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Working Paper

54

ENVIRONMENTAL CHANGE AND DRYLAND MANAGEMENT IN MACHAKOS DISTRICT, KENYA POPULATION PROFILE

Mary Tiffen

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WORKING PAPER 54

**ENVIRONMENTAL CHANGE AND DRYLAND MANAGEMENT
IN MACHAKOS DISTRICT, KENYA
1930-90**

POPULATION PROFILE

Mary Tiffen

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OF ARID, SEMI-ARID AREAS AND WASTELANDS**
Nairobi, Kenya

Preface and Acknowledgements

ODI Working Papers present in preliminary form work resulting from research undertaken under the auspices of the Institute.

This Working Paper is part of a study which aims to relate long term environmental change, population growth and technological change, and to identify the policies and institutions which are conducive to sustainable development. The first stage, published in these Working Papers, is to measure and assess as precisely as the evidence allows the changes that have occurred in the study area, the semi-arid Machakos District, Kenya, over a period of six decades. Degradation of its natural resources was evoking justifiable concern in the 1930s and 1940s. By several measures it is now in a more sustainable state, despite a five-fold increase in population. A long-term perspective is essential, since temporary factors, such as a run of poor rainfall years, can confuse analysis of change if only a few years are considered. The study is developing a methodology for incorporating historical, physical, social and economic data in an integrated assessment. The final report will include a synthesis and interpretation of the physical and social development path in Machakos, a consideration as to how far the lessons are relevant to other semi-arid environments, and recommendations on policies for sustainable economic growth.

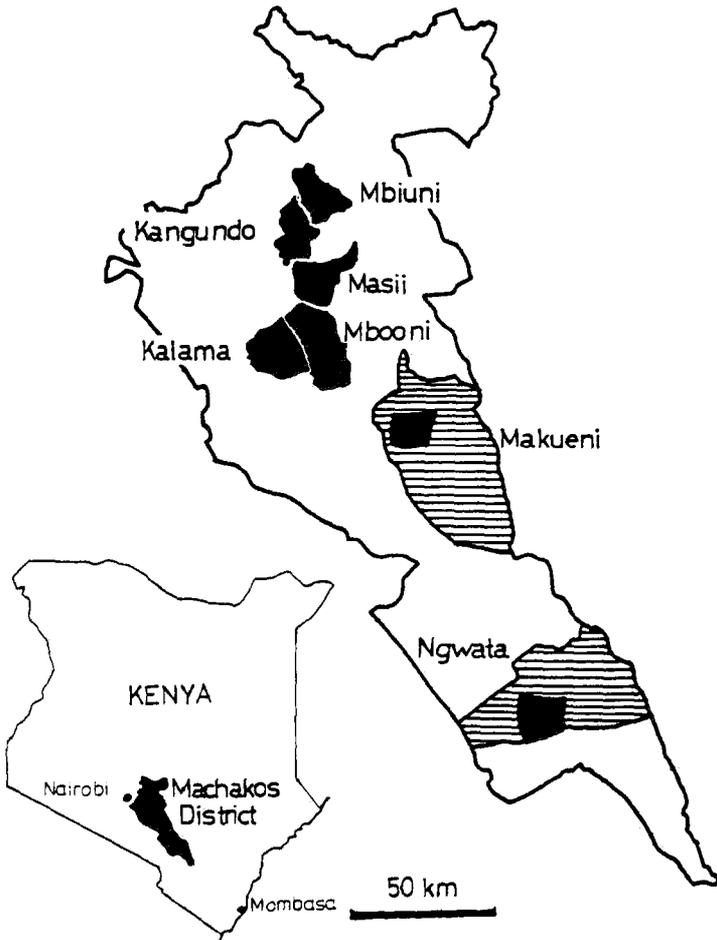
The project is directed at ODI by Mary Tiffen, in association with Michael Mortimore, research associate, in co-operation with a team of scientists at the University of Nairobi, and with the assistance of the Ministry of Reclamation and Development of Arid, Semi-Arid Areas and Wastelands in Kenya. We are grateful to Professor Philip Mbithi, Vice-Chancellor of the University of Nairobi, for his support and advice. We also thank the Overseas Development Administration, the Rockefeller Foundation and the Environment Department of the World Bank for their financial support. Views expressed are those of the authors and do not necessarily reflect the views of ODI or supporting institutions. Comments are welcome, and should be sent directly to the authors or project leaders.

Other titles in this series (in which more are planned) are:

Machakos District: Environmental Profile
Machakos District: Production Profile
Machakos District: Conservation Profile
Machakos District: Technological Change
Machakos District: Land Use Profile
Machakos District: Institutional Profile

Dr Mary Tiffen is the author of this paper, Population Profile. Her objective is to assess changes in population numbers, and consequential changes in population structure and distribution. Mary Tiffen is a Research Fellow of the Overseas Development Institute.

Preface Figure: Machakos District, Kenya, showing study locations
(In Makueni and Ngwata Locations, field studies were mostly within the areas shown black.)



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1. INTRODUCTION

1.1 Aims of the Population Profile

The aim of the population profile is to describe the rapid growth in the population of Machakos District since 1930, which has led to a more than fivefold increase by 1990. People have adopted various means of adapting to the consequences of this increase, seeking new ways of earning a living. Those which have necessitated permanent or temporary migration within or without the District are described here. There has been a redistribution of the population towards the more arid areas of the district, but population densities have increased in both the high potential and the lower potential areas. There has been the beginning of urbanization, but, as yet, Machakos is more affected by the development of large urban centres outside the District than of major towns within it.

The extraordinarily rapid growth of population has changed the face of the land and increased its value. The story can be epitomized in one man's experience. In Kangundo, we interviewed an old man, who knew that his father had migrated to this previously uninhabited area a few years before he was born, in 1906. At that time a mission had been established, and the missionaries began shooting the wild animals which had made the area too dangerous for settlement. This same area had a population density of 367 per km² in 1979; its people are now worried for the landlessness of their children. In the 1920s a man sold our informant one of his present plots in exchange for a goat; now such land is worth Ksh 100,000 per hectare; double that with trees.

1.2 Machakos in Relation to Kenya

Kenya has had high population growth rates, due to rising fertility and falling mortality, particularly infant mortality since 1948. This has been ascribed to improvements in nutrition and health services (Muganzi, 1988). Total national population, annual population growth and national estimates of the total fertility rate and the crude death rate are given in Table 1 below. Machakos District follows the national pattern. Since 1948 it has accounted for some 6 to 7% of Kenyan population.

Table 1: Estimated crude birth and death rates and Kenyan population totals, 1948-79

| | <i>Crude Birth Rate</i> | <i>Crude Death Rate</i> | <i>Total Population</i> | <i>% in Machakos District</i> |
|------|-----------------------------|-----------------------------|-----------------------------|-----------------------------------|
| 1948 | 50 | 25 | 5,405,966 | 6.8 |
| 1962 | 50 | 19 | 8,636,263 | 6.6 |
| 1969 | 50 | 17 | 10,942,705 | 6.5 |
| 1979 | 54 | 14 | 15,327,061 | 6.7 |

Source: Kenyan censuses for totals; ODI calculation for percentage in Machakos, 1948. Crude birth rate and crude death rate as quoted by Z. Muganzi in Ominde, (ed.) 1988.

2. BOUNDARIES AND DATA

2.1 Census and Other Data

This paper is based mainly on the findings of various censuses and population counts, 1932-89.

The first reliable census, based on house calls by trained enumerators, was held in 1948. Earlier counts were made by low-level officials for taxation purposes. The 1932 count seems to have been particularly thorough as it was undertaken to provide evidence to the Kenya Land Commission (Kenya Land Commission, 1934. Vol.3, Evidence). However, it is likely that a proportion of the adult males who were the main taxpayers successfully evaded the count.

There is no reason to think there was substantial undercounting in the censuses of 1948, 1962, 1969 1979. Preliminary 1989 Census results were made available in September 1991, and will be incorporated in a later production. They were disputed. The original figures were widely believed to show overcounting due to over-complex questions on family size.

Analysis of census data has been supplemented by a review of literature on migration and other forms of population movement, by a limited search for archival material, and by interviews with groups of community leaders in 5 sub-locations in 1990.

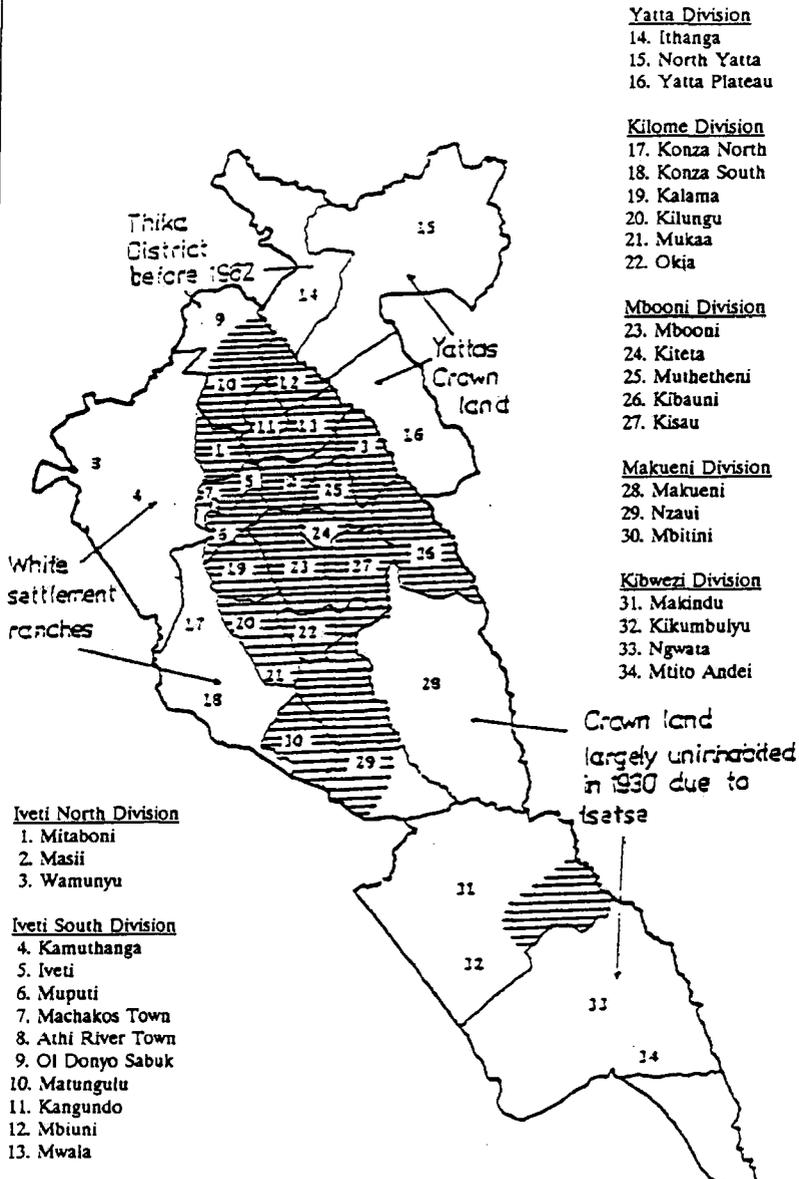
2.2 Boundaries

The analysis of census data has to take into account changes in administrative boundaries. We have used the 1979 boundaries of both the District, and its sub-division, the Location, as the unit for our analysis.¹ In some earlier censuses, the 1979 locations were subdivisions of a larger Location. In our tables, the figures relate to the named location and its area at the time of the census in question. However, it is important to draw attention to one change we made in the general principle of using 1979 Location boundaries as our standard. One of the main changes in administrative boundaries between 1969 and 1979 was the enlargement of Machakos Municipality to take in considerable areas of all neighbouring locations, and it grew from 19km² to 323km². In some cases, this truly reflected the urbanisation of the areas concerned. However, areas such as the Mua Hills where the main occupation was farming were also included in the municipal boundaries. In order not to exaggerate the degree of urban growth, we defined as urban only those sub-locations adjacent to 'Machakos Old Town' which had densities over 600 km². The rest, for the purposes of our analysis, were reallocated to their original Location.

