SOCIO-ECONOMIC AND DEMOGRAPHIC DETERMINANTS OF FERTILITY: A COMPARATIVE STUDY OF NYERI, TAITA-TAVETA, KISII-NYAMIRA AND BUNGOMA DISTRICTS

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

I dedicate this thesis to my wife, Wambui, my daughter Malemba and son Njai

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ABSTRACT

This study examines and compares the socio-economic and demographic factors that affect fertility. Specifically, this study will estimate the effect of socio-demographic factors on overall fertility in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma districts. In addition, the study attempts to draw some policy lessons from our findings.

The data in the study was drawn from the Kenya Demographic and Health Survey (KDHS) of 1993. Cross tabulations, simple bivariate regression and multiple regression were used to determine the relationship between total children ever born and socio-economic and demographic variables.

The findings of the study revealed that demographic determinant of fertility were; ages of respondents and age of respondents at first birth in all the four districts, current marital status and the number of living children in Taita-Taveta and Kisii-Nyamira districts. The socio-economic factors which explained differences in fertility were secondary and above education and primary education in Nyeri and, respondents income in Taita-Taveta district. On the other hand, the desired family sizes that explained differences in fertility were a desired family size of between 4 and 5 children in Kisii-Nyamira and Bungoma districts. Finally, the proximate determinants of fertility in all the four districts was the use of traditional methods of family planning, while the use of modern methods of family planning in determined fertility in Nyeri and Taita-Taveta districts.

Therefore, in summary and as expected the factors found to be significant in explaining differences in fertility are namely; age of respondents and age of respondents at first birth, education level and ever use of any method of family planning in all the four districts. Marital status, number of living children, respondent's income and desired family size were the other

significant determinants of fertility. Contrary to the expectations, respondents work status was found not to be significant in explaining differences in fertility in all the four districts.

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CHAPTER ONE

INTRODUCTION AND STATEMENT OF THE PROBLEM

1.1. Background

The historically high population growth rates experienced in Africa were the result of sustained high fertility levels as infant and child mortality began to fall. Recent data from the Demographic and Health Surveys conducted in sub-Saharan Africa indicate that Total Fertility Rate (TFR) in a number of countries, most notably Botswana, Kenya, and Zimbabwe, have began to decrease (Ewbank and Gribble, 1993:5)

For example, in Kenya, which for a long time has had one of the highest levels, fertility has declined from the previous high of over 8 births per woman to about 6.7 in 1989 and to 5.4 according to the 1993 Kenya Demographic and Health Survey. However, fertility levels remain relatively high in much of sub-Saharan Africa than in other areas of the world (Bongaarts et al, 1990).

Recent estimate indicate that Kenya's birth rate of about 45 per thousand, and an annual population growth rate of about 3.3 per cent are still high (Population Data Sheet, 1995)

According to Sindiga (1984), the observed family size in Kenya closely corresponds to the number of children desired by most women. He found out that there is lack of motivation for parents who do not want so many children and also there is no incentive to limit family size.

Consequently, according to Easterlin and Crimmins, (1985), this has resulted in limited deliberate fertility control.

Rapid population growth rates and high fertility hinders both social and economic growth leading to numerous problems e.g. unemployment, housing, environmental degradation, inability of the local and central governments to provide even the basic services, increased crime and low levels of standards of living among others.

In recognition of this, the government of Kenya has continued to formulate policies and programmes to lower fertility and rapid population growth.

Therefore, studies concerned with determinants of fertility will greatly assist in shedding light on Kenya's fertility situation as well as suggest possible solutions to planners, policy makers and population control programmers to design effective interventions and policies aimed at reducing fertility.

It is in recognition of the problems caused by high fertility that, a study to establish the determinants of fertility in Nyeri, Taita/Taveta, Kisii-Nyamira and Bungoma district was conceived.

1.2. Problem statement

Although it is empirically documented that fertility is declining in Kenya, there still exists distinct regional differences within the country. Fertility is observed to be low in Cental Province and Nairobi and high in Nyanza and Western Provinces. Even within these provinces, substantial differences by ethnic composition, climate, culture and economic activities are also noted.

Kenya has distinct ethnic homogeneity to the extent districts or ethnic groups become good proxies for estimating socio-cultural effects in fertility and, Kenyan studies have tended to establish fertility behaviour of individual districts. This study is an attempt to compare and contrast inter-district differences in fertility behaviour.

Therefore, in order to understand the dynamics of reproductivity in this largely rural district, different factors believed to affect fertility need to be investigated. This is that examines the impact of (1) socio-economic factors namely, education, occupation and income

(2) demographic factors namely, age of the respondent, age of the respondent at first birth, marital status, infant and child mortality (3) desired family size, and, finally (4) proximate determinants namely, use of contraceptives and frequency of intercourse on fertility.

1.3. Objectives of the study

General objective

The main objective of the study will be to examine and compare the socio-economic and demographic factors that affect fertility. Specifically, this study will estimate the effect of socio-demographic factors on overall fertility in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma districts. In addition, we shall attempt to draw some policy lessons if any from our findings.

1.4. Justification of the study

The variation in fertility in rural districts in Kenya is evident and a concern to policy makers, planners and population specialists, especially at such a time when Kenya has entered the fertility transition. Therefore, studies aimed at understanding the determinants of fertility especially in the rural districts are necessary if further national and overall reduction in fertility is to be achieved.

Nyeri, Taita/Taveta, Kisii-Nyamira and Bungoma districts were selected because of a number of reasons; administratively they belong to four different Provinces and also represent different ethnic groups, Nyeri represents the Kikuyu; Taita/Taveta represents the Taita, Kisii/Nyamira represents the Kisii, and Bungoma represents the Luhya. In addition, the districts

have distinct climatic zones, agricultural productivity, communication and transport systems and distribution of resources and facilities.

From a policy perspective, this will be a comparative study ascertaining the main factors responsible for the variations in fertility in the four districts of study, further it will provide planners and policy maker's information for devising strategies for reducing the fertility.

1.5. Scope and limitation

The study is based on women aged 15-49 years who were interviewed in the 1993 KDHS from Nyeri, Taita/Taveta, Kisii-Nyamira and Bungoma districts.

Owing to scarcity of resources and time, a comparative study of all rural districts in Central, Coast, Nyanza and Western Province was not found to be feasible.

Kisii/Nyamira district is considered as one district in this study although it is now sub-divided into three districts, Kisii, Nyamira and Gucha districts.

Although numerous cultural, economic, social, environmental, demographic and proximate determinants have been found to influence fertility in Kenya, some of these will not be analysed. For example although breastfeeding is shown to be an important factor, it will not be included in this study because of the methodological difficulties of operationalizing this variable.

Finally, the study aims at provoking and stimulating other researchers to carry out further investigations based on its results and recommendations.

1.6. Characteristics of the selected districts

The discussion below highlights a comparative analysis of the main characteristics of the four selected districts; Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma.

Location and size

Nyeri district is in Central Province and forms part of Kenya's Eastern Highlands, while Taita-Taveta district is situated in the southwest part of Coast Province. On the other hand, Kisii-Nyamira district is found in Nyanza Province, while Bungoma district is in Western Province, situated on the southern slopes of Mt. Elgon.

Taita-Taveta is the largest and covers an area of 16,965 sq.km, while the other three are smaller, Nyeri 3,266 sq.km, Bungoma 3,072 sq.km, and Kisii-Nyamira 2,198 sq.km (Ministry of planning and National Development, 1994).

Population size and density

Table 1. Population projections and densities for Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma Districts

	Projected population	Density (People per sqkm)
NYERI	692,000	186
TAITA-TAVETA	225,000	12
KISII-NYAMIRA	1,546,000	517
BUNGOMA	889,000	221

Source:CBS, Kenya population census, 1989 and District development plans for Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma.

According to the 1993 population projections as shown in the table above, of the four districts, Kisii-Nyamira had the largest population of 1,546,000 people, Bungoma 889,000,

Nyeri 692,000 while Taita-Taveta had a much smaller population, 225,000 people. The population density was highest in Kisii-Nyamira 517 people/sq.km, followed by Bungoma 221 people/sq.km, then by Nyeri 186 people/sq.km and finally very low by Taita-Taveta 12 people/sq.km. (Ministry of planning and National Development, 1994)

Major economic activities

Nyeri district experiences equatorial type of climate. The annual rainfall is around 750mm in the lower parts and 2,000 in the higher parts. Soils in Nyeri are well developed on the higher altitudes as a results of lava outpouring, which sustain a high agricultural potential in terms of cash crops such as coffee, tea and other subsistence crops. In low altitudes where soils are poor, livestock keeping is dominant.

Taita-Taveta district is in a very dry area except for the high catchment areas in the hills, and the effects of the Southeast trade winds influences the climate of the area. The district has variations in the pattern and distribution of rainfall over time and locality, however, the mean annual rainfall for the entire district is 55mm, the area means vary from 250mm in the lowlands to about 1,250mm in the highlands. Therefore, the highlands are potential lands suitable for the production of crops such as coffee, horticultural products, maize and beans.

Kisii-Nyamira district has a highland equatorial climate and receives high and reliable rainfall, which is well distributed throughout the year. On average, the district receives an annual rainfall of between 1,500mm and 2,000mm. The high and reliable rainfall received supports cash crops such as tea, coffee, pyrethrum, and subsistence crops like maize, beans, finger millet, potatoes and dairy farming.

The relief and landforms in Bungoma district affect the climate and the general potential of the area and, being on the slopes of mount Elgon also influences rainfall and mitigates temperature. The well-distributed annual rainfall of 1,250mm to over 1,800mm allows growth of tea, wheat, maize, pyrethrum, coffee, sunflower, sugarcane, cattle and sheep rearing.

