland and Zanzibar.

Table 8.5 shows that maximum fertility on the Mainland occurred between age groups 20-24 and 30-34 with a peak at age 25-29. Although the maximum fertility in Zanzibar occurs at the same age range as that of the Mainland, the age pattern of fertility in Zanzibar shows that women in age group 25-29, 30-34 and 35-39 have higher fertility than their counter parts on the Mainland.

In studying the pattern of fertility, three major types of fertility curves can be identified in terms of two variables; the age at which the Age Specific Fertility Rate (ASFR) is at a maximum, and the degree of concentration of fertility in age group at/or near the peak. The three broad groups are:

- i) The early peak where the maximum is in age group 20-24.
- ii) The late peak where the maximum is in age group 25-29, and
- iii) The broad peak where the age specific rates for women aged 20-24 and 25-29 years differ only slight.

The fact that two populations with the same level of fertility may differ with respect to the distribution of births in the reproductive ages, makes it worth while to compare the pattern of fertility portrayed by the women in Tanzania during the 1978 and 1988 censuses. Table 8.6 presents the estimated ASFR for Tanzania during the two censuses.

TABLE 8.5 RECORDED AND ADJUSTED AGE SPECIFIC FERTILITY RATES: 1988 Census

AGE	TANZANIA		MAINLAND		ZANZIBAR	
	Rec. ASFR	Adj. ASFR	Rec. ASFR	Adj. ASFR	Rec. ASFR	Adj. ASFR
15 - 19	0.084	0.106	0.084	0.107	0.104	0.117
20 - 24	0.227	0.280	0.226	0.281	0.284	0.309
25 - 29	0.241	0.310	0.239	0.310	0.292	0.334
30 - 34	0.219	0.272	0.217	0.272	0.261	0.286
35 - 39	0.176	0.206	0.176	0.205	0.186	0.209
40 - 44	0.097	0.105	0.097	0.105	0.097	0.103
45 - 49	0.050	0.017	0.050	0.017	0.064	0.016
TFR		6.5		6.5		6.9

From the table, it is evident that the peak age of fertility has shifted from age group 20-24 in 1978 to age group 25-29 in 1988. This is clearly shown in Figure 8.1 which shows the pattern of fertility for Tanzania during the 1978 and 1988 Censuses.



TABLE 8.6 ADJUSTED AGE SPECIFIC FERTILITY RATES: 1978 and 1988 Census

Age	Adjusted Age - Specific Fertility Rate	
	1978 Census <sup>1</sup>	1988 Census
15 - 19	0.146	0.106
20 - 24	0.325	0.280
25 - 29	0.314	0.310
30 - 34	0.253	0.272
35 - 39	0.194	0.206
40 - 44	0.100	0.105
45 - 49	0.040	0.017
<b>TFR</b>	<b>6.9</b>	<b>6.5</b>
<b>m</b>	<b>29.2</b>	<b>29.7</b>

Comparison between the 1978 and 1988 curves shows that fertility in Tanzania has been declining. The fertility decline in Tanzania can be attributed to the overall economic hardship as well as to the rising age at first marriage which rose from 19 years in 1978 to 23 years in 1988.

A rise in age at marriage reduces the exposure time to pregnancy, thus reducing the number of children a woman would have during her reproductive period. During the same period, the Mean Age at Fertility Schedule increased from 29.2 to 29.7 years. Table 8.7 shows the Singulate Mean Age at First Marriage (SMAM) and the Mean age at Fertility Schedule for Tanzania since 1967. It appears that the Singulate Mean Age at First Marriage for women in all regions increased from late teens in 1978 to early twenties in 1988. For more insights in the age pattern of fertility in the regions see Appendix 3.3.

<sup>1</sup> Modified S.A.M., *ibid.*

Figure 3.1 Age Pattern of Fertility in  
Tanzania 1978 and 1988 Censuses

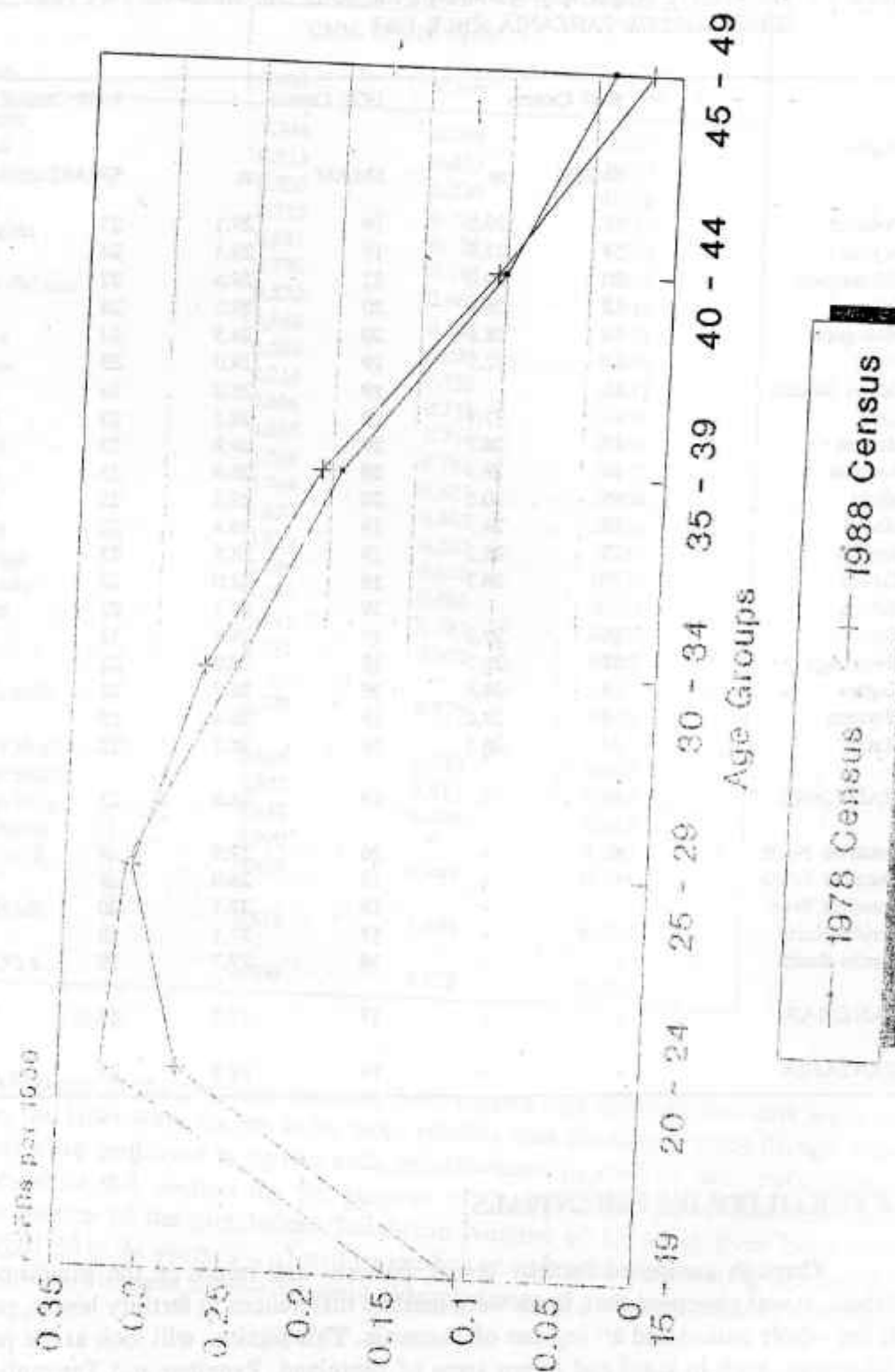




TABLE 8.7 SINGULATE MEAN AGE AT MARRIAGE AND THE MEAN AGE AT FERTILITY SCHEDULE FOR TANZANIA SINCE 1967

Region	1967 Census		1978 Census		1988 Census	
	SMAM	m	SMAM	m	SMAM	m
Dodoma	18	29.2	19	29.1	23	29.4
Arysha	19	27.7	19	29.4	24	29.7
Kilimanjaro	20	30.0	22	29.6	27	30.1
Tanga	18	28.9	20	29.2	24	30.1
Morogoro	18	28.6	20	28.5	24	29.6
Coast	17	27.7	19	29.0	23	29.2
Dar es Salaam	18	-	19	28.0	26	30.3
Lindi	-	27.7	19	28.1	23	29.4
Mtwara	17	28.7	19	28.9	23	29.2
Ruvuma	18	29.1	20	28.9	23	29.5
Iringa	19	30.1	20	29.5	25	30.4
Mbeya	18	29.7	19	28.4	22	28.8
Singida	17	28.2	19	28.5	23	29.5
Tabora	17	28.7	18	28.0	22	29.6
Rukwa	-	-	19	29.3	23	29.6
Kigoma	18	29.0	19	28.8	23	29.6
Shinyanga	17	29.2	18	28.9	22	30.0
Kagera	18	28.8	18	28.7	22	29.3
Mwanza	18	28.6	19	28.4	23	29.7
Mara	17	28.3	19	28.4	22	30.0
MAINLAND	18	-	19	28.8	23	29.7
Zanzibar North	-	-	16	27.5	18	25.2
Zanzibar South	-	-	17	28.0	18	26.6
Zanzibar West	-	-	18	27.1	20	26.4
Pemba North	-	-	17	27.1	18	24.8
Pemba South	-	-	16	27.7	19	25.6
ZANZIBAR	-	-	17	27.7	19	25.4
TANZANIA	-	-	19	28.8	23	26.9

## 8.8 FERTILITY DIFFERENTIALS

Through examined fertility levels, patterns and trends in the previous sections of this chapter, it was observed that, there were marked differences in fertility levels, patterns and trends for the whole nation and all regions of Tanzania. This section will look at the patterns of fertility differences, both in rural and urban areas of Mainland, Zanzibar and Tanzania.

TABLE 8.8 CHILD WOMAN RATIO (CWR) BY REGION: 1988 Census

Region	Child Woman Ratio		
	Total	Rural	Urban
Dodoma	0.744	0.763	0.604
Arusha	0.813	0.863	0.521
Kilimanjaro	0.700	0.730	0.556
Tanga	0.712	0.754	0.543
Morogoro	0.681	0.720	0.558
Coast	0.730	0.747	0.645
Dar es Salaam	0.523	0.662	0.510
Lindi	0.645	0.668	0.531
Mtwara	0.566	0.580	0.495
Ruvuma	0.714	0.735	0.637
Iringa	0.696	0.711	0.565
Mbeya	0.685	0.714	0.569
Singida	0.769	0.786	0.613
Tabora	0.769	0.801	0.608
Rukwa	0.870	0.902	0.704
Kigoma	0.873	0.887	0.777
Shinyanga	0.796	0.809	0.632
West Lake	0.793	0.806	0.594
Mwanza	0.765	0.797	0.637
Mara	0.791	0.803	0.697
<b>MAINLAND</b>	<b>0.729</b>	<b>0.770</b>	<b>0.548</b>
Zanzibar North	0.849	0.842	0.907
Zanzibar South	0.803	0.811	0.710
Zanzibar West	0.633	0.690	0.617
Pemba North	0.990	*	0.880
Pemba South	0.915	0.945	0.771
<b>ZANZIBAR</b>	<b>0.810</b>	<b>0.891</b>	<b>0.676</b>
<b>TANZANIA</b>	<b>0.730</b>	<b>0.772</b>	<b>0.572</b>

Note \* Error

Although in the previous sections, both current and retrospective data were noted to be defective, the latter were shown to be more reliable than the former even though some indirect techniques were employed to correct such defectiveness. In view of this, retrospective data will be employed in this section for the purpose of analysing fertility differences among socio-economic groups of the population. The Mean Number of Children Ever Born (MNCEB) to women aged 20 to 34 years ( $P_{20-34}$ ) will be used as an index for determining fertility differentials associated with different socio-economic characteristics of a woman such as education, marital

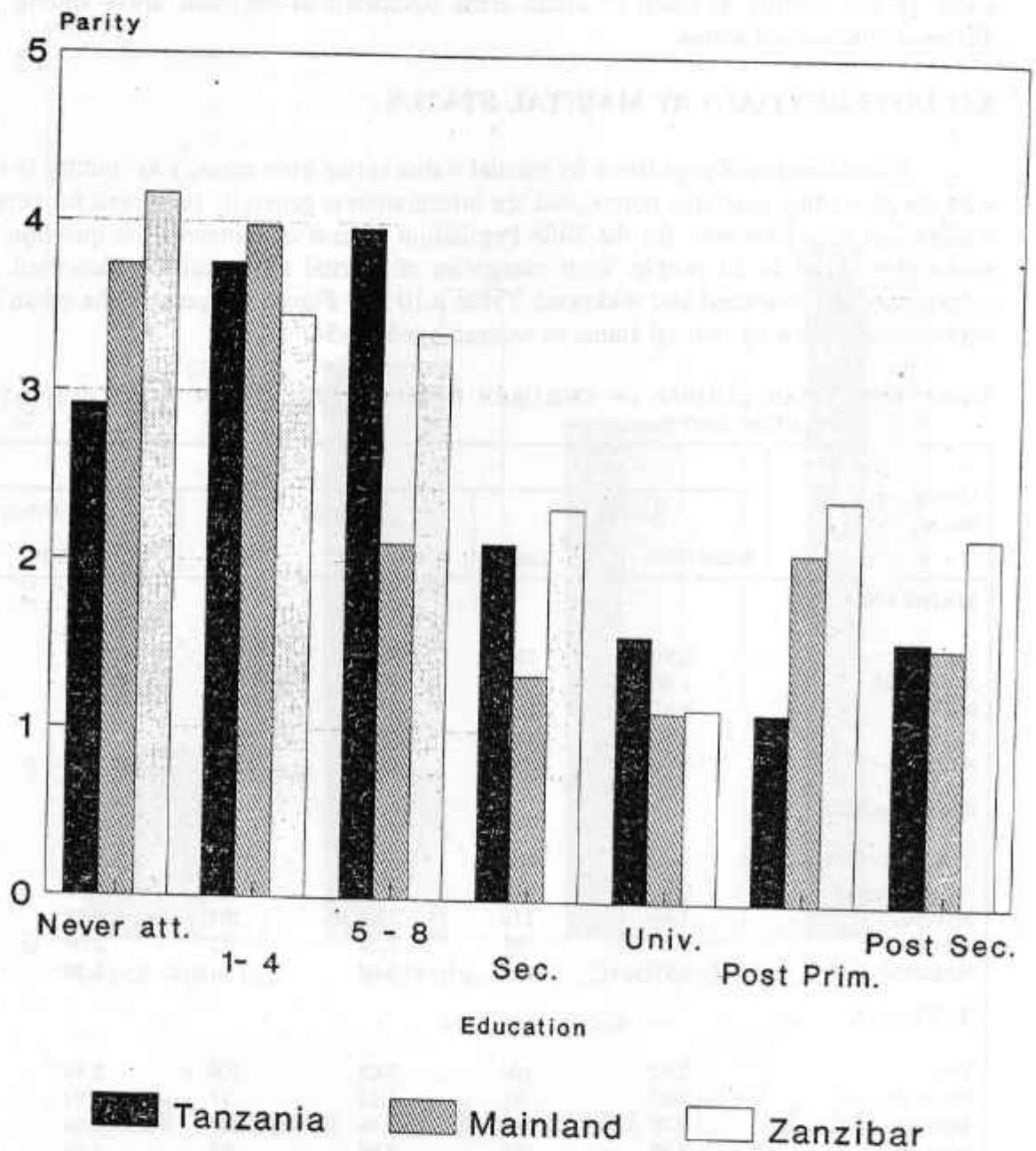


TABLE 8.9 MEAN NUMBER OF CHILDREN EVER BORN TO WOMEN AGED 20-34 BY EDUCATIONAL STATUS FOR RURAL AND URBAN AREAS: 1988 Census

Level of Education	P <sub>20-34</sub>					
	Total		Rural		Urban	
	Mean CEB	Index	Mean CEB	Index	Mean CEB	Index
<b>MAINLAND</b>						
Total	2.91	100	3.04	100	2.42	100
Never Attended	3.75	129	3.77	124	3.53	146
1 to 4	3.98	137	4.05	133	3.69	152
5 to 8	2.11	72	2.10	69	2.12	88
Secondary	1.34	46	1.28	42	1.36	56
University	1.13	39	1.26	41	1.11	46
Post Primary	2.08	71	2.20	72	1.92	79
Post Sec.	1.53	53	1.36	45	1.62	68
<b>ZANZIBAR</b>						
Total	3.34	100	3.55	100	3.00	100
Never Attended	4.17	125	4.18	118	4.14	138
1 to 4	3.46	104	3.50	98	3.38	113
5 to 8	3.36	100	3.24	91	3.51	117
Secondary	2.33	70	2.42	68	2.26	75
University	1.15	34	0.97	27	1.22	41
Post Primary	2.40	72	2.64	74	2.32	77
Post Sec.	2.19	65	2.63	74	1.76	59
<b>TANZANIA</b>						
Total	2.92	100	3.05	100	2.45	100
Never Attended	3.76	129	3.78	124	3.56	146
1 to 4	3.97	136	4.04	132	3.68	150
5 to 8	2.12	73	2.11	69	2.14	88
Secondary	1.58	54	1.67	55	1.54	63
University	1.13	39	1.22	40	1.12	46
Post Primary	2.08	71	2.20	72	1.92	79
Post Sec.	1.57	54	1.50	48	1.62	66

Note: The "Index" of fertility is calculated by using total P<sub>20-34</sub> as a base for each category of educational level.

Figure 8.2  
Fertility Differentials by Educational  
Status: Tanzania, Mainland and Zanzibar





With regard to rural-urban differentials the table reveals again that, rural women of any given level of education on Mainland, Zanzibar and Tanzania have experienced high fertility compared to urban women of the same level of education. The difference could probably be due to the mode of life between rural and urban areas. Many facilities such as schools, health facilities and access to family planning are situated more in the urban areas compared to the rural areas. In all, fertility is lower in urban areas compared to the rural areas among women of different educational status.

### 8.11 DIFFERENTIALS BY MARITAL STATUS

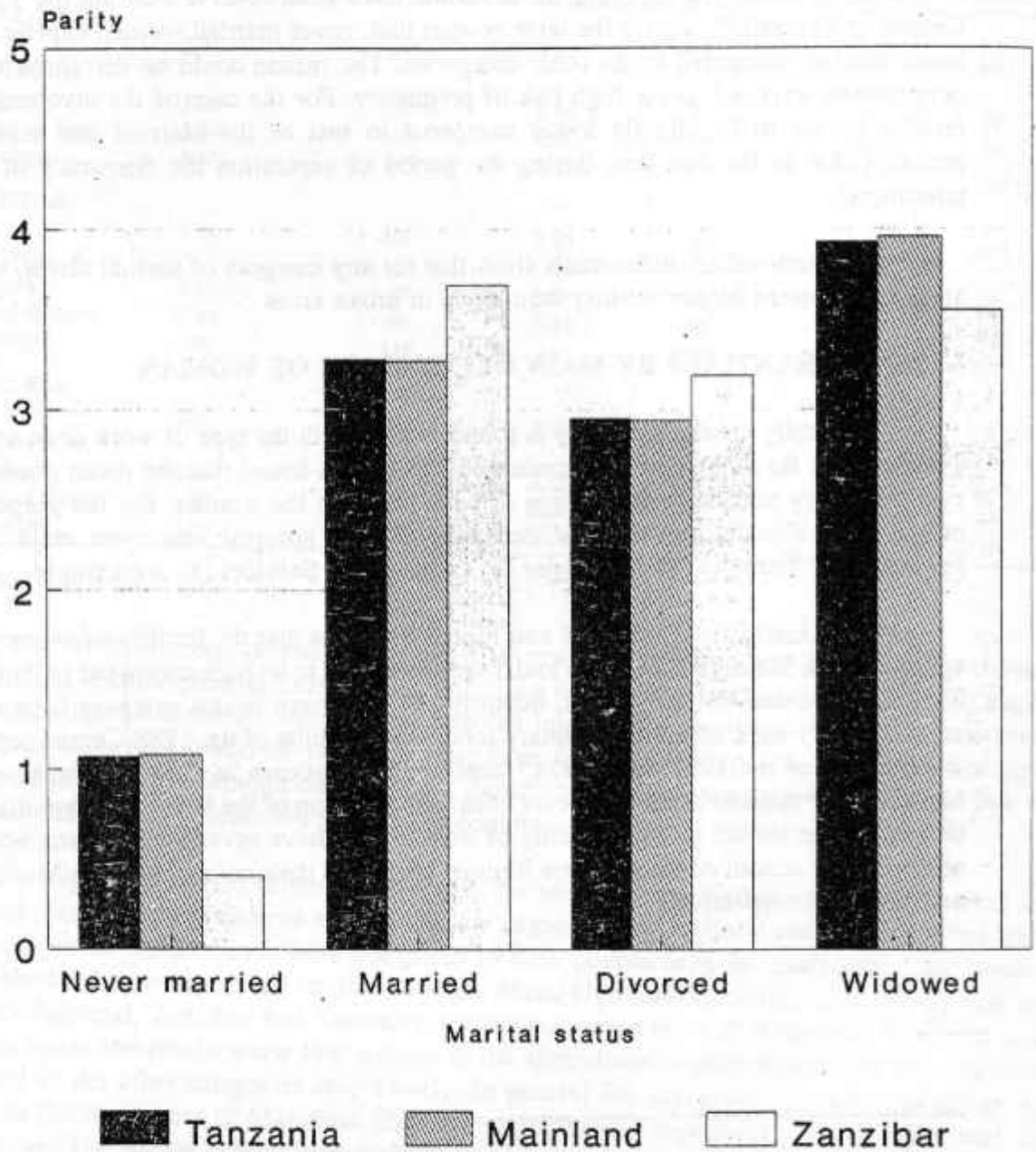
Classification of population by marital status varies from country to country in accordance with the prevailing marriage norms, and the information is generally presented for persons above a minimum age. However, for the 1988 Population Census of Tanzania the question on marital status was asked to all people. Four categories of marital status can be identified. These are single, married, divorced and widowed. Table 8.10 and Figure 8.3 present the mean number of children ever born by marital status to women aged 20-34.