¹ Locations are grouped into Divisions. Divisional boundaries have frequently been changed, and the Location is therefore preferred as the unit for analysis. After 1979 several more Locations were created by subdivision, but as the 1989 census was not available, we have ignored this for the purposes of our analysis.

Fig 1:

Machakos District: administrative locations in 1979
and the approximate position in 1930



Before 1963 the District as currently defined was divided into four main areas. There was the Reserve area, for African farming. Statistics for the colonial period frequently relate only to the Reserve area, but they sometimes included a second area, the White Highlands of Machakos District. These were allocated to European farmers, and mainly used for ranching. The third area was Crown Land attached to the District but largely uninhabited. This was the Yatta Plateau, the Chyulu Hills and the southern plains stretching towards what is now the Tsavo National Park. The fourth area, in the north, was until 1963 part of Thika District. The approximate location of these four areas are shown on Figure 1.

For the purpose of our analysis the Locations have been grouped according to their predominant agro-ecological zone (AEZ) into three classes; predominantly AEZ 2 or 3; predominantly AEZ 4; predominantly AEZ 5 or 6. AEZ 2 and 3 represent the wetter, higher potential zones.

3. POPULATION STRUCTURE AT THE DISTRICT LEVEL, 1932-79

3.1 Population Totals and Growth Rates, 1932-79

The 1932 taxation count was broken down by age, sex and location. As already mentioned, the high ratio of adult females to males may be due to some undercounting of males, although we know there was considerable outmigration. The population may have been nearer 260,000 than the 240,000 counted.² Table 2 shows it grew to more than 1,000,000 in 1979. The population in 1989 has been estimated as 1,382,264, (preliminary information from Central Bureau of Statistics, Machakos office, 1991), a more than five-fold increase in 60 years.

If we are correct on the degree of undercounting in 1932, annual population growth between 1932 and 1948 was 2% rather than 2.5% p.a. Since 1948, growth rates have been over 3% p.a. Between 1948 and 1969 population growth rates in Machakos were below the national average; after 1969 they slightly exceeded the national average (Table 2, section 2). We think this is due to the return of emigrants, as later sections will show there is no evidence of a local rise in birth rates, or of large-scale immigration by non-indigenous people. Growth rates were as high as 3.76% p.a. in the period 1969-79 but, according to preliminary estimates, fell back to 3.09% in the period 1979-89. (Preliminary information, Central Bureau of Statistics, Machakos office.). The high birth rate is confirmed by the percentage of the population under 15 years of age, (Table 2, section 4).

² It was reported there were 37,879 adult male hut taxpayers, 15,292 adult female hut taxpayers, 58,990 adult females not paying hut tax, 63,080 male children and 63,669 female children. Only 5,000 males were known to be outside the District. It is inherently unlikely that the ratio of adult males to females was as low as 58%. A more likely figure is 80%, which would have meant the undercount was about 20,000 and the true population nearer 259,000. The 1932 totals exclude the Asian and European populations, but as their numbers were small and they resided mainly in the urban areas this does not have much effect on the calculation of growth rates.

Table 2:

Machakos district population, totals, growth rates, age group, sex and tribe, 1932-79

| | 1979 | 1969 | 1962 | 1948 | 1932 |
|--|----------------|----------------|----------------|----------------|----------------|
| 1. Totals | | | | | |
| 1979 boundaries | 1,022,522 | 707,214 | 566,463 | 366,199 | n.a. |
| 1948 boundaries | | | 550,779 | 357,802 | 238,910 |
| 2. Intercensal annual growth rate (%) (Kenya average) | 3.76 (3.42) | 3.22 (3.44) | 3.17 (3.40) | 2.68 (n.a.) | |
| 3. Males/100 females (Kenya average) | 93 (98) | 92 (99.6) | 90 (98.1) | 87 (97.5) | 73 (n.a.) |
| Males/100 females >15 (Kenya average) | 86 (96) | 82 (97) | 74 (89) | 71 (88) | n.a. (n.a.) |
| % Males over 15 apparently absent** | 10 | 15 | 17 | 20 | n.a. |
| 4. Percentage of population <15 * (Kenya average) | 50 (48) | 53 (50.5) | 54 (51) | 50 (48) | 53 (n.a.) |
| 5. Kamba % * | 96.6 | 97.6 | 98.2 | 98 | n.a. |

* Using boundaries in operation at the time of census.

** See text for method of calculation

Sources: Censuses for 1948, 1962, 1969 and 1979; Land Commission Evidence, 1933 for 1932; and ODI calculations. 1948 figure includes both African and non-African totals, which were separately counted, to ensure comparability with later censuses.

3.2 Sex Ratios

The proportion of male children to every 100 female children has been comparable to the Kenyan average. The figures for the 1948, 1962 and 1969 censuses, which used the classification "adult" and "child" are shown in Table 3.

| | <i>Machakos District</i> | <i>Kenya</i> |
|------|------------------------------|--------------|
| 1948 | 107 | 110 |
| 1962 | 106 | 107 |
| 1969 | 103 | 102 |

By contrast, in the over-15 age group the number of males has always been below the national average due to out migration by males of working age.

Table 2 shows that the adult sex ratio rose from 71 to 86 between 1948 and 1979. In the earlier censuses, females tended to be considered adult at 14 and males at 16, so considerably more females were enumerated as adult. From 1969, censuses may have become more accurate as regards age but there is a continuing tendency to count some females aged less than 15 as more than 15. Using the Kenyan adult sex ratio as the norm, we calculated the number of males that were to be expected in the >15 age group. By expressing the actual number of males as a percentage of the expected, we get the percentage of males who were apparently out of the District. Table 2 shows out-migration appears to have fallen steadily since 1948, for reasons which will be discussed in a later section.

3.3 Age Distribution, 1932-79

Table 2, section 4, shows that, throughout the period under review, over 50% of the population were aged less than 15. There appears to be a falling trend from the 54% in 1962 to 50% in 1979, at which time the national figure was 48%.

3.4 Dependency Rates and Education

Education has a dual effect on development. On the one hand, it improves the quality of the labour force. On the other, young adults in education remain dependent on their families for a longer period, reducing available labour. Educational costs mean savings are increasingly diverted to schooling, so that, unless total wealth is also rapidly increased, less capital is available for farm improvements, etc. Since 1945, when the Kamba returning from the war first began pressing for education in large numbers, the growth of schooling has meant that the labour force has shrunk as a fraction of the whole population. Children used to be part

of the family labour force from an early age, with boys particularly important in herding. By 1979 children helped in the holidays and at weekends, particularly at peak labour times, but could not be considered part of the regular labour force. Nor could many of the young people. By then 94% of the 10-14 age group and no less than 74% of the 15-19 age group were in school (Table 4). The latter included 80% of the males and 67% of the females. In the 20-24 age group 23% of males and 7% of females were still at school. The continuance of schooling into this age is associated with a late start at school; Table 4 shows 49% of the children aged 5-9 are not in school, while education is almost universal for those aged 10-14. Judging by a study in Kitui District, this late start is due to the difficulties parents have in finding money for school fees, which leads them to postpone schooling for some children (O'Leary, 1984). Table 4 shows that Machakos District is comparable to the rest of Kenya in the late start at school, but that parents were managing to keep their children at school for a longer than average number of years. As a consequence 39% of the population aged 20-24 had completed Standard 7 of Primary School, compared with a national average of 31%; 29% of this age group had some secondary education, compared with a national average of 25%. Taking into account the older students and half the age group 55+, the true dependency ratio in 1979 was 65%.

Table 4: Proportion of children in school, Machakos and Kenya, 1979

| <i>Age group</i> | <i>Machakos</i> | <i>Kenya</i> |
|------------------|-----------------|--------------|
| 5-9 | 51.4 | 49.9 |
| 10-14 | 93.6 | 83.4 |
| 15-19 | 74.0 | 55.5 |
| 20-24 | 14.4 | 9.7 |

Source: Calculated from Kenya Population Census 1979, Table 4

3.5 Changes in Fertility and Mortality Rates

There are no estimates of changes in crude death rates and crude birth rates at District level, such as have been estimated at national level (Table 1). A study made in a small area of northern Machakos estimated the average crude birth rate 1975-78 as 43.6 and the death rate at 6.3, both below the national estimates quoted in Table 1. However, we cannot draw conclusions from such a localised study, particularly as the methodology of calculation was different from that used at the national level.³

³ The calculation was based on household visits at two points in time (Van Ginneken et al, 1984).

Censuses have endeavoured to pick up some of the important indicators of change. The mean number of children ever born is available for 1962 and 1979 at District level. The data for the age group 45-49 shows Machakos to be somewhat below the Kenyan average in 1962, possibly indicating either that female nutrition and health levels to be then less than the national average, or that fertility was reduced by above-average male absenteeism, or both. However, in 1979 the District was close to the Kenyan average, as shown in Table 5.

Table 5 Mean number of children ever born to females aged 45-49

| | <i>Machakos</i> | <i>Kenya</i> |
|-------------|-----------------|--------------|
| 1962 Census | 5.08 | 5.90 |
| 1979 Census | 7.19 | 7.17 |

Sources: District level data from 1962 and 1979 censuses. Kenya level data from Muganzi, 1988, (citing Central Bureau of Statistics, 1983).

3.6 Tribe

The District has always been predominantly Kamba, (Table 2, section 5). Even in 1979, some 97% of the population was Kamba.

4. POPULATION DENSITY AND GROWTH RATES AND TOTALS, BY AEZ AND URBAN AREA, 1932-79

4.1 Growth of Population in the Arid Zones

Table 6 shows the total population and the density for each of the locations, which have been grouped according to their predominant AEZ. The urban areas are shown separately. The proportion of the Machakos population living in the arid and semi-arid zones has grown steadily since 1932. The proportion in AEZ 2 and 3 fell from 36% to 22% and that in AEZ 5 and 6 rose from 9% to 35%. Thus, there had been a very considerable increase in the population of the most arid areas of the District. This is shown graphically in Figure 2. Changes in population density by location 1932-79 are shown in the maps in the Annex.

4.2 Changes in Population Densities by Zone

There have been various efforts to measure the carrying capacity of agricultural land, in the sense of the number of people who can be supported at a reasonable standard of living given

current technologies. Under any given level of technology the carrying capacity of AEZ 2 and 3 land is higher than that of AEZ 4, and AEZ 4 is higher than that of AEZ 5 and 6. Table 6 shows that AEZ 2 and 3 densities typically rose from 82 in 1932 to 285 in 1979, those in AEZ 4 from 56 to 110, and those in AEZ 5 and 6 rose either from 30 to 50 (if already inhabited in 1932) or from zero to 50 in case of those previously uninhabited. This is shown graphically in Figure 3.

In 1932 and 1948 densities in AEZ 4 were about 55-60% of those in AEZ 2 and 3. By contrast, from 1962 to 1979, AEZ 4 had only 40-45% of the density of AEZ 2 and 3. Looking at the more detailed locational figures in Table 6 we can see that in 1948 some of the AEZ 4 locations such as Kalama, Kiteta, Matungulu, Mukaa and Muthetheni had densities over 90/km² compared with the average of 116/km² in AEZ 2 and 3. The high densities suggest that if there was overpopulation in relation to the level of technology and the nature of the resource base in the period 1932-48, we should expect to see it especially in Iveti, Mitaboni and Kangundo in AEZ 2 and 3, and in Kalama, Kiteta, Matungulu, Mukaa and Muthetheni in AEZ 4.

4.3 Population Growth Rates by Zone

Between 1932 and 1948 population growth was between 2 and 3% in most locations (taking the official 1932 population figure). It was highest in Iveti, near Machakos town and the road to Nairobi, and in Matungulu and Kalama. The AEZ 5 and 6 locations also grew fast, but this was from a very low base. Only 9% of the District's population lived in this vast area in 1932, and this had only risen to 13% in 1948 (Figure 2).

