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Population Change Among the Maasai

Isaac Sindiga

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Acronyms

DC:	District Commissioner
KCPS:	Kenya Contraceptive Prevalence Survey, 1984
KDHS:	Kenya Demographic and Health Survey, 1989
KFS:	Kenya Fertility Survey, 1977/78
KNA:	Kenya National Archives, Nairobi
MCH-FP:	Maternal-Child health and family planning not available
N/A	Not Available
NCPD:	National Council for Population and Development, Ministry of Home Affairs, Government of Kenya
M.A.R.	Maasai Annual Report
NGO:	Non-governmental organization
PEM:	Protein-energy malnutrition
PID:	Pelvic inflammatory disease
SIM:	Spontaneous intra-uterine mortality
STD:	Sexually transmitted disease
TB:	Tuberculosis
TFR:	Total Fertility rate

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Preface

Tropical Africa's annual population growth rates have varied between 2.5 and 3.0 percent over the past three decades. Amidst these high rates are areas with much slower growth and depressed fertility (Adadevoh, 1974; World Bank, 1984; Doenges and Newman, 1989). Available data show that a broad belt across tropical Africa extending from West Africa (Senegal, Ivory Coast, Nigeria, Upper Volata, Cameroon and Niger; to Central Africa (Central African Republic, Gabon, Zaire, Chad, and Congo Republic); to Eastern Africa (Sudan, Kenya, Uganda and Tanzania) suffers from impaired fertility (Adadevoh, 1974). The recorded total fertility rate varies from 2 or 5 children for such areas compared to 6 to 9 children in the high fertility regions (Doenges and Newman, 1989). However, the problem of subfertility and involuntary infertility is suspected to be far more widespread (Adadevoh, 1974: 3). Data are not available to allow a generalized statement.

Despite the existence of these significant subfertility and infertility problems, inordinate attention by both scholars and the mass media has gone into the phenomenon of high fertility and population growth rates. Yet, it is clear that, once the impediments have been removed from the peoples and areas experiencing lower completed fertility, there will be population booms and busts. These will increase rather than reduce fertility. The ultimate consequence will likely negate the purpose and effects of various population planning programmes currently going on in various countries.

Kenya is an example of a country with a relatively high population growth rate averaging some 3.8 percent per year in 1990. National level data show that the total fertility rate is consistently above 6.5. The TFR has varied over time from 6.8 in 1962 to 7.6 in 1969 and to 7.9 (Kenya, 1983a). The recent Kenya demographic and health survey conducted between December 1988 and May 1989 shows a TFR of 6.7, reflecting some decline in TFR (Kenya, 1989a).

Kenya's rapid population growth rate is a consequence of an increasing fertility rate as well as declining mortality. However, the national fertility and population growth picture tends to conceal large geographic areas of the country with relatively low growth and completed fertility. Nomadic pastoral peoples of Kenya, of whom the Maasai are an example, appear to record an annual population

growth rate of only about 2.2 percent (Kenya, 1984). Their completed fertility similarly is lower with an average of about 5 live births.

This study is population change among the Maasai of Kenya attempts to probe the factors which may be responsible for the impaired fertility among the pastoralists. This analysis is done within the framework of proximate determinants of fertility as proposed by Davis and Blake (1956) and refined by Bongaarts and Potter (1983) and applied to tropical Africa by Doenges and Newman (1989)

As explained above, most of the studies heretofore have concentrated on the areas of high and even increasing fertility. Little has been done on the zones with lower-than normal fertility. Should the significance of the factors associated with the low fertility wane, population is likely to increase rather than decrease. Policy makers should therefore be sensitized to this probable future scenario. This is particularly so because the consequences of such population growth are likely to be substantial, albeit negative, in ecologically fragile and economically uncertain environments.

This study has taken more time than initially anticipated because of a number of events. I departed from Kenyatta University, where the project was initiated to take up my present post of associate professor of geography at Moi University towards the end of 1988. This decision translated into time loss as the family and myself had to settle down in a new, if somewhat colder environment. Then there were the heavy teaching duties at my new workplace - I stated teaching within barely two days of my reporting on duty at Moi University! My departure from Nairobi also meant removal from the major documentary and research centres in Kenya. Above all, the time taken to complete this study says something about conducting sensitive socio-cultural investigation into a group which has remained relatively isolated from the progress achieved elsewhere in Kenya (Sindiga, 1984).

My thanks are due to my research assistant who endured difficult environmental and cultural circumstances in Narok. Joel Meitamei Ole Naisuako of the Central Bureau of Statistics, Narok, assisted in data collection in Megwara; Philip Sompe worked in Poroko, Kilgoris; whereas Mrs. Grace Saiyuah left her household chores to interview women in Sikawa, Uasin Gishu West location. Grace and her husband Paul, a Supplies Officer at South Nyanza Sugar Company graciously welcomed my research party to their home and frequently served soda. They

encouraged us to endure the treacherously muddy and virtually impossible "roads" of Kilgoris. To Shem Onsare, for much kindness. I would be remiss not to acknowledge the companionship and assistance of Charles Gichana in executing numerous tasks.

This study would of course, have remained only a dream were it not for the financial assistance of the Organization for Social Science Research in Eastern Africa. My thanks are due to the organization and the understanding of its Executive Secretary.

This is only a small contribution to population change among the Maasai. I hope it shall stimulate further inquiry.

1. INTRODUCTION

Objectives of the Study

ACKNOWLEDGMENTS

The preparation of this report has been aided by many people. I would like to thank Michael Kivuva for partly assisting in preparing the figures.

To Mrs. Josephine Onyinkwa and Mildred Okech for their efforts in deciphering my hand writing and typing this work.

Finally, this study would not have succeeded were it not for the cooperation of Maasai women and other interviewees.

Rationale to the Statement of the Problem

"Infertility poses a major problem to gynecologists working in East Africa, and in our own practice nearly two-thirds of clinical time is spent seeing cases of infertility" (Mati, Anderson, Carty and Mc Glashan, 1973: 94).

1. INTRODUCTION

1.1. Objectives of the Study

This study sought to investigate four intertwined problems:

1. population change among the pastoral Maasai of Kenya and to establish the effects of that change on society and landscape;

2. the validity of the claim that women in pastoral societies, as represented by the Maasai, have generally lower fertility than neighbouring peoples especially cultivators (Adadevoh, 1974; Newman and Lura, 1983; Sindiga, 1987);

3. factors which determine fertility among the Maasai, in particular the relationship between women's roles and fertility; and

4. the widely-held assumption that there are high levels of sterility, infant mortality among the Maasai and to establish their causes.

Among the specific objectives of this study were the following:

1. examining the effects of population and fertility changes on the Maasai and their landscape;

2. investigating the way Maasai pastoral lifestyle and social structure regulated fertility both past and present; and

3. finding out women's roles in Maasai society and their effect on fertility.

1.2. Rationale to the Statement of the Problem

Kenya's annual population growth rate of about 3.8 per cent in 1990 is one of the highest in the world. The total population of about 24 million is expected to exceed 38 million in the year 2000 assuming constant fertility and mortality; it will be 37.5 million with constant fertility and mortality; and 34.8 million assuming declining fertility and mortality (Kenya, 1983b: 7). This high growth rate is a consequence of an increasing fertility rate as well as declining mortality rate. The country's total fertility rate (children per woman) increased from 6.8 in 1962 to 7.6 in 1969 and to 7.9 in 1979; it stood at 7.7 in 1984 (Kenya,

1983a: 143; Kenya, 1989b: 207). The Kenya Demographic and Health Survey of 1989 reveals a TFR of 6.7, reflecting a decline (Kenya, 1989a).

Parallel to the increase in national fertility is the decrease in mortality. The latter declined from a crude death rate of 20 per thousand of the population in 1962 to 17 in 1969 and to 14 in 1979. Infant mortality declined as well from 119 per thousand live births in 1969 to 104 in 1979 (Kenya, 1984b: 207; Kenya, 1979:3).

These national level data on population growth and completed fertility, however, conceal large geographic areas of low growth and completed fertility. It is well known, for example, that Kenya's Coast province which is inhabited primarily by the Mijikenda peoples suffers from comparatively lower levels of completed fertility (Kenya, 1978). This is not a result of contraception; it is pathological infertility and sub-fertility. In addition, the country's nomadic pastoral peoples who inhabit over 80 per cent of Kenya's territory in the northern and southern parts of the country also suffer from non-contraceptive infertility. They appear to record an annual population growth rate of only about 2.2 per cent (Kenya, 1984). Their completed fertility similarly is lower with an average of about 5 live births. What is more is that, as elsewhere in tropical Africa, the country's areas of low fertility tend to co-exist with those of very high fertility.

Kenya's zone of impaired fertility is not isolated. It is part of a large belt in tropical Africa extending from West Africa through Central Africa to East Africa covering diverse ethnic groups (Table 1; Adadevoh, 1974; Belsey, 1976; David and Voas, 1981). Involuntary sub-fertility and infertility have caused negative population growth in parts of Gabon, Zaire, Upper Volta, Central African Republic, Cameroon, Guinea Bissau and Sudan (Eraj, 1985:2; Belsey, 1976). Eraj (1985) claims that in the northern parts of Zaire, about half of the women aged 50 are childless. This is true also for parts of Gabon, Sudan, Cameroon and Zaire where rates of childlessness for the same category of women ranged between 20 per cent and 40 per cent during the 1960s (Belsey 1976: 322). This computation was however based on incomplete data.

Birth rates in north-eastern Zaire and Gabon are half what they could be were it not for infertility (Eraj, 1985). Generally, areas suffering from sub-fertility and infertility have a total fertility rate of less than 5 children compared to between 6 and 9 for high fertility areas (Eraj, 1985:2; Doenges and Newman, 1989). The problem of sub-fertility and infertility could be a geographically wider matter but data are lacking to back authoritative generalizations (Adedevoh,

1974). It is suspected that sub-fertility extends to Somalia and Ethiopia and Southern African countries such as Botswana.

The postulated causes of impaired fertility appear to be as diverse as the areas represented. However, it is generally held that the dominant cause of infertility in tropical Africa is chronic gonorrhoea (Frank, 1983; David and Voas, 1981). This is probably the case for parts of Uganda, Zaire, Cameroon, Congo and other countries. Syphilis was found to be responsible for high levels of intra-uterine mortality and hence inability to get a live birth among the Bobo of Upper Volta (Retel-Laurentin, 1974). Pelvic tuberculosis is responsible for infertility in Chad, Gabon, Cameroon and Central African Republic (Adadevoh, 1974). Schistosomiasis is implicated as a cause of women infertility in the Central African Republic whereas trypanosomiasis is endemic in Central Africa and the areas around Lake Victoria, areas which experience comparatively lower fertility. In East Africa areas of infertility tend to be those in which malaria is endemic, for example the Coastal region.

Table 1.1 identifies certain ethnic groups which are reported to suffer from high rates of subfertility and infertility; however, childlessness is not necessarily ethnic group-specific. Rather, it perhaps reflects the social, environmental and health conditions experienced by a particular ethnic group (Belsey, 1976:323). Nonetheless, a group's cultural attributes, for example, marriage, sexuality outside marriage, kinds of marriage, bride wealth, control over the means of production and so on can lead to variations in "demographic regimes" observed from one ethnic group to another (Kreager, 1982). Moreover, fertility is not merely a biological function; it is heavily influenced by cultural behaviour (Bongaarts and Potter, 1983).

Table 1.1 also shows that nomadic pastoralists suffer infertility in each country in which they are present (see also, Newman, 1986). The focus of this study is the Maasai, a pastoral group living in Narok district in Southern Kenya. It will inquire into the factors which may be responsible for the general low fertility and how these factors operate to depress fertility.

Table 1.1: Distribution of sub-fertility and infertility in tropical Africa

Country	Ethnic groups involved
Senegal	Peul (Fulani); Maures. Nomads - group(s) not specified
Ivory Coast	Wobe; Godie
Nigeria	Biroms; nomads - group(s) specified; Yoruba; Mboum; Kanuri
Upper Volta	Peul; Bobo-Oule; Senofo
Niger	Kanuri; Toureg Bouzai; Farfarou; Bororo
Cameroon	Foulbe; Gounde; Dourou; Dzimbou; Bakweri
Central African Republic	Nzakara; Zande
Gabon	Ba-kota
Chad	North Arabs
Zaire	Mongo, Azande; Mangbetu; Bas; Haute Uele
Sudan	Azande; Baggara nomads
Congo Republic	Sangha; Ba-kota; Mbodii, Makaa; Djem
Kenya	Eastern - groups not specified.
Uganda	Baganda; Teso
Tanzania	Haya; Pangani; Swahili

Source: Adadevoh, 1974: 5-6.

1.3 Organization

To tackle the above task, the remaining part of this report is organized in the following way. Section 2 deals with determinants of fertility within the framework of proximate determinants. In section 3, the fertility and population situation in Kenya in general are assessed. Then in the next section is background data on the physical and human environments of the study area. Section 5 discusses fertility and population change in Narok with specific reference to the Maasai people. Section 6 summarizes the methodology and study design employed in field data collection. In section 7, the findings from the field study are presented. The discussion, conclusions and recommendations emerging from the entire study and the emergent socio-economic changes and fertility futures are discussed in sections 8 and 9. The next section comprises of sources consulted while researching and preparing this work. Finally, the questionnaire used in the field survey appears as Appendix 1.

2. A FRAMEWORK FOR ANALYZING FERTILITY DIFFERENTIALS

Fertility varies over space and time. The variation is a result of the interaction between the biological capacity to reproduce and the cultural behaviour of population groups. It is now well established that human reproduction goes beyond biology and is heavily influenced by the cultural mechanisms that a society utilizes with regard to marriage patterns, age at marriage, control over women and so on (Bongaarts and Porter, 1983; Page and Lesthaeghe, 1981; Bongaarts, 1980). But how do the biological and behavioural factors operate to influence fertility outcomes? Which elements in each factor mediate to determine fertility? Can these factors be analyzed within a common framework in order to improve understanding of spatial and temporal differentials in fertility?

2.1 Proximate Determinants

Davis and Blake (1956) proposed a framework by which biological and behavioural factors are linked to affect fertility. This framework is what is termed "proximate determinants" or "intermediate fertility variables" (Table 2.1). By definition, "proximate determinants of fertility are the biological and behavioural factors through which social, economic and environmental variables affect fertility" (Bongaarts and Potter, 1983:1). In reality, a proximate determinant is "anything that directly affects a given behaviour, which in this case is fertility" (Doenges and Newman, 1989:101). Should a proximate determinant, for example, age at marriage especially for women, change and assuming that other proximate determinants remain constant, fertility also changes (Bongaarts and Potter, 1983:1; Bongaarts, Frank and Lesthaeghe, 1990).

Table 2.1: Proximate determinants of fertility or "intermediate fertility variables"

I. Factors affecting exposure to intercourse ("intercourse variables")
A. Those governing the formation and dissolution of unions in the reproductive period
1. Age of entry into sexual unions
2. Permanent celibacy: proportion of women never entering sexual unions
3. Amount of reproductive time spent after or between unions
a. When unions are broken by divorce, separation, or desertion
b. When unions are broken by death of husband
B. Those governing the exposure to intercourse within union
4. Voluntary abstinence
5. Involuntary abstinence (from impotence, illness, unavoidable but temporary separations)
6. Coital frequency (excluding periods of abstinence)
II. Factors affecting exposure to conception ("conception variables")
7. Fecundity or infecundity, as affected by involuntary causes
8. Use or nonuse of contraception
a. By mechanical and chemical means
b. By other means
9. Fecundity or infecundity, as affected by voluntary causes (sterilization, sub-incision, medical treatment, etc.)
III. Factors affecting gestation and successful parturition ("gestation variables")
10. Foetal mortality from involuntary causes
11. Foetal mortality from voluntary causes

Source: Davis and Blake, 1956

Table 2.1 provides the eleven proximate determinants as developed by Davis and Blake (1956). From a review of the literature, Bongaarts and Potter (1983) attempt to simplify the initial framework and identify seven proximate determinants. These are briefly discussed below.

2.2 Societal marital fertility control

2.2.1 Marriage

Most children are born within marital unions. This means that the proportion of women of reproductive age who are married or live in a sexual union will influence fertility. In addition, age at first marriage for women is significant because it determines the period of potential reproduction available and ultimately the number of births. In ideal circumstances, if marriage is close to the onset of ovulation (menarche), there would be more years available for potential reproduction for a couple. And assuming a woman is exposed (to sex with a fertile man), she would get more live births. This relationship, however, is not linear.

There are instances among certain cultural groups where marriage may precede menarche. It is possible that such a woman exposed to sex may contract venereal disease at an early age leading to infertility (Adadevoh, 1974: 9). It has now been demonstrated by empirical studies from many countries that young people face the greatest risk of contracting sexually transmitted diseases (*Population Reports*, 1985). STDs cause pelvic inflammatory disease (PID), permanent damage to the fallopian tubes, ectopic pregnancy of infertility (*Population Reports*, 1985). Other problems experienced by young mothers include birth complications resulting from an immature pelvis, i.e. the infant's head is too big to pass through the pelvis, a condition called cephalopelvic disproportion (Adedevoh, 1974) which is widespread in tropical Africa (Gebbie, et. al., 1971: 266; Doenges and Newman, 1989); higher chances of perinatal mortality; giving birth to premature and/or low weight babies with the attendant risks of high infant morbidity and mortality (*Population Reports*, 1985). Yet, young mothers especially those in the teenage group may suffer high blood pressure, a condition called preeclampsia or toxemia, which may in turn cause heart failure or stroke (*Population Reports*, 1985). Adolescent mothers may also suffer from anaemia resulting in premature birth and maternal and foetal death (*Population Reports*, 1985). Anaemia may come about because of under- and mal-nourishment. Both cephalo-pelvic disproportion and anaemia appear to be the leading complications of pregnancy in Africa in that order (Gebbie, et.al., 1971: 66).

Other factors which have a bearing on marriage relate to traditional practices with regard to pregnancy and delivery. Yet, patterns of marriage, for example, monogamy and polygyny may influence exposure and frequency of sex within marriage. Other related factors are marriage stability and the incidence of divorce (Adadevoh, 1974; Bongaarts and Potter, 1983).

2.2.2. Contraception

Contraception may be achieved via sexual abstention or through sterilization.

2.2.3. Induced abortion

This is used by certain societies and it involves deliberate interruption of normal gestation. Both contraception and induced abortion may be used for marital fertility control.

2.2.4 Natural marital fertility control

Natural marital fertility is fertility without the use of either contraceptives or induced abortion. The body biological function itself can control fertility through postpartum infecundability.

2.2.5 Postpartum infecundability

A nursing woman's body offers contraceptive protection for a few months following parturition. This is attained through the "postpartum anovulation and amenorrhoea caused by elevated prolactin levels which inhibit the release of pituitary and ovarian hormones" (Gray, 1981: 102)

Lactational amenorrhoea is achieved because of prolonged breastfeeding. A sexually exposed woman who does not breastfeed can conceive within a period of 3 months after giving birth. This period can last as long as 1.5 years or more for one who is breastfeeding (Bongaarts and Potter, 1983; Gray, 1981)

However, postpartum amenorrhoea does not provide complete cover from conception. As Gray (1981) notes, ovulation can occur before the first postpartum menstrual flow is realized. Moreover, a healthy and well nourished woman may get a conception despite breastfeeding. Lactational amenorrhoea provides higher chances of immunity when breastfeeding is intense and an infant is not provided with food supplements (Bongaarts and Potter, 1983). The immunity is greatly diminished when breastfeeding is irregular. Breastfeeding then, is not an insurance against conception. Perhaps this is one of the reasons why certain cultures devised postpartum sex taboo.