The above discussion indicates that the predominant economic activities in all the four districts therefore are agriculturally based, and that both cash and food crops are produced and forms the main source of income. The high potential for agriculture and reliable rainfall throughout the year in Kisii-Nyamira, Bungoma and Nyeri which supports cash and food crops are good indicators for high income, in the three districts compared to the drier Taita-Taveta

with varied rainfall which will mostly likely have lower income. This would imply that fertility would most likely be high in Kisii-Nyamira, Bungoma and Nyeri and low in Taita-Taveta.

Ethnicity

In Kisii-Nyamira (98%) of the population were of the Kisii ethnic group and in Nyeri (97%) of the population were Kikuyu indicating that the other tribes constituted an insignificant proportion of the population.

In Taita-Taveta and Bungoma on the other hand, the population was mixed. In Taita-Taveta for example, the Taita were the majority and constituted (72%) of the population, while the proportion of the Kamba was (10%), the Taveta (5%), Mijikenda (3%) and the Luo (2%). In Bungoma the Luhya were the majority and they constituted (83%) of the population, while the Kalenjin and Teso constituted (9.8%) and (3.4%) respectively (ibid). Given the ethnic diversity and cultural background of the populations of the four districts, the composition will lead to fertility difference.

CHAPTER TWO

LITERATURE REVIEW, CONCEPTUAL FRAMEWORK AND OPERATIONAL MODEL.

2.0. Theories of determinants of fertility

This chapter provides an overview of theories and findings of studies conducted in the third world countries explaining the impact of demographic, socio-economic and cultural factors on fertility behaviour of different societies. The review of the effect of socio-economic, demographic and proximate determinants on fertility will form the next discussion.

Demographic Transition Theory

The demographic transition theory was developed as a result of observations of the western societies to explain changes in population growth rates. An adapted version of the demographic transition theory as revised by Omwanda (1996), which accurately fits in this study will be applied.

Warren Thompson (1929) proposed that nations may be classified according to their rates of natural increase and grouped them into three categories. In the first group (A) he placed countries whose rates of natural increase had moved from very high to very low; in the second one (B) were those in which there was some evidence of decline in birth and death rates, and in the third (C) he placed countries in which there was little or no control over births and deaths. Thompson (1929:268) concluded that, in group C countries, population growth would continue to be "determined largely by the opportunities they have to increase their means of existence."

Following Thompson, Frank Notestein (1945) described the countries of group A as being in "incipient decline" those of B as experiencing "transition growth" while those of group

C had "high growth potential". Subsequently, the concept demographic transition came to denote the period of high natural increase during which a country moves from high birth and death rates to low birth and death rates-- that is, from a state of high potential to one of incipient decline. Concern for rapid population growth from the mid-1940s to 1960s in industrialized societies helped to focus attention on the theory and, especially, on the causal phenomena associated with fertility decline over historical time. Emphasis was placed on such factors as the decline in infant mortality, increasing cost, and falling value of children, and substitution of market relationships for kinship networks that accompanied industrialisation and urbanisation in Europe (e.g. Notestein, 1953).

The demographic transition perspective has been extensively discussed in the literature (Robinson, 1968; Demeney, 1968; Teitelbaum, (1975) (1987); Caldwell, 1976; Coale and Watkins, 1976). Very briefly, the theory maintains that in "traditional societies fertility and mortality are high. In modern societies, fertility and mortality are low. In between there is fertility transition." (Demeney, 1968:502).

Two major transformation accompanied the European fertility transition: one was a shift from agrarian systems to economies defined predominantly by industrial production; the other was a breakdown of the extended family system based on kin groups and the rise of nuclear family formations characterized by closer emotional bonds between couples and between parents ant their children.

Other Studies:

A study on causes of fertility decline in South India by Caldwell (1984) revealed there has been much social, economic and demographic change in India during the last third of a century. As a result of massive social and economic changes, the demographic changes mainly

the decline in mortality rising age at female marriage, reduction in fertility and the shortening of postnatal female sexual abstinence period and lactation have taken place. Therefore, reduction in land size and technological changes prepared some family members for non-agricultural employment resulting both from government provision and local demand for education.

The changes have, together, moved the society towards family planning due to economic strains imposed on a family by keeping their children at school, with a major demand on permanent methods of birth control. The urban class on the other hand desire methods that will allow birth spacing. Therefore, at least for the present the area has reached a kind of demographic equilibrium, whereby its population size has not grown over the last few years and, the net village out migration equalizing national increase.

An analysis of cultural and social dynamics of population control in Africa south of Sahara by Ocholla-Ayayo (1985) found out that attempts to slow down population growth rates are affected and modified by socio-cultural, socio-economic and behavioural factors. The socio-cultural factors which affect and modify fertility variations are those related to family formation processes, and which by their several and normative imperatives sanction the production of intended and unintended fertility as well as infertility, including adolescent, psychological and terminal fertility of either primary or secondary nature.

According to Ocholla-Ayayo (1985), in rural Africa, social actions and characteristics are rooted in traditional norms, beliefs and values in marriage and family life. Some of the beliefs and values are of procreation and it has been noted that some of the traditions have negative effects in fertility control while others could be utilised to effectively implement fertility control in Africa.

Ocholla-Ayayo (1985), however observes that process of fertility control has been imposed upon a people whose system of marriage and meaning family life as well as the social organisation on which they operate, are deeply rooted in their traditional beliefs systems and ethical premises, and that adaptability to new principles often meet with resistance which have slowed and continue to slow the pace of fertility control in Africa, especially in Kenya.

2.1. Literature review

2.2. Socio-economic factors and fertility

2.2.1. Education

Education brings a new set of values, new aspirations and a new outlook of life as well as skills for taking advantage of new opportunities. A rise in the level of female education has been found to eventually lead to a decline in fertility. In the short run however, increased female education can raise fertility as it often leads to abandonment of traditional practices which have fertility suppressing effects - prolonged breastfeeding, postpartum abstinence and polygamy (Mosley et al, 1981; Mosley and Werner, 1980).

An analysis of fertility behaviour in Pakistan by Farooq and Irfan (1985) found out that, some formal schooling among women is associated with both lower

Cumulative and current fertility levels, as well as with lower desired family size, compared to those with no education.

Furthermore, at least in metropolitan areas, the strength of this relationship grows as the level of schooling increases. The negative impact of schooling appears to be less significant in the rural areas, although this is probably due to the limited number of women with middle or higher levels of education. This may also partly result from self-selection bias, i.e., the out-

migration to cities of highly educated women with relatively modern tastes and lifestyles (Farooq and Irfan1985.

According to Osiemo (1986) and Ottieno et al (1988), women with primary education in certain cases have been found to have higher fertility than those with no education. This is because primary education makes it possible for women to be more conscious of the importance of hygiene and basic health requirements, which help prevent pregnancy wastage or foetal loss. Also the women with primary education may not be following strictly, the cultural norms of say birth spacing. They tend to follow both the cultural and the modern modes of life. Women with at least secondary education have the lowest level of fertility. Hence secondary education is probably a pre-requisite for a woman to change her attitude towards family size in Kenya.

An important finding is that education stimulates the use of contraception, with an obvious fertility-reducing effect. But equally classic is the observation that more education leads to a reduction in breastfeeding durations, to a shortening of the period of lactational amenorrhoea and to an erosion of traditional abstinence patterns (both postpartum and terminal abstinence) (Lesthaeghe et al, 1983).

Moreover, rise in education may also lead to an increase in fecundity (i.e. the monthly probability of conception in the absence of contraception) as a result of higher coital frequencies as a proxy for exposure to the risk of conception and better health and nutrition (Lesthaeghe et al, 1983)

Sindiga (1984) indicates that education tends to produce delays in marriage for women, which is explained both by the number of years of schooling and the greater flexibility of employment and residence it offers. In contrast, less educated and illiterate rural women tend to marry at a generally earlier age.

In Kenya, according to Henin (1987), higher levels of educational attainment particularly among women is generally associated with a tendency to delayed marriage and childbearing, and also with the greater probability of employment in the modern sector which leads to changing values regarding family roles and childbearing, thus lowering fertility.

According to Lesthaeghe et al (1983), the past and present investment in education in Kenya has started to pay off in terms of an incipient marital fertility reduction because more better educated women are moving to the central child-bearing ages and are creating a more favourable environment for the younger women with even higher educational levels.

2.2.2. Occupation

According to Germain (1975), fertility is not likely to decrease where women work in or near the home or can easily make arrangements for child care, where cultural norms dictate that women should be mothers of large families even if they do not work and where the work available offers little reward to compensate for having fewer children.

In general, married women who work outside the home have smaller families than women who do not work. According to WFS findings, women who work for nonfamilial employers have the lowest fertility, followed by women employed by their family and those who are self-employed; unemployed women have the highest fertility (Lightbourne Jnr et al, 1982)

Jejeebhoy (1991) found out that, other things being equal, a working woman would have had .16 fewer births than a nonworking woman in 1970, but as many as .68 more births in 1980 - largely as a result of considerable shorter birth intervals among working women. This unintended effect dominated the relationship with fertility in 1980's, despite the fact that

working women have considerably shorter marital durations and longer periods of contraceptive use.

According to Waite (1981) the fewer children a woman has, the more likely she is to be employed outside the home. Other studies of fertility and women's labour force participation have consistently shown similar findings. Among ever-married women aged 35 to 44 in 1978, for example, those in the labour force had 2.7 children, on average, compared with 3.2 among women not in the labour force. This lower fertility among employed women is true among women of all ages and all ethnic groups, and for divorced, widowed and separated women as well as the currently married. Generally employed women have the fewest children and women not in the labour force the most, with the unemployed falling in between.