After 1948 population growth rates in highland AEZ 2 and 3 started to decline, both absolutely and relative to other parts of the District. They fell to an average of 1.62% after 1962 and 1.38% after 1969, (Table 6). However, because this was from a high initial base, a growth rate of 1 to 2% per annum was enough to raise densities from an average of 189/km² in 1962 to 285/km² in 1979. Iveti and Kangundo were always the most densely populated areas, having over 360/km² in 1979. Thus, only part of the natural increase in the population of the highland areas was accommodated by increasing the density of population. There was, as we shall see, out-migration.

From 1948-62 growth rates varied considerably within each AEZ. We can detect some southward movement into Okia in AEZ 4 as well as into AEZ 5 and 6. Muputi, adjacent to Machakos town, also grew fast, and the movement away from Mbooni seems to have been reversed.

In AEZ 4 average density, which had already reached 78/km² in 1948, grew slowly to 85/km² in 1962 and reached 110/km² in 1979 (Figure 3). By contrast, AEZ 5 and 6 had very high rates of growth from 1948 to 1979. Density had reached more than 50/km² in the more favoured AEZ 5 and 6 locations by 1979, with only the Settled Area location, the former white ranching area, remaining comparatively empty (Table 6). The migration into these areas is described in a later section.

The urban population rose from 1% of the total in 1948 to 6% in 1979.

Table 6: Population totals, growth rates and density, 1932-79

| <i>Location</i> | <i>Total</i> | <i>1932 Density per km²</i> | <i>Annual growth</i> | <i>Total</i> | <i>1948 Density per km²</i> | <i>Annual growth</i> |
|-------------------------|--------------|--|--------------------------|--------------|--|--------------------------|
| Iveti | 25,668 | 97 | 3.84 | 46,898 | 178 | 2.22 |
| Kangundo | 14,704 | 96 | 2.82 | 22,948 | 150 | 3.45 |
| Kilungu | 25,564 | 74 | 1.69 | 33,411 | 96 | 0.66 |
| Mitaboni | | | | | 178 | |
| Mbooni | 19,639 | 72 | 2.30 | 28,277 | 103 | 5.37 |
| Sub Total | 85,575 | 82 | 2.72 | 131,534 | 127 | 2.14 |
| Kalama | 7,358 | 48 | 4.01 | 13,807 | 90 | 2.39 |
| Kisau | 14,045 | 52 | 2.15 | 19,747 | 73 | (2.17) |
| Kiteta | 17,708 | 74 | 1.43 | 22,236 | 93 | 5.37 |
| Masii | 11,543 | 64 | 1.00 | 13,534 | 75 | 1.67 |
| Matungulu S | 13,938 | 77 | 3.92 | 25,789 | 142 | 4.21 |
| Matungulu N | | | | | | |
| Mbiuni | | | | | 76 | 2.27 |
| Mbitini | 9,748 | 47 | 1.92 | 13,220 | 64 | 2.69 |
| Mukaa | 15,250 | 58 | 2.85 | 23,920 | 91 | 2.15 |
| Muputi | 4,287 | 36 | 2.37 | 6,237 | 52 | 6.67 |
| Muthetheni | | | | | 93 | 5.37 |
| Mwala | 22,699 | 71 | 0.46 | 24,442 | 76 | 0.88 |
| Nzawi | 11,943 | 33 | 2.23 | 16,993 | 47 | 3.13 |
| Okia | 3,888 | 60 | 0.66 | 4,322 | 67 | 9.82 |
| Sub Total | 132,404 | 56 | 2.09 | 184,246 | 78 | 2.64 |
| Kibauni | 7,712 | 34 | 3.23 | 12,819 | 57 | 0.94 |
| Kikumbuliu | 6,439 | 32 | 3.02 | 10,372 | 51 | 3.31 |
| Kinyatta/Yatta Plateau | | | | 457 | 1 | 25.91 |
| Makueni | | | | 2,103 | 2 | 17.53 |
| Masinga/North Yatta | | | | 4,554 | 4 | 6.79 |
| Ndalani/Ithanga | | | | 3,929 | 13 | 7.00 |
| Ngwata/Kibwezi | | | | 4,338 | 1 | (5.36) |
| Settled Area/Kamuthanga | 6,780 | 4 | 1.23 | 8,248 | 5 | 0.92 |
| Wamunyu | | | | | 93 | 5.37 |
| Sub Total | 20,931 | 2 | 5.10 | 46,820 | 5 | 6.69 |
| Athi River Town | | | | | 0 | |
| Kangundo town | | | | | | |
| Tala TC | | | | | | |
| Kibwezi Township | | | | 112 | | 7.03 |
| Machakos Township | | | | 2,028 | 93 | 5.61 |
| Mtito Andei | | | | 202 | 76 | |
| Sub Total | 0 | | | 2,342 | | 11.05 |
| TOTAL | 238,910 | | 2.71 | 366,199 | 67 | 3.17 |

| Total | 1962 | | Total | 1969 | | Total | 1979 | |
|---------|-----------------------------|---------------|---------|-----------------------------|---------------|-----------|-----------------------------|-----------------------------|
| | Density per km ² | Annual growth | | Density per km ² | Annual growth | | Density per km ² | Density per km ² |
| 31,327 | 304 | 1.30 | 34,284 | 333 | (3.65) | 23,637 | 401 | |
| 36,875 | 249 | 1.17 | 39,998 | 270 | 2.47 | 51,063 | 367 | |
| 36,644 | 151 | 2.04 | 42,215 | 174 | 2.42 | 53,606 | 240 | |
| 32,369 | 206 | 1.79 | 36,660 | 234 | 0.51 | 38,590 | 309 | |
| 38,011 | 137 | 1.76 | 42,952 | 155 | 3.06 | 58,061 | 239 | |
| 175,226 | 189 | 1.62 | 196,109 | 211 | 1.38 | 224,957 | 285 | |
| 19,207 | 109 | 1.41 | 21,183 | 120 | 2.52 | 27,175 | 159 | |
| 14,523 | 65 | 1.18 | 15,764 | 71 | 2.76 | 20,698 | 97 | |
| 9,214 | 130 | 2.27 | 10,781 | 152 | 2.58 | 13,907 | 176 | |
| 17,060 | 105 | 1.06 | 18,369 | 113 | 1.36 | 21,027 | 138 | |
| 45,950 | 261 | 2.22 | 53,581 | 304 | (0.88) | 49,070 | 280 | |
| 15,923 | 104 | 0.41 | 16,387 | 107 | 1.99 | 26,106 | 92 | |
| 19,163 | 98 | 2.23 | 22,364 | 115 | 2.22 | 19,947 | 135 | |
| 32,235 | 54 | 4.59 | 44,132 | 73 | 1.42 | 27,865 | 121 | |
| 15,398 | 135 | 1.83 | 17,486 | 153 | 2.41 | 50,840 | 64 | |
| 16,800 | 110 | 0.82 | 17,785 | 116 | 2.19 | 22,194 | 211 | |
| 17,518 | 99 | 0.01 | 17,533 | 99 | 1.64 | 20,367 | 133 | |
| 26,172 | 35 | 3.48 | 17,533 | 99 | 1.64 | 20,630 | 119 | |
| 16,042 | 88 | 0.31 | 33,263 | 45 | 0.75 | 35,847 | 59 | |
| | | | 16,395 | 90 | 2.41 | 20,807 | 150 | |
| 265,205 | 85 | 2.02 | 305,023 | 97 | 2.13 | 376,480 | 110 | |
| 14,603 | 37 | 1.95 | 16,713 | 43 | 2.55 | 21,504 | 58 | |
| 16,362 | 18 | 4.46 | 22,210 | 24 | 5.69 | 38,612 | 23 | |
| 11,499 | 14 | 14.30 | 29,311 | 37 | 0.18 | 29,839 | 53 | |
| 20,191 | 16 | 15.27 | 54,595 | 42 | 2.48 | 69,727 | 53 | |
| 11,421 | 11 | 10.50 | 22,971 | 22 | 11.18 | 66,308 | 51 | |
| 10,130 | 27 | 1.20 | 11,009 | 29 | 14.08 | 41,111 | 137 | |
| 2,006 | 1 | 32.33 | 14,255 | 5 | 14.86 | 56,977 | 33 | |
| 9,377 | 6 | (4.45) | 6,819 | 4 | 9.26 | 16,533 | 12 | |
| 20,291 | 107 | (5.76) | 13,394 | 71 | 0.85 | 14,577 | 78 | |
| 115,879 | 12 | 7.42 | 191,277 | 20 | 6.38 | 355,188 | 40 | |
| 5,510 | 612 | (0.44) | 5,343 | 594 | 6.21 | 9,760 | 542 | |
| | | | 1,540 | | 14.00 | 5,709 | | |
| 290 | | 13.90 | 721 | | 6.27 | 1,064 | | |
| 4,353 | 229 | 5.45 | 6,312 | 332 | 21.96 | 1,324 | 613 | |
| | | | 889 | | 8.80 | 45,973 | | |
| | | | | | | 2,067 | | |
| 10,153 | 363 | 5.54 | 14,805 | | 16.10 | 65,897 | 709 | |
| 566,463 | 42 | 3.22 | 707,214 | | 3.76 | 1,022,522 | 78 | |

Figure 2: Changes in population by AEZone and urban area, 1932-79

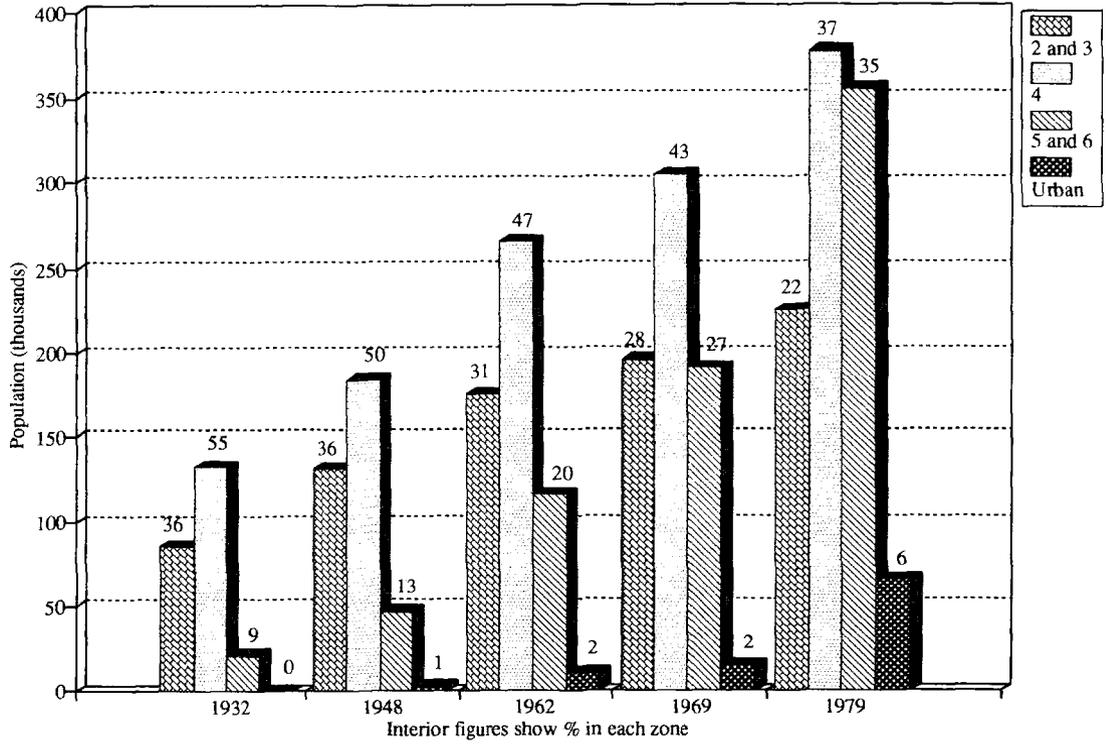
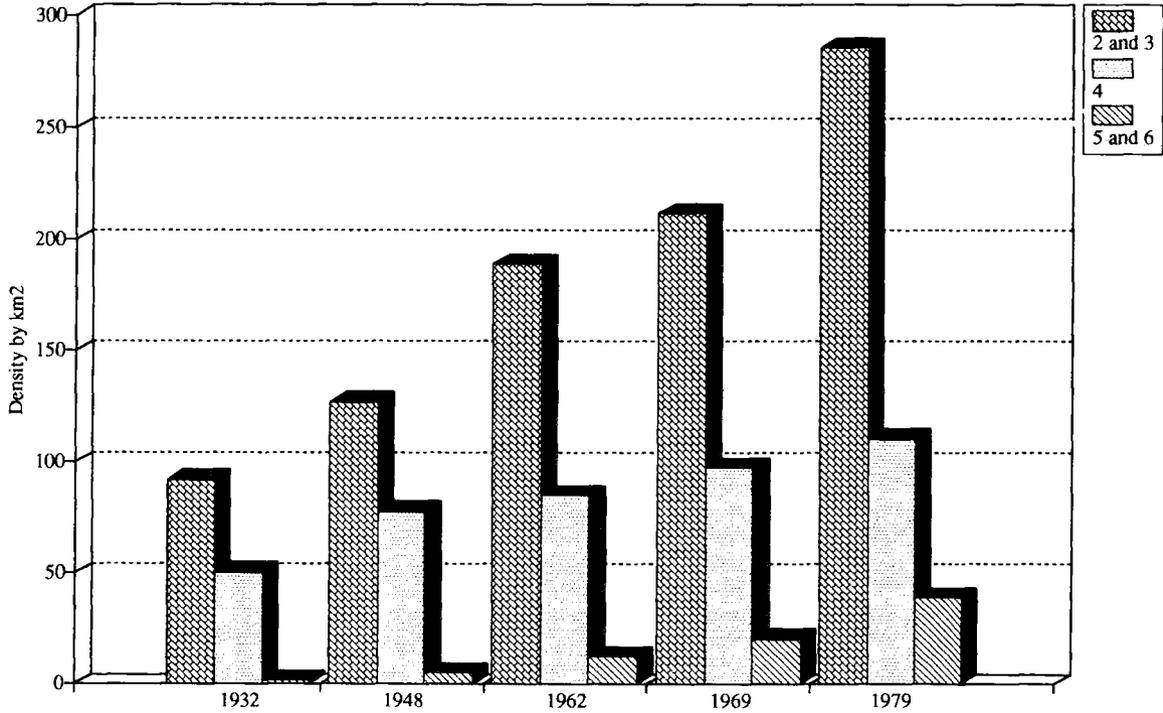