TABLE 8.10 MEAN NUMBER OF CHILDREN EVERBORN TO WOMEN AGED 20-34 BY MARITAL STATUS: 1988 Census

Marital Status	P <sub>20-34</sub>					
	All Areas		Rural		Urban	
	Mean CEB	Index	Mean CEB	Index	Mean CEB	Index
<b>MAINLAND</b>						
Total	2.91	100	3.04	100	2.42	100
Never Married	1.08	37	1.13	37	0.99	41
Married	3.27	113	3.35	110	2.91	120
Divorced	2.94	101	2.94	97	2.92	121
Widowed	3.96	136	4.00	131	3.79	157
<b>ZANZIBAR</b>						
Total	3.34	100	3.55	100	3.00	100
Never Married	0.41	12	0.61	17	0.26	9
Married	3.69	110	3.81	107	3.47	116
Divorced	3.19	95	3.26	92	3.08	103
Widowed	3.55	106	3.40	96	3.70	124
<b>TANZANIA</b>						
Total	2.92	100	3.05	100	2.45	100
Never Married	1.07	37	1.12	37	0.97	40
Married	3.28	112	3.36	110	2.94	120
Divorced	2.95	101	2.96	97	2.94	120
Widowed	3.93	135	3.97	130	3.78	154

Note: See table 2.

Figure 8.3  
Fertility Differentials by Marital  
Status: Tanzania, Mainland and Zanzibar





It can be seen from Table 8.10 and Figure 8.3 that there is a little difference between the fertility of married and widowed women. The reason behind this may be attributed to the fact that, widowed women are older than currently married women (the age group 20-34 is very wide, while widowed women will be mainly in the age group 30-34, with married women mainly in age 20-29. Before they became widowed, women will have been exposed for quite a long time to the risk of child bearing). The same results have been observed during the 1967 Population Census of Tanzania<sup>11</sup>. Again the table reveals that, never married women experienced relatively lower fertility compared to the other categories. The reason could be that these women are not permanently exposed to the high risk of pregnancy. For the case of the divorced women, their fertility seems to be slightly lower compared to that of the married and widowed women, probably due to the fact that, during the period of separation the frequency of intercourse is minimized.

The rural-urban differentials show that for any category of marital status, women in rural areas experienced higher fertility than those in urban areas.

## 8.12 DIFFERENTIALS BY MAIN OCCUPATION OF WOMAN

Generally speaking fertility is found to vary with the type of work done by the people in a society. As far as Tanzania is concerned it has been found that the mean number of children ever born vary according to the type of work done by the women. For the purpose of analysis of the 1988 Census the womens' occupations were grouped into three main categories: (a) Professional, Technical and Manager (b) Clerical and Services (c) Agriculture.

Examination of Table 8.11 and Figure 8.4 show that the fertility of women who work in agriculture on Mainland, Zanzibar and Tanzania seems to be high compared to their counterparts. This could be due to the fact that, majority of the women in this category have never attended school or they have completed primary school. The results of the 1988 Census seems to confirm the findings of the 1967<sup>12</sup> and 1978<sup>13</sup> censuses that, women in the agricultural sector have the highest mean number of children ever born. Examination of the fertility differential by education of woman has shown that the fertility of women who have never attended any school and those with primary school education were high compared to their counterparts on Mainland, Zanzibar and Tanzania respectively.

---

<sup>11</sup> Ibid Egero.B. and Henin, R.A.(eds), 1967

<sup>12</sup> Ibid Egero.B. and Henin, R.A.(eds), 1967

<sup>13</sup> Ibid Ngallaba, S.A.M., 1983

TABLE 8.11 THE MEAN NUMBER OF CHILDREN EVERBORN TO WOMEN AGED 20-34 BY OCCUPATION OF WOMEN

Main Occupation	p <sup>20-34</sup>					
	All Areas		Rural		Urban	
	Mean CEB	Index	Mean CEB	Index	Mean CEB	Index
<b>MAINLAND</b>						
Total	2.91	100	3.04	100	2.42	100
Prof. Techn. & Managers	2.01	69	2.98	69	1.93	80
Clerical & Serv.	1.89	65	2.22	73	1.78	74
Agricultural	3.10	107	3.13	103	2.86	118
<b>ZANZIBAR</b>						
Total	3.34	100	3.55	100	3.00	100
Prof. Techn. & Managers	2.67	80	3.18	90	2.41	80
Clerical & Serv.	2.80	84	2.84	80	2.78	93
Agricultural	3.86	115	3.87	109	3.82	127
<b>TANZANIA</b>						
Total	2.92	100	3.05	100	2.45	100
Prof. Techn. & Managers	2.03	70	2.13	70	1.95	80
Clerical & Serv.	1.93	66	2.24	73	1.82	74
Agricultural	3.12	107	3.14	103	2.88	118

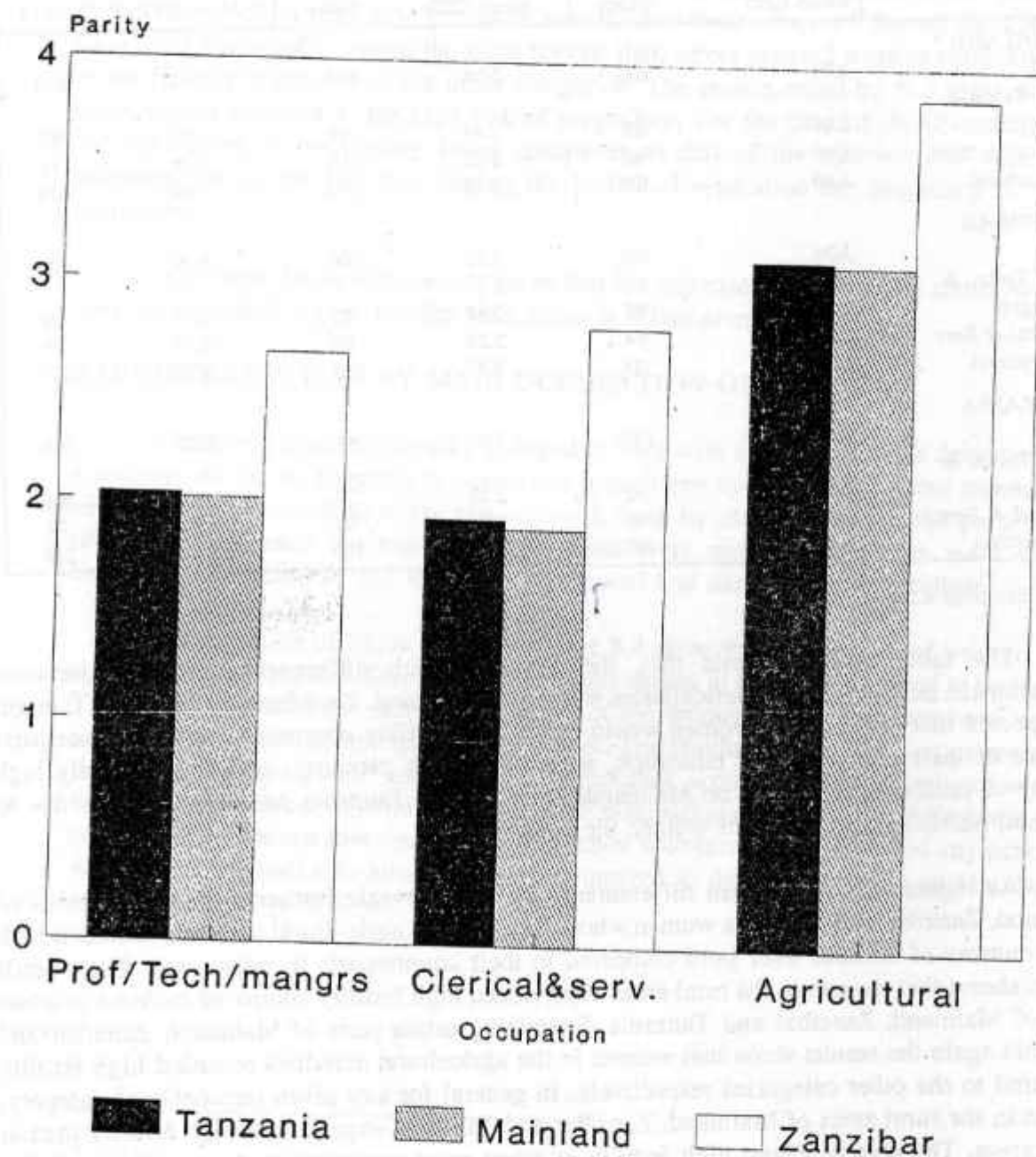
Note: See table 8.2

The table further reveals that, there is not much difference in fertility between professionals, technicians and clerical/sales women on Mainland, Zanzibar and Tanzania. It might be expected that professional women would record low fertility compared to their counterparts because of their high levels of education, access to family planning, etc. The relatively high fertility of professional women on Mainland, Zanzibar and Tanzania probably could be due to the small number of professional women the country.

As regards the rural-urban differentials, the table reveals further that in rural areas of Mainland, Zanzibar and Tanzania women who are engaged in agricultural activities recorded high mean number of children ever born compared to their counterparts in urban area. The overall pattern shows that women in the rural areas experienced high fertility compared to those in urban areas of Mainland, Zanzibar and Tanzania. Examining urban parts of Mainland, Zanzibar and Tanzania again the results show that women in the agricultural activities recorded high fertility compared to the other categories respectively. In general for any given occupational category, women in the rural areas of Mainland, Zanzibar and Tanzania experienced high fertility than in urban areas. The reason behind high fertility in urban areas compared to the rural areas (in all occupational groups) can be attributed to easy availability of facilities such as education, health, family planning, etc.



Figure 8.4  
Fertility Differentials by Occupation of  
Woman: Tanzania, Mainland and Zanzibar



### 8.13 DIFFERENTIALS BY ECONOMIC ACTIVITY

The 1988 Population Census of Tanzania characterized economic activities into the following groups:- worked, looking for work, student/pupils, home makers, Retired/Too old unable to work and other unspecified as Table 8.12 shows. In this analysis "other unspecified" category will not be considered.

TABLE 8.12 MEAN NUMBER OF CHILDREN EVERBORN TO WOMEN AGED 20-34 BY MAIN ECONOMIC ACTIVITY

MAIN ECONOMIC ACTIVITY	P <sub>20-34</sub>					
	All Areas		Rural		Urban	
	Mean CEB	Index	Mean CEB	Index	Mean CEB	Index
<b>MAINLAND</b>						
Total	2.91	100	3.04	100	2.42	100
Worked	2.99	103	3.09	102	2.47	102
Looking for Work	1.02	35	1.11	36	0.96	40
Students/Pupils	0.52	18	0.69	23	0.37	15
Home Makers	2.59	89	2.71	89	2.51	104
Unable to Work	1.51	52	1.53	50	1.39	57
<b>ZANZIBAR</b>						
Total	3.34	100	3.55	100	3.00	100
Worked	3.65	109	3.79	107	3.20	107
Looking for Work	0.93	28	0.93	26	0.94	31
Students/Pupils	0.85	25	0.99	28	0.64	21
Home Makers	3.06	91	3.11	88	3.01	101
Unable to Work	1.70	51	1.74	49	1.47	49
<b>TANZANIA</b>						
Total	2.92	100	3.05	100	2.45	100
Worked	3.00	103	3.10	102	2.49	102
Looking for Work	1.01	35	1.09	36	0.96	39
Students/Pupils	0.54	19	0.71	23	0.38	16
Home Makers	2.63	90	2.75	90	2.55	104
Unable to Work	1.52	52	1.54	50	1.39	5

Note: See Table 8.8

Table 8.12 and Figure 8.5 show that working women followed by homemakers have the highest fertility compared to their counterparts in Mainland, Zanzibar and Tanzania. As far as homemakers are concerned the reason for high fertility could be due to their low level of education, early age at first marriage etc. Both the working women and the homemakers are likely to be older than those who are still in school or looking for work - the latter group would include all those looking for their first job after leaving school but before marriage. Those unable to work may have lower fertility due to illness or invalidity.



The usual rural-urban differentials are observed across all economic activity categories, with rural women having higher fertility than their urban counterparts. One interesting difference between the economic activity differentials in the two residence areas, is that urban working women have lower fertility than urban homemakers unlike the situation in rural areas. This may be due to a higher proportion of urban working women being employed in the modern sector - i.e., they may be more educated than the rural working women. Rural working women are more likely to combine family responsibilities and work.

#### 8.14 CONCLUSION

Although the level of fertility in Tanzania has been high and continues to be high with a TFR of 6.5 there has been a gradual decline in the level of fertility in the country since 1967. This may be attributed to, among other things, the rise in age at marriage for women in the country and the fact that people especially the younger generation are more aware of family planning practices. Another factor which might have contributed to the decline in fertility is the present economic hardships experienced by the people in the country.

Examination of the rural-urban differentials revealed that rural women have recorded higher fertility compared to urban women on the Mainland, Zanzibar and Tanzania. Fertility differentials by education showed that, education has an inverse relationship with fertility. Those women with only primary education recorded higher fertility compared to those in the other categories. However the results revealed further that, fertility decreased as the level education of the women increased.

The study of the occupation of woman and fertility showed that women in agricultural sector have higher fertility than those in other occupational groups. The women employed in the modern sector appear to have low fertility. As regards marital status, married and widowed women experienced high fertility compared to the never married and divorced women on the Mainland, Zanzibar and Tanzania. Examination of main economic activity and fertility the findings showed that women who have reported as "worked and homemakers" recorded higher fertility than those who were reported in other categories.

Fertility is higher in Zanzibar than on the Mainland and all the socio-economic differentials are less marked in Zanzibar.

These findings suggests that there are rural-urban differences in fertility and that some fertility differentials do exist among women of different educational, occupational, marital status and economic activity groups. This study, like the previous ones which has been conducted in Tanzania seems to come up with a clear cut evidence of differentials in fertility among women in different socio-economic conditions.

## REFERENCES

1. Brass, W., 1985: Advances in Methods for Estimating Fertility and Mortality from Limited and Defective Data.
2. Egero, B. and Henin, R., 1967: Fertility in The Population of Tanzania: An Analysis of the 1967 Population Census by Egero and Henin(eds.), Vol. 6, Bralup and Bureau of Statistics.
3. Ngallaba, S.A.M., 1983: Fertility Levels and Patterns in The 1978 Population Census; Population of Tanzania. Vol. viii, Bureau of Statistics, Dar es Salaam.
4. Ngallaba, S.A.M., 1983: Fertility Differentials in The 1978 Population Census; Population of Tanzania. Vol. viii, Bureau of Statistics, Dar es Salaam.
5. Henry, S.S. and Jacob, S. S., 1976: The Methods and Materials of Demography, Academic Press, New York, London, Toronto, Sydney, San Francisco.
6. Van de Walle, E., 1980: Multilingual Demographic Dictionary, English Section. Second Edition.
7. Zaba B., 1981: The Gompertz Ratio P/F Variant, (unpublished).



Appendix 8.1: Methodological Note to go with Fertility Chapter

WORKED EXAMPLE FOR GOMPERTZ P/F PROCEDURE							
Dataset:	Tanzania 1988 with half year's shift						
age group	observed data				gamma values		
	mean parity	ASFRs	cumulants	ratios of P & F in successive age groups		(double log transformation)	
				P(i)	F(x+5)		
i x->x+4	P(i)	f(i)	F(x+5)	P(i+1)	F(x+10)	P ratio	F ratio
1 15-19	0.313	0.084	0.42	0.2015	0.2701	-0.4711	-0.269
2 20-24	1.553	0.227	1.56	0.4924	0.5634	0.3446	0.5556
3 25-29	3.154	0.241	2.76	0.6620	0.7160	0.8857	1.0962
4 30-34	4.764	0.219	3.86	0.8149	0.8141	1.5864	1.5818
5 35-39	5.846	0.176	4.74	0.9140	0.9071	2.4089	2.3277
6 40-44	6.396	0.097	5.22	0.9880	0.9543	4.4128	3.0623
7 45-49	6.474	0.050	5.47				

WORKED EXAMPLE FOR GOMPERTZ P/F PROCEDURE continued						
age group ratios	standard values for graph plot				y axis values for this dataset	
	x axis		y offset		gamma - y offset	
i / i+1	P pts	F pts	P pts	F pts	P pts	F pts
1 / 2	-1.744	-1.450	-1.290	-1.336	-1.761	-1.606
2 / 3	-1.016	-0.743	-1.425	-1.418	-1.081	-0.863
3 / 4	-0.335	-0.038	-1.373	-1.298	-0.487	-0.202
4 / 5	0.439	0.836	-1.142	-0.967	0.444	0.615
5 / 6	1.512	2.165	-0.706	-0.451	1.703	1.877
6 / 7	3.210	4.456	-0.277	-0.047	4.136	3.015

graph indicates co-linearity between P values for ages 20 to 45 and F values for ages 15 to 35

# Appendix 8.1: Cont'd

Regression estimates for gompit fit are based on these age groups, using fertility for shape and parity for level at colinear ages

fitted parameter values:  $\alpha = -0.150$ ;  $\beta = 0.994$ ;  $TFR = 6.48$

## WORKED EXAMPLE FOR GOMPERTZ P/F PROCEDURE continued

constructing model fertility schedule defined by above parameters

age group	standard gompits		model gompits $\alpha + \beta \times \text{standard}$		model transform $tfr \times \text{double exponential of gompit}$		with half year shift
	$P(i)$	$F(x+5)$	$P(i)$	$F(x+5)$	$P(i)$	$F(x+5)$	
1 15-19	-1.079	-0.771	-1.223	-0.917	0.217	0.531	0.106
2 20-24	-0.312	-0.041	-0.461	-0.191	1.329	1.932	0.280
3 25-29	0.354	0.629	0.201	0.476	2.862	3.482	0.310
4 30-34	1.057	1.390	0.901	1.232	4.318	4.842	0.272
5 35-39	1.953	2.474	1.792	2.310	5.488	5.870	0.206
6 40-44	3.413	4.495	3.244	4.319	6.234	6.397	0.105
7 45-49	6.055	9.316	5.871	9.114	6.464	6.482	0.017

FIGURE 1: P/F plot with all points selected

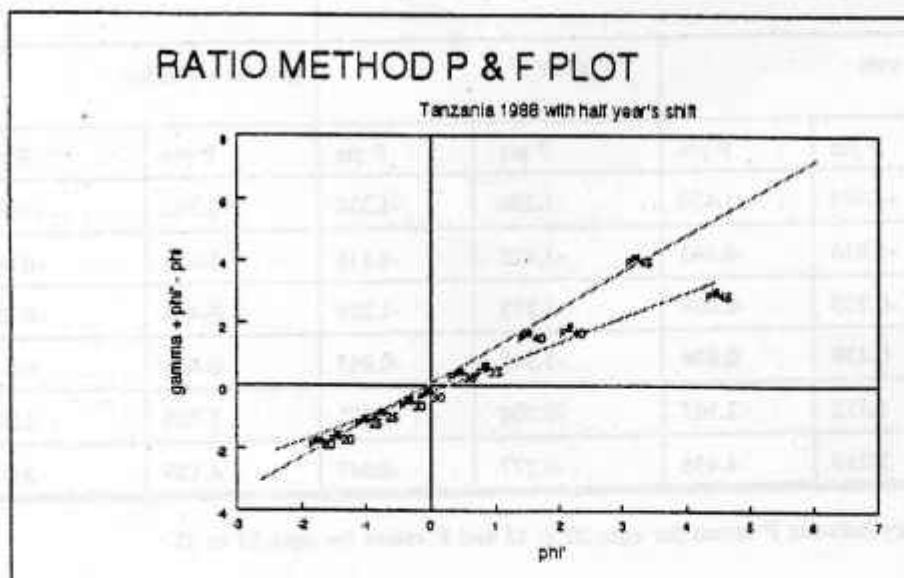
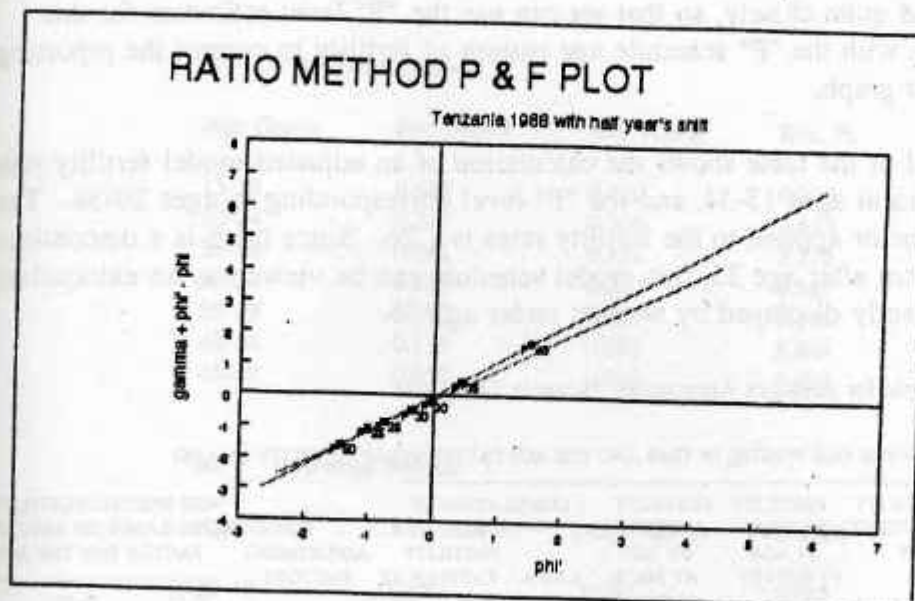




FIGURE 2 P/F plot with colinear points selected



#### Methodological note: P/F Analysis, Gompertz Ratio Variant

The details of this method are described in Zaba, 1981.