The results of a study carried out among Puerto Rican women by Zsembik (1990), found out that contrary to expectation, the fertility levels of informal labour market participants are more like those of formal labour market participants.

However, according to the UN (1985), the fertility of Colombian women was found to differ according to their occupation. Women in professional and clerical occupations tended to have fewer children than other women and to concentrate their childbearing in the early years of marriage.

Different types of work have been proposed as having different effects on the work-fertility relationship. For example, although employment in the modern sector may conflict with childbearing and encourage low fertility, work in the farm may be more compatible with high fertility (UN, 1985).

In the household analysis of fertility differentials in Kenya by Faruqee et al (1980), it was found out that fertility rates were significantly lower if the wife worked away from home.

Data analyzed from a study undertaken by Sly (1987) on development of the modern employment sector in Kenya however strongly suggests that for a woman to gain access to employment in the modern sector, she must have achieved a relatively high level of education, and this, in turn, suggests that she is likely to have lower fertility.

2.2.3. Income

In the 1993 Kenya demographic and health survey, income as a variable was omitted, therefore in this study income was categorised and analysed in terms of whether the respondent earned or did not earn cash for work. For that case it is postulated that people who earn cash are most likely to be in the modern sector employment, which can be a proxy to high income.

In many societies, according to Mosley et al (1982), women's participation in wage employment has been associated with a decline in fertility. In Kenya, while essentially all married women are fully engaged in the rural agricultural economy, few are in the formal sector. In the KFS sample, only 304 married women reported that they were currently in a salaried job. The fertility of these women was 15 percent lower than that of other women.

McDonald and Mueller (1975) observe that in the analysis of net income/fertility relation in developing countries, the following three kinds of problems make it difficult to sift out empirical evidence:

(1) The income data used for economic-demographic analysis often are very rough (2) Some questions exist about how income should be defined for purposes of economic demographic analysis; permanent income, relative income, and expected income have been put forth as alternatives to current income .

(3) A great many variables that are correlated with income have a bearing on fertility education, occupation, location, wives earnings potential, tastes and preferences, the cost and benefits of raising children and child mortality. Unless a data set is available that enables the researcher to take these variables into account, the observed relation between income and fertility may be spurious.

However, Safilios-Rothschild and Mburugu (1986) found out that in rural Kenya, when women earn a high income that permits a fair degree of autonomy, their aspiration for children, especially for their children education rises and subsequently they spend more on children. In the absence of labour contribution when women's income is high, a new mother-child relationship emerges in which the child becomes a cost and not an economic asset to the mother, thus, encouraging contraceptive use in order to lower the fertility level.

2.3. Demographic factors and fertility

2.3.1. Age

Findings of a survey which was part of the World-wide Demographic and Health Survey project carried out in Ecuador in 1987 indicate that in 1979, 57 percent of all childbearing was accounted for by women under 30. By 1987, this proportion had risen slightly to 60 percent, which suggests that Ecuadoran women are increasingly concentrating their childbearing into their earlier reproductive years (International Family Planning Perspectives, 15:74, 1989).

According to Neupert (1994), in Mongolia, although women of all ages (except those 20-24) have reached their desired fertility, those in the older age groups have experienced the most significant decline. Hence, births have become more concentrated among women aged

20, and about half had had their first birth between ages 20 and 24. Median age at first birth was higher among urban women (25.5) than among rural women (23.0). The survey found no difference in age at first birth between women living in the north and those in the south (Edwards, 1992).

One of the demographic consequences of early childbearing is that it leads to large completed families and significantly shortens time period between generations, with concomitant dramatic increases in population growth rates (Bogue et al, 1977).

According to the Kenya Demographic and Health Survey (1993), childbearing begins early in Kenya. One in five teenage women (age 15-19) has began childbearing (either given birth or is pregnant with her first child). By the time they reach age 19, over 40 percent of women have began childbearing.

In an illustrative analysis, Ferry and Page (1984) found out that Kenyan women bear their first children at age 19 on average, but 10 percent of them start as early as 14 or 15 years. The first birth occurs on average some four to five years after menarche and in most cases quite soon after the first regular sexual union.

According to Remez (1991), women begin childbearing at relatively young age in Paraguay. One-third of the sample had their first child before age 20, and one-half before age 22. Among women aged 25-49, the median age at first birth (22 years), applies across all age-groups, all this has not changed much over time. However, the median age at which women start childbearing varies according to urban or rural residence (22 years vs 20 years), region (23 years in Asuncion, compared with 21 years in the other regions) and educational level (24 years for the most educated women, 21 years for women who have completed primary school and 18 years for the least educated women.

The results of an analysis of Demographic and Health Survey (DHS) data from 25 countries in Africa, Asia, Latin America and Caribbean indicate that the median age at first birth among women aged 40-44 ranged from 18.3 years in Uganda to 23.1 years in Sri Lanka. In general, women in Sub-Saharan Africa were about two years younger than women in other regions when they had their first child: The median age at first birth was younger than 19 in six of the 10 Sub-Saharan countries, but it was at least 20 years in all but two of the countries in other regions. First births occurred comparatively late in Sri Lanka and Tunisia: At the time of the Survey, fewer than one-third of the women aged 20-24 and fewer than two-thirds of those aged 25-29 had given birth to their first child (Althaus, 1991).

2.3.3. Marital status

The distribution of women by marital status influences aggregate fertility levels and patterns. This distribution results from trends in age at marriage and age-specific incidence of marriage, divorce, separation and widowhood, conditions which, along with levels of remarriage, determine the number of reproductive years that a woman spends within marriage (UN, 1983).

An intensive analysis of data for 21 developing countries disclosed a moderate correlation (r=0.6) between time spent married and the total fertility rate. Divorce, separation and widowhood together accounted for less than 10 per cent of the reproductive span in nine out of 11 Asian countries and three out of eight Latin American nations (UN, 1983).

According to the UN (1983), where marital status composition is concerned, the main sources of variation in national levels of fertility appear to be the amount of time that a woman spends single, that is, prior to first union, which is, on average, greater than the time lost to

marital disruption. This was evident despite the finding that extramarital fertility is of important magnitude especially in Africa and Latin American countries, and that childbearing is more frequent among formerly married than among single women (UN, 1985).

A study on determinants of fertility conducted in Athoor Block, Tamil Nadu by Dutt et al. (1988) revealed that between 1959 and 1985, the crude birth rates in Athoor block declined from 43.1 to 25.6. The decline in marital fertility contributed more than other factors to the decline in fertility rates, and the change in marital status caused by an increase in age at marriage and a decline in widowhood, at least in younger ages, contributed almost 50 percent of the change in marital fertility.

According to Mosley et al (1982), currently married women aged 15-44 in Kenya have a general fertility rate (MFR) of 310 per 1,000. This results from a combination of an average pregnancy progression ratio of 0.80 and an average live birth interval of 30 months. With these parameters, a Kenyan woman continuously married from age 15 could expect 9.6 live births over a 30-years reproductive life.

In Ghana, the high fertility levels prevailing among the rural women are attributable to high proportions married and little use of contraception, which outweighs their long durations for the post-partum variables. They constitute more than 60 percent of the female population in Ghana and they are both less equipped and motivated to reduce their fertility levels than are urban women (Gaisie, 1984).

Klitsch (1994), noted that, currently married Tanzanian women have borne an average of 4.0 children, of whom a mean of 3.3 are still living. However, currently married 40-49-year-olds have had 7.1-7.2 births, on average.

Muinde and Mukras (1979) found out that at age group 25 and 39 years, more women have been reported currently married. This occurrence characterises early-peak fertility patterns which is the case in Kenya. Also at this age-category, women are biologically fit, a fact which enhances high fertility performance among the married women who do not engage in the practice of fertility control.

2.3.4. Number of living children

A report by the Economic Commission for Africa, Population Division (1991) states that in Africa, childbearing starts early and continues till menopause, with close birth intervals because of lack of contraception, lack of education for women, poverty, therefore, high levels of infant and child mortality factors which perpetuates high fertility in most countries in the region.

As noted by Chandler (1984), family planning services increase the chances of survival of all children. Parents in regions with high infant mortality rates typically bear more children than they desire because they have little access to contraception or because they want to ensure the survival of a minimum number.

According to Kimani (1994), the effect of infant and child mortality is usually conceptualised within two broad categories: biological and behavioural. The latter is assumed to take place as a result of mothers attempting to replace infants or children who have died or having more children than desired number surviving in anticipation that some of them will die. The direct response to experienced deaths is referred to as replacement effect while the effect due to anticipated deaths is referred to as insurance or hoarding.

Biological effects of infant or child deaths occur primarily as a result of the curtailment of breastfeeding when an infant or a child who is breastfeeding dies. This curtailment in turn

hastens the return of ovulation and thus exposes the mother to the risk of pregnancy sooner than if the infant or the child had not died.

The results of a study on the effects of breastfeeding on infant and child mortality in Kenya applying a conditional logit model by Bankole and Olaleye (1991) found out that breastfed children were more susceptible to the risk of dying in the second year of life. The results also showed that age of artificial feeding is positively related to infant and child mortality. The authors however, indicate that the results should not be regarded as conclusive, thus suggest a need for further research aimed at a better understanding of this relationship in Africa using a different statistical tool.

Using the 1989 Kenya Demographic and Health Survey data, Musalia (1991) found out that replacement effect was more effective in cases of women who ever use contraceptives than those who do not.