Figure 3: Changes in density by AEZone, 1932-79



5. CONSTRAINTS ON MOVEMENTS BEFORE 1960

The Kamba settled by preference on the better-watered hill massifs, cultivating the depressions, slopes of hills and irrigable areas more or less permanently (Lindblom, 1920: 501 et seq). They used the lower lands for grazing, shifting cultivation and new homesteads. Settlement in the lowland was, however, constrained by both political and physical factors. The physical constraints were the lack of dry-season water supplies, the presence of thick, usually tsetse-infected bush, particularly in the central and southern part of the district, and wild animals. Tsetse infestation may have increased after the population losses in 1898-9, (Owako, 1969:128). In 1944 330,000 acres, about 23% of the reserve, were said to be useless owing to fly and lack of water. The only areas fit for settlement were in the Chyulu Hills, which were, however, designated Crown Land after the Kenya Land Commission in 1934. Their main springs were used to supply Mombasa town.

In the nineteenth century the political factor was the enmity of the Masai who claimed the same grazing areas. In the twentieth century it was the tribal reserve boundary, which the British imposed about 1906. Most of the land then taken for white settlement was AEZ 5 and 6 land the Kamba had previously used only occasionally for grazing. However, in 1908-10 some 2,000 Kamba were expelled from the high potential area of the Mua Hills, near Machakos, and cattle-owners in Iveti and Muputi lost communal grazing land near Machakos town. There were also a few other disputed areas in the north towards Ol Donyo Sabuk. These particular losses were deeply resented by the Kamba and never forgotten (Forbes Munro, 1975:77-79).

On the north-eastern side of the Machakos reserve was the Yatta Plateau and North Yatta. These were regarded as unoccupied Crown land, to be used only as the Government saw fit. The Kamba maintained a constant pressure to continue to use the Yattas as wet-season grazing lands, particularly in years of drought when grazing land within the reserve was exhausted.

6. POPULATION MOVEMENTS TO 1960

6.1 Types of Population Movement

Population movements are commonly analysed through typologies of rural-urban and rural-rural movements. This is not very helpful in the case of Machakos for it does not make the distinction between temporary and long-term movements. We prefer therefore to use the distinction between migration proper, involving a change in the location of home, and which generally involves a whole family, and circulation, or temporary movements for particular purposes, such as herding, wage labour, trade, study, with an intention to return home (therefore circular). Circulation frequently involves an adult male not accompanied by his family. This typology is based on Clyde Mitchell and developed by Chapman and Prothero (Chapman and Prothero, 1985).

The Kamba have always coped with the erratic rains by supplementing agriculture with other means of livelihood. Temporary migrations for work or trade are recorded in the nineteenth century.

The most frequent purpose of movement has changed, but circulation and migration as responses to a variable climate have continued from pre- to post- colonial times. They are alternatives; at any given time, according to circumstances and their own social needs, individuals and families may choose circulatory movement to earn additional income or to accumulate capital, migration to new land, or intensification of activities on land already farmed. Labour that has been drawn out of the District for circulation is not available for intensification.

While migration and circulation are distinct activities, there is some overlap. A man may migrate to an urban occupation with the intention of returning. That return may be indefinitely postponed, although it frequently takes place eventually at retirement. If it is postponed indefinitely, the visits to the original home, the despatch home of remittances and the receipt from home of farm produce, etc, may become more and more intermittent, till it can be said that the migrant has established a new home base to which his children will feel their primary loyalty. For most Kamba, however, urban life is not an ideal. Even in 1978, nearly 80% said they accepted temporary migration as a response to drought, but they would not move to a town and 90% would not contemplate taking their family (Consortium, Report 6, 1978:79). Lang noted that the conversation of workers in Machakos town constantly reverted to their village and the land (Lang, 1974). Nevertheless, by 1979 there were some permanent Kamba settlers in Nairobi and other towns.

6.2 Phases in Migration and Circulation in Machakos

Migration and circulation in Machakos can be conveniently understood in four phases. The first was 1898-1925, a period of recovery from the population losses of 1898, when high-grade land was still available for settlement. This is just before the period of our study and we need only say that there is evidence of people moving from the older settled areas where soils were becoming exhausted to newer areas in the north of the District, such as Kangundo. They opened these up initially by shifting cultivation, but, according to one of our informants, were beginning to cultivate the land annually by the beginning of the 1920s. The combined result of population growth and the introduction of new technologies such as the iron hoe and the plough was that by 1937 practically all the *wetu* (unclaimed land) had been claimed, except for tsetse infested areas and Crown land (Owako, 1969, quoting KNA: Barnes, 1937; Forbes Munro, 1975). This led to the rising densities in AEZ 2 and 3 and the older parts of AEZ 4 we have already noted.

The land losses of the 1908-10 period were increasingly resented. During the session of the Kenya Land Commission at Machakos in 1933, the Kamba marshalled 187 complainants to testify to the losses of farms and cattle, particularly the former. The Commission agreed there had been minor losses, but it was obviously unwilling to displace any white farmers. As compensation, it was agreed to add to the reserve Yatta Plateau, Makueni and some smaller areas around Emali and north of Kikumbuliu (Kenya Land Commission, 1934). This had the advantage of joining the Kamba settlements in Kikumbuliu to the main reserve area.

However, it did not immediately increase the area available for new farms. The Yattas remained strictly controlled for grazing, and the other areas were tsetse-infested. The recovery of the land on the northern border became the primary motivation behind the formation of the Ukamba Members Association which was linked to the Kikuyu Central Association, and which successfully fought the destocking campaign in 1938 (Newman, 1974). Newman quoted one of his informants as saying:

After our cattle were returned the only thing we wanted back was our land which had been taken by the government and for our cattle not to be taken again. Our lands round Mua, Lukwena, and that area up to [Ol Donyo Sabuk] had been taken.... When the cattle were returned people still wanted a strong committee to go claiming for the land (Newman, 1974:35).

The second phase in population movement was from about 1925 to 1960. As there was no more free land, either in the Reserve's high-potential areas or in tsetse-free AEZ 4 areas, circulation for work became the main relief to population pressure. This peaked in the 1950s.

The year 1960 marks another turning point. Colonial controls were breaking down and from c.1960 to c.1980 many people moved to new homes on vacant low-potential land. The 1960s also saw the rapid expansion of coffee in the high potential areas of coffee growing. Local urban areas began growing with the increasing demand for workers and services. Nevertheless, out-migration to large towns continued, particularly Nairobi and particularly in the aftermath of independence. A new feature was a great increase in female migration to towns.

The fourth period began at some point in the 1970s. The areas of new settlement were filling up, and despite increasing Kamba investments in education, urban jobs were becoming more difficult to find. There has been a slow-down not only in migration for agricultural settlement, but also, probably, in circulation beyond the District boundaries for work. This is difficult to document, as full details of the 1989 census are not yet available.

6.3 Migratory Movements c. 1925-60

6.3.1 Squatting, 1925-60

One response of those without adequate land was to take up the option of 'squatting' on European farms. In return for his labour, the squatter was given land and grazing rights for a limited number of cattle. The Kamba were driven to this necessity later than the Kikuyu, who had lost more land. However, some 2,700 families had taken up the squatting option by 1927 and in 1932 it was reported there were 10,000 squatters on European lands within Machakos District. This number stayed constant, with approximately the same numbers on the 1948 census. Young adults were forced to leave if not required as workers. The evicted young adults constituted part of the 'numerous landless class' noted in 1938 (Forbes Munro, 1975:238, quoting a district report). The attraction of squatting was the acquisition of grazing rights for cattle (Owako, 1969), but the risk was difficulty in re-establishing rights to family land in

the Reserve. One prominent settler, Major Joyce, had 1,350 Akamba on his farm, with 660 cattle, for whom 600 acres of terraced arable land and 5,000 acres of grazing were provided (Pereira and Beckley, 1952).

Additionally some Kamba were in what was then Thika District, where 560 were said to have signed squatter contracts in 1929 (Forbes Munro, 1975:194-7). The Kenya Land Commission referred to 2,000 Machakos Kamba and 6,000 Kitui Kamba as residing in Thika and 'other areas outside their home districts' (Kenya Land Commission, 1934).

6.3.2 Circulation for work, 1920-58

Circulation for work seems to have been at its highest in the 1940s and 1950s, in terms of the percentage of adult males absent from the District.

Until the 1920s most Kamba could pay taxes, meet other cash needs and buy food as occasionally necessary from their maize sales, supplemented by other foodstuffs, beeswax, hides and skins, and very occasionally, livestock (Peberdy, 1958, based on District reports). Stichter estimated only 7-8% of the able-bodied adult males were in employment before and just after the 1914-18 war, but that this had risen to 15% by 1923, (compared to 55% from Kikuyu districts). In 1929 and 1930 there were about 8,000 in work, perhaps 18-19% of the able-bodied labour force (Stichter 1982). This increase may be associated with poor rainfall and locust invasions, 1928-31. Numbers dropped below 5,000 in 1932 and rose again to a monthly average of 9,500 in 1937 (Forbes Munro, 1975:209).

Unless grazing land was available, the Akamba male preferred not to take up agricultural work. Many became drivers, went into the army, where they often learnt further skills, the police force, or the railways. The administration had taken the unusual step of establishing an industrial school at Machakos in 1914 (Forbes Munro, 1975:88). The Post Office's telegraph apprentices were all Kamba (Stichter, 1982:119-120).

During the 1930s there was a general change in the balance of advantage between going out to earn, and male participation in farming in the reserve (Stichter, 1982, chapter 4; Kitching, 1980). The drought of 1928-9, the falling demand for workers in the slump of 1929-33, the accompanying fall in the price of livestock and the improvement in roads and marketing led to an expansion of the area under cultivation (Gupta, 1973:68).