2.2.6 Sterility

Sterility may be caused by any of several factors e.g. genetic disorders affecting one spouse and sexually transmitted diseases. Generally, some 3 per cent of the couples in any population are sterile at the beginning of their reproductive years (Bongaarts and Poter, 1983).

2.2.7 Spontaneous intrauterine mortality (SIM)

This usually involves spontaneous abortions and stillbirths. SIM really is a measure of successful conceptions which do not end up in live births. SIM is termed spontaneous abortion when the foetus dies before the 28th week of

gestation; it is a stillbirth when death occurs after the foetus is viable, usually after the 28th week (Bongaarts and Potter, 1983).

SIM may be caused by undernutrition, environmental stress, and a host of other complications. Among the latter are such diseases as syphilis, malaria and sleeping sickness.

2.2.8 Frequency of intercourse

This involves all factors interrupting intercourse, save for deliberate abstinence (Doenges and Newman, 1989). Frequency of intercourse has a significant effect on fecundity (Lesthaeghe, et al., 1981:5; Menken, 1979). According to an intriguing study by Barrett and Marshall (1969: 459), fecundity rises from 0.14 where coitus takes place once per week to 0.68 when there is daily intercourse. Also, it is now generally agreed that frequency of coitus declines with age (Bulatao, 1984:61).

2.3 Proximate determinants: A summary

There are numerous variables which affect fertility. Fitting these variables into the framework of the seven proximate determinants makes it possible to give "order to the seemingly endless and bewildering array of fertility variables. Each socioeconomic, biological, cultural, and environmental factor that influences fertility must operate through at least one of the seven proximate determinants" (Doenges and Newman, 1989: 101).

In tropical Africa, there is no evidence for customs which permit voluntary contraception and even induced abortion (Caldwell and Caldwell, 1981; Page and Lesthaeghe, 1981; Doenges and Newman, 1989). Nearly all traditional African peoples favour large family norms. Children are desired by couples as they help to stabilize a marriage and enhance the status of the family into which they are born (see, for example, Mbiti, 1969; Kenyatta, 1984).

It is possible, at least for tropical Africa, to reduce the list of proximate determinants of fertility to five i.e. marriage, postpartum infecundability, sterility, spontaneous intrauterine mortality, and frequency of intercourse. However, detailed statistical data are lacking to allow a quantitative assessment on how each proximate determinant affects the fertility rate of any given population. It is possible, though, to isolate factors prosecuted for low fertility and attempt a qualitative study of the influence of the factors on the proximate

determinants (Doenges and Newman, 1989). This approach is attempted in the present study.

Below, I discuss a number of factors which inhibit fertility and how these may affect the proximate determinants. These factors are marriage, nutrition, disease, postpartum taboo, and breastfeeding.

2.3.1 Marriage

"For African peoples, marriage is the focus of existence ..... Everybody, therefore, must get married and bear children: that is the greatest hope and expectation of the individual for himself and of the community for the individual" (Mbiti, 1969: 133, 134).

The above quotation shows clearly that each person in tropical Africa is expected to marry. Marriage is a central institution in African life and as such marital fertility is significant. This is the case in Kenya (Table 2.2). Thus, the proportion of women who are married may not be important; celibacy is not institutionalized and it is insignificant.

A myriad socioeconomic and cultural factors operate to influence patterns of marriage and ultimately fertility. As shown above, age at marriage especially for women is important. Before marriage is consummated, various ceremonies and rites of passage must be performed (Kenyatta, 1984; Mbiti, 1969). Among the Maasai for example, an uncircumcised girl, that is, one who has not undergone clitoridectomy cannot get married. Such circumcision is usually conducted when the girls are between 14 and 17 years old. Women are free to get married after circumcision is concluded.

A related factor is that women who do not go to school tend to marry at an earlier age. Inevitably, those who attain higher education must delay their reproductive intentions (Tables 2.3). Table 2.3 also shows that rural women in Kenya on average marry earlier than their urban counterparts.

Table 2.2: Kenyan women who have never married, by age group, 1962 - 1989 (Figures are percentages)

Age	1962[a]	1969[b]	1977[c]	1977/78[d]	1979[e]	1984[f]	1989[g]
15-19	55	64	71	72	71	74	80
20-24	13	18	22	21	25	24	32
25-29	5	6	6	4	9	6	11
30-34	3	4	3	1	5	4	5
35-39	2	3	2	1	3	2	3
40-44	2	3	1	1	3	1	2
45-49	2	3	1	0	2	1	2

The data sources for this table are:

a. The 1962 national census;
b. The 1969 census;
c. National Demographic Survey, 1977;
d. Kenya Fertility Survey, 1977/78;
e. The 1979 census;
f. Kenya Contraceptive Prevalence Survey;
g. Kenya Demographic and Health Survey;

Sources: Kenya, 1984b: 40; Kenya, 1989a: 10.

Table 2.3: Average age at marriage for women in Kenya

Category	Age (years)
No education	16.5
Post-primary education	23.5
Women in rural areas	17.8
Women in urban areas	19.2

Source: Kenya, 1984a: 6

Yet, the form of marriage consummated has been implicated in fertility differentials. Claims have been made that women in monogamous unions have a higher total fertility rate than those in polygynous families. This conclusion is however tenuous in light of evidence, which points to the opposite direction (Henin, 1969; Aborampah, 1987). Higher completed fertility has been shown among women in polygynous unions in Mali whereas the contrary is true among the Ibo and Ibibio of Nigeria (Adadevoh, 1974).

Many scholars (David and Voas, 1981; Henin, 1969; Ohadike, 1974) agree that family marriage instability does have a bearing on fertility. Studies conducted in certain French-speaking countries in Central and West Africa have shown that marital instability is associated with a lower level of completed fertility (Ohadike, 1974: 30). This is attributed to a reduced period of risk to pregnancy (Ohadike, 1974: 30).

Henin's (1969) study on the fertility of the nomadic Baggara of Western Sudan and the settled Kawahla of the Gezira irrigation settlement also found a higher incidence of infertility among women with broken marriages than those in stable ones. Marriage instability was also implicated as one of the factors causing infertility among the settled Fulani of northern Cameroon (David and Vœas, 1981). The latter found that economic problems led both men and women to travel widely during the dry season. Further, divorce is relatively easy to obtain. It merely needs a man to repudiate his wife in the presence of two other people. Thus separation and divorce do have an impact on the exposure to the risk of pregnancy, this translates to reduced chances of conception. This conclusion is itself controversial as the relationship between marriage instability and infertility or reduced fertility is not linear. There are many cases in which infertility is the cause of marriage instability leading to divorce (Adadevoh, 1974).

2.3.2 Nutrition

Nutrition is another factor which may influence fertility. Frisch (1978) has argued that undernutrition and malnutrition in females may delay the onset of ovulation and bring forward the timing for menopause. Another effect is that of enhancing the chances of miscarriages and stillbirths, and the period of Lactational amenorrhoea. Conversely, better nourished women would experience early onset of menarche and delay in menopause. This has the effect of prolonging the potential reproductive period available. Theoretically, such women would have an enhanced fertility (assuming all other variables are held constant).

There is some disagreement on the exact impact of malnutrition on fertility (Bongaarts and Potter, 1983). What seems to be agreed upon is that sharp famine may reduce fertility (Bongaarts, 1980; Bongaarts and Potter, 1983). However, poor nutrition may cause anaemia which, as shown above, can cause premature births, and maternal and foetal mortality.

It is possible that malnutrition per se has little impact on fertility. But there may be other factors operating. In pastoral communities, severe dry seasons may lead to periodic food shortages necessitating the movement of people in search of water and pastures for their herds and flocks, and to purchase grain. This will lead to the separation of couples thereby reducing the frequency of coitus. Also, the harsh environmental circumstances may lead to the decline of the sexual drive of the people involved. Thus, food shortages may influence fertility by acting through other factors.

2.3.3 Disease

Of all the factors individually implicated in causing subfertility and infertility in tropical Africa, disease is the most important. There is a wide list of diseases which may contribute in varying measure to infertility (Table 2.4). Whereas positive correlations have been established between some of the diseases and infertility (Table 2.5), there are many which are held suspect (Table 2.4). Extensive and urgent research is required especially for areas in which these diseases are endemic and fertility remains impaired.

Table 2.4: Infections associated with infertility

1. Pelvic inflammatory disease
gonorrhoea
genitourinary tuberculosis
treponemal infection
Schistosomiasis
T. vaginalis
T. mycoplasma
non-specific urethritis
2. Syphilis
3.Malaria
4.Rickettsiae
5.Brucellosis
6.Histoplasmosis
7.Toxoplasmosis

Source: Adadevoh, 1974: 17

Table 2.5: Some disease associated with infertility

Infection	Effect	Remarks
1. Gonorrhoea	infertility	Chronic gonorrhoea causes tubal occlusion in females and thickening of the vas deferens which obstructs sperm passage in males.
2. Syphilis	intra-uterine mortality/pregnancy wastage	Chronic syphilis causes spontaneous abortions; the infection is passed from expectant mother to foetus.
3. Genitourinary or pelvic tuberculosis	infertility	When TB attacks the genitals it causes complications similar to those of gonorrhoea in both men and women.
4. Schistosomiasis	infertility	Generates the production of chemicals in the cervix and vagina which repulse sperms thereby hindering conception. There is little evidence that it causes infertility in all areas.
5. Malaria	abortion	Not clear how it acts but malaria causes anaemia, thus affecting food supply to the foetus. Also certain malaria parasites infect the placenta.
6. Sleeping sickness	infertility; abortion	Infertility occurs in areas where sleeping sickness is endemic but this association is tentative.
7. Sickle-cell anaemia	infertility	Especially important in marital unions where both spouses carry the sickle-cell gene.

Source: Adadevoh, 1974; Henin, 1969; Doenges and Newman, 1989; Mati, Anderson, Carty and McGlashan, 1973; Belsey, 1976; Frank,1983

Perhaps the single most important gynaecological disorder which causes infertility in tropical Africa is pelvic inflammatory disease (PID) (Mati et al., 1973; Doenges and Newman, 1989). Doenges and Newman (1989: 103-104) report that PID affects genitals, the uterus and the fallopian tubing. In its chronic form, PID may cause great pain which is suspected to lessen the frequency of coitus and cause tubal occlusion which may in turn lead to infertility and ectopic pregnancies (Doenges and Newman, 1989).

In section 1, we specified some of the areas in which various diseases associated with infertility are located in tropical Africa. It would appear that gonorrhoea is the leading sexually transmitted disease (STD) which is responsible for infertility in many countries. Mati and his colleagues (1973), in a study of 104 women at Kenyatta National Hospital, Kenya's premier referral institution, found gonorrhoea to be the main cause of pelvic inflammatory disease. STDs are particularly important in communities where people are highly sexually mobile (see also section 5).

As seen above, pastoral communities also suffer from marital instability occasioned by the separation of spouses during the long dry season. This may add to gonorrhoea to depress fertility.

2.3.4 Postpartum Taboo and Breast-Feeding

Postpartum infecundability is attained by virtue of breastfeeding by a nursing mother. However, lactational amenorrhoea can provide complete immunity from conception only when breastfeeding is regular, intense, and no food supplements are given.

Recognizing this problem most cultures have a taboo against postpartum sexual intercourse. Different communities explain the purpose of the taboo in different ways. For some, sexual intercourse with a nursing mother will lead to the poisoning of mother's milk with the consequence of infecting the infant; others look at it as indecent and immoral (Caldwell and Caldwell, 1981). What seems to be agreed on is that the taboo helps in delaying subsequent conception thereby improving the health of the mother and child, and maximizing child survival.

African societies regulate fertility by child spacing within marriage. In traditional African societies, fertility control appears to have been part of a larger cultural arrangement where child spacing through prolonged breast-feeding and postpartum sexual abstinence worked together with mechanisms of social regulation (Lesthaeghe, 1980). The Rendille of northern Kenya weaned their children during the period of the long wet season when milk and other foods were abundant (Spencer, 1973). This improved the probability of a child's survival against protein-energy malnutrition and related infections. Elsewhere in Kenya the child spacing period ranged from 2.5 to 3.5 years for the Kikuyu, 3 years for the Akamba, 2 years for the Luo and Luhya (Ndeti and Ndeti, no date) and 2 years for the Gusii (Le Vine and Le Vine, 1966:112).

The postpartum taboo was practised everywhere in tropical Africa (Schoenmaeckers, et al., 1981). The period of observance tended to vary very widely from a few days in some communities to months and a year or more. Schoenmaechers and his associates (1981: 43-65) provide a long list of the time variation of the observance of the postpartum taboo for various communities in tropical Africa for which data were available.

Whiting (1964) cited in Schoenmaechers et al. (1981) hypothesized that areas of the world suffering from protein-energy malnutrition tend to have a long postpartum taboo. While accepting Whiting's nutrition hypothesis, Saucier (1972) suggested that the postpartum taboo is related not only to malnutrition but also the women's work roles and the social organization of society (Schoenmaechers, et al., 1981). Saucier believes that long postpartum taboo is merely one element within a given social organization.

In order to uphold the postpartum taboo, men practised polygyny. But couples in monogamous unions could circumvent the taboo without publicly appearing to violate the child-spacing norm by using coitus interruptus. This practice was widespread in East Africa (Lesthaeghe, 1980: 528).

Some societies in Africa, however, partly regulated fertility through late marriages rather than early marriage and child-spacing within marriage. This was particularly so for pastoral groups that insisted on young men going through a period of residence as warriors. In such communities, male elders controlled social and

economic institutions in society. They also controlled livestock and procreating women, the means of production (see section 5 for the case of the Maasai).

The postpartum taboo then was part of the cultural patterning of society as suggested by Saucier. In many areas of tropical Africa, the taboo has become severely eroded especially since the onset of European colonial rule. This is also a result of education and general social and economic progress. The spread of the universal religions of Islam and Christianity has also been instrumental in the decline of the postpartum taboo (Schoenmaechers, et al., 1981).

From the review of the factors which cause subfertility and infertility, it is clear that there is probably no single factor responsible for the problem in any given area. Rather, several factors may be acting together in a synergistic manner ultimately leading to depressed fertility (Sindiga, 1987). This is however not to say that all the factors discussed above must exist at a place. The reality may be one in which there is a primary determinant and one other or more factors acting in a secondary role.

It is therefore necessary to take various areas (and communities) individually and investigate in detail both the health-environmental circumstances and the cultural patterning which influence infertility. The task would then be to identify the major and minor factors responsible for infertility at a particular place within a certain time framework. This will make it possible to devise useful ameliorative measures to cope with the problem.

3. FERTILITY AND POPULATION CHANGE IN KENYA

In section 1 it was shown that Kenya's fertility rate is one of the highest in the world. In fact, fertility increased over the various census years since 1948 (Table 3.1). Life expectancy and the rate of population growth have been gaining as well. And with rising numbers of women expected to enter their child-bearing ages (Table 3.2), no significant decrease in the population growth can be expected until well into the next century.

Fertility is the most significant factor responsible for Kenya's rapid population growth (Kenya, 1984a: 7). By the end of her reproductive period, a woman would

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Fertility is the most significant factor responsible for Kenya's rapid population growth (Kenya, 1984a: 7). By the end of her reproductive period, a woman would

have given birth to a mean 8 live births with 6.3 survivors (Kenya, 1982: 54; Table 3.3). This large fertility rate can partly be explained by the fact that Kenyan women marry early. The median age at first marriage for women is 18.1 years although there is variation according to province (Table 3.4).

It has been argued that the demographic changes experienced between 1948 and the 1980s are a result of several factors, notably decline in infant and child mortality and improved medical services (see Kenya, 1989b: 206). These have led to higher birth rates. In the words of Kenya's Sixth Development Plan, improvement in medical services has "helped to overcome infertility, reduce stillbirths and abortions and to generally lower morbidity and mortality" (Kenya, 1989b: 206).

However, the positive signs of the macro-demographic indicators and the quantitative increase in the number of health facilities may not necessarily translate into progress for the majority of Kenyans. Rural incomes have not risen significantly since the 1960s (Ghai, et al., 1980). Further, the majority of the rural people have no access to basic health services (Sindiga, forthcoming). In a radical critique of the alleged improvement in the health of the people, Wisner (1989) has noted that the majority of Kenya's population has had little access to health facilities. If the health macro-indicators were disaggregated temporally, argues Wisner (1989: 68-74), little improvement would be demonstrated. Moreover, most medical facilities are located in urban areas where only about 20 per cent of the country's population resides. Again, 75 per cent of the medical personnel continue to live in the urban centres. It will be shown in the proceeding sketch of Kenya's demographic history that many factors, probably acting in a synergistic manner, are responsible for the high fertility.

Table 3.1: Demographic indicators of census years in Kenya.

	1948	1962	1969	1979
Population (million)	5.4	8.6	10.9	16.1
Total fertility rate	6.7	6.8	7.6	7.9
Crude birth rate	50	50	50	52
Crude death rate	25	20	17	14
Natural rate of increase (%)	2.5	3.0	3.3	3.8
Infant mortality rate	184	126	119	104
Life expectancy at birth	35	44	49	54

Source: Republic of Kenya, 1989b: 207

Table 3.2: Kenya: Projected population by selected groups (thousands)

	1989	1990	1991	1992	1993
Total population	23,500	24,400	25,300	26,200	27,200
Children 0-14 yrs	11,800	12,200	12,600	13,000	13,400
Children 0-5 yrs	5,500	5,700	5,900	6,000	6,200
Females in reproductive ages 15-49	5,000	5,200	5,500	5,700	5,900

Figures are rounded off.

Assumptions: The above projection which are derived from the 1979 census data are based on the following assumptions: 1) decline in mortality from 13 per thousand in 1980 to about 9 per thousand by 2000; 2) decline in fertility rate from 7.9 in 1980 to 5.6 in 2000;

Source: Republic of Kenya, 1989b: 208

Table 3.3: Mean number of children ever born by current age group of women.

Age group	Ever-born	Surviving
15 -19	0.35	0.32
20 - 24	1.84	1.61
25 - 29	3.76	3.22
30 - 34	5.55	4.70
35 - 39	6.82	5.62
40 - 44	7.59	6.16
45 - 49	7.88	6.00
50 and above	8.10	6.30

Source: Republic of Kenya, 1982: 54

Table 3.4: Median age of women at first marriage by province of residence.

Province	Median Age
Coast	16.3
Eastern	20.0
Central	19.0
Rift Valley	17.9
Nyanza	16.6
Western	17.5
Nairobi	19.8
Kenya	18.1

Source: Republic of Kenya, 1982: 53

3.1 Background to the Current Demographic Circumstances[1]

3.1.1 Precolonial Situation

Little is known about Kenya's demographic circumstances in the pre-colonial period. Such is particularly the case for the period before the eighteenth century. The difficulties of reconstructing population trends in the pre-colonial period can be pursued elsewhere (Sindiga, 1990). The concern at the instant is the period from the beginning of the nineteenth century.