Results of a study undertaken by Akwara (1994) on the impact of breastfeeding practices on infant and child mortality in Amagoro division of Busia district, Kenya, indicate that the environmental factors (type of toilet facility) and socio-economic factors (immunization and work status) are significant in influencing infant and child deaths, and that the impact of breastfeeding and age at supplementation greatly modified these factors.

According to Chowdhury et al. (1978), child mortality experience is an important determinant of fertility; hence, the reduction of child mortality may be a precondition for successful population control efforts.

2.4. Desired family size and fertility

Results of the National Longitudinal Study undertaken in Thailand suggest that rural women have larger families than urban women because they are less effective in implementing their fertility desires. It also suggests that their larger reported ideal family size may be in part a result of a rationalisation of their actual number of children rather than a true desire for larger families (Stoeckel, 1975).

In India, the average desired number varied relatively little across age categories, from 3.3 children in the 15-24 age group to 3.6 children in the 35-49 cohort. Not surprisingly, women with larger families gave higher desired numbers than those with smaller families, but 35 percent of these with five or more living children, and 42 percent of those with six or more said that they would want three or fewer children if they could start all over again. These ideals reflected a growing feeling that large numbers of children placed too much of strain on family resources, and that smaller families were more suited to modern conditions.

In spite of the stated preference for smaller numbers, older women already had families larger than their ideals (Vlassoff, 1990).

Findings from the first Korean national survey of young unmarried women on their attitudes towards marriage, family planning, and induced abortion and their sources of information about contraception indicate that sex preferences for children affects the desired number of children, with those having a sex preference desiring a mean of 2.8 children and those not having a sex preference desiring a mean of 2.0 children (Song, 1975).

According to the results of a survey undertaken by Ajayi et al (1991) in Kenya, responses on the desired number of children revealed a pattern indicating that men with a low

level of education desired to have more children. The ideal family size ranged from 3-5, with an overwhelming majority of subgroups citing 4-5 children as ideal.

On the other hand, Nigerians appear to favour larger families: on average, married women considered 8.5 children to be ideal family size; their husbands mentioned a larger ideal family size of 12.6 children (Remez, 1994).

Even in Pakistan, as in most of the developing world, the demand for children appears to be quite high. The average desired family size ranges from five children in the urban metropolitan areas to 5.5 children among rural non-farm households (Farooq and Irfan, 1985)

Highlights of the 1991-1992 Tanzanian Demographic and Health Survey (TDHS) regarding the desired family size indicate that currently married women desired an average of 6.4. The mean ideal family size increased with age from 5.4-5.5 among those aged 15-24 to 7.5 among those aged 45-49. There was also a steady decline in ideal family size with increasing education, from 7.3 among women with no schooling to 6.3 among those with an incomplete primary education and to 4.2 among those with a secondary or higher education (Klitsch, 1994).

2.5. Proximate determinants and fertility

2.5.1. Use of contraceptives

According to the U.N (1996), availability of family planning information and services is among the most important factor associated with increased use of contraception. Studies in numerous countries show that contraceptive use is clearly related to ease of access, particularly knowledge of and distance from a source of service. Scope and density of coverage are therefore critical to programme performance; rural areas, in particular, tend to be under served.

On the other hand, supporters of expanded family planning programmes argue that in many parts of the Third World the supply of family planning information and services is inadequate, and that when men and women are better educated about family planning and have full access to family planning services, then many more of them will use those services effectively (Finkle et al, 1979).

According to Pi-chao and Miller (1975), many countries use an extension approach to motivate people but less often to provide supplies or services. Getting to clinics and stores is often very difficult in developing countries with poor roads and transport, agricultural work schedules, and overcrowded clinics with long lines and short hours.

The effect of poor access on contraceptive behaviour depends not only on the decline in prevalence as distance increases but also on the distribution of the population by distance to outlets. As a consequence, improving the density of service points will have a relatively small impact in countries where the density is already high, while a significant effect can be expected where a large proportion of women live far from a source (Bongaarts and Bruce, 1995).

According to Ampofo et al (1976), few people will travel far for a preventive service. Contacting women at MCH clinics is obviously the first place to start. Further, there is still a relative scarcity of such clinics in rural Africa, however, and many women rarely visit them. Therefore, a large number of women in need will never be reached in a clinic-based programme. Bringing the services into the villages will markedly improve the rates of acceptance. This is not easy in rural Africa. Many villages are inaccessible by road, and even reaching those that are accessible is difficult and often a costly logistical problem.

The Nepal Contraceptive Prevalence Survey data of 1981 indicate that an inverse relationship exists between the prevalence of current contraceptive use and distance, or travel

time to an outlet. A little more than one-third of the currently married women who knew of an outlet and were current users could reach an outlet within less than 30 minutes. This proportion decreases with increased distance to outlet (Tuladhar, 1987).

Using data obtained from the WFS surveys in Colombia, Costa Rica, Korea, Malaysia and Nepal, Rodriguez (1978) found out that greater availability and accessibility of family planning services is associated with increased use of contraception. In countries where services are widely available, differences in use between urban and rural women are small. Where services are few and distant, as in Nepal, increasing availability and accessibility might bring about a large increase in use.

According to Brackett (1980), only 20 percent of family planning users in Kenya lived near an outlet. Kenya's outlet tends to be far apart. The average land area per clinic was 1,127 sq.km for all of Kenya, but this average masks wide variations. Clearly most Kenyans would need to travel great distances to obtain family planning services.

According to the 1984 Kenya Contraceptive Prevalence Survey, travel time in the rural areas was considerably longer than in urban areas, such that only 36 percent of the rural users could reach the source within an hour, as compared to about 78 percent in the urban areas. The reported travel times seem reasonable in view of the fact that women in most parts of rural Kenya travel long distances from their homes to obtain health services because of the general inadequacy of these facilities in the rural areas.

Results of the 1993 Kenya Demographic and Health Survey further indicate that urban users are generally closer than rural user to their supply source; half of urban users are within 30 minutes from their supply sources, compared to one sixth of the rural users. Almost three fifths of the latter have to travel for one hour or more to get their supplies.

The use of contraception to delay or limit the number of children born clearly affects a society's fertility level. Historically, contraceptive use in sub-Saharan Africa, including Kenya, has been very low (Brass and Jolly, 1993). The use of contraception to delay or limit the number of children born clearly affects a society's fertility level. Historically, contraceptive use in sub-Saharan Africa, including Kenya, has been very low (Brass and Jolly, 1993). The use of contraception to delay or limit the number of children born clearly affects a society's fertility level. Historically, contraceptive use in sub-Saharan Africa, including Kenya, has been very low (Brass and Jolly, 1993).

According to Khasiani (1988), the constraints of contraceptive use will be removed when education reaches more women and their status is improved through access to employment and income. This will occur through economic and social development. It will lead to changes in attitudes favouring low fertility and more use of family planning.

The results of the Thailand Third Contraceptive Prevalence Survey indicate that, with respect to education, women who had less than four years of schooling practised contraception somewhat less than women who had four or more years. Differentials with respect to work status were modest. Women who were not participants in the labour force practised contraception somewhat less than women in the labour force. Among the latter, those women involved in non-farm activities exhibited a higher rate of current use than women working on farms (Chamratrithirong et al, 1986).

In Bangladesh, from the perspective of rural women, family planning is a major health issue. For many users or potential users, the perceived health costs are considerable; in fact most rural women perceive the health risks of contraceptive use to be far more extensive than

those medically indicated. Most health complaints that occur subsequent to the adoption of contraceptive methods are attributed to family planning (Simmons et al, 1990).

Van de Walle et al (1990) found out that family planning services are still not widespread in the sub-Saharan Africa region and there are signs of unmet need for contraception among some group of the population. Van de Walle et al. (1990) found out that the most important reason for low contraceptive use in Africa is high desired family size - over 6 children per woman on average.

Similarly, the Ankole have recorded the highest fertility in Uganda over the past several decades. One of the main proximate determinants of fertility in the area is the low level of contraception. Several factors have contributed in the past to low use of modern contraceptives in Ankole society. Perhaps the most important influence has been the desire for more children (Ntozi and Kabera, 1991).

Anker and Knowles (1982) state that in light of the very high fertility rates and family size ideals found in Kenya, it is not surprising that the family planning programme has not yet reached a very high proportion of the country's women.

Throughout the world a shift from high to low fertility has invariably accompanied economic and social modernization. This change has largely been accomplished by family size limitation within marriage - by a shift from what is commonly called a natural fertility regime to one of deliberate control of family size by individual couples (Easterlin and Crimmns, 1985).

2.6 Summary of Literature Review

The literature review reveal that women education is the single most important factor in the process of fertility decline, and that generally, in Sub-Saharan Africa compared with other developing countries, childbearing starts early, and that there is a decline in the mean age of women giving birth in all the regions covered by the literature review.

It also indicates that employed women and, particularly those working away from home have low fertility and that the aspirations of women who earn high income are raised, such that they view children as costs and not economic assets, a fact that encourages contraceptive use resulting to low fertility levels.

The literature review demonstrates that married women have higher fertility compared with the divorced, widowed or separated women mainly because of a higher exposure to sex and, that reduction of infant and child mortality has a strong effect in reducing fertility.

It further indicates that the desired family sizes in Africa though declining, are still high and contraceptive prevalence rates especially in rural areas are low mainly because of poor accessibility and inadequate supply of family planning information and services.