The tables above show a worked example of its application to Tanzanian data for the whole country. Figures 1 and 2 show graphs used to facilitate the fitting.

The first panel in the table presents the input data - the reported mean parities and fertility rates by age of woman - and the transformations made to enable the relational Gompertz model schedules to be fitted. These transformations involve cumulating the age specific fertility rates, calculating the ratios of successive parities and fertility cumulants, and then obtaining the "gompits" - double logarithms of these ratios.

The second panel shows the standard values for plotting points on the x-axis, and the standard y-offsets which must be added to the calculated "gompits" to give the y-axis co-ordinates for the graph points. The resulting y values are regressed against the x values (separately for "P" and "F" plots) to yield the slope and intercept of the graph lines.

As can be seen from figure 1, the last "P" point which depends on the mean parity value for the age group 45-49 deviates considerably from the line defined by the other "P" points. This is probably due to omission of children ever borne from the reports of older women. Similarly, the "F" points above age 35 deviate from the line defined by the points below this age. This could be caused either by age mis-reporting (the "P" values are less affected by this since they differ less from each other than do the "F" values) or because of recent changes in fertility which seem to affect younger ages only.

Figure 2 shows the effect of removing the nonlinear points from the graph. The "P" and "F" lines now correspond quite closely, so that we can use the "P" level estimates for this age range in conjunction with the "F" schedule age pattern of fertility to correct the reporting errors evident in the first graph.

The bottom panel of the table shows the calculation of an adjusted model fertility schedule defined by the "F" pattern at ages 15-34, and the "P" level corresponding to ages 20-34. The average P/F correction factor applied to the fertility rates is 1.26. Since there is a discontinuity in the observed "F" pattern after age 35, this model schedule can be viewed as an extrapolation of the fertility rates currently displayed by women under age 35.

#### Appendix 8.2: Worked Example for Arriaga's Approaches Tanzania Total 1988

BASED ON CHILDREN EVER BORN FOR ONE POINT(S) IN TIME AND THE AGE PATTERN(S) OF FERTILITY (BRASS)

AGE GROUPS	CHILDREN EVER BORN (C.E.B.)	FERTILITY CONSISTENT WITH C.E.B. (A.S.F.R.)	FERTILITY PATTERN BY AGE AT SURVEY DATE	FERTILITY PATTERN BY AGE AT BIRTH OF CHILD	CUMULATION OF		ADJUSTMENT FACTORS	AGE SPECIFIC FERTILITY RATES BASED ON ADJUSTMENT FACTOR FOR THE AGE GROUP	
					A.S.F.R.	FERTILITY PATTERN BY AGE AT BIRTH		20-25	25-30

AUG 1988

		RECORDED	CALCULATED							
15-20	0.313	0.1690	0.0840	0.1001	0.1690	0.1001	1.6885	0.1391	0.1388	0.1
20-25	1.553	0.2964	0.2270	0.2348	0.4654	0.3349	1.3896	0.3263	0.3257	0.3
25-30	3.154	0.3332	0.2410	0.2409	0.7986	0.5758	1.3869	0.3347	0.3341	0.3
30-35	4.764	0.2796	0.2190	0.2157	1.0781	0.7915	1.3622	0.2997	0.2991	0.2
35-40	5.846	0.1547	0.1760	0.1705	1.2329	0.9620	1.2816	0.2369	0.2364	0.2
40-45	6.396	0.0821	0.0970	0.0888	1.3150	1.0507	1.2515	0.1234	0.1231	0.1
45-50	6.474	0.0300	0.0500	0.0433	1.3450	1.0940	1.2295	0.0601	0.0600	0.0

MEAN AGE OF FERTILITY: 26.92 28.04

TOTAL FERTILITY RATE: 6.73 5.47 7.60 7.59 7.5



### Appendix 8.3: Age Pattern of Fertility at Regional Level

#### 01 Dodoma Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.087	0.110	0.325	0.214
20-24	0.247	0.306	1.613	1.423
25-29	0.261	0.332	3.275	3.086
30-34	0.225	0.280	4.847	4.612
35-39	0.192	0.200	6.115	5.778
40-44	0.118	0.095	6.644	6.475
45-49	0.052	0.014	6.654	6.671

#### 02 Arusha Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.072	0.091	0.262	0.163
20-24	0.241	0.292	1.454	1.268
25-29	0.262	0.335	3.082	2.917
30-34	0.237	0.288	4.681	4.479
35-39	0.210	0.207	5.851	5.688
40-44	0.130	0.098	6.478	6.408
45-49	0.055	0.014	6.513	6.608

#### 03 Kilimanjaro Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.055	0.075	0.150	0.119
20-24	0.231	0.294	1.058	1.172
25-29	0.265	0.367	2.600	2.936
30-34	0.254	0.326	4.388	4.688
35-39	0.209	0.236	5.884	6.065
40-44	0.108	0.110	6.823	6.884
45-49	0.045	0.005	7.388	7.105

#### 04 Tanga Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.073	0.097	0.325	0.198
20-24	0.202	0.262	1.517	1.227
25-29	0.223	0.301	3.085	2.693
30-34	0.209	0.273	4.742	4.133
35-39	0.161	0.214	5.755	5.331
40-44	0.099	0.115	6.326	6.126
45-49	0.046	0.020	6.456	6.383

# Appendix 8.3 Cont'd: Age Pattern of Fertility at Regional Level

## 05 Morogoro Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.088	0.126	0.365	0.290
20-24	0.193	0.272	1.596	1.422
25-29	0.199	0.287	3.128	2.856
30-34	0.179	0.253	4.709	4.200
35-39	0.137	0.197	5.571	5.303
40-44	0.076	0.108	6.209	6.044
45-49	0.045	0.019	6.370	6.292

## 06 Coast Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.114	0.111	0.224	0.259
20-24	0.236	0.226	1.938	1.682
25-29	0.234	0.229	3.667	2.825
30-34	0.204	0.195	4.684	3.802
35-39	0.158	0.148	5.165	4.545
40-44	0.090	0.079	5.328	4.939
45-49	0.059	0.014	5.349	5.007

## 07 Dar es Salaam Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.042	0.058	0.227	0.109
20-24	0.132	0.183	1.127	0.800
25-29	0.153	0.221	2.489	1.863
30-34	0.149	0.203	3.861	2.934
35-39	0.115	0.158	4.841	3.823
40-44	0.058	0.082	5.338	4.402
45-49	0.026	0.013	5.158	4.583

## 08 Lindi Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.097	0.126	0.439	0.303
20-24	0.196	0.248	1.709	1.356
25-29	0.194	0.254	3.122	2.634
30-34	0.176	0.222	4.472	3.818
35-39	0.149	0.175	5.305	4.792
40-44	0.071	0.098	5.694	5.454
45-49	0.043	0.018	5.587	5.682



**Appendix 8.3 Cont'd: Age Pattern of Fertility at Regional Level**

**09 Mtwara Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.094	0.130	0.421	0.313
20-24	0.196	0.253	1.790	1.392
25-29	0.176	0.255	3.214	2.683
30-34	0.169	0.220	4.341	3.863
35-39	0.132	0.170	5.129	4.818
40-44	0.080	0.093	5.129	5.457
45-49	0.046	0.017	5.573	5.671

**10 Ruvuma Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.088	0.121	0.346	0.260
20-24	0.214	0.290	1.646	1.439
25-29	0.223	0.309	3.141	2.985
30-34	0.197	0.268	4.752	4.424
35-39	0.151	0.202	5.808	5.572
40-44	0.080	0.104	6.415	6.308
45-49	0.046	0.017	6.769	6.537

**11 Iringa Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.061	0.088	0.201	0.171
20-24	0.187	0.268	1.294	1.178
25-29	0.215	0.316	2.924	2.699
30-34	0.206	0.293	4.616	4.234
35-39	0.167	0.231	5.807	5.527
40-44	0.097	0.124	6.520	6.382
45-49	0.051	0.021	7.206	6.666

**12 Mbeya Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.087	0.129	0.314	0.266
20-24	0.223	0.318	1.549	1.568
25-29	0.213	0.322	3.192	3.216
30-34	0.181	0.259	4.732	4.652
35-39	0.140	0.179	5.798	5.711
40-44	0.067	0.083	6.384	6.325
45-49	0.037	0.011	6.445	6.492

Appendix 8.3 Cont'd: Age Pattern of Fertility at Regional Level

**13 Singida Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.063	0.076	0.231	0.124
20-24	0.248	0.278	1.505	1.148
25-29	0.266	0.322	3.242	2.738
30-34	0.240	0.268	5.021	4.215
35-39	0.180	0.183	5.994	5.308
40-44	0.095	0.080	6.363	5.918
45-49	0.044	0.010	6.093	6.071

**14 Tabora Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.103	0.124	0.411	0.283
20-24	0.226	0.273	1.737	1.411
25-29	0.242	0.289	3.223	2.853
30-34	0.213	0.256	4.694	4.213
35-39	0.168	0.200	5.634	5.332
40-44	0.094	0.110	5.883	6.084
45-49	0.043	0.020	5.740	6.336

**15 Rukwa Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.087	0.114	0.327	0.217
20-24	0.260	0.333	1.820	1.509
25-29	0.280	0.370	3.611	3.347
30-34	0.247	0.317	5.488	5.066
35-39	0.199	0.230	6.500	6.398
40-44	0.103	0.110	7.272	7.204
45-49	0.017	0.016	7.549	7.433

**16 Kigoma Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.077	0.094	0.288	0.166
20-24	0.258	0.306	1.711	1.323
25-29	0.287	0.350	3.557	3.051
30-34	0.252	0.299	5.194	4.676
35-39	0.231	0.212	6.249	5.920
40-44	0.128	0.098	6.430	6.651
45-49	0.061	0.013	6.331	6.850



Appendix 8.3 Cont'd: Age Pattern of Fertility at Regional Level

17 Shinyanga Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.102	0.123	0.360	0.266
20-24	0.251	0.297	1.662	1.462
25-29	0.273	0.329	3.220	3.080
30-34	0.252	0.298	4.802	4.651
35-39	0.209	0.236	6.032	5.966
40-44	0.113	0.130	6.590	6.858
45-49	0.054	0.024	6.635	7.157

18 Kagera Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.091	0.108	0.255	0.196
20-24	0.297	0.335	1.641	1.486
25-29	0.308	0.370	3.440	3.337
30-34	0.272	0.308	5.223	5.029
35-39	0.242	0.214	6.401	6.294
40-44	0.119	0.097	6.797	7.021
45-49	0.055	0.013	6.857	7.214

19 Mwanza Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.106	0.127	0.345	0.279
20-24	0.255	0.299	1.627	1.499
25-29	0.264	0.322	3.346	3.102
30-34	0.241	0.284	5.033	4.616
35-39	0.189	0.219	6.202	5.850
40-44	0.108	0.117	6.830	6.664
45-49	0.063	0.020	6.792	6.928

20 Mara Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.100	0.129	0.410	0.280
20-24	0.246	0.314	1.855	1.544
25-29	0.269	0.348	3.569	3.254
30-34	0.246	0.314	5.278	4.911
35-39	0.189	0.248	6.493	6.293
40-44	0.057	0.136	7.303	7.224
45-49	0.081	0.024	7.240	7.535

**Appendix 8.3 Cont'd: Age Pattern of Fertility at Regional Level**

**51 Zanzibar North Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.139	0.131	0.489	0.334
20-24	0.272	0.246	2.089	1.371
25-29	0.307	0.270	3.651	2.687
30-34	0.299	0.261	5.674	4.019
35-39	0.196	0.233	6.445	5.245
40-44	0.120	0.154	6.787	6.211
45-49	0.068	0.037	6.543	6.618

**52 Zanzibar South Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.094	0.117	0.325	0.235
20-24	0.279	0.309	1.830	1.465
25-29	0.289	0.334	3.686	3.134
30-34	0.255	0.286	5.330	4.681
35-39	0.230	0.209	6.312	5.888
40-44	0.094	0.103	6.987	6.632
45-49	0.068	0.016	6.558	6.851

**53 Zanzibar West Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.065	0.089	0.193	0.145
20-24	0.241	0.314	1.438	1.321
25-29	0.265	0.347	3.164	3.069
30-34	0.217	0.277	4.945	4.620
35-39	0.150	0.180	5.959	5.717
40-44	0.055	0.074	5.608	6.300
45-49	0.046	0.008	6.610	6.437

**54 Pemba North Region**

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.137	0.153	0.569	0.344
20-24	0.309	0.334	2.341	1.740
25-29	0.300	0.343	3.951	3.476
30-34	0.268	0.292	5.800	5.054
35-39	0.182	0.219	6.727	6.300
40-44	0.117	0.113	6.600	7.096
45-49	0.070	0.019	6.689	7.345



# Appendix 8.3 Cont'd: Age Pattern of Fertility at Regional Level

## 55 Pemba South Region

Age Group	Rec. ASFR	Adj. ASFR	Rec. Pi	Adj. Pi
15-19	0.121	0.127	0.373	0.253
20-24	0.350	0.337	2.010	1.600
25-29	0.324	0.359	3.986	3.405
30-34	0.306	0.300	5.852	5.043
35-39	0.225	0.214	6.846	6.290
40-44	0.116	0.102	7.016	7.036
45-49	0.080	0.015	6.892	7.247

## CHAPTER 9

### HOUSEHOLDS AND HOUSING CHARACTERISTICS

by Noah L.A.M. Musyani<sup>1</sup>

#### 9.1 INTRODUCTION

The household is considered to be the basic social and/ or economic unit of society. Changes at the household level are known to have repercussions at the aggregate level of nation and vice versa. For example, the changes in household composition and structure have impact on the distribution of goods and services, and on the planning of community development requirements for schools, housing and health infrastructure. The household is also the primary unit of consumption used in various marketing and cost-of-living studies.

The household as the most socio-economic population grouping has therefore, been used as the unit of visitation in the process of enumeration. As the unit of statistical enumeration, household is central to this study seeking to understand the trends and variations in its size, composition and structure. The census data on households will also form an important input in studies which examine the relation of the demographic transition to processes of modernisation, industrialisation and urbanisation as well as widespread social and economic effects in such areas as consumption and saving patterns, economic participation and social welfare.

#### Definition

The concepts of the "family" and "household" are often confused and sometimes used interchangeably because of their close relationship. There is, however, a distinction between the two terms. Unlike the family where members need to be related by blood or associated by marriage, there can be members of the household who are not necessarily family members. There is no uniform and universally acceptable definition of the family as a sociological-anthropological concept, partly due to differences in the structure and function of family organisation existing in various parts of the world and partly due to many varieties of approaches and schools of thought. For practical reasons, therefore, censuses and surveys deal with the household unit rather than the family unit.

The household is a person or a group of people who usually live and eat together and are not necessarily a family<sup>2</sup>. During training of interviewers, emphasis is placed on making the distinction between a family where members are to be blood related and a household, where according to this definition, the sharing of a housing unit and facilities is the main concern.

This definition, however, is not easy to apply in practice in developing countries. First, the household usually occupy the whole, or part of a single housing unit; but may also be found in more than one housing unit; in camps; boarding houses or hotels, or as administrative personnel in institutions or they may be homeless. There are also households consisting

---

<sup>1</sup> The author is a Senior Statistician and Demographer, Population Planning Section, The Planning Commission.

<sup>2</sup> DHS, 1987, Interviewer's Manual.



extended families which make common provision for food; and there may be potentially separate households with a common head, resulting from a polygamous union, which may occupy more than one housing unit. Note that a house, an apartment or other group of rooms or a single room is regarded as housing unit when it is occupied or intended for occupancy as separate living quarters.

Second, in the Sub-Saharan Africa region, the family has a broad meaning and there is a tendency for relatives and non-relatives to live together. Besides the husband, his wife or wives and children, the elderly, uncles, aunts, and cousins are also considered family members. They may or may not be part of the same household. Foster children and housemaids can also be part of the household. According to this definition, in cases where all eat together they will be considered as members of one household, whereas if they do not share food provisions they will be considered to belong to different households.

Third, the practice of polygyny which is accompanied by complex residence arrangements, especially in urban areas also complicates the identification of households and their members. The husbands normally, as a common pattern of behaviour visits alternatively his wives and children who live in separate residences. To avoid double counting in such cases, the husband is considered to be part of the household where he sleeps and spends more time.

Fourth, the socio-cultural circumstances may also pose a problem in identifying head of the household. Where traditional values are still strong, even if a female member is the real provider for the household, she might not be designated as the head of the household, if there is an adult or elderly male who is a member of the same household.

This lack of uniform and universally acceptable statistical definition of the household poses conceptual and practical difficulties associated with some fairly wide differences in national definitions of household thereby limiting international comparability. The statistics, moreover, may be limited by the extent to which enumerators and respondent faithfully adhere to the definitions. The changes in the definition and variation of questions from one census to another even within the same country also contribute further to limit such comparability<sup>3</sup>.

The United Nations has recommended a definition of a household for international use as follows: The concept of "household" is based on the arrangement made by persons, individually or in groups, for providing themselves with food and other essentials for living. A household may be (a) a one-person household, that is, a person who makes provision for his own food or other essentials for living without combining with any other person to form part of a multiperson household, or (b) a multiperson household, that is; a group of two or more persons who make common provision for food or other essentials for living. The person in the group may pool their income and have a common budget to a greater or less extent; they may be related or unrelated persons or a combination of both<sup>4</sup>.

---

<sup>3</sup> Shryock, H.S. et al. 1976, *The Methods and Materials of Demography*, Academic Press, San Diego, p.171.

<sup>4</sup> United Nations 1973, *The Determinants and Consequences of Population Trends*, Volume 1, p. 336.



According to the 1988 Population Census of Tanzania the "private household" is defined as a group of persons who live together and share their expenses. Usually this type of household includes the husband, wife, children and other relatives. Visitors and servants are also included as members of the household as long as are present in the household on the census night. Unlike the 1978 Population Census when questions were asked on the building materials and the year when the building was constructed, such questions were omitted from the 1988 census. In fact, the 1988 Population Census, directed its attention at the available facilities in the house for the private household and information on the following were collected: (i) Number of persons in the household; (ii) Number of rooms; (iii) Type of drinkable water available; (iv) Type of toilet; (v) Availability of electricity; and (vi) Type of tenure. Thus the published Population Census tables number 20 to 23 both for national and regional profiles refers to the household and housing characteristics and are based only on "private households" enumerated using the detailed questionnaire served to a probability sample of the total population.

Census Table 20 provides vital information on rooms available to the household. This information enables us to estimate and understand the magnitude of accommodation problem in a particular residence. The information is also important for planning purposes as an indicator on the requirements for accommodation. As in the 1978 Census, only rooms used by the household for living (whether they are in one or more houses) were included. The number of rooms occupied were recorded as one to nine or more. The "9+ rooms" category has been assumed to have 10 rooms in the analysis. Rooms used for other purposes such as storage, kitchen, bathrooms, toilet, keeping animals, etc. were excluded.

Census tables 21 - 23 give information on the type of drinkable water, availability and use of toilet facilities and the availability of electricity supply according to "tenure" respectively. Regarding tenancy three main categories have been classified as the "owner", "tenant", "other" and those who did not state their tenure. The term "other" included all persons who were neither owners nor tenants such as caretakers, relatives living rent free, squatters, etc.

Census table 21 provides information on the availability of drinkable water in the household and six categories were distinguished: piped water within/outside the house or village, well water in/outside the plot or village, and other inside/outside plot or village. The category "other" included sources such as rivers, ponds, lakes, etc. Census table 22 shows information on the availability of toilet facilities at the disposal of the household and there are four categories namely: flush toilet inside/outside the house, pit latrine and no toilet. Note, unlike the 1988 census no information on the type of toilet facility was collected in 1978 census.

Census table 23 presents information on the availability of electricity in which three categories distinguished as "electricity available", "electricity not available" and "not stated". The main focus of this table is on rural electrification, a new direction in which the Government is striving to achieve and accelerate rapid rural development in the country. Finally, Census table 24 in the national profile provides information on households by relationship to head of household.



## 8.2 METHODS APPLIED

The basic tables for analysis from both the national and regional profiles have been transformed into percentage distributions. In most cases, the "N.S - Not Stated" households have been excluded in the calculations. In some cases, it is possible that the totals do not add up to 100 percent because of rounding. Wherever possible all calculations have been disaggregated by region and urban/rural residence.

### Type of Households

Table 9.1 shows the percentage distribution of private households by type and residence. According to this table, Tanzanian households are classified into three categories namely "nuclear" (52.1%), "extended" (37.3%) and "composite" (10.6%). In Tanzania Mainland "nuclear" and "extended" households account for about 52.1 and 37.3 percent of all households, whereas in Zanzibar the figures are 50.8 and 38.7 percent respectively.

Zanzibar has a higher proportion of "extended" households in urban areas than in rural areas as opposed to the Mainland where the proportions in both residence categories are almost the same. On the other hand, urban areas in the Mainland have a relatively high proportion of "composite" households than their counterparts in Zanzibar.

TABLE 9.1 PERCENTAGE DISTRIBUTION OF PRIVATE HOUSEHOLDS BY TYPE OF HOUSEHOLDS AND RESIDENCE, 1988

Type of Residence	Type of Household			
	Total	Nuclear	Extended	Composite
<b>Tanzania</b>				
Total	100.0	52.1	37.3	10.6
Rural	100.0	52.4	37.4	10.2
Urban	100.0	50.8	37.0	12.2
<b>Mainland</b>				
Total	100.0	52.1	37.3	10.6
Rural	100.0	51.4	37.4	10.2
Urban	100.0	51.1	36.6	12.3
<b>Zanzibar</b>				
Total	100.0	50.8	38.7	10.5
Rural	100.0	53.8	35.2	11.0
Urban	100.0	44.7	45.7	9.6

## Household Size

### Variations in the size of households

The household size which measures the average number of persons included in the household is described in this section by Tables 9.2 through 9.5. Table 9.1 shows the household size by type of household and gender of the head of household, whereas Table 11.2b shows the household size by age of the head of household for Tanzania, Mainland and Zanzibar for 1988. In Table 9.3 the household size is shown for each region by residence both for 1978 and 1988. The other remaining tables show the percentage distribution of private households by size of household regionwise for total, rural and urban Tanzania for the same period.