Writings by European colonial officials tell of never-ending warfare among African peoples. In addition, they allege that nineteenth century populations were reduced by diseases and famines. Demographer Kuczynski (1977) disputed this view and argued that mortality was not as high as reported by some of the colonial officials. Some scholars, for example, Muriuki (1974) have noted that extensive economic and social networks existed among various Kenyan peoples. Beneath the so-called hostilities was mutual cooperation and interdependence. Such cooperation included intermarriages and trade.

Up to mid-nineteenth century, Kenya's population was perhaps stable and sometimes gradually increasing. Cultivation and livestock-keeping must have insured food security and thus reasonable survival rates. However, mortality must have remained high thereby lowering the rate of population growth. In addition, the presence of such diseases as pneumonia, measles, influenza, diarrhoea, dysentery and tuberculosis could lead to high infant and child mortality. Ultimately, the pace of population growth probably was attuned to food availability, traditional medicine, existent environmental health circumstances and social controls of fertility. The latter was intended to enhance infant and child survival and was achieved via child spacing within marriage by invoking the postpartum taboo.

Towards the end of the century a series of misfortunes afflicted the people of Kenya and East Africa as a whole (Kjekshus 1977). A rinderpest epidemic and an outbreak of bovine pleuro pneumonia came in 1889-1890. Smallpox attacked in 1892. Rinderpest and pleuro pneumonia killed livestock and undermined the subsistence basis of life. Smallpox killed many people. Then a sand flea (*sarcopsylla, penetrans*) plague attacked and had its severest effects on the Maasai

and Mount Kenya peoples. The sandfleas epidemic led to serious disabilities to feet forcing people to limit their movement with serious consequences to the economy (Kjekshus, 1977). The demographic impact of all these misfortunes was adverse.

3.1.2 Colonial situation: from 1900

Colonial rule began in Kenya at a time of demographic relapse arising from the epidemics and misfortunes of the late nineteenth century. Sleeping sickness broke out in the Lake Victoria region at around 1900. By 1902 the disease was well established on the Kenyan side of the lake. Also, there were outbreaks of plague, measles, chicken pox and influenza. These were followed by locust invasion and drought. All this led to famine which could cause infertility and affect conceptions and deliveries. Food shortages lead to irregular menstrual cycles and pregnancy vastage in case of successful conceptions.

During the early years of British occupation in Kenya, certain actions were taken which tended to exacerbate mortality. During the three decades up to the 1920s, Kenya's population was generally low and even declining. For one, the onset of colonial rule coincided with the infestation of new diseases which killed people. In addition the First World War saw some 50,000 Kenyans dying while engaged as soldiers and porters. Finally an influenza epidemic broke out in 1918 and was shortly followed by famine. These claimed another 150,000 people.

After the 1920s Kenya's populations slowly began to recover. But it is difficult to determine either the fertility rate or the annual growth rate. It would appear from the records of the Kenya Land Commission of 1933 that the annual growth rate was 1.5 per cent. However, Kuczynski (1977) calculated a much lower but more believable rate of 1.1 per cent. It is probably that the period up to 1950 was characterized by high fertility and high mortality

The national average population growth rate of 1.1 per cent or the period conceals regional variations within the country. Colonial officials frequently noted "great" discrepancies between the population density of pastoralists and cultivators. Pastoral peoples appear to have had a much lower growth rate of about 0.5 per cent per year. Their fertility must have been much lower as well. Writing about the pastoral Nandi at the onset of colonial rule, Matson (1972: 13)

notes that "families were much smaller than among neighbouring tribes and only averaged two or three children to every union". Cultivators and mixed farmers living adjacent to the Nandi, for example the Luhya and Luo had 7.75 and 10.6 children in a family (Matson, 1972: 13). Whereas the actual average figures might be suspect because of lack of corroborative data, the general observation of lower fertility among pastoralists than groups with different modes of production is true. The postulated reasons for these fertility differentials will be discussed later on in this section and in section 5.

The first census in Kenya was conducted in 1948 (Table 3.1). By the time of the second census in 1962, the population was shown to have increased by 60 per cent. These data must however be handled cautiously. Many parts of the country especially the vast semi-arid and arid zone were inaccessible to enumerators. Other difficulties related to cultural taboos against counting. The Maasai, for example, do not count people or livestock. The latter are known by the colours of their skins. Also, most people did not reveal the exact numbers of their family members because of the fear that the data would be used for taxation purposes; a well-founded fear based on colonial tax collection procedures.

Notwithstanding the caveats outlined above, the rate of population growth was probably much higher in the years after 1950 than before. This was partly a result of the establishment of modern health care facilities. Both birth and death rates remained high with relatively low life expectation.

3.1.3 Contemporary time

The growth rate since the early 1960s was much higher. The data reveal that by the 1980s, fertility had actually increased. At independence in 1963 Kenya's health facilities were unevenly distributed and the majority of the people did not get access to them. One of the pledges of the new national government was to fight disease. The government embarked on a programme of expanding health care facilities which partly helped to reduce mortality. In 1979/80, the government spent 2.5 per cent of the Gross National Product on health; 2.4 per cent during 1981/82 and 2.1 per cent in 1982/83 (Bennett and Maneno, 1986:16). Overall, the government health expenditure grew by a rate of 18.4 per cent per year during the 1970s; second only to education as the largest recipient of public financial allocation (Kenya, 1983a: 32). This high cost of health services to government did

not necessarily mean greater access of the facilities for the bulk of the rural population. It reflects the fact that government health services were largely free of cost to patients. Nevertheless, it can be pointed out that other efforts in socio-economic development for example greater food production as a result of access to land, basic education for more women, etc. in the post-independence period contributed to the increase in fertility. Thus, the assumption prevails that Kenya's relatively high fertility is a result of a complex mix of factors among which are "young age at first marriage (for women), high age-specific fertility rates, residence in rural areas for a large proportion of the population and low education among women" (Kenya, 1984b: 4).

The Kenya Demographic and Health Survey of 1989 however, found a significant fall in fertility. The 1979 total fertility rate was 7.9 and it stood at 7.7 in 1984. This was reported to have gone down to 6.7 by 1989 (Kenya, 1989a). Barring any errors both in the census and the surveys, the fall in fertility could be a result of certain gains by the Kenya family planning programme in getting people to space child bearing (and even reducing their fertility), a reduction in the infant mortality rate (thereby enhancing survival) and making couples bear the number of children they want. "Perhaps the largest (sic) single factor that has contributed to fertility decline is education, especially education for women. Age at marriage increases with education, hence delaying the start of childbearing" (Kenya, 1989a: 20).

3.2 The Geography of Fertility in Kenya

Fertility rates vary both over time and space. Within Kenya, there are significant regional differences of fertility reflecting in the social, economic and cultural factors operating in different places. Inquiring into the spatial differences in fertility and the associated factors is therefore a useful exercise which can also provide data for commenting on future patterns of fertility (Kenya, 1989a: 21).

Overall, fertility in Kenya is high. The family size desired by evermarried women was 6.2 children according to the Kenya Contraceptive Prevalence Survey (KCPS) of 1984. However, the ideal family size desired by all women was 5.8 children which was much lower than the total fertility rate of 7.7 at the time (Kenya, 1986: 9).

Total fertility rates in Kenya vary between 5 and 9 in different regions (Table 3.5) Nairobi metropolitan area has a TFR of 5 whereas the Coast records 6.8. The highest rates are in Nyanza (8) and Western (9) provinces.

Nairobi's relatively lower fertility may be attributed to better socio-economic conditions and perhaps higher educational attainment for women. The story for the Coast, save for Mombasa town is not the same. The Coast suffers from anaemia caused by malaria infection which affect women, children and nursing mothers (Kenya, 1989b: 235). This problem is experienced in the malaria-endemic areas around Lake Victoria as well. Also, coastal peoples may suffer loss of iron through chronic haemorrhage caused by hookworm and schistosomiasis (Kenya, 1989b:235). Thus, poor environmental health conditions led to physiological infertility in the coast.

Table 3.6 disaggregates the 1979 TFR data according to district. The data reveal that districts in the Coast and the drier zone of the country have comparatively lower TFRs averaging only 6 children. Such include Kilifi, Kwale and Lamu in the Coast province; and Isiolo, Kitui, Marsabit, Garissa, Elgeyo - Marakwet, Kajiado, Samburu and Turkana in the arid and semi-arid zone. The latter districts which experience sub fertility are occupied by nomadic peoples; however, this feature and its contribution to infertility in Kenya may be problematic. Nomadic pastoral peoples are in certain instances difficult to delineate according to area. This is because of movements of cultivators into previously pastoral areas thus upsetting the nomadic lifestyle and introducing mixed farming and trading (Sindiga, 1984; International Labour Office 1972; Bernard, 1982). Such people may expesience different fertility patterns from those of traditional nomads with whom they share the ecological environment. For Narok district, immigration has gone on since the beginning of colonial time (Sindiga, 1986). This means that the TFR of 7 as shown on table 3.6 reflects the fertility of both the pastoral Maasai and the immigrants (see chapter 5). The TFR of the Maasai as a group within Narok must be comparatively lower. The intercensal population growth rates represented on Table 3.7 provides pointers to differential fertility according to ethnic group.

Table 3.5: Total fertility rates by province

Province	TFR 1979	Per cent women aged 10-14 with no education
Nairobi	5.0	9.4
Coast	6.0	39.7
Eastern	7.0	13.0
North Eastern	7.0	93.6
Nyanza	8.0	6.9
Rift Valley	7.0	23.3
Western	9.0	8.6
Central	7.0	2.9
Kenya	8.0	15.4

Source: Kenya, no date (a)

Table 3.6: Total fertility rate by district, 1979

District	TFR	% women aged 10-14 with no education
Nairobi	5	9.4
Kiambu	8	2.7
Kirinyaga	7	5.0
Muranga	7	2.9
Nyandarua	8	2.9
Nyeri	7	1.4
Kilifi	6	56.5
Lamu	6	36.4
Kwale	6	53.1
Mombasa	5	14.7
Taita Taveta	7	5.8
Tana River	7	67.9
Embu	7	6.8
Isiolo	6	63.0
Kitui	6	19.1
Machakos	7	4.3
Marsabit	6	83.4
Meru	7	13.7
Garissa	6	93.3
Mandera	7	94.9
Wajir	7	92.9
Kisii	9	5.4
Kisumu	8	5.9
Siaya	7	7.2
South Nyanza	8	9.1
Baringo	7	27.9
Elgeyo Marakwet	6	14.3
Kajiado	6	48.7
Kericho	8	8.3
Laikipia	7	14.9
Nakuru	8	7.4
Nandi	7	7.0
Narok	7	60.8
Samburu	6	85.3
Trans Nzoia	9	12.3
Turkana	6	90.3
Uasin Gishu	7	7.5
West Pokot	7	72.2
Bungoma	9	7.3
Busia	8	13.1
Kakamega	9	8.1
Kenya	8	15.4

Source: Republic of Kenya, no date (a). Women of Kenya: A Statistical Data Sheet. Nairobi: Women's Bureau, Ministry of Culture and Social services.

Table 3.7: Intercensal annual population growth rates by principal ethnic groupings, 1969-79.

Group	Rate of growth per cent	Group	Rate of growth per cent
Central Bantu Kikuyu Embu Meru Mbeere Tharaka Kamba	3.73	Plains Nilotes[3] Maasai Samburu Turkana Teso	2.44
Western Bantu Gusii Kuria Luhya	3.59	Il Chamus Okiek	
Coastal Bantu Mijikenda Pokomo Taveta Taita Bajun Swahili/Shirazi, Boni/Sanye	3.29	Eastern Cushitic[4] Rendille Boran Gabbra Sakuye Orma El Molo	5.68[5]
River-lake Nilotes[1] Luo Suba*	2.85	Other Cushitic[6] Gosh Hawiyah Ogaden Ajuran Gurreh Degodia	4.40[7]
Highland Nilotes[2] Kalenjin- speaking	3.33		

Notes: 1,2,3,4 and 6: The names of these ethnic groupings do not appear as given in the source document. Following the rejection of the "hamitic hypothesis", new names to the groups emerged as used here. See Sutton (1974).5,7 These relatively high rates of annual population increase are not a result of high fertility. Rather, it is because of in-migration and population redistribution in the areas where the concerned groups occupy. Such in-migration may have been coming from outside the country, notably Ethiopia and Somalia. Also, it is likely that these groups were undercounted during the 1969 census partly because of their nomadic lifestyles.

* The Suba were originally a Bantu speaking group living within South Nyanza district. However, over the years they have been assimilated by the Luos and may now be at the verge of losing their identity. Because of this assimilation process, the group is sometimes referred to as the Luo-Abasuba. See Ayot (1976).

Source: Republic of Kenya. No date: *1979 Population Census Volume II: Analytical Report.* Nairobi: Central Bureau of Statistics, Ministry of Finance and Planning, p.38.

Table 3.8: Infant mortality rates by current province of residence

Province	Period of Birth	
	Pre 1967	1967-1976
Nairobi	100	75
Central	88	56
Coast	156	129
Eastern	100	77
Nyanza	162	128
Rift Valley	103	64
Western	118	109

Source: Republic of Kenya, 1981. Infant mortality in Kenya: Past nad Present Differentials. Social Perspectives, 6 No. 1 and 2.

Fertility is highest in Nyanza and Western provinces. These provinces together with the Coast also have high infant and child mortality (Table 3.8). This will encourage couples to have more children in order to enhance the number of those who survive to become adults. The high infant and child mortality will also tend to offset the high fertility in Western and Nyanza provinces. Mortality is lowest in Central and Nairobi, respectively a rural area which has attained a comparatively high level of socio-economic development and a primate metropolitan area.

3.3 Explanation of Kenya's Fertility Differentials

3.3.1 Education

Educational attainment especially that of women significantly affects fertility. It is interesting to note from the district level data presented in Table 3.6 that the higher the proportion of women aged 10-14 years with no education, the lower the TFR. If women 10-14 years are not already in school it is likely that they will never go[2] This is a useful indicator of the illiteracy level. Certain districts in the arid and semi-arid zone with a TFR of 7 represent sizable immigration as explained above. Such include Tana River, Mandera, Wajir, Narok and West Pokot.

In general, TFR decreases with increased educational level attained by women. According to Kenya data, TFR is 8.5 for women with no education and 5.4 for those with 9 or more years of schooling (Kenya, 1986:7). Table 3.9 shows the age-specific fertility by education of women. It shows that the fertility rates are

higher for women in the 20-24 age group and above with primary education than those with no education. The average number of births to women with secondary schooling are lower in all age groups (see also, Kenya, no date [b]:79).

Education affects fertility in at least two ways. Women who obtain primary education learn something about personal hygiene and balanced diet; knowledge which they put into practice. This brings them the dividend of much higher fertility than women without education. The women who go for post-primary education find it imperative to delay getting children. This raises the age at marriage and considerably reduces the period of potential reproduction for individuals (see table 2.3 above). Also, such women do not end up being merely wives and mothers. They must combine these roles with professional careers. They are more amenable not only to space but also to limit their births.

3.3.2 Residence

There is significant rural to urban differences in fertility outcomes which reflects differential behaviour. In Kenya women who live in urban areas form 15 per cent of all women aged 12 and above (Kenya, no date [b]:79). These women have a TFR of about 5 children; however, this figure varies from 4.7 for Nairobi and Mombasa, to 5.3 for other towns (Kenya, 1986: 7). Rural Kenya women achieve a total fertility rate of about 8.1 children.

Table 3.10 shows the age-specific fertility by residence. Although fertility of the age group 15-19 is higher in urban areas than rural areas, all the other rates are lower for urban than rural women. The latter are more likely to spend fewer years in school and to marry early. Ultimately, they experience higher fertility than their urban counterparts.

Table 3.9: 1979 age-specific fertility by education

Age group	Education level (absolute rates)			Education level (relative rates)		
	None	Primary	Secondary	None	Primary	Secondary
15-19	0.1410	0.0967	0.057	0.0120	0.075	0.065
20-24	0.2621	0.2979	0.2132	0.223	0.230	0.241
25-29	0.2606	0.3008	0.2626	0.221	0.232	0.297
30-34	0.2136	0.2583	0.1916	0.182	0.199	0.217
35-39	0.1677	01964	0.1058	0.143	0.151	0.120
40-44	0.0891	0.1035	0.0390	0.076	0.080	0.044
45-49	0.0417	0.0433	0.0149	0.035	0.033	0.016
TOTAL x 5	5.8790	6.4845	4.4210	1.000	1.000	1.000

Source: Republic of Kenya. no date [b]: 86

Table 3.10: 1979 age-specific fertility by residence

Age group	Absolute Rates		Relative Rates	
	Urban	Rural	Urban	Rural
15-19	0.1051	0.0976	0.108	0.081
20-24	0.2290	0.2731	0.236	0.226
25-29	0.2408	0.2842	0.248	0.235
30-34	0.1798	0.2347	0.185	0.194
35-39	0.1264	0.1798	0.130	0.149
40-44	0.0606	0.0947	0.062	0.078
45-49	0.0289	0.0430	0.030	0.036
Total x 5	4.8530	6.0355	1.000	1.000

Source: Republic of Kenya. no date [b]:8.

3.3.3 Health and disease environment

As already noted above, disease and health may contribute either to low fertility or high fertility. Regions in which malaria and schistosomiasis are endemic for example, the Coast record relatively low fertility. These areas suffer from involuntary sub fertility (see table 2.5). However, other areas where these same diseases are endemic, for example, Lake Victoria region do record high fertility. As explained above, poor environmental health circumstances lead to relatively high infant and child mortality rates. These encourage couples to get as many children as possible to insure high survival rates. This is the case for Western and Nyanza provinces.

Another health-related problem is malnutrition especially among pregnant women and children. Malnourishment and under-nourishment affect a woman's capacity to conceive and may also cause anaemia, abortions and stillbirths. Such appears to be the case for the pastoral peoples of the country.

Malnutrition is widespread in Kenya and is a manifestation of poverty. Twelve years ago, smallholders, urban unemployed and underemployed and pastoralists (Table 3.11) were found to suffer greatest from nutrition deficiency. Food shortages are common among these groups either because they do not produce sufficient food or have low incomes to afford purchasing food or, as in the case with pastoralists, they are quite vulnerable to weather fluctuations and have no food security.

In Kenya, protein-energy malnutrition (PEM) is quite prevalent. The 1982 third Kenya child nutrition survey which had a sample of 5400 children of ages 3 to 6 months found relatively high levels of stunting (Table 3.12). When the data are disaggregated according to province, Coast, Nyanza and Western show the highest levels of stunting and mortality than Eastern, Central and Rift Valley provinces. This survey revealed a correlation between the rankings of health indicators and mother's education. Also, areas with high levels of disease incidence are also the ones with many nutritional problems. Such diseases are malaria, diarrhoea, pneumonia and schistosomiasis. As already noted, schistosomiasis and malaria are concentrated in Coast, Nyanza and Western provinces.