2.7. Conceptual framework

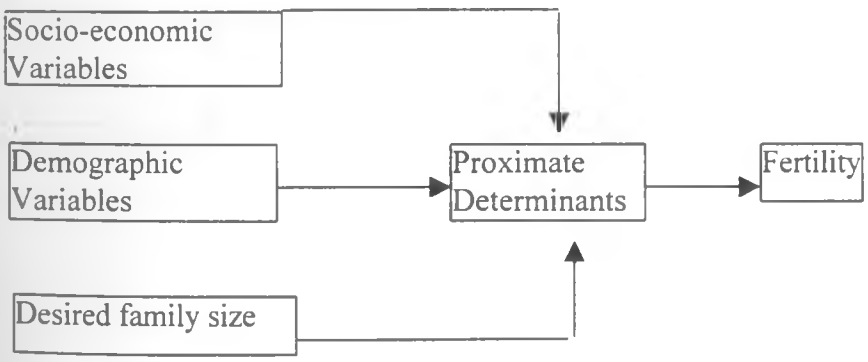
The classical framework which was developed by Kingsley and Judith Blake in (1956) and later (1978) modified by John Bongaarts will be used to analyze the relationship between the background fertility variables and intermediate fertility variables and the resultant fertility.

According to Bongaarts (1978) substantial insights can be gained if, in addition to the socio-economic factors influencing fertility, the specific mechanisms through which these factors operate are identified. For example, the level of education of women is a socio-

economic indicator that is frequently found to be negatively related to fertility. A more detailed analysis may show that among educated women marriage is relatively late or the use of contraception more frequent, thus clarifying the relationship between education and fertility. The biological and behavioural factors through which socio-economic, cultural and environmental variables affect fertility are called intermediate fertility variables, they are (a) exposure factor which is the proportion of women married and (b) deliberate marital fertility factors which include lactational infecundability, frequency of intercourse, sterility, spontaneous intrauterine mortality and duration of the fertile period. The primary characteristic of an intermediate variable is its direct influence on fertility. If an intermediate fertility variable, such as the prevalence of contraception changes, then fertility necessarily changes also (assuming the other intermediate fertility variables remain constant), while this is not necessarily the case for an indirect determinant such as income or education. Consequently, fertility differences among populations and trends in fertility over time can always be traced to variations in one or more of the intermediate fertility variables.

The following is the conceptual model adapted from Bongaarts.

Figure 1. Conceptual framework for studying determinants of fertility



Source:John Bongaart (1978). A Framework for Analysing the Proximate Determinants of Fertility

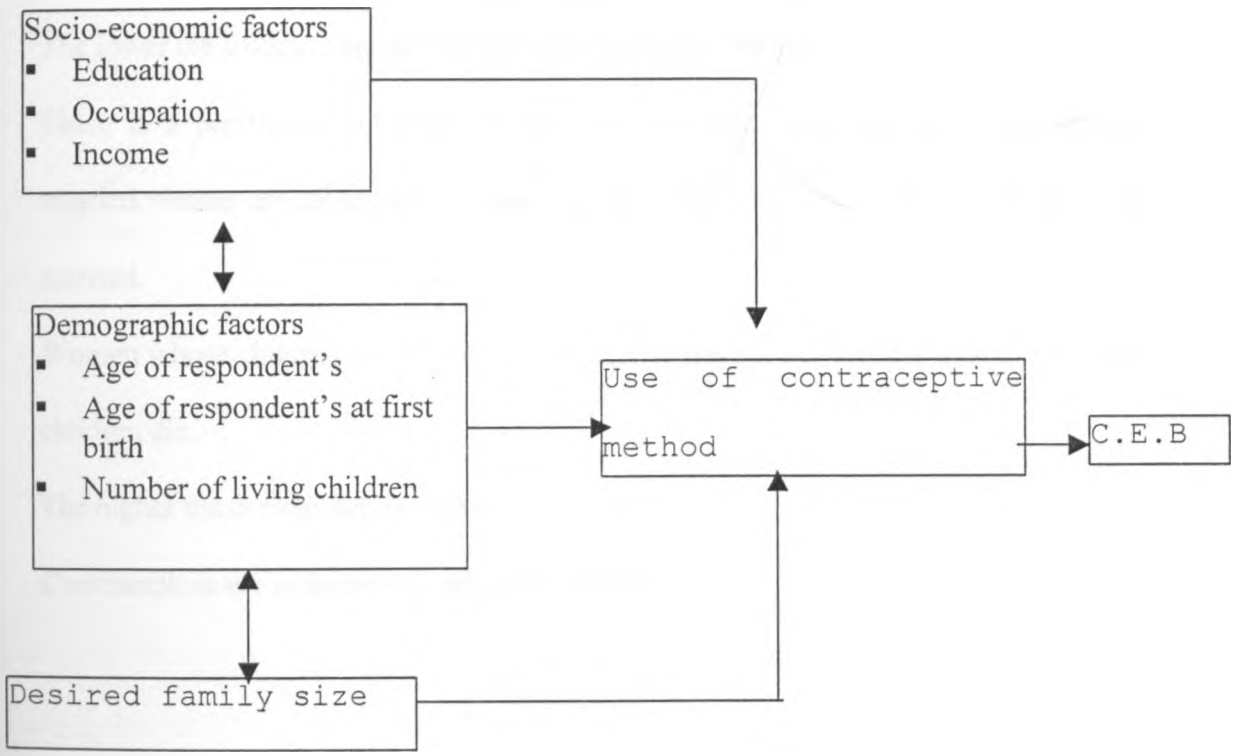
Conceptual hypotheses

1. Socio-economic variables are likely to affect fertility
2. Demographic variables are likely to affect fertility

2.8. Operational model

From the above mentioned conceptual model, the operational model for this study is shown in the diagram below.

Figure 2. Operational model for studying the determinants of fertility



2.9. Study hypotheses

1. Education is negatively related to fertility.
2. There is a negative relationship between formal employment and fertility. The women who are in formal employment are more likely to have lower fertility than those who are not in formal employment.
3. There is a negative relationship between women's income and fertility. The women who earn cash for work are more likely to have lower fertility than those who do not earn cash for work.
4. The age of the woman is positively related to fertility.
5. The lower the woman's age at first birth the higher the fertility.
6. There is a positive relationship between marital status and fertility. The currently married women are more likely to have higher fertility than the formerly and the never married.
7. Women whose children survive are more likely to have lower fertility than those whose children die.
8. The higher the desired family size the higher the fertility.
9. Contraceptive use is negatively related to fertility.

CHAPTER THREE

SOURCES OF DATA AND METHODS OF ANALYSIS

3.1. Data and methodology

Data Source:

Data from the 1993 KDHS was used in this study. The KDHS was conducted by the National Council for Population and Development (NCPD) and the Central Bureau of Statistics in collaboration with Macro international Inc. The survey was launched on 17th February 1993, after the training of interviewers, supervisors and field editors. Fieldwork was completed on 15th August 1993(KDHS, 1993).

A total of 8,805 households were selected for the survey, of which 7,950 were successfully interviewed. The shortfall was due to dwellings being vacant or in which the inhabitants had left for an extended period at the time they were visited by the interviewing teams. Of the 8,185 households that were found, 97 percent were interviewed. Within these households, 7,952 women were identified as eligible for an individual interview and of these, 7,540, or 95 percent, were interviewed. Responses were higher in rural than in urban areas (KDHS, 1993).

Objectives of the Survey:

The 1993 KDHS was intended to serve as a source of population and health data for policy makers and the research community. It was designed as a follow-up to the 1989 KDHS. The KDHS was specifically designed to: -

1. Provide data on the family planning and fertility behaviour of the Kenyan population to enable the NCPD to evaluate and enhance the National Family Planning Programme.

2. Measure changes in fertility and contraceptive prevalence and at the same time study the factors which affect these changes, such as marriage patterns, urban/rural residence, availability of contraception, breastfeeding habits and other socio-economic factors, and

3. Examine the basic indicators of maternal and child health in Kenya (KDHS, 1993).

Sample Design:

The 1993 KDHS sample was national in scope, with the exclusion of all three districts in North Eastern Province and four other northern districts (Samburu and Turkana in Rift Valley Province and Isiolo and Marsabit in Eastern Province. Together the excluded areas account for less than 4 percent of Kenya's population. The KDHS utilised a two-stage, stratified sample consisting of 536 sample units (KDHS, 1993) .

Despite the emphasis on obtaining district-level data for planning purposes, it was decided that reliable estimates could not be provided from the KDHS for all 48 districts, unless the sample was expanded to unmanageable size. However, it was felt that reliable estimates of certain variables could be produced for the rural areas in 15 districts: Bungoma, Kakamega, Kericho, Kilifi, Kisii, Machakos, Meru, Muranga, Nakuru, Nandi, Nyeri, Siaya, South Nyanza, Taita-Taveta and Uasin Gishu; in addition, Nairobi and Mombasa were also targeted. These areas were targeted because they are generally the larger districts in their Provinces, most were districts in which NCPD had posted District Population Officers, and most were also targeted in the 1989 KDHS. Although six of these districts were subdivided shortly before the sample design was finalised, the previous boundaries of these districts were used for the KDHS in order to maintain comparability with the 1989 survey. Due to this over sampling, the KDHS sample

is not self-weighting at the national level. Sample weights were used to compensate for the unequal probability of selection between strata, and weighted figures are used throughout the remainder of this report (KDHS, 1993).

Questionnaires:

The survey utilised four types of questionnaire:

1. A Household Schedule was used to list the names and certain characteristics of all usual members and visitors to selected household.
2. The women's questionnaire was used to collect information from women aged 15-49. In addition, interviewing teams measured the height and weight of mothers and of all her children under age 5.
3. A men's questionnaire was used to collect information from a sub-sample of men age 20-54.
4. The services availability questionnaire was used to collect information on the health and family planning services near the sample areas. One services availability questionnaire was to be completed in each sample point.