According to Table 9.1, the household size for "nuclear", "extended" and "composite" households in Tanzania Mainland are estimated at 3.9, 6.3 and 7.6 persons respectively. In Zanzibar, figures stand at 3.5, 5.7 and 6.3 persons respectively. Two common features are identified from this table. First, urban households in the Mainland with the exception of "composite" households have a slightly smaller household size than their counterpart in Zanzibar. Second, all female headed households have lower household sizes compared to those headed by males.

From Table 9.2, four significant features are observed. First, rural areas both in Zanzibar and the Mainland have their peak of household size for heads in the age group 45-49. Second, urban areas, however, have differing age group for their peak of household size. For example, Zanzibar and the Mainland have their peak of household size in ages 40-44 and 50-54 respectively. All the distributions of household size by age of head are unimodal, rising to a single peak then declining. Table 9.3 provides estimates on the average household size. On the Mainland, rural households are larger than urban ones, whereas in Zanzibar the opposite is true. The same differentials were observed in 1978. The urban areas show less variation than rural areas in the household size between regions.

Just as in the 1978 Census, the largest household size are shown to be located in the border regions towards south-west in Rukwa and Kigoma; and to the north in Tanga, Kilimanjaro, Arusha, Mara, Mwanza, Shinyanga and Kagera. The coastal regions of Morogoro, Coast, Dar es Salaam, Lindi and Mtwara; all regions of Zanzibar; as well as Mbeya and Iringa regions in the Southern Highlands have household sizes less than the national average of 5.2 persons. The regions which have the smallest household size (less than 4.5 persons) include Mtwara, Dar es Salaam and Zanzibar North. For urban areas, Zanzibar has a slightly larger household size than Tanzania Mainland, whereas among the regions, the top three (5 or more) are Kigoma, Pemba South and Zanzibar Town/West.

### Patterns and trends in the size of households

Patterns and trends have been noted with respect to changes in the size and structure of households. One of the main features observed in Table 9.3 is that the average household size in almost all the regions in rural areas increased between 1978 and 1988 to a varying extent. The increase shows high variation for rural areas in which it ranges from 0 in Mbeya region to 1 in Tabora and Tanga regions. The highest increases (above 0.7) are observed in Arusha, Tanga,



Morogoro, Tabora, and Mara. The smallest increases (less than 0.2) are seen in Pemba North, Kilimanjaro, Mtwara, Ruvuma, Mbeya and Rukwa. In the case of urban areas, however, the trend in average household size is mixed. Four regions have shown a decline in household size. Another four regions have shown no change over the period. In most regions, rural household size has increased proportionately more than urban household size.

The second feature of note in tables 9.4 and 9.5 is the type of pattern in the distribution of private households by household size. From tables 9.4 and 9.5 it is apparent that most rural and urban areas in Tanzania Mainland have the highest proportion of households with 6 and 5 members respectively. In Zanzibar, the peaks for rural and urban households occur at the same number but in reverse order. Regions of Mwanza, Mara, Shinyanga, Lindi and Mtwara have peaks at 7 and 5 member households respectively. In Zanzibar, the peak varies from 5 for all Pemba regions to 7 member households in Zanzibar Town/West region. The third feature is the pattern of percent increases in the average household size between 1978 and 1988. The largest top three, all over 15 % are observed in Tabora, Tanga and Morogoro.

The regions of Zanzibar have a slightly higher household size than their counterpart in the Mainland, particularly among urban areas. In urban areas, the housing shortages force co-residence between the young and the old and out-migration of the young from rural areas probably also contributes to this relatively high household size. Zanzibar has 35 percent of its population living in urban areas as opposed to only 18 percent for the Mainland. Female headed households are found to have lower household sizes compared to those headed by males. As will be shown later, the age structure as well as the gender of the head of the household plays a strong role in influencing the composition and size of the household.

On average the household size in almost all the regions with the exception of Mbeya has increased between the 1978 and 1988 censuses. This situation is commonly observed in developing countries which are in a stage of demographic transition with declining mortality combined with relatively constant and high fertility.

In a few urban areas, however, small increases or stability in average size of household are observed, an indication of an increase in the proportion of small-size households. This may be caused by a fragmentation of large households, by internal migration (outward movement of members of large households or inward movements of single people setting up one person households) or by fertility decline.

Although, there are some signs of fertility beginning to decline in some regions, it is more probable that the local process of industrialisation and urbanisation is responsible for the changes in household size.

TABLE 9.2 HOUSEHOLD SIZE BY TYPE OF HOUSEHOLD AND SEX OF HEAD OF HOUSEHOLD

TYPE OF RESIDENCE	TYPE OF HOUSEHOLD				SEX OF HEAD	
	Total	Nuclear	Extended	Composite	Male	Female
TANZANIA						
Total	4.2	3.9	6.4	7.6	5.5	4.6
Rural	5.4	4.1	6.5	7.9	5.7	5.6
Urban	4.5	2.9	5.8	6.7	5.6	4.3
MAINLAND						
Total	5.2	3.9	6.4	7.6	5.5	4.6
Rural	5.4	4.1	6.5	7.9	5.7	4.7
Urban	4.4	2.9	5.8	6.8	4.5	4.2
ZANZIBAR						
Total	4.7	3.5	5.7	6.3	4.8	4.3
Rural	4.5	3.6	5.3	6.2	4.8	4.0
Urban	4.9	3.3	6.2	6.6	5.0	4.8

TABLE 9.3 HOUSEHOLD SIZE BY AGE OF HEAD OF HOUSEHOLD: Census 1988

Age of Head	TANZANIA			MAINLAND			ZANZIBAR		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
All H/holds	5.2	5.4	4.5	5.2	5.4	4.4	4.7	4.5	4.9
10 - 14	3.9	4.0	3.3	3.9	4.0	3.3	2.6	2.6	2.7
15 - 19	3.3	3.5	2.6	3.3	3.5	2.6	2.7	2.6	2.7
20 - 24	3.4	3.6	2.7	3.4	3.6	2.7	3.1	3.1	3.1
25 - 29	4.0	4.3	3.3	4.0	4.3	3.2	3.7	3.7	3.8
30 - 34	4.9	5.2	4.1	4.9	5.2	4.1	4.6	4.5	4.8
35 - 39	5.6	5.8	5.0	5.6	5.9	5.0	5.3	5.1	5.4
40 - 44	6.1	6.2	5.6	6.1	6.2	5.6	5.5	5.4	5.8
45 - 49	6.2	6.3	5.8	6.2	6.4	5.8	5.6	5.5	5.8
50 - 54	6.1	6.1	5.9	6.1	6.2	6.0	5.3	5.2	5.7
55 - 59	6.1	6.1	5.8	6.1	5.8	5.8	5.4	5.2	5.8
60 - 64	5.7	5.7	5.3	5.7	5.7	5.3	4.9	4.7	5.3
65+	5.2	5.3	5.0	5.3	5.3	5.4	4.3	4.1	4.6



TABLE 9.4 AVERAGE NUMBER OF PERSONS PER PRIVATE HOUSEHOLDS BY REGIONS: in 1978 and 1988

REGION	1978			1988			ABSOLUTE CHANGE 1978-88		
	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN	TOTAL	RURAL	URBAN
TANZANIA	4.8	4.9	4.2	5.2	5.4	4.5	0.4	0.5	0.3
MAINLAND	4.8	5.0	4.2	5.2	5.4	4.4	0.4	0.5	0.3
Dodoma	4.6	4.7	4.3	5.0	5.1	4.3	0.3	0.4	0.0
Arusha	5.1	5.3	3.9	5.2	6.1	3.9	0.1	0.8	0.0
Kilimanjaro	5.2	5.3	3.9	5.3	5.5	4.3	0.1	0.2	0.4
Tanga	4.4	4.4	4.3	5.2	5.4	4.6	0.8	1.0	0.3
Morogoro	4.4	4.5	3.6	5.0	5.2	4.4	0.7	0.7	0.9
Coast	4.2	4.2	4.4	4.8	4.9	4.7	0.6	0.6	0.3
Dar es Salaam	4.0	3.7	4.0	4.3	4.4	4.3	0.3	0.7	0.3
Lindi	4.4	4.4	4.3	4.6	4.7	4.2	0.3	0.4	-0.1
Mtwara	4.3	4.3	4.3	4.4	4.4	4.3	0.1	0.1	0.0
Ruvuma	5.2	5.2	4.9	5.2	5.3	4.6	0.1	0.1	-0.3
Iringa	4.4	4.4	4.2	4.7	4.7	4.2	0.3	0.3	0.1
Mbeya	4.9	5.0	4.4	4.9	5.0	4.3	-0.1	0.0	-0.1
Tabora	4.7	4.8	4.4	5.6	5.8	4.7	0.9	1.0	0.4
Rukwa	5.1	5.2	5.5	5.2	5.3	4.6	0.1	0.1	-0.9
Kagera	4.4	4.4	3.6	4.9	4.9	4.1	0.5	0.5	0.5
Singida	4.6	4.6	4.4	5.2	5.3	4.5	0.6	0.7	0.1
Kigoma	5.5	5.5	5.1	5.7	5.7	5.3	0.2	0.2	0.2
Shinyanga	5.8	5.9	4.2	6.0	6.5	4.6	0.2	0.6	0.3
Mwanza	6.0	6.2	4.4	6.3	6.7	4.9	0.3	0.5	0.4
Mara	6.1	6.3	4.9	6.7	7.0	4.9	0.6	0.8	0.0
ZANZIBAR	4.2	4.2	4.2	4.7	4.5	4.9	0.5	0.4	0.7
Zanzibar North	3.9	3.9	3.9	4.2	4.1	4.1	0.3	0.3	0.2
Zanzibar South	4.0	4.0	4.1	4.5	4.6	4.3	0.6	0.6	0.3
Zanzibar West	4.1	3.8	4.2	4.9	4.5	5.0	0.8	0.7	0.8
Pemba North	4.5	4.5	4.3	4.7	4.6	4.9	0.2	0.1	0.6
Pemba South	4.2	4.4	4.7	4.8	4.8	5.1	0.6	0.4	0.4

TABLE 9.5 PERCENTAGE OF RURAL PRIVATE HOUSEHOLD SIZE in 1988

Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
TANZANIA	1.6	4.2	7.3	9.7	11.4	12.0	11.5	9.8	7.9	7.5	3.2	2.7	2.2	1.7	7.1
MAINLAND	1.6	4.2	7.2	9.7	11.4	12.0	11.5	9.9	7.9	7.6	3.2	2.7	2.2	1.7	7.2
Dodoma	1.9	5.0	8.6	11.5	12.5	12.9	12.1	9.5	7.9	7.8	2.0	1.8	1.4	1.1	4.0
Arusha	1.2	3.5	6.7	1.0	12.1	13.3	12.8	10.9	8.8	8.8	2.9	2.4	1.6	1.3	3.6
Kilimanjaro	1.1	3.0	6.0	9.7	13.1	14.4	14.2	12.6	9.2	7.0	2.9	2.1	1.5	0.9	2.3
Tanga	1.7	4.1	6.9	9.4	11.4	12.3	11.8	10.3	8.5	10.0	2.5	2.2	1.8	1.4	5.7
Morogoro	1.9	4.4	7.4	10.0	11.7	12.2	11.4	10.6	7.9	8.3	3.1	2.4	1.9	1.5	5.4
Coast	2.6	5.6	8.1	10.5	12.2	12.4	11.6	10.0	7.6	7.0	3.0	2.1	1.9	1.0	4.2
Dar es Salaam	4.3	7.1	9.1	10.9	11.7	11.9	11.2	9.4	7.0	6.2	3.0	2.3	1.5	0.9	3.4
Liadi	2.2	5.9	9.6	12.4	13.5	12.8	11.6	8.6	7.0	6.7	2.4	1.6	1.4	0.8	3.5
Mtwara	2.4	7.0	11.3	13.8	14.8	13.0	10.0	8.2	5.8	4.7	2.5	1.6	1.1	0.8	2.2
Ruvuma	1.2	4.5	7.9	10.5	11.7	12.2	12.4	10.0	7.7	7.0	3.1	2.8	1.8	1.5	5.6
Iringa	1.9	5.3	9.7	12.9	14.7	14.3	12.5	9.7	6.1	5.1	1.7	1.4	1.1	0.5	3.1
Mbeya	2.2	5.2	9.1	10.8	11.4	12.1	10.8	8.7	6.7	6.3	2.6	2.5	1.8	1.6	8.3
Tabora	1.7	3.9	5.7	7.7	9.4	10.0	10.4	9.4	8.5	8.5	4.3	3.6	3.0	2.6	10.8
Rukwa	1.4	4.4	7.7	10.0	11.8	12.8	12.7	11.3	8.7	7.5	3.0	2.1	1.8	1.3	3.6
Kagera	2.2	5.2	8.7	11.1	12.8	12.8	11.9	9.9	7.7	6.8	2.7	1.9	1.5	1.0	3.8
Singida	1.4	4.6	7.6	10.2	12.5	12.7	11.9	10.0	7.9	7.2	3.1	2.8	1.8	1.3	5.1
Kigoma	1.2	3.5	6.2	8.9	10.1	11.9	12.2	10.6	9.0	7.4	4.0	3.4	2.6	2.4	6.7
Shinyanga	1.0	2.9	4.7	6.8	8.8	9.8	10.4	9.1	8.3	8.6	4.6	4.0	3.5	3.1	14.6
Mwanza	0.9	2.5	4.4	6.4	8.0	9.3	9.7	9.3	8.6	8.6	4.8	4.7	4.5	3.5	14.7
Mara	0.8	2.2	3.7	5.9	7.8	9.1	9.8	9.5	8.5	8.4	5.0	4.5	3.7	3.2	18.2
ZANZIBAR	2.8	5.8	10.2	13.1	14.4	13.8	12.2	9.5	6.4	5.2	2.1	1.6	0.9	0.6	1.5
Zanzibar North	3.4	7.4	12.2	15.3	14.8	13.3	11.8	8.2	5.0	4.6	1.5	0.8	0.8	0.3	0.7
Zanzibar South	2.8	5.7	9.4	13.1	15.0	14.1	10.8	9.4	6.7	5.4	2.4	1.4	1.2	0.8	1.8
Zanzibar West	3.9	5.5	10.2	12.2	11.5	12.8	10.4	9.8	7.5	5.9	3.6	2.6	0.8	0.5	2.8
Pemba North	2.2	5.3	9.8	13.4	15.0	14.6	13.0	10.3	6.5	4.9	1.9	1.1	0.6	0.4	0.9
Pemba South	2.4	5.1	9.4	11.6	14.4	13.4	13.2	9.5	6.8	5.6	2.2	2.3	1.1	1.1	1



TABLE 9.6 PERCENT DISTRIBUTION OF URBAN PRIVATE HOUSEHOLDS BY HOUSEHOLD SIZE: 1988 Census

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
TANZANIA	4.3	6.8	8.8	10.4	11.2	11.1	10.2	8.8	7.2	6.8	3.3	2.6	2.0	1.5	5.0
MAINLAND	4.4	6.9	8.8	10.5	11.2	11.1	8.8	7.2	6.8	3.2	2.6	3.2	2.0	1.5	5.1
Dodoma	4.0	6.7	9.2	10.8	11.9	11.7	10.8	9.2	7.3	6.7	2.7	2.4	1.3	1.3	3.9
Arusha	5.8	9.5	11.4	11.3	11.9	10.9	9.8	8.0	5.7	5.6	2.5	2.0	1.5	1.0	3.3
Kilimanjaro	4.5	6.7	9.0	11.1	12.1	12.5	10.4	9.4	7.1	6.0	3.2	2.1	1.2	1.1	3.5
Tanga	4.2	5.9	8.3	9.6	10.3	10.4	10.5	9.2	8.1	8.0	3.1	2.7	2.4	1.6	5.5
Morogoro	4.7	6.9	8.4	10.2	11.3	11.3	11.1	9.0	7.1	6.7	2.9	2.7	1.7	1.6	4.4
Coast	3.9	5.8	8.8	10.1	10.5	11.3	10.3	9.4	7.6	7.0	4.0	2.7	2.0	1.8	5.7
Dar es Salaam	4.9	7.4	8.8	10.5	11.0	10.9	9.5	8.0	7.3	6.5	3.6	2.6	2.2	1.6	5.1
Lindi	4.4	7.2	10.3	12.6	13.0	12.2	10.0	8.4	6.4	5.7	2.4	2.1	1.3	1.3	2.8
Mtwara	3.9	7.3	10.2	13.1	13.3	12.5	10.5	8.6	6.3	5.4	2.7	1.8	1.4	1.0	2.1
Ruvuma	4.2	6.3	8.7	10.1	11.1	11.4	9.9	8.9	7.1	6.6	3.4	3.0	2.2	1.7	5.3
Iringa	3.9	7.4	10.7	11.2	14.3	12.5	11.4	10.5	5.6	7.3	1.4	0.4	1.2	0.3	1.9
Mbeya	4.3	7.4	9.8	12.1	12.3	11.6	10.6	9.0	6.5	6.2	2.3	1.8	1.6	0.9	3.6
Tabora	4.3	6.0	7.8	9.0	9.6	9.6	10.1	9.9	7.3	8.7	3.1	2.9	2.3	2.0	7.5
Rukwa	3.4	6.0	8.9	11.5	11.6	12.4	10.9	9.5	7.7	5.8	2.7	2.6	2.0	1.1	3.9
Kagera	5.5	7.9	9.8	10.5	11.5	11.1	9.5	9.5	6.5	5.4	2.9	2.9	1.8	1.5	3.9
Singida	4.0	6.9	9.1	10.6	11.8	12.2	10.9	9.0	6.9	6.2	3.3	2.6	1.7	1.2	4.5
Kigoma	3.0	4.5	6.7	7.9	9.4	10.0	10.2	9.4	8.4	7.5	4.8	4.1	3.3	2.1	9.1
Shinyanga	4.4	6.8	8.3	9.4	10.4	10.4	10.2	9.2	7.7	7.3	3.7	3.2	2.1	1.6	5.5
Mwanza	3.4	6.0	7.6	9.2	10.1	9.4	9.9	8.7	7.6	8.5	3.7	3.3	2.4	1.9	8.1
Mara	3.5	5.7	7.5	9.2	9.9	10.9	10.5	9.0	7.1	6.7	3.3	3.5	2.6	2.2	8.5
ZANZIBAR	2.9	4.5	7.5	10.1	11.5	12.7	12.0	9.9	8.0	6.7	4.2	3.0	2.0	1.6	3.3
Zanzibar North	3.4	6.8	9.9	13.4	14.2	13.4	10.4	9.9	8.3	3.8	2.5	1.8	0.6	0.9	0.7
Zanzibar South	3.4	6.0	10.7	13.5	17.9	11.1	11.8	9.4	6.3	5.0	1.6	1.2	1.0	0.6	0.7
Zanzibar West	3.1	4.5	7.1	9.6	10.7	12.6	11.8	9.8	8.1	7.1	4.6	3.3	2.2	1.8	3.9
Pemba North	2.1	4.3	8.6	11.7	14.7	13.4	12.4	10.8	7.1	5.5	3.2	2.4	1.4	1.0	1.6
Pemba South	2.9	3.8	7.4	9.4	10.9	12.4	13.2	10.5	9.2	7.0	3.6	3.1	2.4	1.3	2.9

### 9.3 HEADSHIP OF HOUSEHOLDS

The gender of the head of household is one of the most important characteristics of the household. The age of the household head of is another important factor that influences the size and composition of households in a given country. An imbalance between gender in some age groups affects the propensity of men or women to head households. A high proportion of children in the total population raises the average household size.

The headship rate which denotes the ratio of the number of heads of households by sex, age, marital status, etc. to the corresponding categories in the population. The concept of headship is very important for at least for two aspects. One, it is central in projecting households and families. Two, it serves as a good indicator for measuring the degree of housing privacy.

Traditionally, in most societies, households are predominantly headed by men, and Tanzania is not an exception. When households are headed by women, usually because there is no adult male present and it is generally hypothesised that these households are likely to be more economically deprived and lack the proper emotional environment for psychosexual development in children. With declining economic prospects in many developing countries, there is an increasing incidence of poverty in households headed by women<sup>5</sup>. Todaro (1985) estimates about 17-28 percent of the world's total households are headed by women.

Tables 9.7 and 9.8 show the percentage distribution of heads of households by gender and marital status; and female headed households for 1988 respectively. While Table 9.9 shows the average sex-age specific headship of household by residence in percentage for same year. According to these tables, about 30 and 32 percent of all households in Tanzania respectively are headed by women in rural and urban areas. Out of these, about 2 and 6 percent are single.

In the Mainland, urban areas have higher proportions of households headed by women than in rural areas as opposed to the case in Zanzibar. Furthermore, rural and urban areas in the Mainland have more than 3 and 10 times respectively the proportion of female headed households (expressed as percentage of total heads of households) compared to their counterparts in Zanzibar. On other hand, Zanzibar has higher proportions of "divorced/separated" and "widowed" household heads than the Mainland for both genders and residence areas.

Table 9.9 shows that male headship rates are higher than female rates in almost all age groups. This reflects perhaps the fact that men in their prime of life assume the role of the head of household along with other main responsibilities for family affairs, apart from the domestic chores, child-bearing and child-rearing.

The male specific headship rates is lower in the young ages, but increases with the increasing age and reaches a peak around 85 percent in the age group 55-59 for the Mainland. In Zanzibar, the peak is reached around 90 percent in the age group 50-54.

---

<sup>5</sup> Todaro, M.P 1985, *Economic Development in the Third World*, Third Edition, p. 155.