Table 3.11: Nutrition problems in Kenya, 1978

Nutrition deficient group	Problem	Cause of Problem	Estimated no. in group ('000)
A. Small holders			
(a) Food producers with no sales	PEM*	Insufficient food production	2,200
(b) Landless poor	PEM	Low real income	410
(c) Certain cash crop producers	Periodic PEM	Low earnings	1,090
B. Urban unemployed and under employed	PEM	Low real income	250
C. Pastoralists	Periodic PEM	Vulnerable to weather; no food security	670

* Protein-energy malnutrition

Source: Republic of Kenya, 1979: 151

Table 3.12: Nutritional indicators*

Province	N	% stunted[1]	% wasted	Mortality 1979[2]	% of mothers with no education
Coast	419	36.2	5.0	206	77.4
Nyanza	788	28.9	3.6	220	51.6
Western	787	25.7	2.0	187	46.3
Eastern	1195	22.6	2.7	128	45.9
Central	907	20.4	2.8	85	30.3
Rift Valley	1227	19.8	3.0	132	55.1
Kenya	5323	24.0	3.0	156	48.6

Notes: 1. Less than 90% height for age
2. Proportion of children dying in first 5 years of life per 1000
* Nairobi and North Eastern provinces were excluded in this rural survey.

Source: Kenya, 1983c: 32

3.3.4 Contraceptive use

I argued earlier in this chapter that the decline in fertility recorded by the Kenya Demographic and Health Survey of 1989 can be attributed to several factors among which is contraceptive use. However, the latter is not the primary factor responsible for the decline.

Kenya's official family planning programme started in 1967. The purpose was to reduce the then rate of population growth from a national average of 3 per cent per year at the time to 2 per cent over a period of 10 years. The family planning programme was intended to be voluntary and designed to be part and parcel of the overall socio-economic development. During 1975 to 1979, the government launched a family planning initiative which would become the basis for expanding and integrating services and form a yardstick for monitoring success (Kenya, 1984a). It was expected that this programme would help reduce the annual population growth rate from 3.3 per cent in 1975 to 3 per cent in 1979. Another objective was to improve maternal-child health care (Kenya, 1984a).

This initiative had an ambitious plan of action which included the following (Kenya, 1984a: 3):

a) establishing a national family welfare centre:

b) creating 400 maternal child health and family planning (MCHFP) daily service delivery points and establishing 17 mobile terms covering 190 clinics;

c) providing in-service training for nurses in family planning;

d) expanding information and education activities using trained family health educators; and

e) recruiting 640,000 new family planning acceptors thereby averting 150,000 births

By 1979, this programme had not attained its primary objective. Infact, fertility increased. The annual population growth rate had shot to 3.8 per cent. These events led to the formation of the national council for population and development (NCPD) in 1982. The NCPD is charged with the task of formulating population policy and coordinating all population activities. NCPD's programmes are geared to encouraging Kenyans to adopt the small family size norm as a matter of choice for couples.

One of the avenues for reducing fertility is the adoption of contraceptive use. In 1978, the Ministry of Health estimated that 7 per cent of ever married women were using contraceptives. The Kenya fertility survey of 1977/78 found that current user rate for currently married women 15 to 49 years old was only 9 per cent (Kenya, 1980). However, by the time of the KFS survey, 88 per cent of Kenyan women knew about contraceptives. This means that lack of knowledge of fertility regulation must be discounted when considering the low rate of user adoption.

Results of the 1984 KCPS show some improvement in the proportion of all women and ever-married women 15-49 years who ever used a family planning method (Tables 3.13). The table shows that higher proportions of urban women have ever used a family planning method. Further, the proportion of women who have ever used a modern contraceptive method. The proportion for rural ever-married women is 14.9 per cent. The rural areas of the country require family planning attention because this is where 85 per cent of all Kenyan women aged 12 and above reside.

Provincial level data for 1984 (Table 3.14) show that Nyanza and Western provinces which also record the highest fertility have the lowest percentages of women who are current users of contraception. These are followed by Coast and Rift Valley provinces.

Table 3:13: Proportion of all women and all ever-married women 15-49 years ever using family planning methods, 1984 (Figures are percentages)

Method	Total		Nairobi/Mombassa		Other urban		Rural	
	1	2	1	2	1	2	1	2
Any method	28.5	32.6	35.0	42.4	34.1	39.6	27.6	31.4
Modern	14.1	17.2	27.6	34.2	24.5	31.8	12.2	14.9
Traditional	20.2	22.6	14.4	17.0	21.7	22.9	20.6	22.9
Only traditional	14.4	15.5	7.4	8.2	9.6	7.8	15.4	16.6

KEY: 1. All women
2. Ever-married

Source: Republic of Kenya. 1986: 12

Table 3:14: Current use of family planning (any method) by married women by province, 1984 and 1989: (Figures are percentages).

	1984	1989
Central	34.2	39.5
Nairobi	28.3	33.5
Eastern	26.3	40.2
Western	4.6	13.7
Nyanza	8.5	13.8
Coast	10.5	18.1
Rift Valley	15.0	29.6
North Eastern	N/A	N/A

N/A = Not available

Source: Republic of Kenya, 1986: 16; Kenya, 1989a: 38

Table 3.15: Percentage of all women and currently married women 15-49 ever used a contraceptive method, 1989.

	All Women	Currently Married
Method		
Any method	39.1	45.0
Any modern method	24.1	29.0
Any traditional method	21.9	24.2

Source: Kenya, 1989a: 33

The KDHS of 1989 recorded further improvement in the proportion of women with contraceptive use experience. Some 39 per cent of all women in the survey answered that they had used some method of contraception (c.f. 29 per cent reported by KCPS) (Kenya, 1986; Kenya, 1989a: 33). However, a larger proportion i.e. 45 per cent of currently married women have ever used a contraceptive method (c.f. 33 per cent in 1984) (Kenya, 1986; Table 3.15).

Data from KDHS on current contraceptive use show that 27 per cent of currently married women were using a contraceptive method at the time of the survey (Kenya, 1989a: 34). Some 23 per cent of all the women in the sample were current users of a contraceptive method whereas a higher figure of 27 per cent represented currently married women who were then using a method of fertility regulation (Kenya, 1989a:34). These data on contraceptive use are a significant improvement over the past surveys. For example, the KFS found that only 7 per cent of currently married women were current users of a contraceptive method; the figure for 1984 was 17 per cent. When disaggregated to provincial level (Table 3.14), the lowest proportion of current use of contraceptives for currently married women is recorded for Western, Nyanza and Coast provinces. Although these data represent some improvement over the 1984 findings, the percentage of women using contraceptives is still far too low relative to fertility rates.

3.4 Considering the Data

The Kenya data show that fertility is high. However, there are significant regional variations in total fertility and population growth rates. Certain areas of very high fertility are also the ones with relatively high infant and child mortality and stunting among children. This high infant and child mortality directly feeds into high fertility. The reason is that few children who are born are expected to reach adulthood.

Many rural Kenyans still suffer from poverty and endemic under-and mal-nourishment. Then there is the problem of endemic disease such as malaria, schistosomiasis and diarrhoea in certain parts of the country. Rather than encouraging small families, the threats to health and survival add to poverty and tend to perpetuate the need for large families. This is the case for Nyanza, Western and Coast provinces.

Another problem is access to health care especially for rural families. Most rural Kenyans live more than 2km from the nearest health centre (Kenya, 1982). Only urban areas are better-endowed with health facilities. Urban places also monopolize some 75 per cent of Kenya's health personnel.

The relatively lower fertility in the urban areas of Kenya reflects greater access of women to education and more years in school. Also, it partly tells of the desire by urbanites to have smaller family sizes because of the high cost of rearing children. The use of contraceptives is also higher in urban areas.

Most Kenyan women (90 per cent in 1989) have heard of contraceptives. However, only 27 per cent of currently married women use them. This is probably because of inaccessibility to delivery points, long distances to family planning clinics and a lot of work to do at home (Kenya, 1980; Gachuhi, 1975).

It may be pointed out, however, that matters of family planning in African families are not a preserve of women. It depends very much on husbands' attitudes toward family planning (Sindiga, 1985). Yet, with the notable exception of Greeley (1977), only recently did work on Kenyan men's attitudes toward family planning begin (see Kenya, 1989a).

Having sketched Kenya's fertility and population change patterns, I will now turn to the study area. The next chapter outlines background data on the people of Narok and their landscape. This is a prelude to the discussion on their fertility and population change.

4. STUDY AREA: NAROK - ENVIRONMENT AND PEOPLE

Physical Environment

Narok is one of the two districts inhabited by olmaa speaking peoples in Kenya (the other is Kajiado). It forms the western portion of Maasailand and is bordered by South Nyanza, Kisii and Kericho districts to the west, Kajiado to the east, and

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Nakuru district to the north. The southern boundary is the Kenya-Tanzania border

Narok, which has an area of 18,513km^3, is separated from Kajiado by the Nguruman escarpment which rises to 2700m in altitude. The area to the West of the escarpment is hill territory which slowly merges into the Loita plains and Loita hills. The average altitude of this area varies from 1500m to 2100mm above sea level. The Western part of Narok is the elevated trans-mara plateau with an altitude of 1800m. In general, the Narok landscape rises gently from the south to north, with large plains in the area of Mara national game reserve dotted with hills, notably Loita and peaking at about 3000m in the Mau ranges.

Narok is a district of diverse ecological potentials and contains most of Kenya's moisture availability possibilities (Figures 4.1 and 4.2; Table 4.1). Annual rainfall varies between 500mm in the plains to 1800mm in the uplands.

The arable areas of the district are located near the borders. These include the Mau ranges with annual rainfall averages of between 1000 and 1750mm and trans-mara which receives rain nearly all year round. Rainfall in trans-mara ranges between 800mm and 2700mm.

The largest proportion of Narok district which is in the south and centre, including the Loita and central plain, is too dry for agriculture. Although the total average annual rainfall is between 500mm and 700mm, this is highly unpredictable in occurrence. In addition, evaporation at about 1800mm a year is too high to allow effective crop cultivation. Lack of sufficient rainfall in the Loita plains and the southeastern part of Narok retards development and is the basis for traditional pastoral practice.

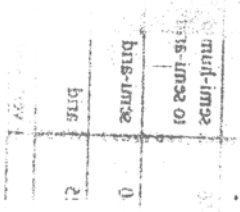

Table 4.1: Moisture availability zones of Kenya

Zone	r/Eo (%)	Climatic classification	Average Annual rainfall (mm) r	Eo	Natural vegetation	Agricultural Potential	Area ('000 ha)	Proportion of Kenyan land area (%)
I	>80	humid	1100-2700	1200-2000	moist forest	very high	2,450	4.3
II	65-80	sub-humid	1000-1600	1300-2100	moist and dry forest	high	2,380	4.1
III	50-65	semi-humid	800-1400	1450-2200	dry forest and moist woodland	high to medium	2,570	4.4
IV	40-50	semi-humid to semi-arid	600-1100	1550-2200	dry wood-land and bushland	medium	2,870	4.9
V	25-40	semi-arid	450-900	1650-2300	bushland	medium to low/marginal	8,730	15.0
VI	15-25	arid	300-550	1900-2400	bushland, scrubland	low	12,640	21.7
VII	<15	very arid	150-350	2100-200	desert scrub	very low	26,530	45.6
Total							58,260	100.0

Key: r = average annual rainfall, Eo = average annual potential evapotranspiration
Sources: Sombroek et al (1982) and Appendix 2, Kenya Soil Survey Report El

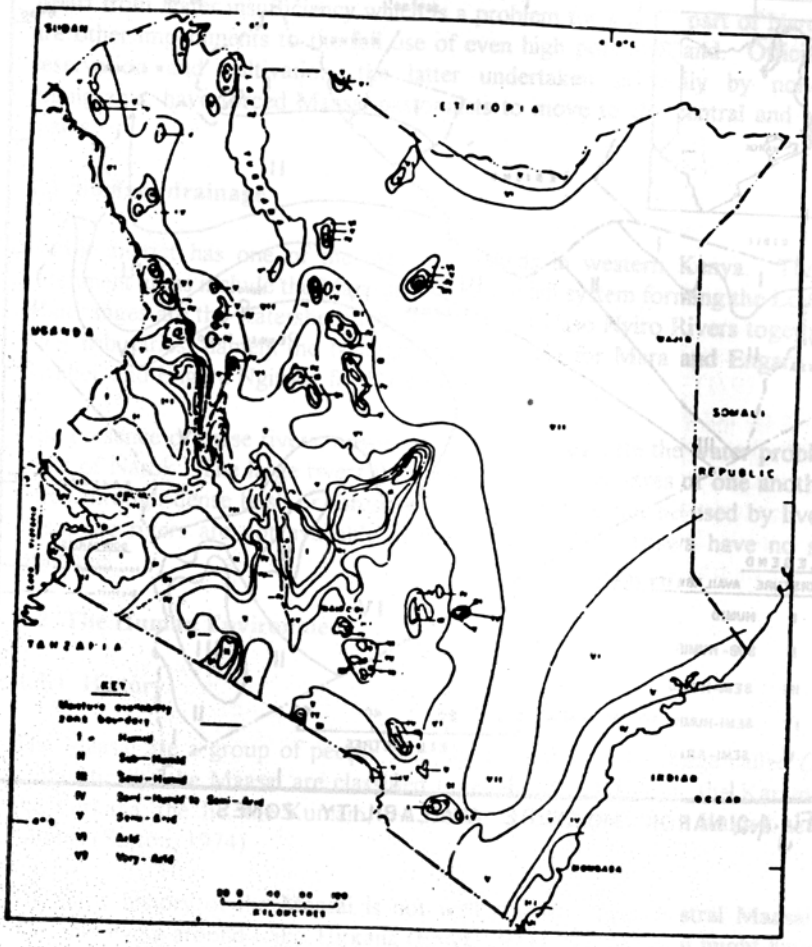

FIGURE 4.1 — MOISTURE ZONES OF KENYA (source: Kenya Soil Surveys)

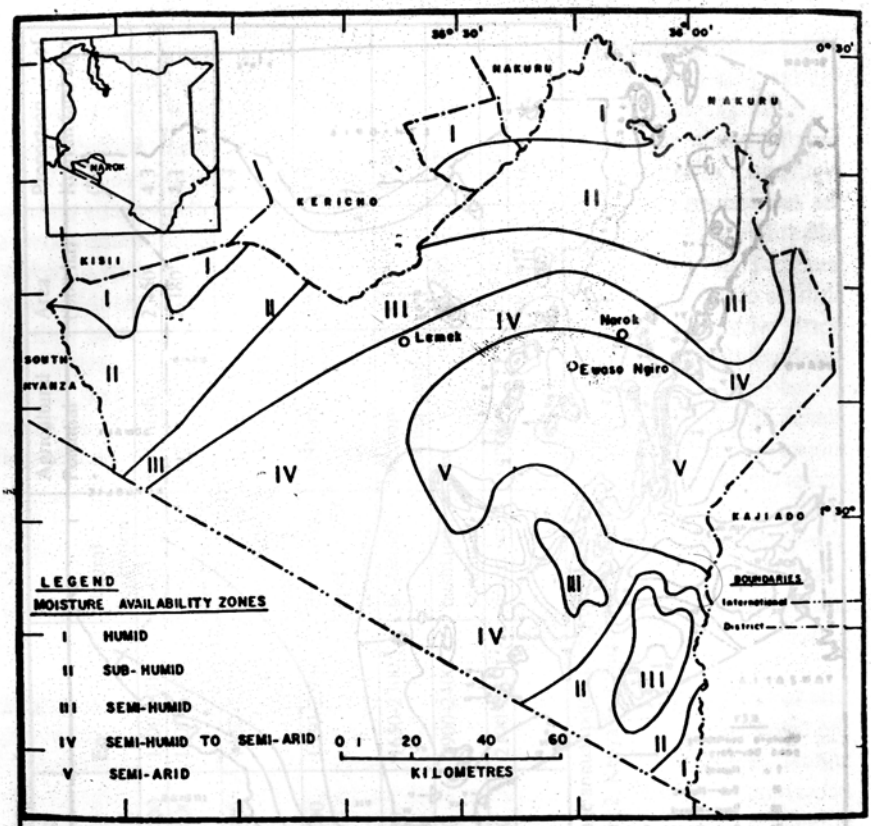

Fig.4.2: NAROK MOISTURE AVAILABILITY ZONES

Apart from water insufficiency which is a problem for a large part of Narok there are other impediments to the full use of even high potential land. Official forest reservation and cultivation, the latter undertaken primarily by non-Maasai immigrants, have forced Maasai pastoralists to move to the central and southern plains.

4.1 Surface drainage

Narok district has one of the main watersheds in western Kenya. The water catchment areas include the Mau ranges and the hill system forming the Loita. The Mau ranges are the watersheds for the Mara and Uaso Nyiro Rivers together with their tributaries, namely the Nyangores and Amala for Mara and Engare Narok, Siyabei, and Engare Ngitwar for Uaso Nyiro.

The presence of these rivers, however, does not ameloirate the water problem for most of Narok. The large rivers flow within a few kilometres of one another and often through dense bush or forest where the water cannot be used by livestock. Also, the rivers are not available in the places such as Suswa have no surface drainage.

4.2 The Human Environment

4.2.1 History

The Maasai are a group of people who share a common language called *Olmaa*. Linguistically, the Maasai are classified together with the Teso, the Karamojong, the Turkana, the Jie, the Kumam, the Dodo, the Kuku and the Kakwa as Plains Nilotes (Sutton, 1974).

The early history of the Maasai is not well known. The anestral Maasai were probably living around Lake Turkana (Ehret, 1974). The Maasai might have been the last important settlers in the Kenya highlands, northern Tanzania and the Rift Valley before European incursion (Sutton, 1966). Basing his evidence on Maasai occupation in Tanzania; in Kajiado, Narok, Laikipia, Samburu and Baringo districts of Kenya, Sutton (1986:3) argues that the Maasai as a group "must be a recent phenomenon because of the relative consistency of the language over such

vast distances". It would appear that the Maasai occupied much of Kenya during the seventeenth century (Ehret, 1974; Sutton, 1966 and 1986).

Despite reports that the Maasai do not mix with other ethnic groups and "have maintained racial purity" (Biss, et. al., 1971: 694) empirical data speak to the contrary. The Maasai, just as many groups in East Africa, have in history assimilated other peoples who in due course lost their identity to the "conquerors" (Sutton 1986). Moreover, the Maasai frequently married women from other ethnic communities (Kantai, 1971: xi). What unites the Maasai is the common language (and associated cultural attributes) and a common mode of production, livestock-keeping. Although certain Maasai groups cultivate the land, e.g. the Nguruman, Arusha and the IL Chamus, all Maasai prefer pastoralism. According to Kantai (1971), the Maasai adopt other subsistence practices only when conditions do not allow pastoralism. However, it is known in Maasai mythology and beliefs that God gave all cattle to them and that no other ethnic group has a right to own and keep them. Consequently, the Maasai justify their raids in other people's territories to "retrieve" livestock. Nevertheless the Maasai are also known to enjoy cereals, for example, maize which is produced by neighbours. Such grain is obtained via trade.

4.2.2 Organization

Maasailand is divided into territorial units or sections called *iloshon*. Narok district is inhabited by some eight sections, namely Iloita, Ildamat, Ilpurko, Isiria, Ilwuasingishu, Ilmoitanik. Ilkeekonyokie and Ilaitayiok (Kantai, 1971:x; Kipury, 1983:ix). Each section is composed of several clans (*ilgelat*). A number of families (*ilmarei*) make up a clan (Lewis, 1967:68). The clans operate as patrilineal exogamous groups.

Each *iloshon* is a separate entity with its own territory. However, the Maasai frequently share herding resources in the territory of other sections especially during times of drought. Also, each section would have its own peculiar dress, weapons, beadwork, ways of conducting its ceremonies and even constructing housing (see, Mol, 1978:viii).