The questionnaires were developed in English by task forces established in Kenya. All except the services availability questionnaire were translated into and printed in Kiswahili and eight of the most widely spoken local languages in Kenya, (Kalenjin, Kamba, Kikuyu, Kisii, Luhyia, Luo, Meru, and Mijikenda).

The women's questionnaire was used to collect information from women aged 15-49. These women were asked questions on the following topics: (1) Background characteristics

(age, education, religion etc) (2) Reproductive history (3) Knowledge and use of family planning methods (4) Antenatal and delivery care (5) Breastfeeding and weaning practices (6) Vaccinations and health of children under age five (7) Marriage (8) Fertility preferences (9) Husband's background and respondent's work (10) Awareness of Aids.

The variables used in this study were specifically obtained from the following topics (1) Background characteristics (2) Reproductive history (3) Knowledge and use of family planning methods (4) Marriage (5) Fertility preferences (6) Husband's background and respondent's work (KDHS, 1993).

3.2. METHOD OF DATA ANALYSIS

3.2.1. Methods for measuring the association between the dependent and independent variables

In this study, the measure of fertility utilised is the number of children ever born to each woman. This study used three analytical techniques, namely frequencies, cross tabulation and multiple linear regression.

Frequency distribution

Frequencies were used to summarise the findings of the study on the socio-economic and demographic factors.

Cross tabulations

Cross tabulations were used to determine the nature of the relationship between the dependent variable (total children ever born) and each of the independent variables specified in the operational model, and multiple regression was used.

3.3. Multiple linear regression

The basic goal of multiple regression is to produce a linear combination of independent variables, which will correlate as highly as possible with the dependent variable. This linear combination can then be used to "predict" values of the dependent variable, and the importance of each of the independent variables. This technique is widely discussed in the literature (Pagano M and Gauvreau, 1993; Wayne et al, 1979;David, 1979; Nie, 1975) and takes the general form:

$$y = \propto + \beta_1 x_1 + \beta_2 x_2 + \ldots\ldots\ldots\ldots + \beta_q x_q + \in$$

Where x_1, x_2,...., and x_q are the outcomes of q distinct explanatory variables as in the sample case, $\in$ is the random error associated with y. The population intercept $\propto$ is the mean value of the response when all the explanatory variables take the value 0; the population slope βi is the estimated change in y that corresponds to a one-unit increase in x_1 given that all other explanatory variables remain constant. (Pagano M and Gauvreau, 1993).

In this study, the multiple correlation coefficient R^2, was used to determine the importance of the model in explaining variations in the dependent variable.

Usually, the overall model in multiple regression is tested for significance using the F-test, which is computed using the following equation:

$$F = \frac{SSreg/k}{SSreg/N - k - 1}$$

$$= \frac{R^2/k}{(1 - R^2)/(N - k - 1)}$$

If the calculated F is less than 5% level of significance, then the model is accepted as being significant.

For individual variables, the T-test is tested using the T-test, which is calculated as follows:

$$t = \frac{\overline{X} - \mu_0}{s/\sqrt{N}}$$

The t-statistic has a distribution with n-k-1 degrees of freedom where n is the sample size and k is the number of independent variables.

In each case, the computed value was significant if it was less than 0.05 percent (Wayne et al, 1979)

Regression with dummy variables

Dummy variables are most commonly used when a researcher wishes to insert a nominal-scale variable into a regression equation. Since the values assigned to categories of a nominal scale are usually not assumed to have an order and unit of measurement, they cannot be treated as "scores" as they would be in conventional regression analysis.

Dummy variables: Coding and interpretation

A set of dummy variables are "created" by treating each category of a nominal variable as a separate variable and assigning arbitrary score for all cases depending upon their presence or absence in each of the categories. For example, the nominal variable RELIGION, with categories Catholic, Protestant, Jewish, and Other, may be conceived as four separate dichotomous variables. All these cases in a sample can be assigned arbitrary scores of, say, 1 or 0 on all four of these variables. If 1's and 0's are used as scores, a Catholic would be scored 1 on the dummy variable standing for Catholic, and 0 on all of the others. A Protestant would be assigned a 1 for a dummy variable standing for Protestant and 0 on all the others, and so on. The newly created dichotomous variables are called dummy variables because their scores have no meaning other than representing or standing for a particular category in the original variable.

Using dummy variables in multiple regression involves exclusion of one of the dummies in order to avoid over-generalisation of the model, which would render the equation unsolvable.

The exclusion of one of the dummy variables does not actually result in a loss of information. The excluded category becomes the reference category by which the effects of the other dummies are judged and interpreted. For this reason, the excluded category is referred to as the reference category.

It was necessary to create dummy variables for the following continuous variables because we wished to estimate differences in effects for each of the categories, for instance, although education was estimated in terms of number of years, we needed to know the differences between each category of years.

SOCIO-ECONOMIC VARIABLES

Education level

NOED Indicates those women with no education. It forms the reference category.

PRIED Indicates those women who had primary education (coded 1 if the case, 0 otherwise).

SECHIG Indicates those women who had secondary education and above (coded 1 if the case, 0 otherwise).

Respondents work status

CURRNWOR Indicates women who were not in any formal employment It forms the reference category.

CURRWOR Indicates women who were in formal employment (coded 1 if the case, 0 otherwise).

Respondents incomes

ENCAFWOR Indicates women who earned no cash for work. It forms the reference category.

ECAFWOR Indicates women who earned cash for work (coded 1 if the case, 0 otherwise)

DEMOGRAPHIC FACTORS

Age of respondents.

AGEA Indicates women were aged between 15 and 24 years. It forms the reference category.

AGEB Indicates women who were age between 25 and 34 years (coded 1 if the case, 0 otherwise)

AGEC Indicates women who were aged between 35 and 49 years (coded 1 if the case, 0 otherwise).

Age of the respondents at first birth

AGE1 Indicates the age of the women at first birth as being less than 15 years. It forms the reference category.

AGE2 Indicates the age of the women at first birth being in the age group 15-19 years. (coded 1 if the case, 0 otherwise).

AGE3 Indicates the age of the women at first birth being in the age group 20-24 years. (coded 1 if the case, 0 otherwise).

AGE4 Indicates the age of the women at first birth being in the age group 25-49 years. (coded 1 if the case, 0 otherwise)

Marital status

NEVMARR Indicates women who were never married at the time of the interview. It forms the reference category.

CURRMAR Indicates women who were currently married (coded 1 if the case, 0 otherwise).

FORMARR Indicates women who were formally married (coded 1 if the case, 0 otherwise).

Number of living children

CHLIVE Indicates the children who are alive out of the total children born.

Desired family size

CHILD0 Indicates women who desired to have less than two children. It forms the reference category.

CHILD1 Indicates women desired to have between 2 and 3 children (coded 1 if the case, 0 otherwise).

CHILD2 Indicates women who desired to have between 4 and 5 children (coded 1 if the case, 0 otherwise).

CHILD3 Indicates women who desired to have more than five children (coded 1 if the case 0 otherwise).

PROXIMATE DETERMINANTS

Ever use of any method

NEVUSE Indicates those women who had never used any method of family planning. It forms the reference category.

USETRAD Indicates those women who had only used folkloric and traditional methods of family planning only (coded 1 if the case, 0 otherwise).

USEDMOD Indicates those women who used modern methods of family planning (coded 1 if the case, 0 otherwise).

CHAPTER FOUR

RESPONDENTS BACKGROUND CHARACTERISTICS, FERTILITY LEVELS AND DIFFERENTIALS IN NYERI, TAITA-TAVETA, KISII-NYAMIRA AND BUNGOMA DISTRICTS.

4.1. A comparative description of the variables used in the analysis in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma districts

Table 2 below shows a comparative analysis of the variables used in the analysis for the different categories of women in each of the four districts presented in form of percentages.

Table 2: Sample distribution of the women by various categories in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma district

Independent Variables	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
Education level	%	N	%	N	%	N	%	N
NOED(Ref.category)	5.4	20	11.4	32	15.2	74	11.6	46
PRIED	58.0	213	66.5	187	64.1	313	61.4	243
SECHIG	36.5	134	22.1	62	20.7	101	27.0	107
Resp work status								
CURRNWOR(Ref.categ)	39.5	145	55.9	157	53.8	262	46.5	184
CURRWOR	60.5	222	44.1	124	46.2	225	53.5	212
Respondents incomes								
ENCAFWOR(Ref.categ)	38.7	86	13.1	16	7.1	16	9.4	20
ECAFWOR	61.3	136	86.9	106	92.9	209	90.6	192
Demographic variables								
Age of respondents								
AGEA (Ref.category)	40.1	147	45.9	129	48.6	237	47.0	186
AGEB	33.0	121	27.4	77	27.7	135	27.5	109

AGEC	27.0 99	26.7 75	23.8 116	25.5 101
Mean age	**28.6**	**27.5**	**27.2**	**27.3**
Age at first birth				
AGE1	8.2 22	9.0 17	15.9 53	7.7 22
AGE2	57.2 154	44.1 83	55.0 183	63.2 180
AGE3	27.9 75	40.4 76	24.9 83	27.4 78
AGE4	6.7 18	6.4 12	4.2 14	1.8 5
Marital status				
NEVMAR (Ref.category)	38.4 141	35.2 99	32.0 156	28.3 112
CURRMAR	55.6 204	56.9 160	59.4 290	64.4 255
FORMAR	6.0 22	7.8 22	8.6 42	7.3 29
Number of living children				
CHLIVE	88.8 326	82.9 233	76.4 373	71 281
Desired family size				
CHILD0 (Ref.category)	2.8 10	1.5 4	1.9 9	1.0 4
CHILD1	54.5 195	32.8 88	41.9 197	33.8 130
CHILD2	39.7 142	52.6 141	49.8 234	50.9 196
CHILD3	3.1 11	13.1 35	6.4 30	14.3 55
Proximate Determinants				
Ever use of method				
NEVUSED (Ref.categ)	30.8 113	61.9 174	52.9 258	60.1 238
USEDTRAD	12.0 44	6.0 17	9.0 44	10.9 43
USEDMOD	57.2 210	32.0 90	38.1 186	29.0 115

Source: KDHS, 1993.