Associated with an apparent expansion in arable production, was an increase in self-employment within the reserve, and of working for Kamba employers. Some of the earnings from work were reinvested in trade and business; Newman quotes a former worker turned entrepreneur who by 1938 reported

I had many helpers: some to push carts, others to assist in the shops, and when I bought a vehicle I hired a driver and with him a turnboy.... I had a large farm and two ploughs and harrows (Newman, 1974:13).

During the 1940s, the balance of advantage swung sharply back to wage labour. Real wages rose. Life within the Reserve was hard. The 1940s and 1950s saw a clustering of bad rainfall years, (Working Paper: Environmental Profile, Section A: Rainfall). Rainfall was consistently below the levels of the 1930s and 1920s (Morgan, 1967:30). Food purchases were necessary to sustain the families left at home; even so, there was frequently need for famine relief. In 1944 there were about 15,000 Machakos Kamba in formal sector employment, another 11,000 in the armed services, and 1,800 had been conscripted as labourers (KNA:MKS/DC/1/8/1, 1945). The 27,800 males known to be in the services and formal employment must have been over 35% of the number of able-bodied men, and this must have depressed agricultural production, particularly as in this period communal work on soil conservation was also required.

The 1948 Census shows about 20% of adult males absent from the District (Table 2) but for many the postwar return to the district was only temporary. By the 1950s demand for labour was high as the Kenyan economy expanded and as Kikuyu labour was withdrawn during the Mau Mau period. In 1953 it was thought 60% of the adult males were outside the District. In the mid 1950s there were still 43,000 working outside, about 40% (Peberdy, 1958:102). Numbers probably fell after 1956, as Kikuyu and others returned to the labour market (Gupta, 1973:70).

6.3.3 Origins and destinations

The Census of 1948 gives us information about the locations with low ratios of adult males to females. Table 7 shows that men were missing from both highland and lowland locations; there was an excess of men only in the locations that offered employment, or which were used for herding, or which were being opened up for settlement. For example, in Machakos town in 1948 there were 994 adult African men, but only 233 adult African females - a situation that was repeated in the smaller trading centres along the railway line. Other men were herding in Yatta Plateau, where there were 278 adult males and only 46 adult females. In Makueni there were 1,228 adult males and 266 females. Most of these were young men rounded up from the older locations for compulsory clearing work on the new settlement area. Other men were working on the farms in the White Highlands, in the locations later known as Mukaa, Ndalani, and Settled Area. Table 7 shows these all had abnormally high ratios of males to females. Kangundo, where there was probably the greatest amount of cash cropping and probably the greatest number of local off-farm jobs, had one of the highest male/female ratios for areas not receiving migrants.

Other men and women were working in the parts of Thika District later included in Machakos as Ndalani location and part of Matungulu. Thika had some 21,000 Kamba, mainly squatters and their families, since there seems from the figures to have been only about 1000 single men. (By contrast, the Kikuyu and Luo workers in the area were unaccompanied migrant workers).

The 1948 Census shows 38,000 Machakos Kamba outside the District as then defined. Apart from the 21,000 in adjacent areas of Thika District, there were 17,000 in other parts of Kenya. 7,800 were in Nairobi District, and of these, 6,700 were men, likely

Table 7: Adult males per 100 adult females

| | 1948 | | | 1962 | | | 1969 | | | AE zone |
|-----------------|--------------|---------------|------------|---------------|---------------|------------|---------------|---------------|------------|------------------|
| | Adult males | Adult females | Sex ratio | Adult males | Adult females | Sex ratio | Adult males | Adult females | Sex ratio | |
| Iveti | 8644 | 13045 | 66 | 5402 | 7772 | 70 | 66530 | 9006 | 73 | |
| Kangundo | 4327 | 6486 | 67 | 6921 | 9086 | 76 | 7960 | 9838 | 81 | |
| Kilungu | 6045 | 10313 | 59 | 6416 | 9855 | 65 | 7459 | 11171 | 67 | |
| Mitaboni | | | | 5500 | 8422 | 65 | 6520 | 9607 | 68 | |
| Mbooni | 5632 | 8481 | 66 | 7217 | 10487 | 69 | 8570 | 11565 | 74 | |
| Subtotal | 24648 | 38325 | 64 | 31456 | 45622 | 69 | 37039 | 51187 | 72 | 2 & 3 |
| Kalama | 2314 | 3893 | 59 | 2910 | 5059 | 58 | 3888 | 5642 | 69 | |
| Kisau | 3699 | 6295 | 59 | 2706 | 4334 | 62 | 3078 | 4470 | 69 | |
| Kiteta | 4246 | 7019 | 60 | 1557 | 2515 | 62 | 2112 | 2880 | 73 | |
| Masii | 2431 | 4295 | 57 | 2694 | 4429 | 61 | 3607 | 4826 | 75 | |
| Matungulu | 3934 | 6113 | 64 | 7671 | 9961 | 77 | 7865 | 10069 | 78 | |
| Mbiuni | | | | 2865 | 4316 | 66 | 3287 | 4273 | 77 | |
| Mbitini | 2619 | 4154 | 63 | 3626 | 5229 | 69 | 4192 | 5867 | 71 | |
| Mukaa | 4931 | 6568 | 75 | 5842 | 8346 | 70 | 9273 | 11181 | 83 | |
| Muputu | 1052 | 1817 | 58 | 2578 | 4050 | 64 | 3278 | 4470 | 73 | |
| Muthetheni | | | | 2696 | 4832 | 56 | 3323 | 4877 | 68 | |
| Mwala | 5087 | 7358 | 69 | 3443 | 4712 | 73 | 3619 | 4544 | 80 | |
| Nzawi | | | | | | | | | | |
| (incl. Emali) | 3671 | 5166 | 71 | 5588 | 7201 | 78 | 7166 | 8586 | 83 | |
| Okia | 889 | 1322 | 67 | 3431 | 4672 | 73 | 3618 | 4575 | 79 | |
| Subtotal | 34873 | 54000 | 65 | 47607 | 69656 | 68 | 58306 | 76260 | 76 | 4 |
| Kibauni | 2665 | 3756 | 71 | 2525 | 4131 | 61 | 3363 | 4485 | 75 | |
| Kikumbuliu | 2237 | 3045 | 73 | 3298 | 4724 | 70 | 5695 | 5873 | 97 | |
| Kinyatta/ | | | | | | | | | | |
| Yatta Plateau | 278 | 46 | 604 | 2390 | 3148 | 76 | 6199 | 7478 | 83 | |
| Makueni | 1228 | 266 | 462 | 4155 | 5191 | 80 | 12417 | 13594 | 91 | |
| Masinga/ | | | | | | | | | | |
| North Yatta | 1093 | 1177 | 93 | 2200 | 3298 | 67 | 5242 | 5939 | 88 | |
| Ndalani/Ithanga | na | na | na | 2953 | 2339 | 126 | 6199 | 5888 | 105 | |
| Ngwata/Kibewi | 1884 | 911 | 207 | 959 | 521 | 184 | 4266 | 3604 | 118 | |
| Settled Areas/ | | | | | | | | | | |
| White highlands | 3489 | 1626 | 215 | 2730 | 1809 | 151 | 2223 | 1346 | 165 | |
| Wamunyu | | | | 4760 | 5251 | 91 | 2937 | 3570 | 82 | |
| Subtotal | 12874 | 10827 | 119 | 25970 | 30411 | 85 | 48541 | 51777 | 94 | 5 & 6 |
| Athi River Town | | | | 2795 | 945 | 296 | 2209 | 994 | 222 | |
| Kangundo town | | | | | | | 515 | 330 | 156 | |
| Kibwezi | | | | | | | | | | |
| Township | 50 | 10 | 500 | 103 | 69 | 149 | 304 | 181 | 168 | |
| Machakos | | | | | | | | | | |
| Township | 994 | 233 | 427 | 1958 | 950 | 206 | 2544 | 1507 | 169 | |
| Mtito Andei | 92 | 25 | 368 | | | | 486 | 183 | 266 | |
| Subtotal | 1136 | 268 | 424 | 4856 | 1964 | 247 | 6058 | 3195 | 190 | Urban |
| TOTAL | 73531 | 103420 | 71 | 109889 | 147654 | 74 | 150019 | 182419 | 82 | |

to have been in formal or informal employment. (The Kamba in Mombasa were said to be from Kitui). There were 2,200 Kamba settled in Kwale, with equal numbers of men and women, who were therefore probably agricultural settlers. Some Kamba had already settled there in the early twentieth century (Lindblom, 1920). The only other District with very substantial numbers of Machakos Kamba was Kajiado, with 1,000, almost all men, who are likely to have been herders, as this is a pastoral area. The census therefore confirms that circulation was much more important than migration to new farms in 1948.

6.3.4 Guided settlement at Makueni

The period 1948 till about 1958 saw Machakos closely administered and experiencing a great drive to enforce soil conservation. There was a great increase in government administrative and agricultural staff at the District and Divisional level. Out of the total of £3,920,897 expended as grants by ALDEV⁴ and its successors 1946-62, Machakos received 36%. It also received 6% of the small loan expenditure of £686,313.

The dominant official belief in 1945 was that increasing population density was one of the main causes of the land degradation from which Machakos was suffering. Work therefore began to open up the Makueni area for controlled settlement in 1945. The control was to impose a new scientific farming system, so that the degradation experienced in the old areas should not spread to the new (Lynam, 1978:53). This experiment eventually absorbed £324,000, some 23% of the total Machakos grant expenditure. The plan was for the bush to be cleared and terraced by a combination of tractors and forced communal labour, (voluntary paid labour after 1948).⁵ The cleared plots were then to be given to approved who would follow the 'Makueni rules' on farming, so as to prevent degradation due to traditional techniques. In addition to free land preparation, the settlers were also given temporary housing, rations, and help in house building. The District Officer had recommended attractive terms for settlers, because of Kamba suspicion that the colonial authorities wanted to take over their land after it had been rehabilitated and to force sales of livestock at low prices,⁶ (RH: Brown, 1945, de Wilde, 1967).

Despite these precautions, the proposal was opposed by the Local Native Council, (KNA: Annual Report, Machakos District, 1946). The Council wanted the right of

⁴ ALDEV went through several changes of name. Its original function was reflected in the original name, African Settlement Board, 1945-46. After two changes of title, it became the African Land Development Board (ALDEV), 1953-57. There were two further changes of name before its final merging into the Ministry of Agriculture after 1963. See Kenya. ALDEV, 1962.

⁵ It is called voluntary in official reports. People interviewed in Makueni in 1990 recollected that the 'servants' clearing their farms were people arrested in the older locations. Those interviewed in Kangundo said every young man aged 14+ was forced to go to Makueni and were not paid till the end of a two-year contract (Village level interviews, 1990).

⁶ The successful Kamba demonstration against destocking in 1938 was still much in the mind of administrations.

free settlement in the traditional manner. However, the programme went ahead. Although roads were laid out and dams and boreholes constructed to provide water supplies, the recruitment of settlers proved difficult. By the end of 1948 only 85 families had been settled. After 1949 applicants came forward in greater numbers. A Kamba, Mr Onesmus Musyoki, was appointed as one of the Agricultural Officers and he went to other Divisions to convince people about the settlement, also using the churches (interview, 1990). By 1960 the settlement was said to be "completely full, having 2,187 registered settlers" (Kenya. ALDEV, 1961). This represents 12 to 16,000 people. At this point the Government lost control of the settlement process but immigrants continue to flow in. In 1960 the Makueni Location Council questioned the continuance of the rules (KNA: DC/MKS/3/265), and enforcement lapsed (de Wilde, 1967, Vol.2:110). By the 1962 census, there were 20,000 people in the area.