The Maasai settlement pattern is dispersed. A number of families live together in a village (*enkang*) which comprises of a ring of huts surrounded by a circular thorn

fence[3] An *enkang* may have a variable number of people and herd size. One family is made up of a man, his wife or wives and unmarried children. One of the reasons for staying together in an *enkang* is to protect one another against wild animal attacks and also to protect livestock from theft. The Maasai own cattle as individual families, but members of an *enkang* usually take their livestock together to the pastures and water; the latter being held as commons.

4.2.3 Housing

Traditional Maasai houses are dome shaped structures with walls made of saplings. The structure stands some 6 feet on the ground. The roof is smeared with cow dung.

The interior of the house is partitioned to accommodate the main room at the centre where the fireplace is located, a bedroom for the lady of the house and a children's bedroom. A Maasai house contains no windows or any form of ventilation, save form a small hole in the wall for watching over the livestock at night.

The Maasai keep calves and shoats in the houses at night. Consequently the inside of the house becomes wet and moist and this creates ideal conditions for the infestation of infectious diseases in general and respiratory disorders in particular. These problems become more acute during the rainy periods when the house tops leak heavily creating good ground for pneumonia.

In an *enkang* people share space with livestock. Inevitably, animal droppings and trampling make the place a quagmire of mud particularly in the wet season. Flies abound and mosquitoes can survive. These foster eye diseases, diarrhoea, malaria and other infectious diseases.

4.2.4 The Health Environment

The primary causes of morbidity and mortality are infectious communicable diseases (Table 4.2). These reflect the problems of environmental sanitation, unavailability of sufficient clean water and the relatively low level of personal hygiene.

Table 4.3 provides rankings of ten leading diseases in Narok district as per the records of health facilities. These rankings are based on the number of cases treated during 1983 and 1987. For these two years, diseases of the respiratory system and malaria were the leading causes of morbidity. Other important diseases are intestinal worms, diarrhoeal problems and skin ailments. The following is an attempt to take accounting of the leading diseases afflicting the people of Narok district.

Table 4.2: Narok district: cases of diseases reported in 1986*.

Disease	Number	Disease	Number
Malaria	14863	Diseases respiratory system	55633
Diarrhoea	13977	Pneumonia	7800
Tuberclosis	184	Abortion	816
Leprosy	14	Diseases of puerperium and child birth	433
Whooping cough	312	Neoplasms	2
Tetanus	3	Mental disorders	36
Meningitis	31	Dental disorders	439
Poliomyelitis	34	Diseases of skin	18086
Chicken pox	550	Rheumatism, joint pains	4496
Measles	2252	Congenital anomalies	80
Infectious hepatitis (jaundice)	23	Pyrexia of unknown origin	830
Mumps	639	Poisoning	620
Gonorrhoea	11510	Accidents, fractures, burns etc.	6396
Urinary tract infections	2286	Brucellosis	-
Schistosomiasis	147	Syphilis	-
Intestinal worms	16235	Anthrax	433
Malnutrition	554	Tonsolitis	3395
Anaemia	1716	Bronchitis	211
Eye infections	6484	All other diseases	49705
Cataract	122	Total new cases	98276
Ear infections	3345	Total number of revisits	77709
Diseases of circulatory system	583		

Note: * These cases probably do not provide the full picture of the incidence of these diseases because the Maasai, who form some 56 per cent of the population of the district - the rest being immigrants - live far away form health facilities. Also, quite a large proportion of the Maasai seek therapy in traditional medicine.

Source: Republic of Kenya, 1988: 139.

Table 4.3: Ranking of ten leading diseases in Narok, 1983 and 1987

Disease group	Rankings	
	1983	1987
Diseases of respiratory system	1	1
Malaria	2	2
Intestinal worms	3	4
Diarrhoeal diseases	4	5
Pneumonia	5	7
Skin diseases	6	3
Gonorrhoea	7	6
Eye infections	8	8
Accidents, fractures, burns	9	9
Rheumatism, joint pains	10	10

Notes: 1. These rankings are based on people who received treatment at health facilities.
Source: Republic of Kenya. no date. Narok District Development Plan 1989-1993. Nairobi: Ministry of Planning and National Development.

4.2.5 Diseases of the respiratory system

The Maasai live in small round huts with hardly any ventilation. They share these with shoats and calves. Such overcrowding is worsened by lighting fires which produce smoke. These conditions lead to various respiratory tract infections including pneumonia, tuberculosis, flu and common colds.

4.2.6 Malaria

Malaria mosquitoes find ideal habitats in the bushes, forests and swamps which characterise Maasailand. Also, mosquitoes can and do survive in pits and quarries, and along roads where water stagnate, since a large part of Narok is usually dry and discourages large mosquito breeding the latter increase dramatically following the rainy season causing malaria epidemics.

4.2.7 Intestinal worms

The Maasai eat considerable amounts of meat in their normal diet and also during ceremonies. However, much of this meat is either eaten raw or is poorly cooked. Yet the cycle of food contamination with various worms cannot be broken without higher personal hygiene and cleaner water supplies. Save for very few exceptions,

the Maasai in Narok do not have would graze. All kinds of worms including hookworms, tapeworms and roundworms are present.

4.2.8 Diarrhoeal diseases

As already indicated, water is a serious problem in Narok. This is worsened by lack of latrines and overcrowding in houses. Overcrowding especially encourages flies which abet the spread of fly-born diseases including diarrhoea and vomiting.

4.2.9 Skin diseases

Skin diseases such as scabies, measles etc. are prominent because of lack of clean water and low personal hygiene. Also, there is little supply and consumption of fresh fruits and vegetables among the Maasai.

4.2.10 Pneumonia

This is related to overcrowding in houses. Maasai houses are smeared with cow dung on the roof and are particularly troublesome during the rainy periods. They leak heavily. These conditions are ideal for pneumonia and upper respiratory tract infections. Sometimes, the Maasai cover the tops with cow hides as shelter against rain. This, however, does not provide complete protection and the houses become a muddy mess, thanks partly to urine, dung and animal trampling.

4.2.11 Gonorrhoea

Gonorrhoea, a sexually transmitted disease, has been known to be widespread among the Maasai since the colonial time. This is associated with the relatively open and liberal sexual mores of the Maasai (see chapter 5). Although the Maasai claim that they have a treatment for the disease, it is likely that a cure is not obtained and the disease tends to perpetuate itself in chronic form.

4.2.12 Eye infections

Trachoma or eye infection is common among the Maasai. It is associated with the poor conditions in the Maasai living environment whereby the many houseflies transfer the disease from person to person.

4.2.13 Accidents

Accidents take place at home and on the range. Such include mauling by wild animals and resultant fractures.

Other important diseases among the Maasai are tuberculosis, whooping cough and anaemia. The latter appears to be a complication of several diseases including intestinal worms, hookworms and even malnutrition and undernutrition. The worms suck blood and leave intestinal walls bleeding. Marasmus, kwashiorkor and underweight which are frequently encountered among Maasai infants and children reflect protein energy malnutrition and are most severe during long dry seasons or drought periods.

4.3 Health Services

Despite the health problems discussed above, Narok district is poorly served with health facilities. Table 4.4 shows the numbers of various categories of health facilities available. There are only two hospitals - Narok district hospital with a bed capacity of 150 and St. Joseph's hospital at Kilgoris, a Roman Catholic Church Institution with a bed capacity of 175 in 1986 (Kenya, 1984c: 25; St. Joseph's Hospital, Kilgoris, 1987).

Narok's health facilities are far removed from the centres of population. Most people travel a distance of 15km to reach the nearest health care facility. This is made more difficult by the unavailability of access roads and thus automobile transport. People must walk on foot through grassland and scrubland to reach a medical facility. The problem is worse in the drier parts of the district which are far removed from health facilities.

By most accounts, the existing health facilities in Narok are underutilized (see for example, Kenya, 1979: 83-84). A decade ago there were 31 existing health centres and dispensaries in the district. Of these, only 16 were described as either "adequately used," "fully used", or "used to the maximum". Nine of the total number were described as underused. A total of 2 health centres and 4 dispensaries were not being used at the time. Of the former, only one, Mulot health centre was under construction. The rest lacked either health personnel or

both health personnel and water. These same reasons were ascribed to the underutilized facilities (see Kenya, 1979a:83-84).

Table 4.4: Medical facility to population*

Facility	Number	Facility: population (1989)
Hospitals	2	1: 177,000
Health centres	10	1: 35400
Dispensaries	36	1: 9800

* The facility to population ratios are calculated on the projected population of 353,994 for Narok in 1989. This projection assumes constant levels of fertility and mortality (Kenya. 1983b: 143).

Table 4.5: Number of out-patient visits per day by level of facility

Facility	Average daily attendance
Health Centres	
Olokurto	20
Nairage-Engare	72
Naroosura	30
Ololulunga	20
Lolgorien	33
Kilgoris	35
Keekorok sub-centre	20
Enabelbel sub-centre	24
Emarti sub-centre	60
Angata Baragoi sub-centre	45
Naikara sub-centre	15
Ilkerin sub-centre	15
St. Anthony	16
Dispensaries	
Government Prison	10
Ewaso Nyiro	12
Ol Choro	15
Oloolpirontio	17
Mosiro	15
Sakutiek	20
Naibor Ajijik	10
Kojonga	22
Siyabei	15
Olposimoru	18
Maji Moto	10
Health Centres	Average daily attendance
Morijo Loita	20
Entasekera Loita	15
Olmesutie	13
Megwara	16
Lemek	15
Aitong	12
Mara Serena	10
Enoosaen	12
Ole Reko	10
St. Theresa	20
Endonyo Erinka	10

Source: Kenya, 1984C: 82

In general there is low outpatient attendance at various facilities (Table 4.5). This is curious in light of the existent numerous environmental health problems. It appears that areas with high population densities are the ones with local health facilities fully utilized. As will be shown later, such areas are settled by non-Maasai immigrants some of whom have been assimilated. Such is the case for Kilgoris, Lolgorien and Angata Barigoi. There are health facilities in ecologically better-endowed areas but which are not fully utilized for lack of drugs, water or personnel

In the Maasai - occupied dry areas of Narok, access to health care is problematic. However, the Maasai themselves add to the problem; a large proportion does not go to health facilities. It procures treatment of common ailments at home. There is heavy patronage of herbal medicine. Each Maasai youth is taught about the medicinal value of herbs as part of youthful education (see Sankan 1971). As such the Maasai know certain herbs which treat several common ailments, for example diarrhoea and vomiting, malaria etc. Belief in the efficacy of traditional medicine, illiteracy, inaccessibility of health facilities, and lack of health personnel all contribute to perpetuate Maasai beliefs and actions to the detriment of their health.

For the vulnerable groups of expectant mothers, infants and children, life is no better. There are scant maternal-child health facilities. Only about 32 immunization centres are in place in Narok with a coverage of about 32 per cent during the last review done in 1987 (District Health Education Officer, personal interview, 1990). However the Ministry of Health targets an immunization coverage of 60 per cent of the district. By 1993 it is expected that there will be 40 immunization centres (Kenya, 1989c:146).

5. POPULATION CHANGE IN NAROK

5.1 Recent Trends

Narok district counted some 210,306 persons in the 1979 census. Of this total over 60 per cent was aged under 20 (Table 5.1). The total population was estimated to be 336,923 in 1988 (Kenya, 1989C:7) whereas the projected total in 1989, assuming constant levels of fertility and mortality, was 353,994 (Kenya,

1983b:143). The 1979 data revealed a district-wide total fertility rate of 6.57 children compared to 7.29 for the Rift Valley province and the national figure of 7.17 (Kenya, 1988: 93)

Although the TFR of 6.57 for Narok is lower than that of the province and Kenya as a whole, it is still thought to be somewhat high for the Maasai people themselves. Narok district has a mix of non-Maasai ethnic groups which formed 44 per cent of the population in 1979 (Table 5.2). Most of these people are immigrants from neighbouring cultivator communities who have moved into the ecologically wetter areas of Narok (chapter 4). Such people record higher fertility than the Maasai people themselves. As can be gleaned from Table 5.2 the total share of the non-Maasai population increased from 21.3 per cent in 1962 to 33.5 per cent in 1969 and to a staggering 44 per cent in 1979. Between the intercensal years of 1969 and 1979 the non-Maasai population grew at an annual growth rate of 8.2 per cent whereas the data show the Maasai people themselves, as having grown at a slower rate of 3.6 per cent. It is not clear whether the latter figure represents Maasai rate of natural increase; however given that some parts of Narok were undercounted in 1969 because of physical remoteness and taboo against counting (Kenya, 1980a) the actual figure could be lower.

Table 5.1: Narok district: Population by sex and age grouping, 1979.

Age group	Male	Female	Total
0 - 4	21316	21836	43152
5 - 9	18412	18155	36567
10 - 14	14031	12125	26156
15 -19	10266	10219	20485
20 - 24	7759	9619	17378
25 - 29	6767	7727	14494
30 - 34	5166	6051	11217
35 - 39	4473	4718	9191
40 - 44	3698	3667	7365
45 - 49	3274	3133	6407
50 - 54	2424	2304	4728
55 - 59	2116	1737	3853
60 - 64	1503	1374	2877
65 - 69	1260	928	2188
70 - 74	857	732	1589
75 +	1261	1140	2401
Age not stated	144	114	258
Total	104,727	105,579	210306

Source: Republic of Kenya, 1981. Kenya Population Census, 1979; Volume I Nairobi; Central Bureau of Statistics, Ministry of Economic Planning and Development, p.218.

Table 5.2: Ethnic composition of Narok district, 1962-1979

Group	1962		1969		1979	
	Number	Percentage	Number	Percentage	Number	Percentage
Maasai	86,472	78.7	83,243	66.5	118,091	56.0
Kalenjin	20,766	18.90	32,242	25.7	59,921	28.0
Kikuyu	670	0.60	4,578	3.66	17,387	8.0
Gusii	251	0.23	816	0,65	4,525	2.0
Luo	151	0.14	834	0.66	2,812	1.0
Luhya	100	0.09	282	0.54	1,821	0.9
Kuria	167	0.15	429	0.34	1,426	0.7
Okiek	871	0.8	1,024	0.82	1,528	0.7
All others	426	0.4	1,371	1.09	2,785	1.0
Totals	109,874		125,219		210,306	

Source: Sindiga, 1986:166

Adding to the complexity of unraveling the fertility of Maasai people is the fact that the Maasai have for generation sought and married Kikuyu women who appeared to record higher completed fertility than their own women. Also, there are numerous cases of Kikuyu people who have moved into Narok, changed their names and adopted the local language. They, however, are mixed farmers and petty traders; effectively engaged in a different mode of production. Such people pass as Maasai-speakers.

If establishing the current Maasia fertility rate is an uncertain exercise, attempting to sketch fertility and population growth trends during the pre-colonial and colonial periods appears futile. All that is known is that the Maasai occupied much of Kenya during the seventeenth century (chapter 4 above). By the mid-nineteenth century they were at the peak of their power in East Africa. The Maasai must have been slowly increasing in numbers and probably amassing more livestock. These seem to have enabled them to cover such a wide territory. They also assimilated other groups in the process.

Towards the end of the nineteenth century the Maasai suffered from the demographic catastrophe discussed in chapter 3. A series of protracted civil wars among Maasai *iloshon* broke out beginning around 1815. These wars were apparently about the control of resources. Nevertheless they led to severe population loss. Then disease epidemics afflicted East Africa. Specifically, the smallpox epidemic of 1892 reduced the Maasai population by half (Sorrenson, 1968:190). These misfortunes were exacerbated by drought and consequently famine. Maasai refugees scattered over a large area among neighbouring peoples (Sindiga, 1984:27). By the time of European incursion in Maasailand the Maasai were only beginning to recover their population.

5.2 Growth Trends in Colonial Period

Narok district was established in 1913. It was administered as part of the Maasai reserve until 1953 when it fall under the aegis of the southern province. However, British overlordship on the Maasai had begun in 1895. During this general period it was difficult to determine the population of the Maasai in general and that of Narok in particular.

Table 5.3 provides estimate of the total population of Narok and that of the Maasai from 1919/1920 to the time the first census involving Africans was taken in 1948. The years represented on this table are only those for which data are available in archival records. These estimates are fraught with many difficulties. They were based on incomplete tax rolls. The standard colonial practice in Kenya was to estimate total population by obtaining the number of huts, multiplying by three, and adding the total number of *ilmurran* or warriors on tax registers. Thirty seven per cent of the population was assumed to be made up of children. As custom prohibited counting, figures of women and children given to hut enumerators were deceptive. Also, the Maasai shifted frequently and there was little way of making accurate estimates as to their population.

With the caveats noted above, the data on Table 5.3 are merely rough estimates. Whatever statements may be made on fertility and population growth trends of the Maasai will be at best speculative. The validity of the generalizations will derive only with comparative observations of neighbouring ethnic groups.

Table 5.3: Narok population, 1919 to 1948[1]

Year	Total	Maasai	Other African Kenyans	Europeans	Asians
1919/20	26,112	26,000	N/A	9	103
1930	33,694	30,046	3648	22	108
1941	23,614	22,817	621	36	140
1942	24,502	23,619	617	35	231
1943	24,817	23,900	664	26	227
1944	23,263	22,449	544	29	241
1945	23,924	23,047	607	29	241
1946	27,654	26,874	500	20	260
1948[3]	34,810	N/A	N/A	N/A	N/A

1. These figures represent only years for which data are available. There was no census involving Africans in Kenya until 1948. Most of the figures for the non-European and non-Asian population are crude estimates based on incomplete data derived mainly from hut tax rolls. Thus the estimates for 1919/20 and 1930 might have been highly exaggerated.
2. These were mainly non-Maasai people such as the Kikuyu, Kipsigis, Somali and so on.
3. The first census involving Africans was conducted in 1948. Even then, the figures on the Maasai may be inaccurate because of the sparse population distribution in vast, remote and largely dry area; taboo against counting; and clerical errors. It may be noted also that in this particular census, clerks combined counting with tax collection (District Commissioner, Narok, 1948). The latter makes it imperative to read the figures with caution as people may have canceled others for fear of tax payment.

Source: District Commissioner, Annual Report of the Narok District, 1919-20; 1930; 1931; 1941; 1942; 1943; 1944; 1945; 1946; 1949. File No. Dc/NRK/1/1/1.

The data on Table 5.3 suggest that Maasai population was more or less static until the first census was done in 1948. The shortcomings of these data have already been highlighted above. For Kenya in general, Governor Philip Mitchell estimated that during the early 1950s population in ecologically better-endowed areas was growing at about 2 per cent per year. But this figure was disputed both by the demographer R.R. Kuczynski (1977) and the East Africa High Commission (Great Britain, 1961). In the early 1930s the Kenya Land Commission noted that population was growing at 1.5 per cent per year (Great Britain, 1934). Again, Kuczynski suggested a much lower rate of 0.5 per cent per year in 1948 (Great Britain, 1961).