In the case of female headship rates peaks are observed for ages 65 and over in rural areas and in the age group 55-59 in urban areas both for Zanzibar and the Mainland. For the 15-24 age groups, higher average headship rates both for males and females are observed in rural areas in Zanzibar and in urban areas of the Mainland respectively.

In the age group 10-14 headship rates are slightly higher for females than males, and this extends to the 15-19 age group in Zanzibar. This might be due to a higher proportion of unmarried mothers in these age groups compared with later ages.

TABLE 9.7 PERCENTAGE DISTRIBUTION OF HEAD OF HOUSEHOLD BY SEX AND MARITAL STATUS IN 1988

MARITAL STATUS	TOTAL				RURAL				URBAN			
	Both Sexes	Male	Female	Female as % of BS	Both Sexes	Male	Female	Female as % of BS	Both Sexes	Male	Female	Female as % of BS
TANZANIA												
Total	100.0	100.0	100.0	30.0	100.0	100.0	100.0	29.6	100.0	100.0	100.0	31.6
Single	8.9	8.8	9.0	30.5	6.2	6.2	6.1	29.4	18.9	18.8	19.0	31.7
Married	76.8	86.0	55.3	21.6	79.4	88.5	57.6	21.4	67.2	76.3	47.5	22.4
Div/Seperated	6.6	3.4	14.2	64.0	6.1	3.3	12.5	61.0	8.8	3.7	20.0	71.4
Widowed	7.7	1.8	21.5	83.4	8.4	2.0	23.8	83.4	5.1	1.2	13.5	83.5
TANZANIA MAINLAND												
Total	100.0	100.0	100.0	29.9	100.0	100.0	100.0	29.5	100.0	100.0	100.0	31.6
Single	9.0	8.8	9.3	31.0	6.2	6.2	6.2	29.7	19.4	19.2	19.8	32.4
Married	76.9	86.0	55.6	21.7	79.5	88.5	57.8	16.7	67.0	76.0	47.8	22.6
Div/Seperated	6.4	3.4	13.7	63.4	5.9	3.3	12.1	60.3	8.6	3.6	19.3	71.4
Widowed	7.7	1.8	21.4	83.5	8.4	2.0	23.9	83.4	5.0	1.2	13.1	83.6
ZANZIBAR												
Total	100.0	100.0	100.0	32.6	100.0	100.0	100.0	33.1	100.0	100.0	100.0	31.6
Single	5.7	7.7	1.6	9.2	4.3	5.7	1.4	11.0	8.4	11.4	1.9	7.3
Married	72.7	84.9	47.5	21.3	74.6	86.9	49.7	22.0	69.0	81.0	42.9	19.6
Div/Seperated	12.8	5.2	28.5	71.8	12.2	5.1	26.6	72.0	14.0	5.4	32.5	73.5
Widowed	8.8	2.2	22.4	83.1	8.9	2.3	22.3	83.0	8.6	2.2	22.7	83.4

TABLE 9.8 PERCENTAGE DISTRIBUTION OF FEMALE HEADED HOUSEHOLDS IN PRIVATE HOUSEHOLDS: 1988 Census

PARTICULARS	% FEMALE HEADED HOUSEHOLD (FHH)	SINGLE FEMALE HEADED HOUSEHOLDS AS PERCENTAGE OF	
		TOTAL HOUSEHOLDS	TOTAL FHH
TANZANIA			
Total	30.0	2.7	9.0
Rural	29.6	1.8	6.1
Urban	31.6	6.0	18.9
TANZANIA MAINLAND			
Total	30.0	2.8	9.3
Rural	29.5	1.8	6.2
Urban	31.7	6.3	19.8
ZANZIBAR			
Total	32.6	0.5	1.6
Rural	33.1	0.5	1.4
Urban	31.6	0.6	1.9



TABLE 9.9 AVERAGE SEX-AGE SPECIFIC HOUSEHOLD HEADSHIP RATES: 1988 Census

Age Group	TOTAL			RURAL			URBAN		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female
TANZANIA									
Total	28.4	41.5	16.3	27.7	41.2	15.6	30.9	42.4	19.5
10-14	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5
15-19	4.2	4.8	3.6	3.7	4.3	3.2	6.1	6.9	5.4
20-24	18.0	15.9	11.8	16.8	25.4	10.2	22.1	27.6	17.4
25-29	33.7	12.0	18.3	31.8	51.4	16.0	39.8	53.6	26.5
30-34	43.9	67.5	23.0	42.0	67.3	21.0	50.2	67.8	30.6
35-39	49.7	75.4	26.0	48.0	75.7	24.4	55.5	74.3	32.8
40-44	51.5	78.6	27.9	49.8	78.9	26.7	58.6	77.8	34.2
45-49	56.0	81.9	30.7	54.7	82.5	29.7	61.8	80.1	36.7
50-54	55.7	83.1	31.7	54.6	83.6	30.9	61.3	80.7	37.5
55-59	60.7	85.0	35.0	60.2	85.6	34.1	64.3	81.8	41.3
60-64	58.0	83.2	35.8	58.1	84.1	35.2	57.4	76.7	40.0
65+	59.6	81.9	35.8	60.3	82.9	35.7	54.3	73.4	36.9
TANZANIA MAINLAND									
Total	28.3	41.4	16.2	28.3	42.1	15.9	31.0	42.5	19.6
10-14	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5
15-19	4.2	4.8	3.6	3.7	4.3	3.1	6.3	7.0	5.6
20-24	18.0	25.8	11.8	16.6	25.2	10.1	22.5	28.0	17.8
25-29	33.6	51.7	18.3	31.6	51.0	15.9	40.0	53.7	26.9
30-34	44.8	67.2	23.0	41.8	67.1	20.9	50.2	67.5	31.0
35-39	49.5	75.1	25.9	47.9	75.5	24.3	55.4	73.9	32.9
40-44	51.4	78.4	27.7	49.7	78.7	26.6	58.7	77.5	34.2
45-49	55.7	81.8	30.5	54.5	82.3	29.5	61.6	79.7	36.6
50-54	55.4	82.9	31.3	54.4	83.4	30.5	61.0	80.2	36.9
55-59	60.5	84.9	34.8	60.0	85.5	33.9	63.9	81.5	41.0
60-64	57.5	82.9	35.2	57.6	83.9	34.6	56.7	96.4	39.4
65+	66.5	91.0	40.0	59.9	82.8	35.1	53.9	73.1	36.5

ZANZIBAR									
Total	32.7	45.8	20.5	34.7	48.4	22.0	29.3	41.4	18.0
10-14	0.2	0.2	0.3	0.3	0.2	0.3	0.2	0.1	0.2
15-19	4.0	3.8	4.1	4.6	4.2	4.5	3.0	3.3	2.6
20-24	19.8	29.2	12.5	22.9	35.1	14.0	15.1	21.2	10.0
25-29	38.5	60.6	19.3	41.4	67.8	19.5	33.8	49.5	19.1
30-34	51.0	78.3	24.4	52.0	81.2	26.9	49.4	74.0	25.5
35-39	55.9	82.6	30.0	55.8	85.1	29.2	56.0	80.4	31.3
40-44	56.9	85.6	34.4	55.9	87.3	33.5	58.7	83.1	36.2
45-49	65.9	89.2	40.5	66.0	91.8	40.6	65.6	85.5	40.4
50-54	66.3	89.5	46.0	66.3	90.8	45.6	66.5	86.9	47.0
55-59	71.8	88.6	49.6	72.4	89.5	49.3	70.8	87.1	48.0
60-64	72.2	88.7	54.8	75.5	90.6	58.7	64.7	84.1	47.2
65+	71.5	85.2	57.1	76.5	88.3	63.4	59.2	76.9	43.2

#### 9.4 NUMBER OF ROOMS PER HOUSEHOLD

There are four tables describing the number of rooms available to the households for habitation. The first three tables 9.10 - 9.12 show the percent distribution of private household by the number of rooms available for the whole country by region and residence for 1988. Furthermore, these tables provide information on the average number of rooms available per household for habitation for the same year. The fourth, Table 9.13 shows the average number of persons per room in Tanzania by region and residence in 1978 and 1988.

According to Tables 9.10 and 9.11 both total and rural areas in Tanzania Mainland have the same pattern of having the highest proportion of households using 2 rooms, followed by 3 rooms and then 4 rooms respectively. In Zanzibar, however, the pattern is different, showing that the highest proportion of households are using 4 rooms, followed by 2 rooms and then 3 rooms. This difference is entirely due to the predominance of 4 room households in Pemba. On average rural private households in Tanzania Mainland have 3.6 rooms per household compared to 3.2 rooms in Zanzibar. The average number of rooms per household available for habitation in rural areas shows little variation among different regions and ranges from 2.8 to 4.4 in Zanzibar Central/South and Mwanza regions respectively. The regions in which private households in the rural areas have an average of 4 or more rooms are Mwanza, Shinyanga, Mara, Kagera and Kigoma. Table 9.11 indicates that most urban households in Tanzania Mainland have three rooms available, followed by two rooms and then by one room; and for Zanzibar, the order is three rooms, followed by four rooms and then two rooms. The average number of rooms per urban private households ranges from the lowest 2.6 in Zanzibar Central/West and Arusha regions to the highest 4.2 in Kigoma region. A much higher proportion of Mainland households have only 1 room available, compared to Zanzibar - the excess amounts to a factor of 3 and 1.5 in urban and rural areas respectively. However, Tanzania Mainland has higher proportions for households using 6 rooms or more both for rural and urban areas.



The most striking feature observed from Table 9.10 is that most rural and urban areas have shown a declining trend for the congestion of people per room between the 1978 and 1988 censuses. The only exception, is noted for the rural areas of Lindi region as well as for the urban areas of Mtwara and Morogoro regions. The rural areas in Coast region have shown no change over the period.

TABLE 9.10 PERCENTAGE DISTRIBUTION OF PRIVATE HOUSEHOLDS BY NUMBER OF ROOMS:  
1988 Census

	1	2	3	4	5	6	7	8	9+	RPH
TANZANIA	9.2	26.6	26.3	15.2	8.2	6.4	2.4	2.2	3.3	3.5
MAINLAND	9.2	26.6	26.3	15.2	8.2	6.4	2.4	2.2	3.3	3.5
Dodoma	9.1	31.4	35.3	9.2	5.8	4.7	1.2	1.3	1.6	3.1
Aruaha	17.3	34.5	29.2	10.1	3.8	2.4	0.8	0.6	0.9	2.7
Kilimanjaro	8.7	25.7	27.3	17.2	9.4	5.6	2.9	1.6	1.6	3.4
Tanga	10.3	30.8	29.3	16.8	5.1	3.8	1.4	0.9	1.4	3.1
Morogoro	9.6	32.8	27.1	15.5	6.3	3.9	1.3	1.3	1.8	3.1
Coast	8.9	35.4	24.3	17.7	5.4	4.9	1.2	0.8	1.3	3.1
Dar es Salaam	26.5	21.5	20.2	14.6	5.9	6.1	1.9	1.4	1.7	3.0
Lindi	10.9	30.2	31.2	18.0	4.8	2.8	0.9	0.6	0.5	3.0
Mtwara	10.7	27.9	29.0	21.9	5.5	2.5	1.0	0.6	0.7	3.0
Ruvuma	3.8	16.7	29.6	19.9	13.9	7.2	3.4	2.2	3.3	3.6
Iringa	3.8	23.0	34.9	11.6	10.9	7.2	2.8	2.4	3.4	3.7
Mbeya	10.4	39.1	22.0	11.3	5.5	5.1	2.0	2.0	2.6	3.1
Tabora	9.0	26.1	22.0	14.6	8.4	7.1	3.5	3.2	5.9	3.6
Rukwa	5.8	32.7	32.4	12.8	6.9	4.4	2.0	1.3	1.6	3.1
Kagera	6.9	15.5	17.7	19.0	18.3	15.4	2.7	1.8	2.5	4.1
Singida	5.5	34.0	28.3	12.7	7.1	5.7	2.3	2.1	2.3	3.4
Kigoma	3.7	17.6	29.9	16.7	10.2	11.8	2.7	2.4	5.0	4.1
Shinyanga	4.1	21.4	24.8	15.1	9.6	8.5	4.4	4.0	8.0	4.2
Mwanza	6.4	21.1	22.3	13.8	10.2	8.3	4.7	4.9	8.3	4.3
Mara	9.8	20.8	19.8	13.6	9.7	8.7	4.1	6.1	7.3	4.2
ZANZIBAR	5.5	26.3	26.2	31.6	6.7	2.5	0.6	0.4	0.2	3.2
Zanzibar North	8.7	40.0	26.4	17.3	4.4	1.9	0.6	0.4	0.2	2.8
Zanzibar South	10.6	42.9	28.3	13.1	3.1	0.9	0.5	0.3	0.2	2.6
Zanzibar West	6.6	20.7	29.2	24.0	12.8	4.4	1.1	0.6	0.4	3.0
Pemba North	2.1	21.8	26.0	44.3	3.4	1.8	0.3	0.2	0.1	3.3
Pemba South	2.0	20.2	20.1	51.5	3.9	1.6	0.3	0.2	0.0	3.4

Note: RPH = Average number of rooms per household.

The figures in Table 9.10 suggest that Tanzania Mainland has more people per room in rural households than in Zanzibar and in urban areas it is the opposite. Furthermore, the figures show that there has been an improvement in the housing condition as measured by the decline in average number of persons per room in households between the 1978 and 1988 censuses.

TABLE 9.11 PERCENTAGE DISTRIBUTION OF RURAL PRIVATE HOUSEHOLDS BY NUMBER OF ROOMS: 1988 Census

	1	2	3	4	5	6	7	8	9+	RPH
TANZANIA	6.9	27.7	27.1	15.2	8.3	6.4	2.5	2.3	3.5	3.6
MAINLAND	7.0	27.7	27.1	14.7	8.4	6.5	2.5	2.3	3.6	3.6
Dodoma	8.1	32.8	36.4	9.0	5.4	4.5	1.0	1.1	1.4	3.0
Arusha	14.8	36.1	30.6	10.2	3.7	2.3	0.7	0.5	0.8	2.7
Kilimanjaro	6.2	26.1	27.8	17.9	9.8	5.8	2.9	1.7	1.6	3.5
Tanga	7.8	32.9	31.4	16.7	4.7	3.1	1.2	0.8	1.1	3.0
Morogoro	7.5	35.3	28.1	15.2	6.0	3.4	1.2	1.2	1.8	3.1
Coast	8.3	37.7	25.0	17.2	5.1	3.8	1.0	0.7	1.2	3.0
Dar es Salaam	10.2	31.0	26.9	18.2	6.0	4.7	1.2	0.7	0.8	3.1
Lindi	11.0	32.0	31.8	17.4	4.0	2.0	0.7	0.5	0.3	2.8
Mtwara	10.6	29.3	29.4	21.7	4.7	2.1	0.8	0.5	0.7	3.0
Ruvuma	2.6	16.4	30.7	20.3	14.4	7.1	3.3	2.1	3.0	3.9
Iringa	3.8	23.8	34.7	11.6	10.6	7.0	2.8	2.4	3.2	3.7
Mbeya	10.7	41.8	20.4	11.1	4.9	4.9	1.8	1.9	2.5	3.1
Tabora	7.8	26.6	22.3	14.0	8.5	7.2	3.7	3.3	6.4	3.9
Rukwa	5.0	32.9	33.4	12.8	6.8	4.3	2.0	1.3	1.5	3.2
Kagera	6.1	15.3	17.8	19.2	18.6	15.7	2.6	1.8	2.5	4.2
Singida	4.5	35.2	28.2	12.8	7.0	5.6	2.2	2.1	2.2	3.3
Kigoma	3.0	18.1	31.0	16.5	10.2	11.4	2.6	2.3	4.9	4.0
Shinyanga	3.2	21.2	24.9	15.0	9.8	8.7	4.5	4.2	8.3	4.3
Mwanza	4.0	20.5	22.3	14.0	10.7	8.8	5.1	5.4	9.1	4.4
Mara	8.6	20.6	19.7	13.7	10.0	9.0	4.3	6.3	7.8	4.3
ZANZIBAR	4.8	28.4	25.1	34.2	4.1	2.0	0.6	0.3	0.2	3.2
Zanzibar North	8.9	40.2	25.6	17.8	4.5	2.0	0.6	0.3	0.2	2.8
Zanzibar South	10.6	42.9	28.3	13.3	3.0	0.9	0.5	0.3	0.1	2.6
Zanzibar West	2.7	18.4	36.9	23.7	9.3	5.1	2.2	1.0	0.7	3.5
Pemba North	1.9	21.2	24.0	47.4	3.0	1.8	0.3	0.2	0.1	3.4
Pemba South	1.8	21.5	19.9	51.5	3.2	1.5	0.2	0.2	0.2	3.4

Note: RPH = Average number of rooms per household.



TABLE 9.12 PERCENTAGE DISTRIBUTION OF URBAN PRIVATE HOUSEHOLDS BY NUMBER OF ROOMS:  
1988 Census

	1	2	3	4	5	6	7	8	9+	RPH
TANZANIA	19.4	21.7	22.8	15.3	7.7	6.4	2.2	1.9	2.5	3.3
MAINLAND	20.1	21.6	22.5	14.7	7.5	6.5	2.3	1.9	2.7	3.3
Dodoma	14.4	19.2	25.9	11.7	9.2	6.5	2.7	3.0	3.9	3.5
Arusha	36.6	21.8	18.8	9.3	4.8	3.2	1.7	1.4	2.1	2.6
Kilimanjaro	23.4	23.3	24.0	13.1	6.8	4.2	2.3	1.3	1.7	3.0
Tanga	22.1	20.7	19.4	17.1	7.1	7.0	1.9	1.7	2.8	3.2
Morogoro	16.9	24.2	23.7	16.6	7.3	5.5	1.8	1.7	2.0	3.2
Coast	12.3	22.3	20.6	20.6	7.2	11.4	2.0	1.5	1.8	3.5
Dar es Salaam	28.4	20.4	19.5	14.2	5.9	6.2	2.0	1.5	1.8	3.0
Lindi	10.7	19.1	27.3	21.1	9.1	7.2	2.0	1.4	1.3	3.4
Mtwara	11.5	19.5	27.0	22.8	10.6	4.9	1.7	1.1	0.9	3.4
Ruvuma	12.3	18.8	21.6	17.2	10.6	7.7	3.2	2.9	5.0	3.8
Iringa	4.4	14.9	36.8	11.7	13.6	9.3	2.5	2.2	4.4	3.9
Mbeya	8.9	26.7	29.4	12.3	8.3	6.2	2.7	2.3	3.3	3.5
Tabora	16.3	23.0	20.1	18.1	7.5	6.9	2.6	2.7	2.7	3.4
Rukwa	10.9	31.0	26.5	12.8	7.5	5.2	2.2	1.7	2.2	3.2
Kagera	20.6	18.6	15.8	13.7	12.3	11.0	3.1	2.1	2.5	3.5
Singida	15.7	22.0	27.7	11.4	8.6	6.4	2.9	2.1	3.4	3.4
Kigoma	8.7	13.6	22.1	17.8	10.2	15.1	3.9	2.8	5.6	4.2
Shinyanga	16.4	24.1	23.4	16.0	7.4	5.1	2.6	1.9	3.0	3.3
Mwanza	17.5	23.4	22.0	12.7	7.9	6.0	3.1	2.7	4.7	3.5
Mara	19.9	22.7	20.9	12.2	7.7	6.1	2.3	4.5	3.6	3.4
ZANZIBAR	6.7	22.4	27.6	26.9	11.5	3.5	0.7	0.5	0.2	3.3
Zanzibar North	7.8	38.8	33.6	13.3	3.6	1.7	0.6	0.7	0.1	2.8
Zanzibar South	10.6	42.3	28.3	11.6	4.7	1.4	0.3	0.3	0.0	2.6
Zanzibar West	7.7	21.4	27.0	24.1	13.9	4.2	0.8	0.5	0.3	3.4
Pemba North	2.6	24.5	33.7	32.1	5.0	1.5	0.2	0.3	0.1	3.2
Pemba South	2.6	14.1	20.9	51.9	7.3	2.1	0.6	0.3	0.2	3.6

Note: RPH = Average number of rooms per household

Table 9.13 AVERAGE NUMBER OF PERSONS PER ROOM FOR RURAL AND URBAN AREAS: 1978<sup>1</sup> and 1988<sup>2</sup>

Region	1978		1988		Absolute change 1978/88	
	Rural	Urban	Rural	Urban	Rural	Urban
TANZANIA	2.1	1.6	1.5	1.4	-0.6	-0.3
MAINLAND	2.1	1.6	1.5	1.3	-0.6	-0.3
Dodoma	2.1	1.8	1.7	1.2	-0.4	-0.6
Arusha	2.5	1.8	2.3	1.5	-0.3	-0.3
Kilimanjaro	2.3	2.1	1.6	1.4	-0.7	-0.6
Tanga	2.3	1.3	1.8	1.4	-0.5	0.2
Morogoro	2.2	1.4	1.7	1.4	-0.5	0.0
Coast	1.6	1.4	1.6	1.3	0.00	-0.1
Dar es Salaam	1.6	1.8	1.4	1.4	-0.1	-0.3
Lindi	1.6	1.4	1.7	1.2	0.1	-0.1
Mtwara	1.8	1.1	1.5	1.3	-0.3	0.2
Ruvuma	1.9	1.4	1.4	1.2	-0.5	-0.2
Iringa	2.5	1.2	1.3	1.1	-1.2	-0.1
Mbeya	2.6	1.7	1.6	1.2	-0.9	-0.5
Tabora	2.6	1.5	1.5	1.4	-1.1	-0.1
Rukwa	2.3	1.8	1.7	1.4	-0.6	-0.4
Kagera	1.8	1.3	1.2	1.2	-0.6	-0.1
Singida	2.2	1.6	1.6	1.3	-0.6	-0.3
Kigoma	1.8	1.5	1.4	1.3	-0.4	-0.2
Shinyanga	2.2	1.9	1.5	1.4	-0.7	-0.6
Mwanza	2.6	2.1	1.5	1.4	-1.1	-0.6
Mara	2.8	1.9	1.6	1.4	-1.2	-0.5
ZANZIBAR	2.1	1.9	1.4	1.5	-0.6	-0.4
Zanzibar North	2.1	2.1	1.5	1.5	-0.6	-0.6
Zanzibar South	2.4	1.8	1.8	1.7	-0.6	-0.1
Zanzibar West	2.1	1.7	1.3	1.5	-0.8	-0.3
Pemba North	1.7	1.9	1.4	1.5	-0.4	-0.3
Pemba South	2.0	1.8	1.4	1.4	-0.6	-0.4

Source: 1) Average number of rooms per household calculated from Table 16.6 in the 1978 Population Census Volume VIII, pp.479-80.  
 2) Calculated from Tables 11.2c, 11.4, 11.5 and 11.6.