6.4 Migration for Farming, 1960-80

6.4.1 The victory of unofficial settlement over official controls

By 1960 the colonial regime could no longer prevent the Kamba from taking up new land in the lands to which they thought themselves entitled. The surge into the former Crown Lands and White Highlands can be seen clearly in the figures for the AEZ 5 and 6 locations in Table 6, some of which experienced growth rates of 10 - 30% per annum between the censuses of 1962 and 1969. In the Yatta Plateau growth began in the late 1950s. Efforts to control settlement in the new areas on the Makueni model failed almost completely. Like their forefathers, the settlers began with shifting cultivation, earning their cash initially from sales of charcoal as they cleared the bush.⁷ The invasion of the new areas proceeded so rapidly that they soon found informal means of demarcating farm boundaries, with the early settlers often selling land to newcomers, or inviting relatives to join them. This unofficial settlement was at first opposed by both the colonial government and the newly independent government, which wanted an orderly sale of large white farms to African ownership, with regulated plot sizes, cropping patterns, and communal facilities for marketing, etc. This policy, known as the million-acre scheme, played a relatively small part in Machakos District. It was applied in the parts of Thika District that were added to Machakos. It resulted in conflicts between would-be settlers and the authorities, recorded in case studies by Mbithi and Barnes, 1975. Military methods were used to drive out squatters and to burn their houses in the period 1963-5, but by late 1966 settlement was being allowed. Settlers were also expelled from the Chyulu

⁷ Shifting cultivation is the description given by contemporary academic observers, e.g. Mbithi and Barnes, 1975; and Consortium, 1978. However, one of our informants from Yatta, Mr. Charles Maithya, said that the policy of his family and that of other immigrants was to clear a plot for cultivation, and then allow it to go to grass while new plots were cleared, since the initial cultivation gave locally recognised rights of ownership. The plots cleared, by deliberate intent, were not necessarily contiguous, as the aim was to deter other settlers and to enable as large an area as possible to be claimed. What observers saw was clearance in stages, rather than shifting cultivation.

Hills in 1962 and immigrants to Ngwata suffered intermittent harassment at intervals up to about 1969.

In some cases, particularly with the ranches in the former 'settled areas' but also with a sisal and coffee estate in the Ndalani/Ithanga area, the authorities tried to secure the transfer of ownership to a co-operative whose members would be investors receiving dividends from an enterprise still managed as a single unit. From the beginning many of those who purchased co-operative shares wanted to divide the ranch into individual farms; in one such case some 800 co-operative members settled by 1972, despite military raids, (Mbithi and Barnes, 1975:141, for Ndalani). From 1964 some ranches were organised as co-operatives in which members had 4 acre residential plots and contributed labour to the joint activities. In many cases each individual co-operative investor had been backed by a number of unofficial partners, who were also pressurising for a share of the benefits (Livingstone, 1976). Pressure for sub-division is still continuing in 1990.

The only partially successful official settlement was on the Mua Hills. Here about 200 families were settled, with 5.6 ha on the higher slopes and 5.6 to 10 ha on the lower slopes, and with recommended cropping patterns. This settlement is not specifically mentioned in those District Agricultural Reports of the 1970s that we have been able to see.

Colonial policy was to divide the Yatta Plateau into enormous paddocks, to be grazed in rotation, in return for annual grazing fees, to permit some relief to the stressed grazing within the locations. A few permanent settlements were allowed - for example, 244 families were allowed in the Matuu area (later part of Masinga), between 1952-7. Attempts were made to find sites for dams and boreholes with the intention of opening up new areas for grazing. The Yatta furrow, a canal taking off from the Thika river, completed in 1959 at a cost of £300,000, was intended to enhance controlled settlement combined with controlled rotational grazing, by providing perennial water. The controls were unsuccessful on two counts. Firstly, they were ignored. There were a large number of unlicensed stock. Secondly, grazing alone was unable to keep bush regeneration in check. Bush infested by tsetse and wild animals encroached steadily, occupying 40,000 ha in North Yatta in 1965 (de Wilde, 1967). However, the new water supply facilitated the uncontrolled settlement that followed. The settlers cleared the bush for agricultural farms before allowing some of the cleared land to revert to grazing. This led eventually to the taming of the bush.

The attempts to extend controlled grazing from Yatta Plateau to North Yatta (Masinga) led to "the bitterest of opposition from local people, supported by Kamba politicians" (Kenya. ALDEV, 1961). In the early 1960s many independent settlers arrived (de Wilde, 1967; Neunhauser et al, 1983).

Makueni's population increased from 20,000 in 1962 to 55,000 in 1969 - a growth rate of 15% per annum despite the cessation of the special programme (Table 6). In Ngwata during these years, from a low initial base of 14,000 and a density of 5/km² in 1962 the population surged to 57,000 in 1969, with a phenomenal growth rate of

33% p.a. During the 1970s Yatta Plateau and Makueni stopped growing, but Masinga, Ndalani and Ngwata continued to receive immigrants at least until the 1979 census. In the 1969-79 period the Settled Area location seems to have received immigrants (Table 6).

Since 1979 there has been little land on which people can settle without payment. Village informants in Ngwata in 1989 told us that newcomers would have to buy land, since all land was now owned and demarcated.

6.4.2 Features of spontaneous settlement

The men of the family played their traditional role of responsibility for clearing new land. The number of men to every hundred women is notably higher in the locations experiencing high growth rates due to immigration: for example, in 1969 the sex ratio was 103 in Ndalani, and 102 in Kikumbuliu, compared with 87 in Mbooni. Indeed, in Kikumbuliu in 1969 there were 5% more adult men than the normal Kenyan ratio would lead one to expect (Table 7).

A study carried out in 1973-4 surveyed a sample of farmers in three locations from which people were departing (Kangundo, Masii and Mwala) and in two locations receiving migrants (Yatta and Makueni), (Matingu, 1974). Matingu found that the reasons for going were basically connected with land shortage. The immigrants to Yatta and Makueni had smaller than average holdings in their home area, or were landless (land had been taken by relatives, lost on return from squatting, sold by father, lost on divorce in the case of women). Similarly, amongst those interviewed who had stayed in their home area, the main reason given for not wishing to move was that the respondent felt he/she had enough productive land, or, that even if the plot was small, it was capable of yielding a good cash income from coffee, fruit, etc.

The reasons for selecting a particular area for settlement were mainly that news had been received of large harvests and large holdings (Matingu, 1974:156). The great majority of migrants went with the intention of farming as well as herding (Matingu, 1974:112). Clearing the land for farms seems to have controlled the tsetse problem, and to have allowed people eventually to build up livestock. The importance of farming as the main motive for moving was confirmed by village leaders we interviewed in Muthingini, Ngwata. They had been unable to have cattle and goats when they first arrived because of tsetse, (village level interview, 1990). By the 1980s, tsetse was no longer mentioned as a livestock problem in official reports on Machakos.

In order to secure the new land settlers had risked and endured great hardships - particularly lack of food in the first seasons, lack of water before tanks or dams could be built, illness, especially malaria, dangerous wild animals such as rhinos and elephants. Many had lost animals in the trek or because of tsetse in the new area. Some migrants returned to their home areas because of these setbacks. However it was generally recognised that those who survived the early difficulties were doing better than they would have done if they had stayed in their home areas. For example, the Makueni migrants who had farmed before their move reported an

average increase in the number of bags of maize they could produce from 5.5 to 24.5 bags (Matingu, 1974:114).

Settlers were obviously selective in their choice of destinations. The Akamba make judgements on fertility and water retention qualities of soils by reference to their vegetation (Mutiso, 1988). It is not clear if the lack of immigration into the ranching country was for reasons connected with its land tenure status or because the UM6 agro-ecological zone into which it falls is much less attractive than the LM4 and LM5 zones which were the destination of most migrants.

7. URBAN GROWTH WITHIN AND WITHOUT MACHAKOS DISTRICT, 1960-89

7.1 The Changing Nature of Kamba Emigration after 1960

From the 1960s there is less data on the numbers of Machakos Kamba employed outside the District and we become more dependent on census data for our analysis of circulation. This data suggests a slowing down of out-migration from the District. In 1962 86.4% of those born in Machakos District were also registered there; 13.6% were registered elsewhere. In 1979 90.2% of those born in Machakos were registered there; only 9.8% were registered elsewhere. The percentage of out-migrants fell between 1962 and 1969. This was reflected in an apparent increase in the District population growth rate, which approached and even, by 1979, surpassed the Kenyan average (see Table 2 Section 2).

Oucho has analysed the main destinations of the 110,000 people born in Machakos who were enumerated in another District in the 1979 census. More than half, 58,668, had gone to Nairobi. Another 10%, 11,528, had gone to Mombasa (Oucho, 1988). This showed the Kamba were maintaining their preference for non-agricultural work, except if they could farm on their own account.⁸

From the 1950s women as well as men migrated for work or study, or to join husbands, or for other reasons. In the 1962 census the predominant age groups amongst Kamba females in Nairobi municipality was 0-4 and 20-24, where they outnumbered men; in all other age groups there was a distinct male preponderance (Ominde, 1968:Fig.7.21). By 1969 females formed about one third of the Nairobi Kamba population.

The change in the nature of the Nairobi Kamba, and their growth in numbers, are shown in Table 8. In 1948 they are all said to be Machakos Kamba; there may also have been a small

⁸ Their rural destinations were areas of settlement: Kwale (12,260) and Embu, (5,696). Those who went to Kiambo (5,317) may have been aiming either for settlement or for work. Thus suggests only about 15% of the out migrants had moved to areas of agricultural settlement.

number of Kitui Kamba. The 1962 and later censuses do not distinguish between the two branches of the Kamba.

Table 8: Kamba population of Nairobi District, 1948-79

| | <i>Total</i> | <i>Female</i> | <i>Female %</i> |
|------|--------------|---------------|-----------------|
| 1948 | 7,829 | 1,142 | 15 |
| 1962 | 23,864 | 6,999 | 29 |
| 1969 | 60,716 | 19,469 | 32 |
| 1979 | 103,185 | 36,246 | 35 |

Source: Censuses of 1948, 1962, 1969 and 1979.

The growth rate of the Kamba population in Nairobi was 8% p.a. between 1948-62, (13.8% for women only), surged in the immediate post independence years to 14%, (15.7% for women), and dropped back to 5% p.a., (6.4% for women), in the 1969-79 period. Part of this growth was due to a natural increase in the resident Kamba population. By 1979 about 22% of the Kamba population of Nairobi had been born there.

7.2 Urban and Industrial Growth in Machakos

7.2.1 Industrial growth

The colonial diagnosis that the District could not support its current agricultural population led to some attempts to encourage industry. An Indian firm set up a wattle-chopping plant alongside a cotton ginnery in Nziu, in 1938, where cotton was being tried, but cotton failed at that time. Kenya Orchards had a canning factory in the Mua Hills and there was another canner in Thika. Government assistance to the meat factory operated by Liebigs in Athi River was associated with the prewar destocking campaign. The Kamba received very poor prices for their beasts, leading to their effective demonstration against compulsory destocking in Nairobi in 1938, (Forbes Munro, 1975).

After the 1939-45 war the District Commissioner pressurised the County Council to invest in a sisal factory in the 1950s; this was useful in buying sisal from farmers particularly in dry years when they might otherwise be dependent on government famine relief. However, when sisal prices collapsed, the finances of the Council were left in a very parlous state (KNA: various Machakos District Annual Reports, 1950s).

Athi River, the second largest town in the District, has an industrial base. However, it is isolated from all other areas of the District, on which it has little impact. It has developed as a suburb of Nairobi, which is only 35km distant.

7.2.2 Commercial and service centres

Urban growth in Machakos is associated with commerce, services and small-scale workshops rather than industry. Machakos town has remained the primary commercial and administrative centre of the District but has little industry. Table 6 shows it grew rapidly between 1969 and 1979. In 1970 industry was represented only by one small sawmill. It then also had 2 banks, several garages, a maize store and hides and skins warehouse. Other sources of employment were the hospital, two secondary schools and technical schools (Lang, 1974). During the 1970s a Rural Industrial Development Centre was created at Machakos, with only moderate impact. By 1978-9 it had created 177 jobs in 29 projects, not all of which would have been new jobs (Livingstone, 1986:111-12). However, many of its clients were outside Machakos; a survey of 22 of its clients in 1973 showed them to be located in ten different market centres (Child, 1973).

Table 6 shows that Machakos town and Kangundo town grew rapidly between 1969 and 1979. The Kangundo growth is associated with a new road from Nairobi to a ranch near the District boundary in the 1950s. This also helped the development of nearby Tala, both servicing coffee and fruit and vegetable growing areas. The coffee areas attracted shopkeepers, labourers and servants from other parts of Machakos District. Kangundo became a recognised township by 1969 and Tala by 1979. There seems to have been a fall in the influx and even a reverse movement in 1979 and 1980, with the fall in the coffee price, (van Ginneken et al, 1986), but urban growth resumed in the 1980s.