Whatever evidence is available from archival records suggests that Maasai fertility and population growth rate were much lower than for peoples in ecologically wetter areas. The officer in charge of Maasai extra territorial district, for example, noted that Maasai birth rate was lower than that of other African peoples (Maasai Annual Report, 1924-5). In the words of an earlier report, Maasai birthrate was an "extraordinarily low one" (M.A.R. 1921-9). It would seem that the population of the pastoral Maasai was growing much more slowly than the neighbouring cultivator groups or even among Maasai men who married Kikuyu wives (District Commissioner, Narok, 1953-14). The reason given for the conclusion is that the non-Maasai experienced less infant and child mortality than the Maasai. As to the Maasai marriages to the non-Maasai, it is not clear what motivated the men to do so. It would appear that part of the explanation is the high level of sterility among Maasai women. The Maasai are known to have intermarried with many other groups notably the Kikuyu and the Kipsigis. Indeed, Maasai men married from any ethnic group provided the women were circumcised. Be that as it may, the Kikuyu women who were married among the Maasai tended to keep their customs and cultivated land (DC, Narok, 1953:7).

A health survey conducted among the Maasai between November 1930 and April 1931 revealed evidence of high levels of sterility and extremely high child mortality(Kenya, Colony and Protectorate, 1933:25-26). The medical officer conducting the investigation visited not just Narok district but all parts of Maasailand. He concluded that "about 34 per cent of the women appear to be sterile" and "almost certainly the folk are not increasing in numbers----" (Kenya, 1933: 25). He noted that child mortality "bordered on 500 per 1000 live births". While the cause of the high level of sterility was identified as gonorrhoea, the

reasons for the high infant and child mortality were not explicitly identified. However, environmental sanitation was poor with high rates of infection with hookworm, tapeworm, eye infections and gonorrhoea (Kenya, 1933). The prevalence of diarrhoea and pneumonia was high. In addition there was no intake of vegetables and fruits which provide the body with vital vitamins and minerals (Kenya, 1933).

Another study was conducted during 1951 by Dr. Mackay, Medical Officer of Health in Narok district, to inquire into fertility and child mortality. His report did not provide figures of completed fertility. But while concluding that the number of births among the Maasai was normal he noted that "infant wastage rate is (sic) in the region of 400 per 1000" (quoted in District Commissioner, Narok 1952:19). This conclusion might appear to be supported by the results of a sample survey of 256 Maasai women taken at the end of the 1950s. It showed a total fertility rate of eight children per woman; however, only three survived beyond 10 years of age (see Molnos, 1972:241). According to estimates, half of all children born alive died by the end of the first year essentially from diarrhoea and pneumonia (Molnos, 1972: 241).

5.3 Fertility Determinants Among the Maasai

5.3.1 Patterns of Marriage

In order to understand patterns of marriage and sexual unions among the Maasai one needs to examine their societal structure. Maasai society is organized hierarchically with male elders holding the ultimate control (see chapter 2). Traditionally, male elders are heads of households and keep the ultimate ownership of family herds and flocks. This translates into control over bride wealth and the ultimate authority to sanction the marriage of younger men.

Younger men must undertake a period of residence as warriors and go through obligatory ceremonies and rites of passage before obtaining elder permission to marry. A Maasai young man first becomes circumcised at the age of 16 or 17 or higher (Fosbrooke, 1938:31). He then teams up with other initiates to form an encampment or *emanyatta.* The time between circumcision ceremonies and the formation of such a *manyatta* is, on average, 3 years (District Commissioner, Kajiado, 1948). In the *Manyatta* the warriors are instructed and guided by *ol*

piron. The latter are all the elders whose age set takes responsibility for a particular age-group of warriors and is usually one age set above the most junior elders (District Commissioner, Narok, 1948; Fosbrooke, 1938).

The next step for the il murran is to go through the *eunoto* ceremony. The time lag between the formation of the *emanyatta* and *eunoto* varies from one Maasai *iloshon* to another; however, it varies from 3 to 7 years (Holford Walker, 1959). The *eunoto* ceremony is a blessing festival bestowing rights of marriage to warriors. Effectively, the *eunoto* marks the promotion of junior warriors into senior warriors. During the ceremony, *moran* and girls assemble and spend the day dancing. Elders eat and drink. After the *eunoto*, a moran gains senior warrior status and remains so until the "drinking of milk" ceremony. The latter really is the marriage ceremony and usually takes place 2 years after the *eunoto*. After individual senior morans have married, another ceremony called *ol ngesher* takes place. Upon this ceremony, members of the entire age-set or the group circumcised together officially become elders.

It is clear that young men spent many years, infact up to 10 years in warriorhood and this inevitably delayed their marriage. On average, a Maasai male could marry at between 25 and 35 years of age (Jacobs, 1973:399; Hollis, 1943:121). This high age at first marriage for men allowed sub-fecund male elders to accumulate more livestock and marry other, younger wives with adverse effects on fertility. As will be seen below, dowry is not really heavy; however a rich elder who is able to give gifts to the prospective father-in-law stands in better stead to consummate a marriage than either a poor elder or *il murran* (see Kituyi, 1990:126). Hence the significance of accumulating livestock, a sign of wealth among the Maasai. It should be understood that marriage among the Maasai is an affair organized between male parties, that is, the bride's father and local elders and either the suitor or his patrilineal representatives (Kituyi, 1990:124). Such arrangements are made before a girl is circumcised or during the period of convalescence for the female initiate.

A Maasai woman (save for a few Christians now) cannot get married before she is circumcised. Also, it is a shame for a woman to have sex if she is uncircumcised. Any love making and petting taking place between uncircumcised girls and warriors in a manyatta is expected to preclude coitus (Jacobs, 1973). Similarly, a Maasai woman is not expected to have a child if she is not circumcised. Thus, the

period of wound recovery after circumcision is the time when a number of potential suitors arrive at the home to negotiate marriage. It is upon the father and close male relatives to select a future husband for the daughter. The would-be-bride may or may not have knowledge about the future husband. But she has no say in the ultimate choice.

From fieldwork in Kilgoris division in 1989, I gathered that poor old men are not able to marry many wives. The parents of prospective subsequent wives would not agree. Hence the necessity to accumulate livestock. Among the Uasin Gishu iloshon, dowry payable in the olden times was 5 head of cattle. Currently, the maximum number is 9 head outside an assortment of other requirements. Dowry composition is something like the following: 8 cows, one bull, one sheep (for the mother of the girl because the cattle belong to the father), one *osurutial* or wire ring for the arm of the girl's mother, one blanket and one hundred Kenya shillings for the father. Fosbrooke (1938) found that among the Tanganyika Maasai, dowry consisted of 2 heifers and one bullock. However, a richer elder was preferred to a poor *il murran*.

The Maasai hierarchical structure was stable because young men themselves aspired to become elders upon which they would be accorded the same status and enjoy the benefits appertaining thereto.

Average age at first marriage for women is 17 to 18 years. But this relatively young age does not always insure high completed fertility. Taboos related to postpartum sexual intercourse and polygyny traditionally kept fertility relatively low. Also, as seen in chapter 2 above, early marriage may mean a period of infertility for the woman and/or come with childbirth complications because of an immature pelvis.

Among the Maasai, widows are usually not remarried. In case of a younger woman, the elders appoint a person, often a cousin to the deceased, to father children. The widows are not expected to run away. However, widowers can remarry.

5.3.2 Postpartum taboo

The Maasai avoid coitus during the first six months after parturition. The actual period of sexual abstention according to field informats varies from 4 to 6 months.

For the time the postpartum taboo is in force, a man seeks coitus with another wife. Partly for this reason, polygyny is a universally approved practice among the Maasai. The number of wives a man marries depends on his wealth. Other reasons for polygyny are every African's desire to have many children and the socio-economic roles of women in the Maasai society. The women tend family livestock, and attend to household chores such as cleaning gourds, fetching water and firewood, milking cows, cooking, and brewing *busaa*, traditional beer. They construct housing apart from cutting tree saplings and carrying these to the site. In addition, some women are beginning to cultivate land especially in ecologically wetter areas.

Even in monogamous families, the postpartum taboo discouraged sexual intercourse for several months (Jacobs 1973: 403). However, there may be limited sex between couples through the practice of coitus interruptus. This is allowed providing that there is no resulting conception. Thus, the postpartum taboo ensured reasonable child spacing which had the overall effect of lowering fertility.

5.3.3 Frequency of intercourse

The regularity or otherwise of sexual intercourse has a significant effect on fecundity. The latter rises with more frequent coitus and declines with infrequent intercourse (see chapter 2 above).

The Maasai live on land where herding resources (pastures and water) vary spatially and temporally. During the dry season between January and March the men must move with livestock farther a field into Kajiado and even across the border into Tanzania, leaving their wives behind. This separation of spouses, sometimes for several months reduces coital frequency and may ultimately lead to lower fecundity (Lesthaeghe et. al., 1981:5; Menken, 1979; chapter 2 above). Also, allowing for the fact that a woman's fecundity declines with age, long separation will tend to reduce the chances of conception (Lesthaeghe et. al., 1981).

Another factor influencing the frequency of intercourse is age which is associated with polygyny. As noted above, polygyny is a prevalent practice and old sub-fecund men marry young, adolescent brides. Such men are highly unlikely to have coitus frequently because of their declining sexual libido (see Bulatao, 1984 61) This will affect chances of conception even for young brides Frequency of intercourse for any one woman would, on average, decline significantly if the husband has more than two wives because of the time it takes to visit with one of them.

Yet a related problem which may hinder conception is the Maasai conservative coitus position. Maasai couples reportedly sleep side by side facing one another thus hindering full penetration (Jacobs, 1973: 399).

5.3.4 Nutrition

It was shown in chapter 2 above that nutrition may have a significant effect on fertility. The Maasai experience seasonal food shortage. During the past two decades, there were periodic droughts notably in 1976, 1980 and 1984. The Maasai lost most of their herds because of insufficient fodder. In a survey conducted in Maasiland in early 1984, 43 per cent of the respondents said that the food produced in their farmsteads in the previous year was not sufficient to feed the family members (Sindiga, 1986). However, about half of the respondents reported that the 1983 food harvest was normal suggesting that food shortages are a recurrent problem among the Maasai. Under nutrition may lead to anaemia and weight loss among expectant mothers and translate into weak and under weight infants. These problems combine with other environmental health hazards in Maasailand (chapter 4) to cause high infant and child mortality.

For pregnant women, the Maasai have a taboo against eating certain foods. Such include fresh milk which may make the foetus too big. It is believed that this will sap the energy of the expectant mother and end up in a large sized baby which would cause problems during delivery. An expectant woman is expected to be slim. She is given sour milk which is skimmed to remove the butterfat content. Occasionally, a Maasai expectant mother is given boiled meat mixed with blood (*monono*). This is believed to strengthen the foetus. Starch foods such as *ugali* (maize meal) and potatoes may be eaten where these are available. The reason for

this appears to be that the Maasai are unaware of the fattening attributes of starch foods (Sankan, 1971: 52).

In the effort to keep pregnant women slim, the women may be denied fresh milk, the only food source available especially in the drier areas of the range. The result is undernourishement which may lead to pregnancy wastage and underweight children with increased chances of early deaths. Indeed, Maasai women themselves suffer from "acute anaemia shortly after childbirth" (Jacobs, 1973: 403). This is caused by undernutrition and lack of a balanced diet; one which also supplies minerals and vitamins. Fresh fruits and green vegetables, for example, are rarely consumed.

5.3.5 Disease

As shown at the head of this report, PID is the primary gynecological disorder in tropical Africa. It is common among the Maasai (Doenges and Newman, 1989). In general, sexually transmitted diseases especially gonorrhoea are common among the Maasai. This problem has persisted since the colonial time. Hollis (1943), noted that STDs were a common problem in Maasailand in colonial time. Most administrative reports for the period noted STDs to have been one of the leading health problems; others were eye diseases and intestinal worms. An estimated one in five adults had venereal disease (Gulliver, 1979: 31).

One of the problems of coping with venereal disease was the inability to obtain sufficient penicillin supplies (see for example, DC, Narok, 1952). Also, most of the people could not present themselves for treatment because of long distances to the few existing health facilities. However, it was common for a man to present himself for treatment and leave his spouse back (DC, Narok, 1952). This tended to perpetuate the infection. Finally, since the Maasai are migratory in nature, they were unable to complete their prescription and obtain a cure.

STDs are still widespread among the Maasai. A decade ago, eye ailments and venereal diseases accounted for most of the drugs ordered in Narok district (Kenya, 1980a: 53). Even at the present time, gonorrhoea is one of the leading ten diseases treated in the Narok district health facilities (see Table 4.3). But what is the accounting for the prevalence of venereal diseases?

Among the Maasai, males of the same age-set are allowed to have sexual intercourse with the wives of their contemporaries[4]. This is especially so with visitors from a distant place. The male host moves away to sleep in another village and leaves the wife with the visitor. Also, a man could visit and have sex with a woman whose husband was away on safari provided that the men are of the same age-set. Such arrangements are tacitly approved in traditional Maasai society. It is believed that this group sexual behaviour leads to the expansion of venereal diseases which could contribute to depressed fertility.

Although not approved, it is widely acknowledged that the *il murran* have coitus with unmarried girls. Also, the warriors make arrangements to have sex with married women belonging to men of another age-set. As noted earlier high sexual mobility is a probable cause of the wide expansion of venereal diseases which in turn cause infertility.

There are a number of other health problems which have a bearing on fertility and infant and child survival. Personal hygiene is low especially because of lack of enough water and because of the housing circumstances (chapter 4 above). The relatively poor sanitation leads to a high incidence of infectious and parasitic diseases which are the major causes of morbidity in Narok. Malaria, which is a suspected cause of infertility (chapter 2 and 3), is for example, a major problem among the Maasai.

5.3.6 Implications of Population Change

Although the Maasai fertility and population growth rate have been comparatively low, this cannot be said for Narok district as a whole. Population has been growing rapidly over the past several decades. The engine to that growth has been the immigration of cultivators from neighbouring communities.

Immigration has had a number of consequences:

1) alienating most of the wetter areas of Narok from pastoral use. The immigrants, and now some Maasai themselves, cultivate the land thus keeping away livestock.

2) forcing the pastoralists to move to the drier areas of the range. These areas which previously were used for only wet season grazing (while the wetter areas served as dry season grazing) have now to be used continuously with adverse consequences both to the landscape and the people.

Sindiga's (1986) work in Maasailand using carrying capacity estimates and indicators of population pressure revealed that areas suffering the greatest pressure are the semi-arid and arid parts. Here, overgrazing and soil erosion were obvious on the landscape. The people were not self-sufficient in food production and there were hardly any surpluses. A large proportion of herders supplemented ranch production with off-farm income derived primarily from petty trading.

It is clear that the Maasai are slowly experiencing higher fertility than previously. Should this trend pick up, it will add to the population of the district with negative consequences. It is expected that with greater sedentarization of the Maasai and higher food production, fertility will increase (see chapters 7 and 8). This will put additional pressure on the available resources.

6. FIELD METHODOLOGY AND STUDY DESIGN

Fieldwork for this study was conducted in Narok district. The latter is one of the two districts in Kenya inhabited mainly by the Maasai-speaking peoples (chapter 4). Narok was selected as a place for field focus because its biophysical environments span from the arid and semi-arid in the southern, central and some eastern parts of the district to the humid in Mau Narok and trans-Mara.

In the semi-arid and arid parts of the district, the Maasai practise a pastoral economy. They rear a mix of livestock comprising of sheep, goats and cattle. While the latter are the main stay of the Maasai economy through the provision of milk, blood, hides and skins; the role of shoats is equally significant, albeit frequently underestimated. Shoats are quite hardy in semi-desert conditions. Goats in particular, browse thereby utilizing leaves of shrubs and trees left on the range through the selective grazing of cattle. Shoats are slaughtered for meat and can provide milk. In addition, they are sold to provide cash for other household requirements.

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In the wetter areas of Narok, most Maasai are believed to have adopted mixed farming. They keep livestock and plant crops such as maize, beans, onions, vegetables and even wheat. In trans-mara, large areas are under maize. From field information, it appears that the Maasai offer their land for cultivation by Gusil and sometimes Kipsigis immigrants while they themselves remain basically herders. The maize harvest is then shared between the immigrant and the Maasai owner of the land. Under this "share-cropper" arrangement, the Maasai provide land and the immigrants till the land and supply farm inputs. Be that as it may, the Maasai eat grain. It is expected that in time they would adopt mixed farming at a larger scale.

Narok thus offered a setting for testing hypotheses on fertility dynamics (chapter one) of a single pastoral community undertaking different modes of production. The primary issue to be probed was the relationship between fertility and the socio-cultural and socio-economic profiles of this pastoral group. If such relationship could be established then it would be possible to postulate possible changes in fertility should the social and economic structures be modified. A specific goal of the study was to comment on changes in fertility associated with the sedentarization of pastoral peoples.

6.1 Preparation for fieldwork

As will be explained below, the fieldwork component of this study involved structured questionnaire administration and in depth interviewing. At the beginning of the fieldwork, assistants were recruited from the study sites. Both men and women participated. These people were Maasai speakers conversant with local customs and etiquette. And since these people were known in their locations, interviewer - interviewee confidence was achieved.

Field enumerators were trained both in the classroom and in the field. Initially, I familiarized the assistants with the purposes and objectives of the research. Then the questionnaire (Appendix I) was studied by going through each question. After this, the entire participating group went to the field for sample interviewing. A number of findings emerged from this exercise and were quite helpful in executing the final fieldwork. Among the insights gained were the following:

1) Culturally - sensitive questions were answered well when the questions were asked in a friendly human and tactful way. The interviewer had to endeavor

early on in the interview to strike an informal relationship with the respondent and then ask the prepared questions. The reason for this approach was that some of the questions were quite personal and involved issues about an individual's life. Unless such questions are asked carefully and sensibly, informants may decline to answer or simply provide false answers (Bleek, 1987).

2) Maasai women felt free when they were interviewed individually and in confidence rather than in group settings. It was intended when the study was proposed that only female interviewers be used to interview women following the success of this strategy with the Kenya Fertility Survey of 1977/78 (Kenya, no date (b): 69). However, in this study it was found that the integrity of the enumerator, conducting interviews individually, and maintaining the privacy of the respondent were more important to obtaining reasonably accurate information and minimizing the incidence of lying. Specifically, Maasai women respondents discussed the subject of the questionnaire freely when there were no men around the place of the interview.

3) Any problem which was met with recalling dates probably emanated more from illiteracy than willingness to answer or deliberate attempts to conceal the truth. A survey conducted about ten years ago revealed a very high illiteracy level in Narok. Some 78.8 per cent of the population could not read in any language while 80.9 per cent could not write in any language (Kenya 1982a). These figures are now dated and they provide little indication of the level of women illiteracy which must be much higher as will come out in the next chapter.

In this study, dates regarding age at menarche, age at first marriage and first live birth were estimated from date of circumcision. Generally, a Maasai woman gets married within a year of circumcision. This makes it possible to work out timing for the related events from this benchmark of circumcision.

6.2 Research sites

The sublocation, the smallest areal unit used by the Central Bureau of Statistics for the purpose of conducting the Kenya census, was used in this study. In the drier area of Narok, Megwara sublocation in Naikara location was selected. Megwara is in moisture zone IV (Table 4.1) which receives an average annual rainfall of

between 600 and 1100mm. The general climatic classification is semi-humid to semi-arid and the dominant vegetation is dry woodland and bushland. Here, crop cultivation using rainfall is difficult because of the high average annual potential evapotranspiration of between 1550 and 2200mm. The area is used for traditional pastoralism.