## 9.5 TENANCY

Table 9.14 shows the percent distribution of private households for each type of tenure by residence for regions of Tanzania in 1988. In all rural areas, ownership is the most common form of household tenure, ranging from 75 percent in Dar es Salaam to 95 percent in Kigoma. Apart from Dar es Salaam on the mainland, all regions have over 90 percent ownership tenure, whereas in Zanzibar ownership ranges from 80 to 90 percent across the regions. Tenancy predominates in urban areas, though ownership is high in urban areas of Zanzibar and of Coast, Lindi, Mtwara, Mbeya and Kigoma. Zanzibar has 12.8 percent tenancies in the "other" category proportionately 5 times as many as the Mainland.

The main characteristics observed include: the majority (over 75 percent) of private households own their own dwelling in rural areas with relatively small variations among different regions. In the case of urban areas, both the "owner" and "tenant" categories show high variation between regions. For example, the "owner" category ranges from the highest 83.5 percent in Zanzibar Central/South region to the lowest 24.0 percent in Arusha region. The "tenant" category ranges from 1.2 percent to 18.6 percent in rural Pemba North and rural Dar es Salaam regions respectively.

In urban areas the proportions of households falling in the "tenant" category ranges between 3.3 and 74.3 percent for Zanzibar Central /South and Arusha regions respectively. The urban areas which have proportions of their households exceeding 60 percent in the "tenant" category are found in Arusha, Shinyanga and Dar es Salaam. Households falling in the "other" category are highly concentrated in Zanzibar with 12.0 and 15.0 percent for rural and urban areas compared to the corresponding proportion of only 2.2 and 3.0 percent for Tanzania Mainland respectively.

The majority of private households in Tanzania particularly in rural areas own their dwelling. On the other hand, in urban areas, more than half of private households are tenants. The "other" category of households forms about one-eighth of all households in Zanzibar whereas it is very insignificant in the Tanzanian Mainland.

TABLE 9.14 PERCENTAGE DISTRIBUTION OF PRIVATE HOUSEHOLDS BY TENANCY: 1988 Census

REGION	TOTAL								
	RURAL			URBAN					
	OWNER	TENANT	OTHER	OWNER	TENANT	OTHER	OWNER	TENANT	OTHER
TANZANIA	82.1	15.2	2.7	92.8	4.7	2.5	42.6	53.9	3.5
MAINLAND	82.2	15.4	2.4	93.0	4.8	2.2	41.4	55.6	3.0
Dodoma	88.2	10.3	1.3	94.7	4.0	1.2	39.6	57.9	2.2
Arusha	80.9	16.4	2.6	91.3	5.8	2.8	24.0	74.3	1.7
Kilimanjaro	82.4	14.3	3.3	91.7	5.3	3.0	39.5	55.9	4.6
Tanga	81.2	16.6	2.1	91.7	6.2	2.0	38.6	59.0	2.3
Morogoro	82.2	15.9	1.5	92.7	5.3	1.3	50.5	47.3	2.1
Coast	85.8	10.9	3.3	90.4	6.5	3.0	60.0	35.1	4.8
D'Salaam	34.5	62.0	3.5	75.2	18.6	6.2	29.9	67.1	3.0
Lindi	87.3	8.5	4.1	92.3	3.8	3.9	61.8	32.6	5.5
Mtwara	87.7	8.4	3.9	92.5	3.8	3.7	59.6	35.1	5.3
Ruvuma	88.3	9.6	3.3	94.4	3.8	3.0	51.7	35.1	4.8
Iringa	87.7	10.0	2.3	91.8	6.2	2.0	54.3	41.2	4.5
Mbeya	87.0	11.5	1.5	94.1	4.4	1.5	59.0	39.2	1.9
Tabora	85.1	12.2	2.8	93.8	3.2	2.9	43.3	54.7	2.0
Rukwa	85.0	13.0	2.1	91.5	6.5	2.0	49.9	47.4	2.6
Kagera	90.1	6.7	3.2	93.4	3.4	3.1	40.2	56.0	3.8
Singida	89.5	9.1	1.4	94.4	4.2	1.4	45.1	53.4	1.5
Kigoma	90.9	7.0	2.1	95.5	2.7	1.8	59.3	36.6	4.1
Shinyanga	88.9	9.6	1.4	94.5	3.7	1.8	34.1	64.0	1.9
Mwanza	82.3	15.6	2.1	93.7	4.3	1.9	44.1	53.3	2.6
Mara	86.5	12.0	1.5	93.7	5.0	1.3	43.6	54.4	2.0
ZANZIBAR	78.8	8.7	12.5	85.8	3.0	12.0	64.9	20.1	15.0
Zanzibar North	88.7	2.1	9.3	88.6	1.4	9.9	40.2	56.0	3.8
Zanzibar South	89.5	2.5	8.0	90.0	2.4	7.6	83.5	3.3	13.1
Zanzibar West	66.3	20.2	13.5	85.3	10.0	4.7	60.2	23.5	16.3
Pemba North	78.7	3.4	17.8	80.0	1.2	18.8	73.6	12.8	13.6
Pemba South	84.0	5.5	10.4	86.8	3.6	9.7	69.5	16.0	14.4



## 9.6 ACCESS TO DRINKABLE WATER

Tables 9.15 - 9.19 describe the different types of drinkable water supply. Table 9.15 shows the percentage distribution of private household according to the type of access to drinkable water for Tanzania, Tanzania Mainland and Zanzibar at a national level by residence and tenure for 1988. From this table Tanzania Mainland shows a high proportion of households with access to piped water among the "owner" category compared to the "tenant" category in rural areas, whereas, it is the opposite in urban areas. In the case of Zanzibar, the "owner" category both in rural and urban areas have the highest proportion of households with access to piped water. The proportion of households using "other" sources of water both in rural and urban Zanzibar is significantly lower than that in Tanzania Mainland. For example, the proportion of households having access to either piped water or well water is 10.2 and 15.0 percent in Tanzania Mainland compared to 1.7 and 2.6 percent in Zanzibar for rural and urban areas respectively.

Table 9.16 shows the percentage distribution of private households according to access to drinkable water for the whole of Tanzania and its regions. Two features are noted in this table. The first feature observed is the high proportion of households in Zanzibar which have access to piped or well water within the plot or house compared to Tanzania Mainland. The proportion of households having access to piped water and well water are 42.8 and 52.4 percent in Zanzibar respectively. The corresponding proportion in Tanzania Mainland are 31.2 and 51.2 percent. Furthermore, the proportion of households having access to other sources of water supply are four times higher in Tanzania Mainland than in Zanzibar. The second feature is the high degree of variation in the type of access to drinkable water. The proportion of households with access to piped water, for example, ranges from 6.6 to 93.5 percent in Kagera and Zanzibar Town/West regions respectively. Like the access to piped water, households with access to well water show high degree of variations among different regions, with proportion of households ranging from 6.2 to 81.9 percent in Zanzibar Town/West and Tabora regions respectively.

The third feature noted in tables 9.17 through 9.19 is the general decline in proportion among households which have access to piped water and a substantial rise in proportion for households with access to well water between 1978 and 1988. This massive switch from piped water to well water seems to have taken place largely due to breakdown of pumping schemes and shortage of finances for maintenance and rehabilitation.

There is a higher proportion of households with some kind of easy and nearby access to drinkable water within the plot or house in Zanzibar compared to Tanzania Mainland.

TABLE 8.15 PERCENTAGE DISTRIBUTION IN PRIVATE HOUSEHOLDS BY ACCESS TO DRINKABLE WATER AND TENURE: 1988 Census

	TANZANIA											
	TOTAL				RURAL				URBAN			
	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Piped water within	10.3	7.3	25.8	14.8	3.8	3.3	10.6	8.0	27.4	22.3	30.9	25.3
Piped water outside	21.1	16.0	49.0	22.2	12.7	12.0	25.3	14.9	32.1	47.2	36.1	44.3
Well water within	18.8	30.9	7.3	18.3	22.3	22.3	19.1	12.1	3.7	8.1	3.8	3.3
Well water outside	32.3	36.4	12.6	36.0	38.2	38.8	27.2	33.4	11.3	17.1	7.2	13.3
Other supply within	3.4	6.1	1.3	7.4	6.8	6.8	6.4	8.0	0.6	0.8	0.4	1.3
Other supply outside	11.7	13.1	4.0	11.1	14.2	14.4	11.0	13.6	2.7	4.0	1.6	1.3
MAINLAND												
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Piped water within	10.1	7.1	23.4	12.3	3.0	3.3	10.8	8.6	26.0	20.0	30.2	23.3
Piped water outside	21.2	15.8	49.1	23.0	12.6	11.9	25.6	13.3	33.2	49.0	36.3	44.3
Well water within	18.7	20.8	7.3	16.7	22.1	22.3	18.0	20.9	3.7	8.1	3.9	3.3
Well water outside	32.3	36.6	12.3	33.0	38.2	38.8	28.6	31.9	11.8	17.8	7.4	13.3
Other supply within	3.3	6.2	1.3	8.3	6.8	6.9	3.1	8.4	0.3	0.8	0.4	1.3
Other supply outside	12.0	13.3	4.0	12.3	14.3	14.6	11.3	14.9	2.8	4.3	1.6	1.3
ZANZIBAR												
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Piped water within	21.3	16.4	37.3	27.2	4.2	3.3	23.4	3.6	33.3	30.4	67.3	47.3
Piped water outside	21.3	20.9	29.9	19.2	16.3	16.3	29.7	12.3	31.8	32.4	30.2	37.3
Well water within	22.4	24.7	4.6	20.0	30.3	30.9	13.9	31.2	6.1	8.3	1.1	3.3
Well water outside	30.0	32.9	6.9	28.0	41.9	42.2	36.3	44.1	6.2	8.3	1.1	6.3
Other supply within	2.4	2.4	0.8	3.2	3.4	3.3	2.2	4.9	0.2	0.3	0.1	1.3
Other supply outside	2.4	2.7	0.3	2.4	3.3	3.6	0.3	3.7	0.2	0.3	0.2	0.3



TABLE 9.16 PERCENTAGE DISTRIBUTION OF PRIVATE HOUSEHOLDS BY ACCESS TO DRINKABLE WATER BY REGIONS: 1988 Census

REGION	PIPED WATER		WELL WATER		OTHER SUPPLY	
	Within	O/shared	Within	O/shared	Within	O/shared
TANZANIA	10.4	21.1	18.8	32.5	5.4	11.7
MAINLAND	10.1	21.1	18.6	32.6	5.5	12.0
Dodoma	17.6	14.1	36.6	19.3	6.8	5.4
Arusha	10.7	31.0	14.2	16.2	10.5	17.3
Kilimanjaro	18.3	39.8	5.2	6.9	23.9	0.8
Tanga	11.2	25.3	9.0	35.6	4.9	14.0
Morogoro	10.4	25.5	15.7	26.6	4.0	17.4
Coast	4.7	16.4	18.7	52.6	0.9	6.7
Dar es Salaam	26.2	59.9	4.3	9.1	0.2	0.2
Lindi	6.9	15.6	23.1	45.7	1.4	7.3
Mtwara	11.4	32.5	16.3	38.2	0.5	1.2
Ruvuma	4.6	16.4	15.0	54.5	0.8	8.7
Iringa	16.7	16.4	27.1	22.4	10.9	6.4
Mbeya	10.9	17.5	24.6	30.4	5.7	10.9
Tabora	4.6	10.3	26.2	55.7	0.7	2.5
Rukwa	3.2	22.1	7.9	43.4	1.5	21.9
Kagera	2.2	4.4	21.1	23.1	16.9	32.3
Singida	3.0	8.8	18.9	52.9	3.0	13.4
Kigoma	11.9	16.7	16.7	16.1	15.5	23.1
Shinyanga	4.7	6.1	24.1	42.2	8.8	14.0
Mwanza	3.4	12.4	20.8	51.0	3.7	8.7
Mara	3.1	10.8	17.4	53.4	3.5	11.8
ZANZIBAR	21.3	21.5	22.4	30.0	2.3	2.4
Zanzibar North	4.1	13.2	40.2	23.7	11.4	7.4
Zanzibar South	7.6	22.4	37.8	31.8	0.2	0.2
Zanzibar West	51.5	42.0	3.3	2.9	0.0	0.2
Pemba North	9.3	7.2	28.3	49.8	0.3	5.1
Pemba South	9.3	11.4	21.6	56.1	1.6	0.0

TABLE 9.17 PERCENTAGE DISTRIBUTION OF RURAL PRIVATE HOUSEHOLDS BY ACCESS TO DRINKABLE WATER: 1978 and 1988 Censuses

	PIPED WATER				WELL WATER				OTHER SUPPLY			
	Wides		Oxlowd		Wides		Oxlowd		Wides		Oxlowd	
	1978	1988	1978	1988	1978	1988	1978	1988	1978	1988	1978	1988
TANZANIA	11.6	5.8	16.1	12.7	18.9	22.3	27.5	38.2	10.1	6.8	15.8	14.2
MAINLAND	11.6	5.8	16.3	12.6	18.5	22.1	27.2	38.1	10.3	6.8	16.1	14.5
Dodoma	8.8	14.0	28.7	9.8	15.7	41.0	21.9	21.5	1.4	7.6	23.2	5.9
Arusha	24.8	8.3	29.8	24.9	6.4	16.0	7.5	18.7	10.8	12.1	20.3	19.8
Kilimanjaro	40.6	16.5	20.7	34.7	4.1	6.2	0.3	7.8	26.0	7.0	8.1	27.8
Tanga	19.8	4.8	50.7	18.6	2.9	10.2	15.8	43.5	3.9	5.9	5.8	16.9
Morogoro	20.6	2.5	32.9	19.9	12.9	17.8	19.9	32.3	5.1	4.9	8.5	22.0
Coast	25.8	2.8	11.0	10.9	43.5	19.6	15.0	59.4	0.2	1.1	4.4	6.3
Dar es Salaam	2.1	8.1	32.9	26.2	26.4	20.4	37.7	44.1	0.0	0.8	0.0	0.4
Lindi	4.8	5.3	6.2	9.2	26.7	25.3	58.4	50.0	1.4	1.6	2.4	8.5
Mtwara	4.9	10.6	28.3	29.4	16.5	17.5	33.7	40.9	2.5	0.6	13.9	0.9
Ruvuma	1.4	1.1	13.2	13.2	19.8	16.5	37.6	58.5	21.0	0.8	7.0	10.0
Iringa	22.4	15.2	10.0	10.6	23.3	29.9	18.9	24.9	12.0	12.2	13.2	7.1
Mbeya	3.8	6.7	8.7	9.2	17.3	29.2	33.1	35.3	17.1	6.8	19.9	12.8
Tabora	4.8	0.9	1.0	2.3	39.1	29.6	39.9	63.3	0.2	0.8	15.0	3.0
Rukwa	6.6	0.3	8.5	0.4	13.1	91.9	42.0	7.4	9.0	0.0	20.3	0.0
Kagera	2.4	1.4	6.2	2.4	8.0	21.9	26.7	23.5	28.6	18.0	28.1	32.9
Singida	6.2	1.3	7.5	5.2	32.0	19.3	33.7	56.4	6.6	3.3	13.9	14.5
Kigoma	6.5	9.0	8.7	13.2	11.1	18.2	11.6	16.2	20.7	17.8	41.2	25.0
Shinyanga	5.0	1.5	4.5	4.1	27.3	30.3	27.3	46.9	13.9	5.8	21.8	11.3
Mwanza	5.7	0.6	3.3	3.4	26.2	24.2	44.3	57.2	4.6	4.7	15.7	9.9
Mara	2.1	1.3	13.4	3.7	13.9	19.2	48.2	58.7	4.7	4.0	17.4	13.1
ZANZIBAR	13.2	4.2	11.5	16.4	34.2	30.5	36.6	41.9	1.0	3.4	3.5	3.5
Zanzibar North	13.4	1.7	11.3	14.3	19.2	39.2	47.7	24.0	0.4	12.6	8.0	8.1
Zanzibar South	19.2	5.6	13.5	22.0	48.5	39.0	16.2	33.1	1.5	0.2	1.2	0.2
Zanzibar West	13.3	51.5	29.9	42.0	15.9	3.3	35.4	2.9	2.4		3.2	0.2
Pemba North	13.4	1.4	5.9	3.6	40.4	32.0	36.8	56.7	0.6	0.1	2.6	6.3
Pemba South	9.2	3.1	8.9	8.3	40.8	23.5	38.5	63.2	1.1	1.9	1.5	0.0

Source: 2) 1978 Population Census, Volume VI, Table 8.



TABLE 9.18 PERCENTAGE DISTRIBUTION OF URBAN PRIVATE HOUSEHOLDS BY ACCESS TO DRINKABLE WATER: 1978 and 1988 Censuses

	PIPED WATER				WELL WATER				OTHER SUPPLY			
	Within		Out/shared		Within		Out/shared		Within		Out/shared	
	1978	1988	1978	1988	1978	1988	1978	1988	1978	1988	1978	1988
TANZANIA	34.0	27.4	54.1	52.1	2.6	5.7	5.7	11.5	1.2	0.6	2.4	2.7
MAINLAND	32.2	26.0	55.8	53.2	2.6	5.7	5.7	11.8	1.2	0.6	2.5	2.8
Dodoma	38.8	44.8	47.8	46.3	1.1	3.7	6.7	3.3	0.8	0.3	4.8	1.3
Arusha	41.7	23.3	50.6	64.0	1.3	4.4	3.1	3.0	0.7	1.6	2.6	3.6
Kilimanjaro	56.3	26.6	40.7	63.5	0.5	0.9	1.0	2.4	0.5	0.6	1.0	6.0
Tanga	47.0	37.1	46.8	54.4	2.4	3.9	2.6	3.4	0.6	0.7	0.6	2.5
Morogoro	32.6	34.0	50.4	42.0	2.4	9.5	8.5	9.7	0.8	1.2	5.3	3.5
Coast	44.2	15.3	48.1	47.2	3.8	13.9	3.7	14.5	0.1	0.1	0.1	8.9
Dar es Salaam	31.4	28.3	66.7	63.8	0.0	2.5	0.8	5.1	0.9	0.1	0.2	0.2
Lindi	27.0	15.3	56.8	48.1	1.9	11.5	13.0	23.8	0.1	0.4	1.2	1.0
Mtwam	14.4	15.9	60.6	50.3	3.6	8.9	19.1	22.3	0.7	0.2	1.6	2.4
Ruvuma	25.3	25.8	40.8	36.0	6.6	6.3	13.9	30.2	2.7	0.9	10.7	0.8
Iringa	28.3	29.2	50.5	63.9	4.6	4.4	9.0	1.6	3.8	0.3	3.8	0.6
Mbeya	27.9	27.5	54.1	49.7	2.6	6.9	7.4	11.3	2.3	1.3	5.7	3.2
Tabora	29.3	22.3	49.6	48.1	11.1	9.7	8.0	19.4	1.7	0.4	0.3	0.1
Rukwa	22.1	18.9	50.5	40.0	6.3	3.6	15.6	31.0	1.4	0.0	4.1	6.4
Kagera	26.6	15.4	35.3	35.5	1.3	8.6	5.3	17.1	5.3	1.0	26.2	22.4
Singida	17.6	18.8	38.9	41.4	8.9	14.6	24.2	21.2	2.2	0.1	8.2	3.9
Kigoma	31.6	31.9	58.4	40.7	1.5	6.0	1.7	15.7	1.0	0.1	5.8	5.7
Shinyanga	45.9	28.2	41.3	35.1	2.9	7.0	5.4	22.2	2.8	3.0	1.7	4.6
Mwanza	26.6	12.8	55.7	42.5	6.1	9.3	9.2	30.1	1.4	0.4	1.0	4.9
Mara	31.8	13.5	48.3	53.3	7.2	7.0	9.2	21.8	0.2	0.5	2.8	3.9
ZANZIBAR	59.2	55.5	30.7	31.7	3.4	6.1	6.2	6.2	0.1	0.2	0.4	0.2
Zanzibar North	12.3	15.4	0.1	35.5	33.9	8.6	52.3	17.1	0.0	1.0	1.4	22.4
Zanzibar South	18.3	31.4	66.1	27.8	5.4	24.2	10.2	16.5	0.0	0.0	0.0	0.0
Zanzibar West	66.4	62.8	33.4	36.3	0.1	0.3	0.0	0.4	0.1	0.2	0.0	0.0
Pemba North	40.9	42.1	22.1	22.0	10.4	12.9	23.6	21.7	0.2	1.3	2.8	0.2
Pemba South	59.1	42.7	24.8	27.7	5.4	11.4	10.1	18.1	0.6	0.0	0.0	0.1

Source: 1) 1988 Population Census National and Regional Profiles Table 21.  
2) 1978 Population Census, Volume VIII, Table 16.13.