Kibwezi, Emali and Mtito Andei, all on the Mombasa highway (and the railway) are said to have experienced phenomenal growth in the 1980s, providing services to travellers and tourists. An urban census in 1987 showed Mtito Andei to have grown from 2,067 in 1979 to 3,840 persons in 1987 (Kenya. Ministry of Planning, 1988). Table 6 shows it only had 202 persons in 1948; the development of railway depots was extremely slow when there was no population in their hinterland but by the 1970s and 1980s they were able to buy and sell from the settlers flooding into Ngwata. The limited road infrastructure of the district has undoubtedly inhibited town growth; the recent explosive growth of Mutuu in northern Machakos is associated with the tarring of the Nairobi-Kitui road (Kenya Ministry of Planning, 1988). Matuu services another vegetable growing area, irrigated from the Yatta canal. It was scheduled to become a municipal area in 1992.

During MIDP Phase 1, 1978-82, plans were made to build six small outlying rural industrial estates. These were not well conceived, creating few new jobs at very high cost, (ODI, 1982). Two were abandoned as electricity was not available.

Urban population was still only 6% of the total District population in 1979. However, there has also been a development of commercial activities and small-scale workshops in scattered villages.

7.3 Urban Growth in Kenya, 1948-79

In 1948 the urban population of Kenya was only 276,000. Over 80% of the urban dwellers were in Nairobi and Mombasa. Urban growth averaged 6.6% to 1962, and had accelerated to 7.9% in between the 1969 and 1979 censuses. By 1979 there were 90 urban centres with an urban population of 2,240,000.⁹ This represented about 16% of the total population. Machakos District lies between the two largest urban agglomerations, Nairobi (1979 population 834,500) and Mombasa (1979 population 341,500). The growth of these towns has had a substantial effect on the District, by providing an ever-growing market for meat, fruits and vegetables, other foodstuffs, building materials and charcoal. The increased market demand for agricultural products seems, in the Machakos case, to be one of the factors leading to a deceleration of migration out of the district.

8. EFFECTS OF POPULATION MOVEMENT

8.1 Effects on Terracing

Up to the early 1960s the government had more or less succeeded in controlling movement on to new lands. Consequently, land shortage continued to be felt in AEZ 2, 3 and 4 locations and the government's campaign for terracing and intensive farming appeared to have acceptance. In reality it was unpopular; many people wished to pursue the alternative option of extensive farming in new lands, and after 1963 they were largely free to do so. In the 1960s many observers noted a slackening in the progress of terracing, and indeed, some neglect of older terraces. This was usually ascribed to the political changes and less government pressure. However, it may well have been rather due to the slackening of population pressure in the older locations, where growth rates had dropped to 1 - 2% per annum, combined with lack of labour for terrace maintenance when many younger men and women migrated to new farming areas or to Nairobi. The older leaders in the sublocations where we interviewed say that the usefulness of *fanya juu* type terraces built in the 1950s were always recognised and they were maintained as well as possible, though they had criticisms of terraces built by tractor, with the soil thrown downhill.

By the 1970s and 1980s the slow but steady increases in population in these areas was causing subdivision of farms and increased need for intensification. People were investing in new terraces and repairs, often with hired labour (interviews, 1990), or accepting willingly soil conservation programmes organised by NGOs or the government under the Machakos Integrated Development Programme. In-migrants in new areas such as Ngwata, having completed initial investments in demarcation and in livestock, had begun to terrace at least the arable parts of their farm, using the knowledge acquired from their previous locations (interviews, 1990).

⁹ Urban defined as centres with a population of over 2,000. The urban population is somewhat exaggerated by the inclusion of rural areas in some towns.

8.2 Effects on Land Prices

Population pressure also had the effect of driving up land prices. Village leaders agreed that land had been bought and sold in the 1960s, and in many places, also in 1945. They also agreed that in earlier times prices were considerably lower, but had difficulty in giving a price, partly because of the influence of inflation, and partly because payment was often made in livestock. The 1990 price of land, shown in Table 9, reflects both population pressure and the quality of land in different areas. We tried to find if there was a different price for terraced and unterraced arable land; the usual reply was that there was no longer any unterraced arable. It will be noticed that AEZ 2 and 3 land is four times as valuable as AEZ 4 land, 8 to 20 times more valuable than AEZ 5 land.

| <i>AEZ</i> | <i>Location</i> | <i>Ksh per acre (0.4 ha), 1990</i> |
|------------|------------------------|------------------------------------|
| 2 & 3 | Kangundo - with coffee | 80,000 |
| | - without coffee | 40,000 |
| | Mbooni | 40-50,000 |
| 4 | Masii | 10,000 |
| 5 | Ngwata | 2,000-5,000 |

Source: Village interviews, 1990.

8.3 Effects on Attitudes to Family Planning

Our village interviews suggest that farm sizes have recently begun shrinking rapidly, due to subdivision, as it is impossible to find unoccupied farm land. The densities shown in Table 6 have increased in all AEZs since 1979.

Everywhere we interviewed, people talked of the burden of school fees, and the difficulty of finding jobs even for children for whose education much had been sacrificed. This was leading some community leaders to favour teaching of family planning. However, as they said, it was too late for those who have already had their families; it has to start in Primary 6. Unfortunately, due to the existing shape of the population pyramid, this means that even if those currently adolescent adopt family planning, population growth in Kenya will only slowly be checked. Preliminary figures for 1989 show a fall back in population growth to 3% per annum.

9. INFRASTRUCTURE, RURAL MIGRATION AND URBAN DEVELOPMENT

A good transport and marketing infrastructure not only facilitates rural-rural migration, but also provides the necessary incentives for growth in agricultural productivity, and nodal points for the development of new urban centres. The growth in the agricultural output of the district can be correlated with its improved connections to Nairobi and Mombasa, just as the very slow development of its own urban population can be linked to the poor development of its internal roads. Normally, government investment is required to provide roads and railway lines, which, if they run through potentially productive agricultural areas, will then promote complementary private investment in transport vehicles, storage depots, shops, etc.

Investment in water development also facilitates settlement of new areas. Deep boreholes, large dams, canals, or pipelines generally require government investment, while smaller water facilities can be developed by private persons or small groups. Water provision began before the war but there was an intensified drive to drill boreholes and make dams in the 1940s and 1950s. Water provision was an important part of Phases I and II of the Machakos Integrated Development Programme (MIDP) from 1978 to 1987. The time required for investigation, planning and construction of new storage sites in the upper catchments, and conveyance by pipeline to lower areas meant progress was relatively slow on the larger projects. However, a large number of small projects were implemented and private and group investment in such things as roof catchment tanks was encouraged.

Settlement in new areas may be facilitated by other types of government investment such as bush clearance, agricultural extension, terracing, and housing, as was done in Makueni, but the experience of Machakos show that these will be provided by private investment in areas that have access to water and transport.

10. SUMMARY AND CONCLUSIONS

Population increased at a rate of about 2.5% per annum till 1948, accelerating afterwards and peaking at over 3.7% in the period 1969-79. There are now signs of a small decline in these high growth rates which have caused a more than five-fold increase in population 1930-60.

The population was at first compressed within the reserve boundaries. Population increase without the market incentives to develop and apply more intensive technologies contributed to land degradation. In the absence of market incentives the natural desire was to provide for the enlarged population by continuing with existing extensive techniques on vacant land. Since this was politically disallowed till about 1960, people resorted instead to temporary outmigration for work.

From about 1960 population pressure was relieved by permanent migration to underdeveloped land within the District. The bulk of this was unaided and unsubsidised. Government investments in transport and water facilities gave a much higher return in terms of new land developed than its intensive investments in localised settlement schemes. As a consequence

of population growth and movement, 35% of the population were living in the dry AEZ 5 and 6 in 1979, as compared with only 9% in these areas in 1932.

Most Akamba did not wish to settle permanently in towns. Within the District, the urban population still formed only 6% of the total in 1979. There has been some permanent outmigration to towns as Nairobi and Machakos, but in 1979 only 6% of the total Akamba population of Kenya was temporarily or permanently resident in Nairobi District. In 1979 90% of those born in Machakos District were resident in Machakos District. The major influence of the growth of large towns such as Nairobi and Mombasa has been to increase the profitability of farming.

Rapid population growth has resulted in a population structure in which 50% of the population is aged under 16. Dependency rates are higher than this suggests, because a very large proportion of 16-20 year olds are still at school. The typical farm is short of labour with about 1.5 adults whose principal occupation is farm work. The proportion of farm workers in the total available labour force is not known, but surveys suggest that about 1 adult per family may have a non-farm occupation.

In consequence of population pressure since 1960 investments have been made in farm improvements. There is now no free land for occupation, and land has acquired a high price, though this varies with its ecological zone. As farm sizes fall, the urgency of enabling children to qualify for a non-farm job increases, and high educational costs are forcing people to think of family limitation. In the complete absence of free land for development the only options available are still greater intensification on an already small farm in a difficult farming environment, or the development of new occupations in the processing and servicing sectors of the economy.