To represent the wetter part of Narok were Sikawa sublocation in Uasin Gishu West location and Osupuko sublocation in Miotanik West location (Figure 6.1). Both Sikawa and Osupuko are humid and have high agricultural potential. The choice of the sublocations was somewhat arbitrary. However, physical accessibility by road and availability of competent local field assistants influenced the choice.

Within each sublocation, clusters of villages were randomly selected. The enumerator then took the selected villages one by one interviewing each married woman in every household. Women within polygynous unions were interviewed as well.

6.3 Approaches to data collection

1. The questionnaire

A prepared questionnaire (Appendix I) was administered to married women of all ages within the study sublocations. A total of 224 people were interviewed; 114 in Megwara and 110 in Osupuko/ Sikawa. These interviews were conducted between November 1989 and June 1990.

The questionnaire sought basic data on the respondents including district of birth and residence, ethnic group, age and religious affiliation. Other data were collected on the home environment. Specifically, responses were elicited on the type of main house, the presence or otherwise of a toilet and type of water source for domestic use.

Data were also sought on the socio-economic status of the respondents. Questions were asked on the educational level, occupation and sources of household income. Questions on demographic characteristics included marital status, type of marriage, age at menarche, number of live births, birth intervals and

experience of abortion, if any. Other questions covered frequency of sexual intercourse, antenatal care and delivery, family planning and utilization of health services.

2. Unstructured, in-depth interviews

In addition to questionnaire data, I conducted detailed informal interviews with Maasai people. The purpose was to gain deeper insights into societal controls of fertility. Questions were asked on such issues as breast-feeding practices, prevalent modes of child delivery, widow remarriage, divorce, women's roles in household production arrangements and on the postpartum taboo. In general data were sought on the social structure and economy of the Maasai and how these affect fertility both past and present.

Data from informal interviews added to data gleaned from documentary and archival sources. The latter was used to obtain epidemiologic data, for example, prevalence of sterilizing diseases (gonorrhoea, malaria etc.); prevalence of abortive diseases e.g. syphilis; maternal morbidity and mortality; and incidence of abortion and stillbirths.

7. EMPIRICAL FINDINGS

7.1 Basic Changes

In addition to data provided in chapter 6, Table 7.1 provides basic geographic and population characteristics of the study sites. Of the total sample size of 224 respondents, 96.4 per cent claimed that they were Maasai-speaking. All the Megwara respondents (N= 114) said that they were Maasai; although six noted that they were born in Tanzania.

All the interviewees were married women. Their age profiles are shown on Table 7.2. In general, respondents stretched from the 15-19 age group to over 60 years.

The literacy level among Maasai women is very low. Of all the women in the sample, 87.5 per cent admitted that they could not read or write. This rate may be compared to 78.8 per cent for the entire Narok population according to a survey

reported in the early 1980s (Kenya, 1982: 3). The largest proportion of illiterate women is in the drier Megwara area where 98.2 per cent replied that they cannot read or write. Only one person was attending an adult literacy class in the area. In contrast, some 76.4 per cent of the women from the high potential areas could not read or write. Some 20.9 per cent of these women could read and write. This group was under 30 years of age. A total of 8 women was attending adult literacy classes.

It is possible that the higher proportion of women in Sikawa/Osupuko who could read and write may be explained by the presence of non-Maasai speaking women in the sample. It is well known that Maasai women are heavily disadvantaged in matters of education. Even the few who may get into primary school do not stick in there for a long time. They drop out and prepare to get married by undergoing the madatory circumcision rites.

Table 7.1: Population characteristics of study sublocations, 1979

Sublocation	Area	Population 1979			No. of Households	Household size	Density
	(KM^2)	Male	Female	Total			Persons/Km^2
Megwara	184	1057	1070	2127	348	6.1	11
Sikawa	107	829	977	1806	255	7.0	16
Osupuko	31	579	669	1248	149	8.37	39
Total	322	2465	2716	5181	752	7.2	22

Source: Kenya, 1981b

Table 7.2: Age profiles of respondents

	Number		
Age group	Sikawa/Osupuko	Megwara	Total
15-19	0	8	8
20-24	7	21	28
25-29	27	17	44
30-34	18	13	31
35-39	10	11	21
40-44	4	7	11
45-49	8	6	14
50-54	2	9	11
55-59	4	7	11
60 +	7	9	16
	87	108	195

Source: Own field data.

In terms of occupation, nearly all the interviewees reported that they worked as housewives and herders. This suggests that they are involved in traditional roles assigned to Maasai women; namely, constructing dwelling places, collecting water and firewood, and doing other domestic chores such as cooking and child-rearing. Some 24.6 per cent of the respondents from Megwara, however, said that they combine household chores with making various ornaments such as bungles and bracelets. It may be noted that the Megwara sublocation borders that Maasai Mara game reserve, a popular European tourist destination in Kenya. The Maasai women in the area have organized themselves into groups to make curios which they sell to the tourists.

7.2 Home Environment

This survey asked questions on the home environment with specific reference to environmental sanitation. The purpose was to gauge the environmental-health circumstances in which women live and bring up their children. This would form the basis for interpreting data on morbidity and mortality.

In the drier part of Narok (as represented by Megwara in this study), everybody lives in the Manyata-type dwelling as described in chapter 4 above. However, in the wetter part, the Maasai have put up grass-thatched houses instead of the traditional manyata-type. Some 84.9 per cent of the interviewees (N= 106) said that they lived in such housing. The rest were in houses which were roofed with iron sheets. This can partly be explained by the influence of the large group of Gusii and Kipsigis immigrants in Kilgoris.

The disposal of human excrement is also a problem in Maasailand. Virtually everybody goes to defecate in the bush where also the livestock go for pasture. There was no pit latrine in Megwara (N= 114). However, 14 per cent of the Sikawa/Osupuko respondents said that they have a pit latrine at home. The preponderant number uses the bush. Overall, 93.2 per cent of the respondents (N=221) had no toilet facilities at home. These conditions are quite ideal for the spread of intestinal worms and other parasitic and transmissible diseases (chapter 4).

When asked on their source of water for domestic use, all the Megwara interviewees said that they use the river. The sources of water for the

Sikawa/Osupuko people are more diversified. Some 52 per cent of the respondents (N=110) draw water from the well/bore-hole, 36 per cent from the spring and 12 per cent from the river.

The water is not treated before being used. When asked on whether the women usually boiled water before drinking, only one per cent of the whole sample (N=221) admitted so doing. This means that the water used is likely contaminated by virtue of defecating on the ground.

In general, the conditions of Maasai homes are such that they are excellent habitats for the spread of infectious and parasitic diseases. As shown in chapters 4 and 5 above, these circumstances are aggravated by housing certain livestock with people. The result is various transmissible diseases (chapter 4) which may contribute to a relatively high infant and child mortality.

7.3 Marital Status

As noted above, the target group for the field study (Appendix 1) was married women including any woman who was once married but not necessarily living with the husband at the time of the interview. This decision was based on the notion that virtually all Maasai women get married. This means that the category of "single" in question 21 was not meaningful in the context of this study. The aim of the question was to decipher the incidence of divorce or separation among Maasai women.

The findings from this question show little evidence of divorce or separation. Only 2 per cent of the entire sample replied that they were divorced. There were no reported separations.

The divorce rate among the Maasai is very low; infact negligible. This may be understood in the context of the hierarchical structure of the Maasai society in which women have little say even in the choice of marriage partners. It is difficult to adjudge whether this necessarily translates into marital stability. This conclusion holds, at least at societal level and relations, notwithstanding whatever discontent the women themselves may have. Family problems between Maasai men and women are usually referred to the elders both from the home of the woman and the man. Whatever disputes exist are usually arbitrated this way to maintain harmony.

It may be recalled that marital instability and frequency of divorce are significant factors causing infertility in the Islamic areas of West Africa (see Adadevoh, 1974). If divorce is not a significant practice among the Maasai, then explanation of their low fertility might be sought elsewhere. It is probable that spousal separation (because the men must move livestock far away during the dry season) affecting coital frequency might be significant in reduced fertility.

There were a number of cases of widowhood. The proportion of widows in Megwara was 18 per cent (N =114) whereas that of Sikawa/Osupuko was 7 per cent (N= 107). Overall, the proportion of widowhood was 13 per cent (N =221).

Maasai widows are not usually remarried. They stay on and may get children from other men. The practice is for the male elders to appoint a person, often a cousin to the deceased man to father children. Such children are fathered in the name of the deceased person.

Table 7.3: Marital Status*

Question: Are you married, separated, divorced or widowed?

Category	Sikawa/Osupuko (N = 107)	Megwara (N = 114)	All N = 221
Married	98(92)	90(79)	188(85)
Widowed	8(7)	20(18)	28(13)
Divorced	1(1)	3(3)	4(2)
Separated	0		

* The figures in parenthesis are percentages.

7.4 Type of marital union

A large proportion (79 per cent) of marital unions are polygynous. Only a small proportion (21 per cent) of the interviewees were living in monogamous unions (N=202). The proportions are the same both for the dry and the humid parts of Narok. The data reveal that the majority of the men each have two to three wives. Eighty per cent of the women interviewed share a husband with one or two other women (Table 7.4).

These data show that Maasai traditions with respect to marriage patterns are very much alive. Polygyny facilitates child-spacing within marriage as the husband to a

nursing mother can turn to another woman for sexual satisfaction. Beyond this, more wives traditionally served certain economic and social functions which enhanced the status of the man (Sindiga, 1986: 156-157). The economic motive related to begetting more daughters and hence more livestock into the family herd when they got married. Boys could tend livestock and go raiding for more. In a nutshell, a large family size insured greater social and economic network via marriages. Such networks were always useful at the time of food insecurity which could be caused by diseases, drought or war.

7.5 Age at menarche and first marriage

From the survey responses, the age at menarche appears lower in the drier than the humid area. The mean age at menarche for women at Megwara is 15.5 years whereas it is 16 years for Osupuko/Sikawa. The respective median ages at menarche are 15.5 and 16 years (Figure 7.1).

Figure 7.1: Age at menarche

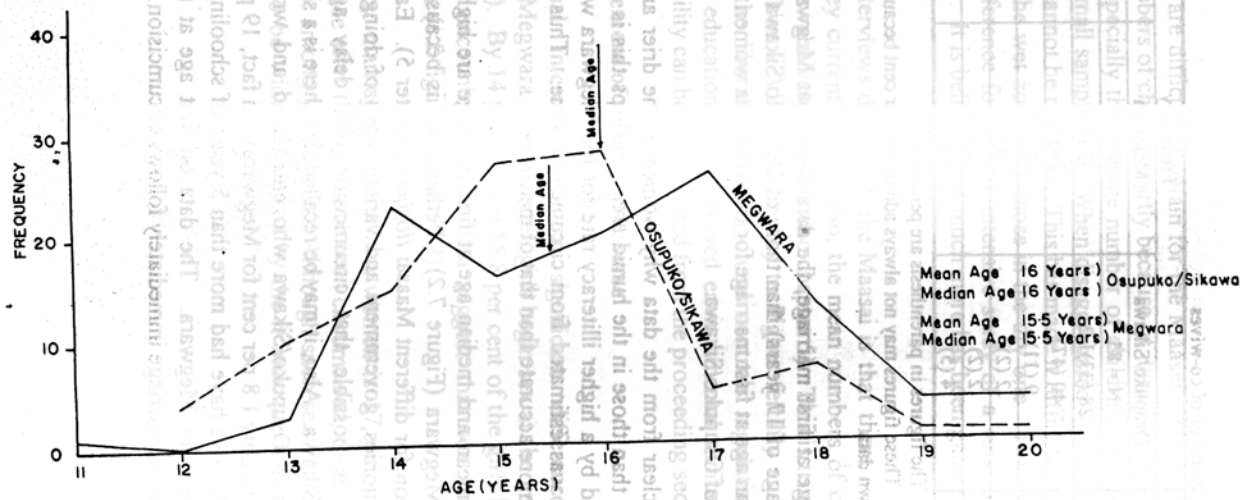

Table 7.4: Number of co-wives

Number	Frequency		
	Osupuko/Sikawa	Megwara	Entire sample
	N = 85	N = 75	N = 160
1	28 (33)1,2	32 (43)	60 (38)
2	40 (47)	26 (35)	66 (41)
3	9 (11)	11 (15)	20 (13)
4	2 (2)	4 (5)	6 (4)
5	2 (2)	2 (3)	4 (3)
6	4 (5)	Nil (-)	4 (3)

Notes: 1. The figures in parenthesis are percentages
2. These figures may not always add to 100 per cent because of rounding.

Source: Own data.

For the age at first marriage, the data show that Megwara women marry earlier (average age of 17 years) than those of Osupuko/Sikawa (19.1 years; figure 7.2). The median age at first marriage for the Megwara women is 17 years; and 20 years for those of Osupuko/Sikawa.

It is not clear from the data why women in the drier area have a lower age at menarche than those in the humid area. Perhaps this is a problem of inaccuracy occasioned by a higher illiteracy rate for the Megwara women. Also, the age at menarche was estimated from circumcision time. Thus age at first marriage is probably more accurate than that of menarche.

Both the mean and median age at first marriage are higher for Osupuko/Sikawa than for Megwara (Figure 7.2). Perhaps this is because of differential age for circumcision for different Maasai *iloshon* (chapter 5). Each iloshon organizes its own ceremonies, government and various ways of doing things (see Mol, 1978: Viii). It is possible that circumcision rites delay age at first marriage in Osupuko/Sikawa. Also, it may be recalled that there is a slightly higher percentage of women in Osupuko/Sikawa who could read and write (that is 21 per cent compared to only 1.8 per cent for Megwara). In fact, 19 per cent of the women in Osupuko/Sikawa have had more than 5 years of schooling compared to less than one per cent for Megwara. The data on first age at marriage are reasonably accurate, since marriage immediately follows circumcision.

7.6 Fertility

Accurate fertility data are difficult to obtain for the Maasai. This is because they conceal the actual numbers of children partly because of illiteracy. For this survey, the data on fertility especially the average number of children born by age group were affected by the small sample size. When disaggregated according to the age groupings the results cannot be relied on. This has made it difficult to compare the fertility of women in the wet zone with those in the dry one. The reason for the sample size is the preference for a more intensive study of a smaller group to a large, extensive survey. It is believed that much more has been gained by adopting this approach.

What is clear from interviews done with the Maasai is that there is a desire for more children than they currently get. Also, the mean numbers of children who survive beyond age 5 is relatively low (see also chapter 5). This is true of both the wet and dry parts of Narok. Perhaps the key to higher fertility and population growth rate will be the liberalization of cultural controls regulating marriage, greater food security, education, and improved environmental sanitation. Other factors influencing fertility can be extrapolated from the proceeding sections.

7.7 Age at commencement of sexual intercourse

Data on first sexual intercourse reveal significant differences between Osupuko/Sikawa and Megwara. In the latter, girls begin sex at the very early age of 10 years (Table 7.5). By 14 years, some 55.8 per cent of the girls have already had their first sexual encounter. These data suggest that sex precedes both menarche and marriage (c.f. figures 7.1 and 7.2).

The median age at first marriage for Megwara women is 17 years. And since marriage must take place after the girls have been circumcised, these data suggest frequent premarital sex among young girls. Although such sex is disapproved by custom, it is known to be widely practiced by the *il murran* in their manyattas (chapter 5).

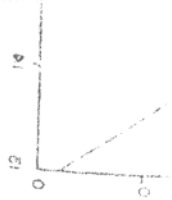

Figure 7.2

Age at first marriage

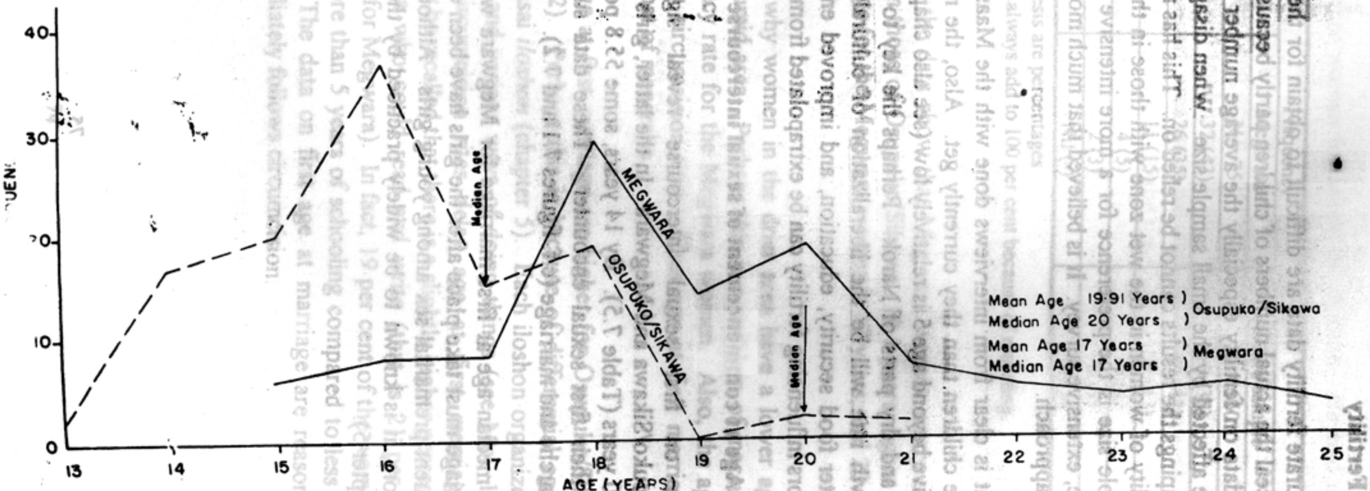

Table 7.5: How old were you when you had your first sexual intercourse?

Age	Frequency			
	Osupuko/Sikawa N = 109	Per cent*	Megwara N = 113	Per cent*
10	-	-	9	8.0
11	-	-	1	8.9
12	-	-	20	26.6
13	1	0.9	10	35.4
14	0	0.9	23	55.8
15	8	8.2	23	76.2
16	5	12.8	17	91.2
17	10	22.0	5	95.6
18	32	51.4	2	97.4
19	21	70.7	1	98.3
20	21	90.0	2	100.0
21	6	95.5	-	-
22	4	99.2	-	-
23	0	99.2	-	-
24	1	100.1	-	-

* These figures represent cumulative percentages.

Source: Own field data.

So long as such sexual relationships are arranged secretly and providing that a conception does not occur, the society does not mind. However, as shown in chapter 2 above, early sex can expose the girls to a host of complications including the probability of contracting sterilizing and abortive diseases during the teen age. Such diseases can affect fertility.

In contrast, women in the humid part tend to have their first sexual experience relatively much later. This begins at age 14; but even here, by age 18, over 50 per cent of the women would have had their first sexual encounter. By the time of marriage, that is 20 years, a full 90 per cent would already have become sexually experienced.

7.8 Frequency of sexual intercourse

One of the factors that affects conception and hence fertility is frequency of intercourse (chapter 2). Table 7.6 provides the responses to the question on the number of days that respondents were engaged in sexual intercourse within the

week preceding the interview. Sexual intercourse is quite infrequent. This is more so in Megwara where a full 70 per cent of the interviewees (N=114) reported that they had not had any sexual contact in the week preceding the interview. This rate can be compared to 50.9 per cent for Osupuko/Sikawa. For Megwara, those who had had sex within the week had it for between one and four days. Also, the majority of the Osupuko/Sikawa respondents had sex for the same range of days, that is one to four times.