TABLE 9.19 CHANGES IN ABSOLUTE NUMBERS OF HOUSEHOLDS WITH DIFFERENT TYPES OF SOURCES OF DRINKABLE WATER SUPPLY: 1978 and 1988 Censuses

Particular	Piped		Well		Other		N.S	Total H/holds ( <sup>000s</sup> ).
	In	Out	In	Out	In	Out		
TANZANIA								
Total '78	537	785	581	855	309	486		3,555
Total '88	459	932	830	1438	240	519	2	4,420
Rural '78	347	482	566	823	302	473		2,994
Rural '88	201	443	776	1329	235	493	2	3,480
Urban '78	190	303	15	32	7	13		560
Urban '88	234	480	51	107	5	25	0	903
MAINLAND								
Total '78	508	768	553	824	307	483		3,479
Total '88	432	908	800	1401	237	516	2	4,297
Rural '78	339	476	540	794	301	470		2,918
Rural '88	197	428	749	1295	232	491	2	3,394
Urban '78	169	292	13	30	6	13		524
Urban '88	234	480	51	107	5	25	0	903
ZANZIBAR								
Total '78	32	20	27	30	1	3		113
Total '88	29	29	31	41	3	3	0	137
Rural '78	10	9	26	28	1	3		76
Rural '88	4	15	28	38	3	3	0	91
Urban '78	22	11	1	2	0	0		37
Urban '88	25	14	3	3	0	0	0	45

Source: 1) 1978 Population Census, Volume VI, Table 7, pp. 39-48.  
2) 1988 Population Census, National and Regional Profile, Table 21.



## 9.7 ACCESS TO TYPE OF TOILET

For the description of the availability of toilet facilities, which is an important aspect in environmental sanitation, three tables 11.14 through 11.16 have been included in this section. Table 11.14 shows the percent distribution of private households with access to and the type of toilet at the disposal of the household for total, rural and urban Tanzania, Tanzania Mainland and Zanzibar by type of tenure. From this table, five main characteristics are observed. First, there is a higher proportion of households with access to pit latrines in Tanzania Mainland than in Zanzibar. The proportions of households using pit latrines in Tanzania Mainland are 84.8 and 84.2 percent for rural and urban areas compared to 24.5 and 65.4 percent in Zanzibar respectively.

Second, the proportion of households using flush toilet is higher in Zanzibar than in Tanzania Mainland. The statistics show that 17.8 percent of urban households have access to flush toilet in Zanzibar compared to 12.6 percent in Tanzania Mainland. This is partly accounted for by the predominantly urban character of Zanzibar. Third, Zanzibar has a very high proportion of households without toilet facilities compared to Tanzania Mainland. The proportions of households without toilet facilities are 73.7 and 17.2 percent for rural and urban Zanzibar compared to only 14.2 and 3.2 percent for rural and urban Tanzania Mainland respectively.

Fourth, "tenant" households indicate to have higher proportions of access and use of flush toilet than "owner" households both in Tanzania Mainland and Zanzibar. Fifth, there is a high variation between proportions of rural and urban households in Zanzibar with access to pit latrines compared to Tanzania Mainland.

Table 11.15 shows the proportion of private households in percent with access to and the type of toilet for the whole country and for each region by residence. Two clear features emerge from this table. One, there is a relatively high variation in proportion of households without access to toilet facilities in the country. Second, the access to pit latrines is the most common toilet facility in the country accounting over 84 percent in the case of rural and urban households in Tanzania Mainland. In Zanzibar, however, the proportion of rural and urban households with access to pit latrines are 25 and 65 percent respectively.

For Tanzania rural, the proportion of households without access to toilet facilities ranges from 2.0 to 93.9 percent in Iringa and Pemba North respectively. The top three regions with households (exceeding 70 percent) include Pemba North, Pemba South and Zanzibar North. On the other hand, the Southern Highlands regions of Ruvuma, Iringa and Mbeya; and Kilimanjaro have less than 5 percent of their rural households without toilet facilities.

In urban areas, the proportion of households without access to toilet ranges from 1.0 to 66.5 in Dar es Salaam and Zanzibar North respectively. The top three regions with exceeding 40 percent of their households without toilet facilities are Zanzibar North, Pemba North and Pemba South. On the other hand the top three regions with less than 1.5 percent of households without toilet facilities are Dar es salaam, Iringa and Ruvuma.

Table 9.16 shows the trend in percentage among private households without toilet facilities between 1978 and 1988. Trends on the type of the toilet facilities has not been included because unlike the 1988 census no information on the type of the toilet was collected in 1978.

All three tables 9.14-9.16 indicate that households with no toilet are more common in rural areas than in urban areas and are more dominant in Zanzibar than in Tanzania Mainland. In Zanzibar, the highest proportions of households without access to toilet over 45 percent are found in Zanzibar Central/West rural and the whole of Pemba both for rural and urban areas.

The regions of Rukwa, Mbeya, Iringa, Ruvuma, Dar es Salaam, Kilimanjaro and Kigoma all have the lowest percentage (less 5 percent) of households without toilet facilities in the country. On the other hand shared toilets are more common in urban areas than in rural and also more common on Tanzania Mainland than in Zanzibar.



TABLE 9.20 PERCENTAGE DISTRIBUTION OF PRIVATE HOUSEHOLDS BY TYPE OF TOILET AND TENURE: 1988 CENSUS

TANZANIA												
	TOTAL			RURAL			URBAN					
	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Flush toilet inside house	2.3	1.0	9.9	4.3	0.6	0.3	3.4	1.5	2.8	4.9	11.7	11.8
Flush toilet outside-shared	1.2	0.5	4.6	2.2	0.4	0.3	2.0	1.5	4.1	2.0	5.8	4.1
Pit latrine	83.9	83.8	81.6	72.8	83.2	83.4	84.4	77.1	83.2	87.1	80.6	77.2
None	13.2	14.7	3.9	20.7	15.8	15.8	10.2	25.9	3.9	6.0	1.9	5.6
MALAWI												
	TOTAL			RURAL			URBAN					
	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Flush toilet inside house	2.2	0.9	9.1	4.1	0.6	0.5	3.0	1.5	8.3	4.5	11.0	11.4
Flush toilet outside-shared	1.2	0.5	4.9	2.5	0.4	0.3	2.0	1.7	4.3	2.1	5.8	4.9
Pit latrine	84.7	85.3	82.3	78.1	84.8	84.9	85.4	78.0	84.2	88.6	81.9	78.4
None	11.9	13.3	3.7	15.3	14.2	14.3	9.6	15.8	3.2	4.8	1.9	5.3
ZANZIBAR												
	TOTAL			RURAL			URBAN					
	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER	TOTAL	OWNER	TENANT	OTHER
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Flush toilet inside house	6.4	3.0	37.4	6.0	1.5	0.7	21.9	1.4	16.2	8.9	42.0	13.0
Flush toilet outside-shared	0.6	0.4	1.6	0.7	0.3	0.3	1.2	0.2	1.2	1.0	1.7	1.2
Pit latrine	38.1	37.0	44.5	41.1	24.5	25.0	28.0	19.9	65.4	68.6	49.5	72.9
None	54.9	59.6	16.5	52.2	73.7	74.0	48.9	78.5	17.2	21.5	6.8	12.9

Source: 1988 Population Census National Profile Table 22.

TABLE 9.21 PERCENTAGE DISTRIBUTION OF PRIVATE HOUSEHOLDS BY TYPE OF TOILET: 1988 Census

	TOTAL			RURAL			URBAN		
	Flush	Pit Latrine	None	Flush	Pit Latrine	None	Flush	Pit Latrine	None
TANZANIA	3.6	83.2	13.2	1.0	83.1	15.8	12.9	83.2	3.9
MAINLAND	3.4	84.6	11.9	1.0	84.7	14.2	12.6	84.2	3.2
Dodoma	2.5	80.8	16.6	0.6	81.0	18.2	16.5	78.6	4.2
Arusha	3.8	68.0	28.0	1.2	65.9	32.8	18.4	79.5	2.0
Kilimanjaro	6.7	88.8	4.5	2.7	92.5	4.5	24.4	71.3	4.3
Tanga	3.9	80.5	15.6	0.8	80.8	18.3	16.2	79.2	4.5
Morogoro	4.1	87.6	7.7	1.3	88.6	9.5	12.7	84.8	2.5
Coast	1.5	78.0	20.5	0.9	76.1	23.0	4.8	88.3	6.7
Dar es Salaam	14.6	82.9	2.5	3.8	80.9	15.2	15.9	83.1	1.0
Lindi	1.3	78.5	20.3	0.6	77.2	22.2	4.7	85.0	10.3
Mtwara	2.0	84.5	13.6	1.0	84.2	14.8	7.4	86.1	6.6
Ruvuma	1.7	95.3	3.0	1.3	95.4	3.2	4.0	94.7	1.3
Iringa	1.3	96.9	1.9	0.9	97.1	2.0	4.0	94.9	1.1
Mbeya	2.3	93.7	3.9	1.4	94.3	4.4	6.1	91.8	2.1
Tabora	2.0	76.0	22.0	0.7	91.9	7.4	9.1	89.5	1.5
Rukwa	1.3	92.0	0.8	0.5	73.2	26.3	4.2	92.4	3.4
Kagera	1.3	86.3	12.4	0.5	86.6	12.9	13.0	81.4	5.7
Singida	1.4	79.5	19.1	0.9	78.6	20.5	7.0	87.6	5.5
Kigoma	1.3	93.8	4.9	0.7	94.1	5.2	5.3	91.9	2.8
Shinyanga	1.4	83.8	13.8	1.0	84.3	14.7	16.1	79.4	4.6
Mwanza	3.3	85.5	11.2	0.6	86.9	12.4	11.9	80.7	7.3
Mara	2.1	77.3	20.7	0.8	76.0	23.2	9.0	85.0	6.0
ZANZIBAR	7.0	38.1	54.9	1.8	24.5	73.7	17.4	65.4	17.2
Zanzibar North	1.0	25.0	74.0	0.3	24.8	74.9	7.1	26.3	66.5
Zanzibar South	2.4	54.2	43.4	1.8	53.2	45.0	8.4	66.6	24.9
Zanzibar West	17.3	69.9	12.8	9.9	52.4	37.7	19.7	75.5	4.8
Pemba North	2.4	13.1	84.5	0.4	5.7	93.9	10.6	44.0	45.3
Pemba South	3.3	17.0	79.6	0.8	12.7	86.5	17.3	39.9	42.8

Source: 1988 Population Census National and Regional Profile Table 22



TABLE 9.22 PERCENTAGE CHANGE IN PRIVATE HOUSEHOLDS WITHOUT TOILET FACILITIES: 1978 and 1988

	RURAL		URBAN		PERCENTAGE CHANGE 1978-88	
	1978	1988	1978	1988	Rural	Urban
TANZANIA	15.3	15.8	4.4	3.9	0.5	-0.5
MAINLAND	13.7	14.2	3.5	3.2	0.5	-0.3
Dodoma	10.7	18.2	3.6	4.2	7.5	0.6
Arusha	25.1	32.8	3.3	2.0	7.7	-1.3
Kilimanjaro	3.5	4.5	1.8	4.3	1.0	2.5
Tanga	2.9	18.3	2.9	4.5	15.4	1.6
Morogoro	3.1	9.5	1.1	2.5	6.4	1.4
Coast	9.8	23.0	5.4	6.7	13.2	1.3
Dar es Salaam	19.3	15.2	0.9	1.0	-4.1	0.1
Lindi	9.6	22.2	5.2	10.3	12.6	5.1
Mtwara	13.0	14.8	7.7	6.6	1.8	-1.1
Ruvuma	5.4	3.2	4.0	1.3	-2.2	-2.7
Iringa	4.6	2.0	2.5	1.1	-2.6	-1.4
Mbeya	7.8	4.4	3.0	2.1	-3.4	-0.9
Tabora	37.8	7.4	5.5	1.5	-30.4	-4.0
Rukwa	8.6	26.3	6.1	3.4	17.7	-2.7
Kagera	15.7	12.9	5.9	5.7	-2.8	-0.2
Singida	29.4	20.5	19.7	5.5	-8.9	-14.2
Kigoma	3.5	5.2	2.5	2.8	1.7	0.3
Shinyanga	25.7	14.7	3.8	4.6	-11.0	0.8
Mwanza	17.7	12.4	9.4	7.3	-5.3	-2.1
Mara	23.5	23.2	8.5	6.0	-0.3	-2.5
ZANZIBAR	76.3	73.7	17.0	17.2	-2.6	0.2
Unguja N	75.9	74.9	75.1	66.5	-1.0	-8.6
Unguja C&S	52.0	45.0	31.4	24.9	-7.0	-6.5
Zanzibar T&W	41.0	37.7	5.5	4.8	-3.3	-0.7
Pemba North	92.0	93.9	44.2	45.3	1.9	1.1
Pemba South	90.3	86.5	41.7	42.8	-3.8	1.1

Source: 1) 1988 Population Census National and Regional Profile Table 22.

2) 1978 Population Census, Volume VIII, Table 16.4, p. 508.

## 9.8 ACCESS TO ELECTRICITY

Two tables 9.23 and 9.24 are included in this section to provide information on the availability of electricity supply in the household. In Table 9.23 the figures show percent distribution of the private households who had or did not have electricity for total, rural and urban Tanzania, Tanzania Mainland and Zanzibar by type of tenure. The second Table 9.24, figures show the proportion of households in percent with access to electricity supply for whole of Tanzania and its regions between 1978 and 1988.

According to Table 9.23 the majority of private households in Tanzania have no access to electricity supply. Furthermore, there is a marked variation among different regions for the households with access to electricity. Zanzibar shows a relatively high proportion of households with access to electricity supply compared to Tanzania Mainland. For example, the proportions of households having access to electricity in rural and urban Zanzibar are 2.0 and 35.8 percent compared to 0.9 and 26.4 percent in Tanzania Mainland respectively. Furthermore, the figures in this table show that households in the "owner" category dominate in access to electricity supply in Zanzibar both for rural and urban areas. In the case of Tanzania Mainland, the households in the "owner" category have a lower proportion with access to electricity supply than the "tenant" category.

From Table 9.24 we can see that the proportion of rural households with access to electricity supply ranges from 0.3 to 9.1 percent in Singida and Zanzibar Town/West regions respectively. In the case of urban areas, the proportion with access to electricity varies from 3.8 to 42.0 in Iringa and Zanzibar Town/West regions respectively. For Tanzania urban, the areas with more than 25 percent of private households having access to electricity supply are located in the regions of Arusha, Kilimanjaro, Tanga, Dar es Salaam, Morogoro, Dodoma, Shinyanga, Mara, Zanzibar Town/West and Pemba South. The second feature noted in this table beside high variation among the regions is the declining and rising trends among rural and urban private households respectively. The rural areas in which there is a rising trend in access to electricity supply are located in only four regions, Pemba South, Zanzibar Town /West, Dar es Salaam, and Kilimanjaro. For urban areas, the highest increases over 8 percent in the proportion of private household in access to electricity supply between 1978 and 1988 are observed in the regions of Dodoma, Tanga, Singida, and Tabora.

The proportion of private households with access to electricity supply is very low for rural areas both in Tanzania Mainland and Zanzibar. For urban areas there is a much higher proportion of the households with electricity supply and it is more common in the urban areas of Zanzibar than on Tanzania Mainland. As with piped water, the downward trend in electricity supply is surprising. Rapid increases in electricity tariffs and general falling standard of living of the people particularly in rural areas are possible explanations for this trend.



TABLE 9.23 PERCENTAGE DISTRIBUTION IN PRIVATE HOUSEHOLDS BY ELECTRICITY AVAILABILITY, TENURE: 1988 Census

TANZANIA											
TOTAL				RURAL				URBAN			
	Total	Owner	Tenant	Other	Total	Owner	Tenant	Other	Total	Owner	Tenant
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity available	6.5	2.4	27.6	11.1	1.0	0.6	6.4	4.0	26.3	16.9	34.5
Electricity not available	93.5	97.6	72.4	88.9	99.0	99.4	93.6	96.0	73.2	83.1	65.5
TANZANIA MAINLAND											
	Total	Owner	Tenant	Other	Total	Owner	Tenant	Other	Total	Owner	Tenant
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity available	6.3	2.3	27.3	8.3	0.9	0.6	6.2	2.3	26.4	15.9	34.1
Electricity not available	93.7	97.7	72.7	91.7	99.1	99.4	93.8	97.7	73.6	84.1	65.9
ZANZIBAR											
	Total	Owner	Tenant	Other	Total	Owner	Tenant	Other	Total	Owner	Tenant
All Households	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity available	13.3	8.9	47.1	17.6	2.0	1.3	20.0	2.7	35.8	28.8	55.2
Electricity not available	86.7	91.1	52.9	82.4	98.0	98.7	80.0	97.3	64.2	71.2	44.8

Table 9.24 Percent distribution of Private Households by electricity availability

	1978			1988		Absolute Change	
	Rural	Urban	Total	Rural	Urban	Rural	Urban
TANZANIA	3.1	23.5	6.4	0.9	26.8	-2.2	3.3
MAINLAND	3.1	22.6	6.2	0.9	26.4	-2.2	3.8
Dodoma	0.7	20.1	3.8	0.5	28.4	-0.2	8.3
Arusha	1.6	21.9	5.2	1.4	26.0	-0.2	4.1
Kilimanjaro	3.2	30.4	9.1	4.2	31.8	1.0	1.4
Tanga	11.4	30.2	8.9	1.6	38.5	-9.8	8.3
Morogoro	11.5	19.0	7.0	0.7	25.7	-10.8	6.7
Coast	7.6	13.9	1.5	0.8	15.9	-6.8	2.0
Dar es Salaam	1.8	31.8	34.3	3.9	37.8	2.1	6.0
Lindi	0.6	17.0	3.1	0.4	16.7	-0.2	-0.3
Mtwara	0.7	7.2	2.4	0.5	13.6	-0.2	6.4
Ruvuma	0.7	11.7	2.7	0.7	14.6	0.0	2.9
Iringa	2.8	13.1	1.1	0.8	3.8	-2.0	-9.3
Mbeya	1.2	10.8	3.1	0.8	11.7	-0.4	0.9
Tabora	0.9	11.0	4.2	0.7	20.8	-0.2	9.8
Rukwa	0.7	1.4	1.6	0.5	7.1	-0.2	5.7
Singida	0.6	11.5	2.3	0.3	20.3	-0.3	8.8
Kigoma	1.2	10.1	2.6	0.7	15.8	-0.5	5.7
Shinyanga	2.4	29.8	3.0	0.5	28.6	-1.9	-1.2
Kagera	2.2	18.1	1.5	0.4	18.5	-1.8	0.4
Mwanza	2.8	18.6	4.7	0.4	19.1	-2.4	0.5
Mara	1.7	17.1	4.7	0.8	27.6	-0.9	10.5
ZANZIBAR	2.3	36.3	13.3	2.0	35.8	-0.3	-0.5
Zanzibar N	3.2	1.0	1.2	0.7	6.0	-2.5	5.0
Zanzibar C&S	2.6	5.6	2.8	2.5	6.9	-0.1	1.3
Zanzibar T&W	6.7	42.9	34.0	9.1	42.0	2.4	-0.9
Pemba North	0.7	17.9	4.5	0.4	21.0	-0.3	3.1
Pemba South	1.2	33.4	6.5	6.3	34.6	5.1	1.2

Source: 1978 Population Census, Volume VIII, Table 16.15



## **CHAPTER 10**

### **SAMPLING FOR THE CENSUS**

By Cletus Mkai

#### **10.1 INTRODUCTION**

The 1983 Census of Tanzania was the third to be conducted since the Independence of Tanzania Mainland and Zanzibar Revolution in 1961 and 1964 respectively. The other two censuses were carried out in 1967 and 1978.

During the early stage in the planning of the 1988 population census, it was decided to collect extensive information on economic activity, migration, fertility, mortality, housing conditions and other items through a sample survey within the framework of the census.

Presence of serious measurement problems which should be kept under control, as far as possible, favour a limited amount of data being collected and processed. Reduced costs of collecting and processing the data as well as timeliness of the results are reasons for a sample survey. Furthermore, management and other administrative aspects of the census operation make the sample approach most attractive.

#### **Questionnaire Approaches**

The 1988 census used two types of questionnaires: a general questionnaire that was used to cover all the households and a detailed questionnaire that covered selected households. This was the approach adopted during the earlier censuses.

Each row in both questionnaires recorded information for one household member and each sheet could accommodate a maximum of 10 household members. The members of each household were grouped by sex at the end of each sheet. Totals for each sheet of the questionnaire booklets were also indicated on the covers of the booklets. The first five questions appeared in both questionnaires, general and detailed. These were: name, relationship to head of the household, sex, age, and citizenship. In addition, the detailed questionnaire included 27 extra questions on the following topics:

- Mother still alive
- Marital status
- Name of residence - current and during 1978 census
- Ability to read and write Kiswahili
- Education
- Economic status
- Fertility
- Mortality
- Housing facilities and tenure

The general questionnaire and the first five questions in the detailed questionnaire were used for all persons staying in the country at the census date, except for diplomats and their families. The rest of the questions (27) in the detailed questionnaire were asked to a fraction of the population. The 1978 census formed a natural base in the questionnaire design as information collected from previous censuses are used to study development and changes between the census years, as well as to work out forecasts.

International recommendations in setting up the questionnaire were also taken into account, especially the development of different techniques in setting up questions concerning other sensitive topics such as mortality. The technical committee working on the final version of the questionnaire was faced with, among other problems, the problems of satisfying the needs of data users who put up a number of propositions for the 1988 census.

## **10.2 THE SAMPLE DESIGN**

### **Domains of Study**

The Census Committee decided to use two questionnaires in the 1988 population census, a general questionnaire for all households and a detailed questionnaire for sampled households. This design was also adopted in 1978 population census of Tanzania. An important difference though is that in the 1988 census the results were presented at district level. In the previous census, the lowest level of result breakdown was at regional level. This indicate that, for the 1988 census a larger sample was considered.

The decision that the 1988 population census data should be based on sampled enumeration areas and be presented at district level, sub-divided into urban and rural Domains, was taken into consideration while designing the sample.