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ANNEX

Maps showing population density by location, 1932-79

Figure 4

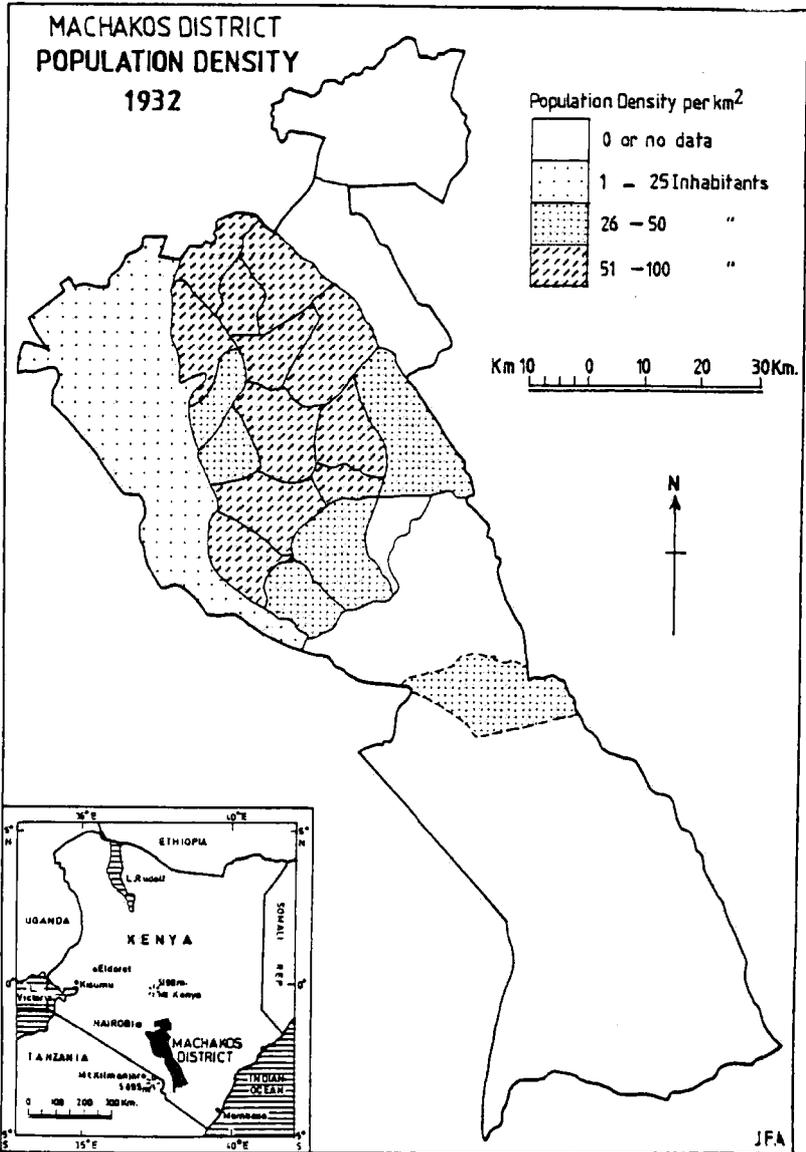


Figure 5

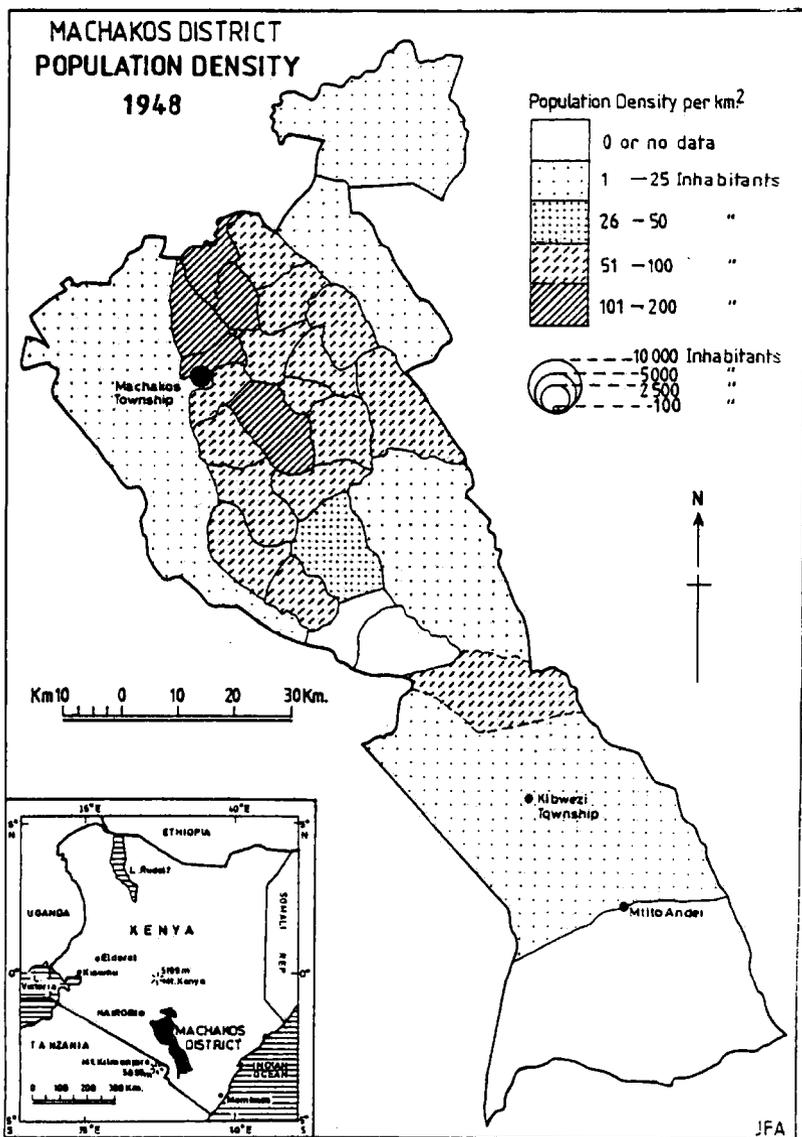


Figure 6

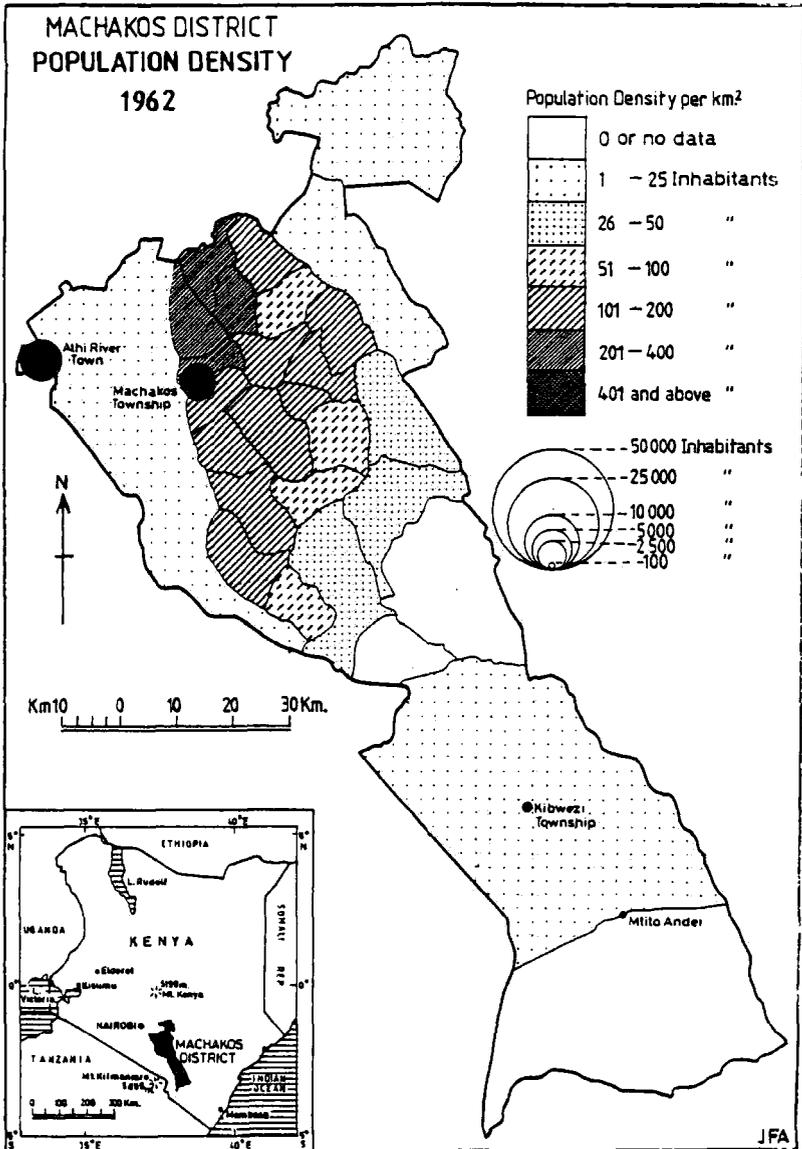


Figure 7

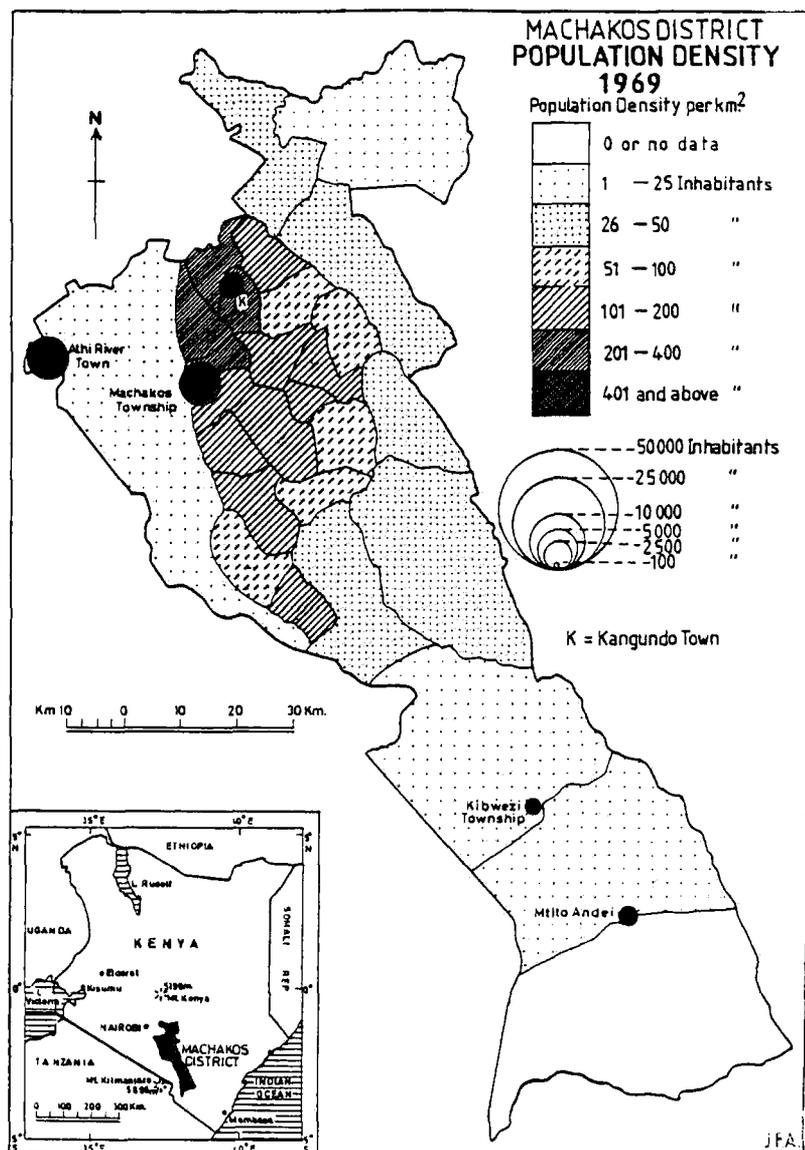
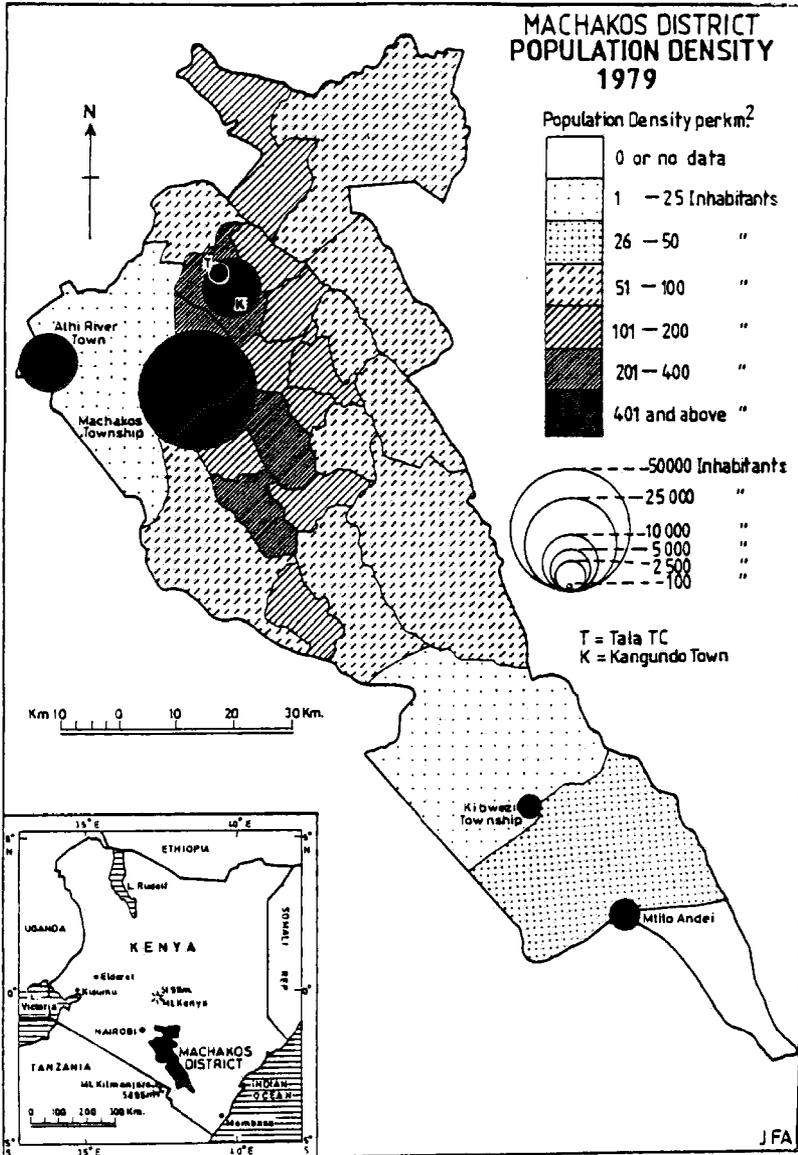


Figure 8



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