When those who had not had sexual encounter were probed on the reasons, several answers were given. In Megwara, 82.5 per cent of the women said that they were either breastfeeding, pregnant or were too old. The rest gave varying reasons including sickness, menstruation or absence of the husband. The four leading reasons for non-involvement in sex in Osupuko/Sikawa were old age, pregnancy, breastfeeding and absence of the husband in that order. These reasons accounted for the majority, that is, some 85.7 per cent of the reasons. Minority responses ranged from old age of husband, possession of many wives by husband, menstruation, to death of husband. It may be noted that these interviews were conducted during rainy periods. This means that virtually no men were in far away locations with livestock in search of fodder and water. Perhaps cases of husbands' absence occur more frequently in the long dry season.

Table 7.6: Frequency of sexual intercourse
Question: Please tell me how many days you have engaged in sexual intercourse within the past one week.

No. of times/days	Frequency*	
	Osupuko/Sikawa	Megwara
	N = 110	N = 114
0	56 (50.9)	80 (70)
1	11 (10)	7 (6)
2	11 (10)	10 (8.8)
3	15 (13.6)	9 (7.9)
4	15 (13.6)	4 (3.5)
5	1 (0.9)	2 (1.8)
6	0 (0)	2 (1.8)
7	1 (0.9)	0 (0)

* The figures in parentheses are percentage; which may not add up to 100 because of rounding.

7.9 Experience of stillbirths and abortion

The incidence of giving birth to a child who died at birth was 11.8 per cent for the entire sample (N = 221). It was slightly higher for Osupuko/Sikawa women than those of Megwara (Table 7.7). However, the incidence of stillbirths was negligible; only about one per cent reported the experience.

In contrast, a much larger proportion of the women have experienced spontaneous abortion (Table 7.8). Some 25 per cent of all the interviewees had had an abortion previously. The proportion of abortions was higher in Osupuko/Sikawa (29 per cent) than Megwara (22 per cent). Of these, the majority had experienced it once. A considerable proportion had experienced it at least twice.

Quite varied reasons were given to explain the abortions (Table 7.9). These ranged from unspecified sickness, malaria to "normal". It may be added that the responses on table 7.9 reflect only the perception of the respondents as to the cause of their abortion experience. The responses do not project a medical diagnosis.

Table 7.7: Incidence of infant deaths at birth
Question: Have you ever given birth to a child who died at birth?

	Frequency		
	Osupuko/Sikawa	Megwara	Total
	N = 107	N = 114	N = 221
Yes	19 (17.8)*	7 (6)	26 (11.8)
No	88 (82.2)	107 (94)	195 (88.2)

* The figures in parentheses are percentages.

Table 7.8: Spontaneous abortions

	Osupuko/Sikawa	Megwara	Total
	N = 107	N = 114	N = 221
Yes	31 (29)*	25 (22)	56 (25)
No	77 (71)	89 (78)	166 (75)

* The figures in parentheses are percentages.

Table 7.9: Reason for abortion
Osupuko/Sikawa (N = 31)

Reason	Frequency
Sickness	14
Accident-fell down	2
Severe malaria	11
Prolonged labour	3
Fight with co-wives	1
Megwara (N = 25)	
Reason	Frequency
Normal - don't know	11
Sickness	8
Knocked down by cow	2
Hard work	1
Fall down	1
Infected meat	1
Fought with husband	1

7.10 Discussion

This study of certain proximate determinants of Maasai fertility in Narok suggests that the primary factor in the relatively lower fertility (both in the wet and dry areas) is the cultural and structural organization of that society. The major element of the Maasai societal organization is the male elder gerontocratic authority. Elders insure that young men serve a period of residence as warriors thereby enabling them to accumulate more livestock and marry another wife. Polygyny is widespread and is a mechanism for child spacing within marriage.

All Maasai women get married. Marital instability occasioned by divorce or separation is virtually insignificant. However, there is relatively high sexual mobility by women. Maasai society tacitly approves sexual relationships of young girls with warriors. This might lead to the contraction of pelvic inflammatory disease which is apparently significant among the women. This has implications on realised reproduction. (The hazards attendant to early motherhood are discussed in chapter 2 above.)

Another finding from this study is the relatively high incidence of spontaneous abortions among Maasai women both in the dry and wet areas of Narok. This

probably reflects the demanding traditional roles assigned to Maasai women and pelvic inflammatory disease. This is because induced abortion is not accepted or tolerated. However, there may be a few instances in which a woman induces an abortion. The most frequently cited circumstance which might lead to a woman taking herbal medicine to eject a foetus is when a conception results from illegitimate sex, that is extra-marital sex.

The imperative for inducing an abortion in the circumstances described in the preceding paragraph is that an illegitimate child may be rejected by the husband. Such a child will normally be taken away and adopted by the woman's mother. If this does not happen, the man will curse the child and it dies. Another course of action is for the woman to be sent away to their home to fetch her father together with a cow for reconciliation. But even in this case, the child is left with the woman's mother. Thus, the relatively liberal sexual mores of the Maasai must go with the responsibility of avoiding pre-marital and extra-marital conceptions.

The Maasai observe the postpartum sex taboo. Generally, such sex is disapproved until the infant starts crawling - about 8 months. However postpartum sex is allowed after six months. It is believed that sexual intercourse before that period will cause the infant to become sickly.

Outside the postpartum taboo, Maasai women do not use any methods of postponing pregnancies. However, when asked on whether the current or last pregnancy was planned or not (question 63, Appendix 1), most women replied that they "planned" it. The Maasai notion of "planning" is different from the conventional Western meaning. Their concept of planning does not refer to conscious timing as to when a child is needed. The Maasai believe that God gives children and when a conception is achieved, it is taken to have been "planned".

Most informants intimated that birth intervals are a husband's responsibility. Hence, in an ordinary sense, conception will depend on when the husband visits. This is especially so for women in polygynous unions.

In monogamous families there are usually two beds in a house. A man usually sleeps with his wife on one bed. When the woman becomes pregnant or is breastfeeding the husband sleeps on the second bed. Older men are, however, allowed to have their own huts.

Maasai couples do not discuss family planning matters Whatever fertility regulation is achieved is a result of societal structures to which women are subservient. Should these structures change, fertility is bound to change as well In the next chapter I turn specifically to incipient and anticipated socio-economic changes in Maasai society and the fertility scenarios that may ensue

8. SOCIO-ECONOMIC CHANGES AND MAASAI FERTILITY FUTURES

The Maasai observance of their traditional lifestyle still is quite strong Their customs which affect fertility are largely intact. Early marriages for women and or early exposure of women to sex expose them to various hazards including sexually transmitted diseases. Youthful motherhood may result into such complications as anaemia, cephalopelvic disproportion and preeclampsia These complications affect fertility, lead to low birth weights, abortion, maternal deaths and influence high infant and child mortality

Partly because of resistance to socio-economic changes and partly because of the nomadic pastoral lifestyle, the Maasai have an extremely high illiteracy level. Illiteracy in women may lead to low levels of personal hygiene and lack of appreciation of a balanced diet both of which may contribute to depress fertility. Kenyan data have shown that women with at least primary education experience slightly higher completed fertility than illiterate ones.

8.1 Economic Changes

Certain economic changes are taking place in Narok which, initially, may lead to higher fertility. The major economic change is the sedentarization of the Maasai. For may decades now, the Maasai have lost the best watered parts of their range initially through European settlement and later by immigration of other ethnic groups (chapter 5). This loss of dry-season grazing resources has led to the restriction of people and livestock into a smaller territory. Although this has meant the perpetuation of nomadic pastoralism (because traditional crop cultivation is impossible without irrigation), there is increasing evidence of the adoption of

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mixed farming. Further, the current campaign to subdivide group ranches into individual freehold will abet the adoption of mixed farming. The change into mixed farming appears to have been brought about by recurrent droughts (which kill livestock), intermarriages and the influence of the cultivator immigrants (Kenya, 1988: 14; chapter 5).

The change from pastoralism into mixed farming is expected to affect fertility in a number of indirect ways. The traditional diet of meat, milk and blood will be modified to include *ugali* (maize meal), potatoes, vegetables and even tea. Even where these crops cannot be grown on account of harsh environmental conditions, sedentarization itself will insure trade connectivity with the wetter areas and make these foods available at the market place. The availability of a variety of foods will contribute to balanced diets and better nutrition for the Maasai. This will add to enhanced fertility. Also, greater sedentarization will act to stabilize sexual relationships and increase coital frequency as dry season movement for men will be curtailed.

There is evidence that certain economic changes are already taking place among the Maasai. Traditionally, Maasai men herded livestock; children took shoats and calves to pastures; and women put up house structures and dealt with all household matters including rearing children. At the present time men and women are moving away form these traditional roles. There are more men taking up paid employment in certain urban areas especially as security guards. Some men have also taken to charcoal burning for cash. Maasai women are beginning to take to livestock grazing, cultivation and making and selling curios (see Kenya, 1988: 100-101).

These production changes are expected to stabilize Maasai economy. They will also act to modify Maasai economic structures which traditionally stifled fertility. People will get to alternative production systems outside livestock, for example wage earning activities. Young men will have alternative means of gaining economic power without reference to the elders. Ultimately this will reduce the age at marriage for men.

8.2 Social Changes

With the incipient modification of the Maasai production system and given changing sex labour roles, several social changes are expected to take place. More Maasai boys and girls are taking to formal education. For men, this is threatening the practice of warrior hood. It appears already that the period of warrior hood has drastically been cut from 7-10 years to only 6 months (see Kituyi, 1990). In time the significance of *eunoto* and *ol ngesherr* ceremonies will fade away (chapter 5). And so will the male elder gerontocracy which governs that society. This will lead to early marriages for young, fecund men. Basic education for women will also add to improve fertility.

Another factor contributing to social change is the Christianization of the Maasai. Christianity is expected to increase among the Maasai. Traditionally, the Christian faith is opposed to polygyny. Were the latter to be discouraged, monogamy will predominate with associated large family sizes. Also, Christianity will discourage premarital and extra-marital sex, the latter especially among members of the same age-set. This will in turn remove the health dangers related to premature sex and teen age motherhood.

Both education and Christianity also teach about nutritious diets and environmental sanitation; factors which are significant in fertility and infant and child survival. However, health care programmes being mounted in Narok will insure better health for mothers and greater survival for infants and children. MCHFP programmes including immunization and growth monitoring will contribute towards the effort. As a consequence, sterilizing and abortive diseases will be minimized thus opening the lead on fertility. The infant and child mortality rate of 400 per 1000 live births reported in the colonial time has now been considerably reduced to 144 per 1000 (compared to 87 for Kenya and 127 for the Rift Valley Province).

In brief, once the male elder Maasai gerontocracy has been broken by the various socio-economic dynamics, there will be several structural adjustments in society - changes in marital patterns, decline in polygyny and decline in warrior hood. These changes are slowly being wrought on Maasai society as a result of more settled life, greater access to education for both men and women, and the expansion of Christianity. These forces of change will remove the current

impediments to fertility. The immediate impact will be higher fertility and population growth rate for the Maasai.

9. SUMMARY AND PROSPECT

Instead of pedantic summarizing of the preceding work, I here propose to highlights only the important points on population change in Narok. Such highlights will include contemporary Maasai population status, major proximate determinants of fertility, and future trends in fertility and population change.

(1) The Maasai experience generally lower completed fertility than other Kenyan communities especially cultivators. This appears to be the case even for the cultivator immigrants living in Narok district itself.

(2) Although mode of production may contribute to fertility differentials between pastoralists and cultivators, the primary factor regulating fertility is the cultural patterning of Maasai society. The male elder gerontocratic authority whereby age at first marriage for men is delayed, is the most significant factor in the comparatively lower fertility of the Maasai. Young men serve in warrior residence and in the meantime, old sub-fecund men marry young brides.

(3) Other factors causing infertility and subfertility include the prevalence of abortive and sterilizing diseases. Although these are intimately related to poor levels of hygience and environmental sanitation, another contributory factor is the relatively early exposure of girls to sex and high sexual mobility among married spouses. A combination of these factors depresses fertility, causes pelvic inflammatory disease in women, low birth weights and consequent threats to maternal and child survival.

(4) Maasai home living conditions are poor; consequently they are excellent habitats for infections and transmissible diseases which increase infant and child mortality. The low survival rates reduce family sizes.

(5) There are certain fertility - enhancing trends in proximate determinants which may lead to a decline in pathological infertility, and subfertility. These trends

include the shortening of the warrior period of residence leading to early age at marriage for fecund males, basic education for Maasai women, and decline in polygamy with greater Christianization. Also, the sedentarization of the Maasai will almost certainly insure higher coital frequency and hence higher probability for conception. It is expected too that the postpartum taboo will weaken leading to early conceptions and short birth intervals.

(6) As the fertility-enhancing trends take root among the Maasai, an initial period of rapid population growth may be expected because of non-adoption of modern contraception.

(7) This high fertility among the Maasai will make Narok suffer from population pressure. Such pressure is likely to affect the resources in an adverse manner as people struggle to experiment with mixed farming in an ecologically fragile environment. Crop failure can be expected and consequently famine.

Notes

1. This section relies heavily on Sindiga (1990) and Sindiga (1984).

2. It is likely however that a small proportion of these people would attend adult literacy classes at some point in their lives. But the numbers would be too small to be significant.

3. *Enkang* is the correct Maasai name for village. In certain literature, however, the term *manyatta* which means a separate settlement for the *ilmurran* (warriors) during their period of residence, is used synonymously with *enkang*.

4. An 'age-set' is a social group comprising of persons who were initiated - usually circumcised during the same period. Each group is organized as a corporate body, ranked hierarchically in relation to other such groups. Members of the same age-set share certain rights and obligations to one another and the society. In addition, members of the same age-set enjoy equality both in social relationships and economic functions. See Sankan, 1971: 31-35; and Jacobs, 1968: 10-31.

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APPENDIX I

MOI UNIVERSITY

FERTILITY AND HEALTH SURVEY

A. BASIC DATA

1. District of residence _____
2. Division _____
3. Location _____
4. Sub-Location _____
5. Village _____
6. Ethnic Group _____
7. Were you born in this district? Yes/No
8. If no, where were you born (district and division)_____ _____
9. Name _____
10. Age (last birth day) _____
11. Education (highest class attended) _____
12. Can you: read and write
    read, not write
    can read name only
    cannot read or write
13. If no formal education, have you ever attended any adult literacy classes? Yes/No.
14. Religion (e.g. African, AIC, SDA, Catholic etc.) _____
15. What do you do for a living? (e.g. housewife, herder, farmer, trading etc.) please specify.

B HOME ENVIRONMENT

Is your main house grass-thatched or mabati-roofed?

17. Do you have a toilet at home? Yes/No

18. If yes, what type is it? Ordinary pit, water closet. (specify where do you get water for domestic use?

- river
- spring
- ordinary well
- well with hand pump
- pond
- pipe
- other (specify)

19. How far (in kilometres) is your nearest water source?

20. Do you usually boil water before drinking? Yes/No

C. MARITAL STATUS

21. Are you married, single, separated, divorced or widowed?

22. If currently married, are you in a polygamous or monogamous union?

23. If in a polygamous union, how many co-wives do you live?

24. Are you the first, second, fourth or fifth wife?

25. What is the occupation of the husband?

26. Please tell me how old you were at the time you got married _____

D. FECUNDITY AND FERTILITY

27. How old were you when you experienced you first menstruation?

_____ years

28. How old were you when you bore your first live birth? _____ years

29. How many children have you ever born alive?_____

30. How many children born alive are still living? _____

31. Have you ever given birth to a child who died at birth? Yes/No

32. If yes, how many?

33. Have you ever given birth to a stillbirth? Yes/No

34. Have you ever experienced a spontaneous abortion? Yes/No

35. If yes, what was the reason for the last abortion? _____

36. How many times have you experienced abortion? _____

37. Was the last birth a boy or a girl? _____

38. What is the birth interval (in years) between your:

    (a) first and second birth _____ years
    (b) second and third _____
    (c) third and fourth _____
    (d) fourth and fifth _____
    (e) fifth and sixth _____
    (f) sixth and seventh _____

E. SEXUAL ACTIVITY

39. How old were you when you had your first sexual intercourse? _____ years

40. Please tell me, how many days you have engaged in sexual intercourse within the past one week _____ days

41. If none, what is the reason? _____

42. When was the last time you had sexual intercourse?
    _____ days ago
    _____ weeks ago
    _____ months ago
    _____ years ago

F. ANTENATAL CARE AND DELIVERY

43. Are you pregnant now? Yes/No.

44. If yes, how old (in months) is your pregnancy?

45. Have you ever attended an antenatal clinic? Yes/No

46. If attended, was it for normal check up or sickness?

47. If you have not attended a clinic, who provides antenatal care?
   - traditional birth attendant
   - relative
   - self
   - other (specify)

48. After giving birth, how long does a woman stay before engaging in sexual intercourse?
   _____ months

49. Was your last birth at a hospital or at home? _____

50. If at home, who helped you to deliver?
   - TBA
   - relative
   - self
   - other (specify) _____

51. Why did you not go to the hospital? _____

52. Who provided antenatal care?
   - TRA
   - hospital/health centre
   - both of the above
   - other (specify)

53. Are there foods which expectant mothers are advised to eat? Yes/No

54. If yes, identify the foods and the reason for eating them

Food	Reason

55. Do expectant mothers use traditional medicine during pregnancy? Yes/No

56. If yes, for what reason? _____

C. FAMILY PLANNING

57. Have you ever heard of family planning? Yes/No

58. If yes, who/where did you hear it?

- friend
- radio/TV
- newspaper
- traditional birth attendant
- nurse/doctor
- other (specify)

59. Have you ever used a family planning method? Yes/No

60. If yes, which one is it?
    - sexual abstention
    - withdrawal
    - pill
    - IUD
    - injection
    - other (specify)

61. If no, why are you not using a method to avoid pregnancy?
    _____

62. If currently pregnant or had a previous child, did you plan the pregnancy or did it come accidentally? Planned/Accidental/Other

63. Have you ever talked with your husband about family planning? Yes/No

64. If yes, does he approve of your using a modern method to delay pregnancy? Yes/No.

65. How many children do you want to get in all or, for older women, how many did you get in all? _____

H. HEALTH SERVICES

66. How far is the nearest health facility to your home?
    Dispensary _____ km
    Health Centre _____ km
    Hospital _____ km

67. Do you usually go to a modern health facility when sick? Yes/No

68. If no, where do you get alternative treatment?
    - shop
    - traditional healer
    - collect herbs myself
    - other (specify)

GLOSSARY

fecundable	ability to conceive
fecundable	the potential ability to reproduce, that is, to bear a live birth.
fertility	actual reproduction, that is, actual realization of a live birth.
infant or child loss	failure of a live birth to survive.
infertility	also called *infecundity* or *sterility* or *physiological infertility*. This refers to the inability to reproduce, i.e. incapacity to get a conception or to impregnate (Belsey, 1976). Infertility then refers to childlessness which may come about by choice or by biological infecundity (Bongaarts and Potter, 1983). Whereas sterility or infecundity suggests infertility, the reverse is not true. *Primary infertility* refers to childlessness and secondary infertility is inability to get a live birth after a previous one.
spontaneous intrauterine mortality	inability of a group to obtain sufficient live births. This means that group's fertility is below the expected standard (see Adadevoh, 1974: 2).