4.1.1 Socio-economic factors

Education

In all the four districts, women with primary education were the majority as shown in the Table 2. The table also reveals differences in the four districts. Women in Nyeri were the most educated while those in Kisii-Nyamira were the least educated. The proportion of women

with secondary education and above was highest in Nyeri (36.5%), followed by Bungoma (27.0%) and Taita-Taveta (22.1%) and finally by Kisii-Nyamira (20.7%), respectively.

The proportions of women who had no education on the other hand was lowest in Nyeri (5.4%) followed by Taita-Taveta (11.4%), then by Bungoma (11.6%) while Kisii-Nyamira (15.2%) had the highest. Given the link between education and fertility the data therefore suggest that fertility of the women in Nyeri is likely to be lower than that of the women in Taita-Taveta, Kisii-Nyamira and Bungoma districts.

Respondents work status

As shown in Table 2, majority of the women in Nyeri and Bungoma districts were in formal employment, while in Taita-Taveta and Kisii-Nyamira the majority were not in any formal employment. The percentage of the women in formal employment was higher in Nyeri (60.5%), followed by Bungoma (53.5%), then by Kisii-Nyamira (46.2%) and lowest in Taita-Taveta (44.1%). On the other hand, the percentages of the women not in formal employment were higher in Taita-Taveta (55.9%) followed by Kisii-Nyamira (53.8%), then by Bungoma (46.5%) and finally low in Nyeri (39.5%).

According to this data, women in Nyeri and Bungoma had higher work status than women in Taita-Taveta and Kisii-Nyamira districts. This would imply that, the fertility of the women in Nyeri and Bungoma districts would be lower than that of the women in Taita-Taveta and Kisii-Nyamira districts.

Respondent's income

According to Table 2, the majority of the women in all the four districts earned cash for work, while only very few of them earned no cash for work. These percentages were very high in Kisii-Nyamira (92.9%) and in Bungoma (90.6%), while in Taita-Taveta and in Nyeri they were (86.9%) and (61.3%) respectively. The proportion of women who earned no cash for work, was lowest in Kisii-Nyamira (7.1%), followed by Bungoma (9.4%), Taita-Taveta (13.1%) and highest in Nyeri (38.7%). The results show that in Kisii-Nyamira and Bungoma districts, women had higher incomes. On the other hand, women in Taita-Taveta had high incomes, while in Nyeri the incomes were moderate. This would imply that fertility would be very low in Kisii-Nyamira and Bungoma districts, low in Taita-Taveta and moderate in Nyeri district.

4.1.2 Demographic Factors

Age of respondents

As indicated in Table 2, the majority of the respondents in all the four districts, were aged between 15 and 24 years: In Kisii-Nyamira (48.6%), Bungoma (47.0%), Taita-Taveta (45.9%) and low in Nyeri district (40.1%). Women who were aged between 35 and 49 years, were more in Nyeri (27.0%), followed by Taita-Taveta (26.7%) then by Bungoma district (25.5%) and lowest in Kisii-Nyamira (23.8%). The above data indicates that the women who were in the younger age group were more in Kisii-Nyamira and Bungoma, moderate in Taita-Taveta and few in Nyeri district.

Mean age of respondents.

As shown in Table 2 the mean ages of the respondents in all the four districts were very high, being 28.6 in Nyeri, 27.5 in Taita-Taveta, 27.2 in Kisii-Nyamira and 27.3 years in Bungoma. This shows that the mean age was lower in Taita-Taveta, Kisii-Nyamira and Bungoma than in Nyeri, though it was lowest in Kisii-Nyamira (27.2%), followed by Bungoma (27.3%) and then by Taita-Taveta (27.5%) compared with Nyeri (28.6).

Age of respondents at first birth

Table 2 shows that in all the four districts, age at first birth was very low. The lowest age of respondents at first birth was below 15 years. However, the majority of the women in all the four districts gave birth for the first time when they were aged between 15-19 years. The women whose age at first birth was between 25 and 49 years as expected were few. As indicated by the results in the table, age at first birth was generally low in all the four districts. However, there were distinct differences in all the districts with, more women in Bungoma having a lower age at first birth followed by Nyeri, Kisii-Nyamira and then Taita-Taveta. Fertility would therefore likely be higher in Bungoma, moderate in Nyeri and Kisii-Nyamira and low in Taita-Taveta.

Marital Status

Although in all the four districts the currently married women were the majority, the number of never married women was quite substantial as shown in the table. The proportion of the currently married women was higher in Bungoma (64.4%) followed by Kisii-Nyamira (59.4%), then by Taita-Taveta (56.9%) and finally low in Nyeri (55.6%). Formerly married

were few (6.0%) in Nyeri, Bungoma (7.3%) then Taita-Taveta (7.8%) and finally Kisii-Nyamira (8.6%). According to the above data, the currently married women would likely have high fertility in all the four districts. This would imply that Bungoma would most likely have higher fertility, Kisii-Nyamira and Taita-Taveta districts medium fertility and Nyeri low fertility.

Number of living children

Table 2 shows that generally in all the four districts the number of living children was very high, although it was higher in Nyeri (88.8%) and Taita-Taveta (82.9%) than Kisii-Nyamira (76.4%) and Bungoma (71%).

4.1.3 Desired family size

As indicated in Table 2 the majority of the women in Nyeri (54.5%) desired to have between 2 and 3 children, while in Taita-Taveta (52.6%), Kisii-Nyamira (49.8.5) and Bungoma (50.9%) districts they desired to have between 4 and 5 children. In all the four districts only very few women desired less than 2 children. In summary this data suggests that the desired family size was high in Taita-Taveta, Kisii-Nyamira and Bungoma districts, and low in Nyeri district. Therefore, fertility is likely to be high in Taita-Taveta, Bungoma and Kisii-Nyamira districts and low in Nyeri district.

4.1.4 Proximate determinants

Ever use of any method

Use of the modern methods of family planning as shown in Table 2 was higher in Nyeri compared with Kisii-Nyamira, Taita-Taveta and Bungoma districts. However, majority of the women in Taita-Taveta (61.9%), Bungoma (60.1%) and Kisii-Nyamira (52.9%) had never used any method of family planning, compared with (57.2%) of the women in Nyeri who used modern methods of family planning. This data also shows that the use of traditional methods of family planning in all the four districts was very low. The proportion of women who used traditional methods of family planning was lowest in Taita-Taveta (6.0%), followed by Kisii-Nyamira (9.0%), then by Bungoma (10.9%) and finally by Nyeri (12.0%).

From the above results, it can be postulated that fertility would likely be higher in Taita-Taveta, Bungoma and Kisii-Nyamira districts and low in Nyeri. This is because the predominance of the use of the modern methods of family planning in Nyeri would control the fertility as opposed to the fertility of Taita-Taveta, Kisii-Nyamira and Bungoma where efforts to limit or control fertility using modern contraceptives were only moderate.

4.2. Factors associated with total children ever born

This section presents the results of cross tabulations, which have been used to determine the relationship between the dependent variable and each of the independent variables hypothesised.

The dependent variable, total children ever born was categorised as follows:-

1. No child 2. 1-3 children 3. 4-6 children

4. More than 6 children.

Women whose mean number of children was between 1 and 3 children were considered to have low fertility, those with a mean of between 4 and 6 children moderate/medium fertility, while those whose with a mean number of more than 6 children were considered to have high fertility. The entire population number of cases for the districts are; Nyeri 206, Taita-Taveta 183, Kisii-Nyamira 370 and Bungoma 415. N in the tables signifies number of cases.

4.2.1. Socio-economic factors

Table 3.1. Distribution of women by mean number of children ever born and education level

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
EDUCATION	MEAN	N	MEAN	N	MEAN	N	MEAN	N
NOED	7.4	15	5.7	19	7.2	50	7.8	59
PRIED	3.3	119	4.1	121	4.7	230	5.0	247
SECHIG	2.6	72	2.9	43	3.2	90	3.9	109

Mean number of children ever born and education

Table 3.1 above shows that in Nyeri, Kisii-Nyamira and Bungoma districts, women who had no education had high fertility, though the mean number of children was higher in Bungoma (7.8), followed by Nyeri (7.4) and then by Kisii-Nyamira (7.2), while in Taita-Taveta, the women who had no education had moderate fertility and the mean number of children was (5.7). On the other hand, the women who had secondary and above education in Nyeri, Taita-Taveta and Kisii-Nyamira had low fertility. The mean number of children was lower in Nyeri (2.6), followed by Taita-Taveta (2.9) and finally by Kisii-Nyamira (3.2). In Bungoma women in this category had moderate fertility where the mean number of children was (3.9).

In Taita-Taveta, Kisii-Nyamira and in Bungoma districts, women who had primary education had moderate fertility, although Taita-Taveta had a lower mean number of children (4.1), followed by Kisii-Nyamira (4.7) and then by Bungoma (5.0. However, in Nyeri women who had primary education had low fertility and the mean number of children was (3.3).