### **Sample Design for Rural Domains**

#### **Mainland Rural Domains**

For the Mainland rural areas, covering the dominant part of the population of the country, samples of clusters of households were drawn in single stage. The mapping and listing work, carried out in 1986-1988 provided the basis for the enumeration. Through this operation, the country was divided into Enumeration Areas (EAs). The EA constituted the frame for the sample survey.

In the rural domain, the sample size depended on the total number of EAs in that particular district where the sample was drawn. Since rural parts of the district varied in size, various sample sizes were used. The sample sizes in the rural part of the district were designed in such a way that for a district with up to 199 rural EAs, the designated sample size was 30 Eas.



In summary rural domain with 200 - 399 EAs, the designated sample size was 40 EAs and a district with 400 EAs and over the designated sample size was 50 EAs. For the district where the number of EAs in the rural domain was less than the designated sample i.e. 30 EAs, all EAs were covered by detailed questionnaire. The assumption made was that, each EA has an equal chance of being selected. The method adopted for drawing a sample was the "Systematically Simple Random Sampling (SSRS)".

### **Zanzibar Rural Domains**

In Zanzibar rural domains, the same procedures as that of Mainland rural domains was adopted in the sample selection of EAs. The district was divided into rural and urban domain.

### **Mainland and Zanzibar Urban Domains**

The size of the urban EA in the 1988 Population Census was about 400 people, just like it was during the 1978 Population Census. Preliminary investigations concluded that there were several facts that pointed towards a design with a larger sample per district in the urban areas than in rural areas. It was decided that a sample of 50 EAs per district would be sufficient. For the Municipality of Zanzibar it was decided to take 70 EAs in the sample. For the district where the number of EAs in the urban domain was less than the designated sample i.e. 50 EAs, then all EAs were covered by the detailed Questionnaire. Systematic Simple Random Sampling was adopted in the selection.

The distribution of total EAs, selected EAs per domain and number of EAs/clusters in which detailed questionnaire was used by urban and rural areas by regions, Mainland and Zanzibar is given in Table 10.1 below.

Region	Total EAs	Selected EAs	Number of EAs/clusters in which detailed questionnaire was used
Arusha	120	40	40
Dar es Salaam	120	40	40
Geita	120	40	40
Kagera	120	40	40
Kilimanjaro	120	40	40
Lindi	120	40	40
Morogoro	120	40	40
Mt. Meru	120	40	40
Mwanza	120	40	40
Njombe	120	40	40
Pwani	120	40	40
Ruvuma	120	40	40
Tanga	120	40	40
Zanzibar	120	40	40

TABLE 10.1 DISTRIBUTION OF TOTAL EAs, SELECTED EAs PER DOMAIN AND NUMBER OF EAs/CLUSTERS IN WHICH DETAILED QUESTIONNAIRE WAS USED BY URBAN AND RURAL AREAS BY REGION: Mainland and Zanzibar

Region/ District	DOMAINS							
	Rural				Urban			
	Total EAs	Sel. EAs	Util. EAs	DQ Used	Total EAs	Sel. EAs	Util. EAs	DQ Used
<b>DODOMA</b>								
Kondoa	377	40	40	446	28	28	28	210
Mpwapwa	312	40	40	704	60	50	50	331
Dodoma(R)	400	40	40	713	0	0	0	0
Dodoma(U)	122	40	40	322	170	50	50	400
<b>ARUSHA</b>								
Monduli	119	30	28	283	18	18	18	162
Arumeru	318	41	40	519	12	12	11	139
Arusha	32	32	32	474	225	225	50	446
Kiteto	127	30	30	303	17	17	17	67
Babati	263	41	39	657	37	37	37	20
Hanang	114	30	30	296	2	2	2	20
Mbulu	295	41	40	390	21	21	14	108
Ngorongoro	74	30	28	258	0	0	0	0
<b>K'NJARO</b>								
Rombo	242	40	42	470	3	3	3	68
Mwanga	110	31	31	395	3	3	3	10
Same	144	30	28	716	67	51	51	362
Moshi (R)	388	40	44	522	4	4	4	56
Hai	222	41	41	630	17	17	17	163
Moshi(U)	0	0	0	0	179	51	50	386
<b>TANGA</b>								
Lushoto	357	40	40	437	24	24	24	-
Korogwe	102	30	29	411	68	51	61	392
Muheza	209	40	38	564	19	19	19	174
Tanga	52	30	31	367	51	51	52	444
Pangani	29	29	25	385	11	11	11	101
Handeni	176	31	31	495	23	23	23	210
<b>MOROGORO</b>								
Kilosa	294	41	41	689	70	50	50	342
Morogoro(R)	473	51	30	350	30	30	30	321
Kilombero	124	30	30	335	88	52	52	439
Ulanga	120	30	30	493	19	19	19	71
Morogoro(U)	0	0	0	0	215	50	50	422

Source: Extracted from the 1988 Population Census Methodology Key: Sel. = Selected  
 Util. = Utilized  
 DQ = Detailed Questionnaire



Table 10.1 (cont'd)

Region/ District	Domains							
	Rural				Urban			
	Total EAs	Sel. EAs	Util. EAs	DQ Used	Total EAs	Sel. EAs	Util. EAs	DQ Used
<b>COAST</b>								
Bagamoyo	124	30	30	681	49	49	49	449
Kibaha	64	30	42	690	22	22	22	257
Kisarawe	195	30	30	573	19	19	19	169
Rufiji	114	30	30	732	46	47	47	350
Mafia	30	30	30	712	9	9	9	101
<b>DAR ES SALAAM</b>								
Kinondoni	48	30	77	427	1312	51	50	901
Ilala	21	21	21	428	721	52	48	717
Temeke	63	30	28	474	825	51	48	776
<b>LINDI</b>								
Kilwa	146	31	31	515	25	25	25	208
Lindi(R)	303	40	40	475	49	49	49	425
Nachingwea	119	31	31	480	22	22	22	211
Liwale	50	31	31	349	23	23	23	166
Lindi(U)	8	8	8	210	74	30	32	1120
<b>MTWARA</b>								
Mtwara(R)	205	40	40	581	14	14	14	115
Newala	356	40	40	477	53	53	53	416
Masasi	410	50	50	570	55	50	50	375
Mtwara(U)	9	9	9	134	143	57	50	479
<b>RUVUMA</b>								
Tunduru	170	31	31	374	28	28	28	330
Songea(R)	243	40	39	370	9	9	9	212
Mbinga	291	40	40	505	18	18	18	167
Songea(U)	31	31	31	726	109	52	50	405
<b>IRINGA</b>								
Iringa (R)	372	40	40	532	0	0	0	0
Mufindi	234	40	40	523	12	12	12	12
Njombe	313	40	35	458	35	35	35	34
Makete	112	30	30	385	6	6	6	6
Ludewa	118	31	31	405	4	4	4	4
Iringa(U)	18	10	11	113	115	51	51	1

Source: Extracted from the 1988 Population Census Methodology Key: Sel. = Selected  
 Util. = Utilized  
 DQ = Detailed Questionnaire

Table 10.1 Cont'd

Region/ District	DOMAINS							
	Rural				Urban			
	Total EAs	Sel. EAs	Util. EAs	DQ Used	Total EAs	Sel. EAs	Util. EAs	DQ Used
<b>MBEYA</b>								
Chunya	130	30	22	374	56	51	49	408
Mbeya(U)	295	40	39	610	79	53	51	415
Rungwe	127	31	31	456	22	22	22	226
Kyela	267	40	40	343	35	35	34	185
Ileje	86	30	26	392	8	8	8	87
Mbozi	334	40	37	515	35	35	35	160
Mbeya(U)	23	23	23	358	237	50	50	504
<b>SINGIDA</b>								
Iramba	302	40	40	509	19	19	19	161
Singida(R)	319	40	40	544	0	0	0	0
Manyoni	125	31	31	364	41	41	41	292
Singida(U)	47	32	31	397	73	53	53	442
<b>TABORA</b>								
Nzega	260	40	40	562	34	34	34	503
Igunga	193	30	30	392	15	15	15	142
Tabora(R)	239	40	41	563	15	15	14	110
Urambo	169	30	30	434	40	40	40	329
Tabora(U)	1	1	1	7	167	51	47	329
<b>RUKWA</b>								
Mpanda	199	30	30	426	66	50	50	427
Sumbawanga(R)	272	40	40	346	0	0	0	356
Nkasi	100	30	30	396	13	13	13	133
Sumbawanga(U)	24	24	24	205	101	50	50	495
<b>KIGOMA</b>								
Kibondo	195	30	30	374	16	16	16	112
Kasulu	354	40	40	668	34	34	34	113
Kigoma(R)	240	40	40	513	2	2	2	30
Kigoma(U)	13	13	13	132	140	50	50	324
<b>S'NYANGA</b>								
Bariadi	341	41	41	519	20	20	20	168
Maswa	209	41	41	486	28	28	28	286
Shinyanga(R)	465	51	51	558	39	39	39	286
Kahama	425	50	50	618	20	20	20	185
Shinyanga(U)	51	30	30	362	83	52	52	459
Meatu	140	31	31	391	6	6	6	45

Source: Extracted from the 1988 Population Census Methodology Key: Sel. = Selected  
Util. = Utilized DQ = Detailed Questionnaire



Table 10.1 Cont'd

Region/ District	DOMAINS							
	Rural				Urban			
	Total EAs	Sel. EAs	Util. EAs	DQ Used	Total EAs	Sel. EAs	Util. EAs	DQ Used
<b>KAGERA</b>								
Karagwe	2774	40	40	491	5	5	32	278
Bukoba(R)	314	40	40	559	0	0	47	557
Muleba	217	40	40	470	4	4	49	406
Biharamulo	177	40	40	485	25	25	33	333
Ngara	18	30	30	390	2	2	35	277
Bukoba(U)	18	18	18	233	61	51	51	584
<b>MWANZA</b>								
Ukerewe	164	30	30	338	32	32	32	278
Magu	286	30	40	462	47	47	47	557
Mwanza	51	40	29	339	302	51	49	406
Kwimba	440	50	50	534	34	34	33	333
Sengerema	340	40	39	427	35	35	35	277
Geita	367	40	35	443	71	51	51	584
<b>MARA</b>								
Tarime	298	41	41	528	20	20	20	204
Serengeti	111	30	30	321	11	11	11	98
Musoma(R)	218	40	40	507	0	0	0	0
Bunda	187	30	30	358	17	17	17	120
Musoma(U)	0	0	0	0	123	51	51	369

Table 10.1 Cont'd

Region/ District	DOMAINS							
	Rural				Urban			
	Total EAs	Sel. EAs	Util. EAs	QD Used	Total EAs	Sel. EAs	Util. EAs	QD Used
<b>ZANZIBAR NORTH</b>								
North 'A'	142	31	13	210	3	3	3	29
North 'B'	75	30	30	172	10	10	10	125
<b>ZANZIBAR SOUTH</b>								
Central	80	31	28	224	4	4	4	53
South	68	31	29	232	13	13	13	102
<b>Z'BAR TOWN/WEST</b>								
West	98	31	31	282	6	6	6	60
Town	0	0	0	0	315	70	70	400
<b>PEMBA NORTH</b>								
Wete								
Micheweni	135	30	33	231	47	47	29	335
	119	30	29	332	20	20	20	180
<b>PEMBA SOUTH</b>								
Chakechake	115	30	30	177	34	34	34	234
Mkoani	141	30	30	206	19	19	19	108

Source: The 1988 Population Census

Note: Sel. = Selected  
 Util. = Utilized  
 DQ = Detailed Questionnaire

### Special Categories in Rural and Urban Areas of Mainland and Zanzibar

Besides the normal EA in urban and rural domains certain "special categories" of the population were defined and identified during the preparatory work of census. The special categories of population were classified as collective house holds, which include boarding schools, hospitals, prisons and their staff quarters, as well as migratory and transit population. All these EAs were covered with general questionnaire both in Mainland and Zanzibar.



## Sampling Units

In the 1988 population census of Tanzania, the sampling unit was an EA. All districts were demarcated into small areas called EAs. It should be noted that, both in rural and urban domains, the sample units were varied according to the population size. The target size of the rural EA during the 1988 population census was about 800 people while in an urban EA it was about 400 people. During the 1978 population census of Tanzania, the sampling unit was also an EA and a two-stage sampling design was used in drawing the sample.

### First Stage

From the lists of rural and urban EA, a random sample of primary units (EA) was drawn in each region in an orderly manner. The sample of EA was selected systematic with a random starting point in each one of the regions.

It was assumed that the EA has an equal probability of selection.

### Second Stage

Each EA selected in the first stage was then divided into approximately equal-sized clusters on the basis of preliminary estimates of number of households and population size, which had been made in the preparatory work. In general an EA of about 240 households/ 1200 persons was divided into three clusters of approximately 80 households /400 persons. Because of the variation in the size of the EAs, the number of clusters of an EA had to vary as follows:

1978 Census			1988 Census	
Est. No. of Household	Est. Population	No. of Clusters	No. of EAs	No. of EAs required in the Sample
Up to 119	Up 599	1	Up to 199	30
120-199	600-999	2	200- 399	40
200-279	1000-1399	3	400 Over	50
280-359	1400-1799	4	-	-
360 Over	1800 over	5	-	-

Source: The 1978 and 1988 Population Censuses of Tanzania.

Note: The information is not available for the 1988 Population Census

For the 1978 population census, in each selected EA, the number of clusters was determined, and the clusters were set up, listed and numbered. Finally the required number of clusters was selected systematically with a random starting point in each region. Likewise, during the 1988 population census, a single stage sampling was adopted in drawing the designated sample size for each district. The table represented above provides the designated sample size in rural areas ( Mainland and Zanzibar) for the 1988 population census.

Turning to the urban areas during the 1988 population census it was agreed to cover 50 EAs with the detailed questionnaire with the exception of the Zanzibar Municipal where the designated sample size was 70 EAs. Moreover, for the districts where the number of the EAs was found to be less than 30 (in rural) and 50 (in urban) all EAs were covered by the detailed questionnaire.

### Stratification

Sample stratification is mainly done to reduce the overall sample errors and to secure a sufficient sample size for sub-groups of interest. The sample design for the 1988 population census was a single-stage sampling. The domains of the study, viz the 113 districts divided into urban and rural parts was the first stratification level. Estimates based in the detailed questionnaire provided for approximately 226 domains of the study (113 districts separated estimates for urban-rural). Number of the EA's in each district (rural-urban) were arranged in a geographical order. It was agreed that, since there was a relatively small variation in size (population wise between the EAs), then the systematic equal probability sample drawn within each district (separated in urban and rural) was adopted. For instance in the rural areas the designated sample size was 30, 40 and 50 EAs while in the urban areas the designated sample size was 50 EAs with the exception of Zanzibar Municipal where the designated sample size was 70 EAs (see the previous sections).

## 10.3 SAMPLE IMPLEMENTATION

### Estimation Methods

This section is concerned with estimation procedures for totals and ratios (percentages). Most of the tables presented from the detailed questionnaire will be of a form where the cells contain the number of persons in different categories (educational attainment, number of children, etc). Usually there is also a basic sex-age breakdown.

The contents in a cell is the  $x_{sc}$ , an estimate of the total number of persons in sex-age group belong to category c. An example: If the categories are levels of educational attainment, category c might be persons who have completed primary school. Sex-age group s might be women 50-54 of age x is then the estimated total number of women in age-group 50-54 who completed primary school.

An estimate of  $X$  ( the population value) is;

$$x_{sc} = \frac{1}{f} \sum x_{isc}$$



where

$x_{isc}$  = number of persons in category  $c$  in sex-age group  $s$  in EA number  $i$   
 $f$  =  $m/M$  = the sampling fraction.

If we sum the  $x_{sc}'$  over all categories  $c$  we get  $x_s'$  the estimated total number of persons in sex-age groups.

$$x_s' = \sum x_{sc}'$$

From the general questionnaire we will have  $x_s$  = the exact number of persons in sex-age groups. In most cases  $x_s' = x_s$ , i.e. the totals in tabulations from the general questionnaire will differ from the totals in tabulations from the detailed questionnaire. (The number of women 50-54 will differ between tables). However, in the tabulations from the detailed questionnaire we might want the number of persons in the different categories to add up to the total  $x_s$  (which is presented in the tables from the general questionnaires). An alternative estimator of  $x_{sc}$  with such properties is

$$x_{sc}'' = \frac{x_s * x_{sc}'}{x_s'}$$

and

$$x_{sc}'' = x_s * \frac{\sum x_{sc}'}{x_s'} = X_s$$

So,  $x_{sc}''$  will provide for consistency between census data from the sample and the complete census.

$X_{sc}''$  is a ratio estimator which in this situation generally will have a smaller variance than  $x_{sc}'$ . However, it requires much more computational work than the simple unbiased estimator  $x_{sc}'$ . The weights  $x_s/x_s'$  need to be computed for 20-30 sex-age classes. Still, given the small samples in terms of number of EAs we could expect significant improvements in precision from the ratio estimator.

### Sampling Errors

The census data suffer from several kinds of errors. Errors of content and coverage have been found as the major source of errors in census data. The most serious problems concerning the quality of the present census data are related to measurement errors arising in the field work especially the collection of age data. The measurement errors are generally considered to

be the dominant factor in the reliability of the census data. However the sampling errors should not be neglected.

### Estimates of Sampling Errors

Estimating sampling errors of the census data presupposes information on the clusters (EA's), which were the particular ultimate sampling unit. In order to get some measures of the size of sampling errors, coefficients of variation were calculated in the selected districts of Morogoro region. The selected districts were Morogoro Urban and Kilombero (The rural part). It should be pointed out that, during the sample design for the 1988 population census, the sample design was up to the district level. Thus, the estimation of the sampling errors will be up to that (district) level.

A simplified (Ultimate Cluster) procedure for estimating coefficients of variation of the selected socio-economic and demographic variables will be employed in this analysis. These variables are:

- (a) Illiterate Population, (d) Unemployed Population and
- (b) Unmarried Population, (e) Cultivators.
- (c) Married Population,

The calculation of coefficients of variations will be based on the selected clusters (EA's) for the above mentioned two districts. An ultimate Cluster/EA estimate of the Variance is given as follows:

$$V^2 = V_{x'}^2 + V_{y'}^2 - 2V_{x'y'}$$

where

$$V_{x'}^2 = (1 - f) \frac{\sum_{i=1}^m (x_i - \bar{x})^2}{m(m-1) \cdot \bar{x}^2}$$

$$V_{y'}^2 = (1 - f) \frac{\sum_{i=1}^m (y_i - \bar{y})^2}{m(m-1) \cdot \bar{y}^2}$$

$$V_{x'y'} = (1 - f) \frac{\sum_{i=1}^m (x_i - \bar{x})(y_i - \bar{y})}{m(m-1) \cdot \bar{x} \bar{y}}$$



The square root of  $V^2$  is an estimate of coefficient of variation for a given variable.

By using the above formula for estimating coefficients of variation the following table has been constructed.

TABLE 10.3 COEFFICIENT OF VARIATION FOR SELECTED DEMOGRAPHIC AND SOCIO-ECONOMIC VARIABLES IN MOROGORO URBAN AND KILOMBERO DISTRICTS

Item/District	Number of Clusters/EA's Selected	Estimated Coefficient of Variation (Percent)
<b>Illiterate population</b>		
Morogoro Urban		
Kilombero	50	0.37
	30	0.59
<b>Not Married</b>		
Morogoro Urban		
Kilombero	50	0.42
	30	1.55
<b>Married</b>		
Morogoro Urban		
Kilombero	50	1.93
	30	1.55
<b>Not Employed</b>		
Morogoro Urban		
Kilombero	50	3.50
	30	3.68
<b>Cultivator</b>		
Morogoro Urban		
Kilombero	50	1.47
	30	2.26

Source: The 1988 Population Census

The coefficients of variation are given in percentages. It can be seen from table 3 above that, the sampling errors are fairly small especially for the demographic variables where the coefficients of variations vary from 0.4 to 2.0 percent only. Examining socio-economic variables, like not employed and cultivators, the sampling errors appear to be higher, ranging from 1.5 to 4.0 percent. Through this range of coefficients of variations both in Demographic and socio-economic variables it means that the variation between clusters is small. Thus the clusters were heterogeneous. To buttress this fact, during the 1978 population census it has been revealed that, for the selected regions that is Dar es Salaam city, Arusha and Kagera the coefficients of variation were much higher in demographic variables compared to socio-economic variable. The range varied from 1 to 2 percent for demographic variable while for the socio-economic variables the range was from 2.0 to 7.7 percent. These findings are expected and agree with consideration and calculations which were made in the preparatory stage of the 1988 population census.

#### 10.4 CONCLUSION AND RECOMMENDATIONS.

From the 1988 population census experience it is recommended that the geographical work in the regions should be finished much earlier. This would provide enough time for the regions and districts to scrutinize the EA lists. This will overcome some problems of not utilizing the selected EA's as it can be seen in table 1 that not all selected EA's have been utilized in the sample frame. Regarding to the omission and interchange of selected EA's it is very important to the trainers to participate in the field work full time with the supervisors and enumerators to countercheck such discrepancy.

When looking at the estimation of the sampling errors the coefficients of variations show that much variation are seen in the socio-economic variables such as not employed and cultivators to mention only a few. Thus in future censuses much attention is required especially during the data collection, keying in data etc. This will minimize both the coverage and content errors.

#### References:

H. Peterson (1988): **Sampling in Tanzania** Report from Mission, April 9 to May 5, Bureau of Statistics, Tanzania, Statistics Sweden, International Consulting Office.

L. Kish (1965): Survey Sampling, John Wiley and Sons, Inc., 1965.

P.O., Olofsson (1984): **A Master Sample for Tanzania, Evaluation, Discussion and Proposals**, The Bureau of Statistics Tanzania, in collaboration with Statistics Sweden, International Consulting Office.

Population Census Vol VIII: Population of Tanzania, Bureau of Statistics, Ministry of Planning and Economic Affairs, Dar es Salaam, 1983.