In this study, education was hypothesised to be negatively related to fertility. This is because in the process of the women acquiring education, marriage is postponed; this raises the age at first birth and subsequently reduces the risk of conception. This is because in marriage women are more exposed to sex, which consequently leads to high fertility.

Further, education reduces the duration of childbearing given that by the time the women complete their desired highest level of education, they have advanced in age and the childbearing period considerably reduced. This coupled with their burning desire to scale the professional ladders and the high cost of childrearing, educated women tend to carefully plan their families so that childbearing does not interfere or compete with their career growth and development.

This they achieve through the use of contraceptives, whose usage has been empirically demonstrated to be high among most educated women, whose enhanced ability to communicate with their spouses and other women helps to break the myths attached to the use of contraceptives.

Data from the four districts summarised in table 2.1 above supports the hypothesis of this study that education is negatively related to fertility.

Mean number of children ever born and women's work status

Table 3.2 below shows that there is a positive relationship between fertility and formal employment in all the districts. The above table further indicates that in Taita-Taveta, Kisii-Nyamira and Bungoma districts, women who were in formal employment had more children than those who were not in any formal employment. In Nyeri however, women who were not in formal formal employment had slightly more children than women in formal employment, while women in both categories in all districts except those in formal employment in Nyeri had

moderate fertility. The mean number of children for women who were in formal employment was higher in Bungoma (5.5), followed by Kisii-Nyamira (4.9), then by Taita-Taveta (4.9) and finally by Nyeri (3.5). Similarly, the mean number of children for women who were not in any formal employment was higher in Bungoma (4.6), followed by Kisii-Nyamira (4.5), then by Taita-Taveta (3.9) and finally by Nyeri (3.6).

In this study it is hypothesised that there is a negative relationship between the women's occupation and fertility. The women who are in formal employment are more likely to have lower fertility than those who are not in formal employment.

Table 3.2. **Distribution of women by mean number of children ever born and work status**

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
WORK STATUS	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**
CURRENTLY NOT WORKING	3.6	64	3.9	90	4.5	190	4.6	160
CURRENTLY WORKING	3.5	142	4.1	93	4.9	198	5.5	255

This is because formal employment offers women an opportunity to meet and mix with other women from different social and economic backgrounds providing avenues for discussions, particularly those related to their reproduction, whereby family planning features prominently. Besides, it's easier for family planning messages and devices to be accessed through established organisations to the target groups. This approach further facilitates the reach of a wider population of women, enhanced through peer communication.

However, their counterparts in non-formal employment are closed from the wider society and in them cultural inclinations prevail, whereby many children are valued as they substitute the family labour. Secondly, they are rigid to accept new innovations like family planning because they are mostly uninformed or wrongly informed about the modern methods of family planning, where the side effects are more accepted than the benefits that accrue from their use or the proper usage of those devices.

Due to the dearth of jobs, maintaining a formal employment has become very competitive and equally difficult because of the existence of a large number of qualified and unemployed people. Therefore, employers capitalise on this aspect thus frequent or prolonged absence from work is a sure way of losing a job.

Thus women in formal employment have no choice other than having fewer children because this will guarantee maximum man-hours put on the job, which will most probably earn them promotion, pay rise and ensured job security.

The most plausible explanation for this situation is that the above stated women were still young and in school or training hence they are yet to start either childbearing or be engaged in formal employment.

According to these results, the hypothesis was rejected in Taita-Taveta, Kisii-Nyamira and Bungoma districts and accepted in Nyeri.

Mean number of children ever born and income

According to table 3.3 below, the relationship between earning cash for work and fertility was positive in Nyeri and negative in Taita-Taveta, Kisii-Nyamira and in Bungoma.

In Nyeri, Kisii-Nyamira and in Bungoma, women who earned cash for work had more children than those who earned no cash for work, while in Taita-Taveta, women who earned cash for work had fewer children than women who earned no cash for work. The mean number of children for women who earned cash for work was higher in Bungoma (5.5), followed by Kisii-Nyamira (4.9), then by Nyeri (3.7). The mean number of children among women who earned no cash for work was higher in Bungoma (5.3), followed by Nyeri (3.5), then by Kisii-Nyamira (2.3). In Taita-Taveta on the other hand, the mean number of children for women who earned cash for work was (3.5) compared to (4.1) among women who earned no cash for work.

Table 3.3. Distribution of women by mean number of children ever born and respondent's incomes

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
INCOME STATUS	MEAN	N	MEAN	N	MEAN	N	MEAN	N
EARNED NO CASH FOR WORK	3.5	60	4.1	93	2.3	3	5.3	26
EARNED CASH FOR WORK	3.7	82	3.5	8	4.9	195	5.5	229

As it can be noted from the above data summary, the hypothesis that there is a negative relationship between the women's income and fertility was accepted in Taita-Taveta and rejected in Nyeri, Kisii-Nyamira and Bungoma.

However, policies designed to expand women's participation in economic activities are popular among population planners in less-industrialized nations as an indirect route to lower

levels of fertility. Consequently, opportunity costs will increase and family sizes will decrease as more jobs in the productive industrial sectors are created and opened to women (Zsembik, 1990:134).

4.2.2. Demographic factors

Age of respondent's

Table 3.4. Distribution of women and mean number of children ever born and age of the respondents

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
RESPONDENTS AGE	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**
15 - 24	1.7	59	1.7	55	2.0	116	2.1	118
25 – 34	3.5	15	4.4	98	4.9	180	4.8	192
35 - 49	7.3	32	7.0	30	8.4	74	9.1	105

Mean number of children ever born and age of respondent's.

Table 3.4 above shows that in all the four districts, the age of the women is positively related to fertility.

The data further indicates that in all the four districts, women who were aged between 35 and 49 years as expected had high fertility, whereby the mean number of children was higher in Bungoma (9.1), followed by Kisii-Nyamira (8.4), then by Nyeri (7.3) and finally by Taita-Taveta (7.0). On the other hand, women who were aged between 25 and 34 years had moderate fertility in all the four districts. The mean number of children was higher in Kisii-Nyamira (4.9), followed by Bungoma (4.8) then by Taita-Taveta (4.4), and finally by Nyeri (3.5).

Finally, in all the four districts, women who were aged between 15 and 24 years had low fertility. The mean number of children was lowest in Nyeri and Taita-Taveta (1.7) for the two districts, followed Kisii-Nyamira (2.0) and finally by Bungoma (2.1). The hypothesis that age of the woman is positively related to fertility was confirmed in all the four districts.

Mean number of children ever born and age at first birth

Age at first birth influences fertility in that the lower the woman's age at first birth, the higher the fertility and according to table 3.5, in all the four districts, the lower the age at first birth the higher was the fertility. Table 3.5 also shows that, in Nyeri, Taita-Taveta and Kisii-Nyamira, women whose age at first birth was less than 15 years had moderate fertility, but had high fertility in Bungoma. The mean number of children was higher in Kisii-Nyamira (4.9), followed by Taita-Taveta (4.8) and then by Nyeri (4.60), while in Bungoma the mean number of children was (6.7).

Table 3.5. Distribution mean number of children ever born and the age of the respondent's at first birth

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
AGE AT FIRST BIRTH	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**
<15	4.6	5	4.8	10	4.9	28	6.7	7
15-19	3.9	125	4.5	99	4.8	234	5.5	279
20-24	2.9	59	3.1	63	4.4	89	4.4	122
25-49	3.2	17	3.7	11	4.4	19	2.1	7

In all the four districts, women whose age at first birth was between 15 and 19 years had moderate fertility. The mean number of children was higher in Bungoma (5.5), followed by Kisii-Nyamira (4.8), then by Taita-Taveta (4.5) and finally by Nyeri (3.9).

Women whose age at first birth was between 20 and 24 years had low fertility in Nyeri and Taita-Taveta and the mean number of children was lower in Nyeri (2.9) than in Taita-Taveta (3.1), but in Kisii-Nyamira and Bungoma districts they had moderate fertility and the mean number of children was in both Bungoma and Kisii-Nyamira (4.4). However, women whose age at first birth was between 25 and 49 years had moderate fertility in Taita-Taveta and Kisii-Nyamira, whereby the mean number of children was higher in Kisii-Nyamira (4.4) than in Taita-Taveta (3.7), but in Nyeri and Bungoma they had low fertility and the mean. The above results therefore, accepted the hypothesis in all the four districts.

The most likely explanation for the observed difference in Kisii-Nyamira and Taita-Taveta in terms of fertility among women aged between 25 and 49 years who had their first babies at advanced ages that they felt an obligation to attain the community desired family size or in the process of trying to catch up with the lost time, they tend to have shorter inter-birth durations which lead to higher fertility among this group of women.

Mean number of children ever born and marital status

As the Table 3.6 indicates, in all the four districts the never married women had low fertility compared to the formerly married and the currently married women. The currently married women in all the four districts had moderate fertility. The mean number of children among the currently married women was however lower in Nyeri (4.0), followed by Taita-Taveta (4.1), then by Kisii-Nyamira (5.0) and finally by Bungoma district (5.4).

Table 3.6. **Distribution of women by mean number of children ever born and marital status**

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
MARITAL STATUS	MEAN	N	MEAN	N	MEAN	N	MEAN	N
NEVMAR	1.5	33	1.3	9	1.2	26	1.2	13
CURMAR	4.0	163	4.2	164	5.0	319	5.4	373
FORMAR	2.7	10	3.7	10	4.0	25	3.9	29

Similarly, the formerly married women in Taita-Taveta, Kisii-Nyamira and Bungoma districts had moderate fertility, but the mean number of children was lower in Taita-Taveta (3.7), followed by Bungoma (3.9) and finally by Kisii-Nyamira (4.0). On the other hand, the never married women in all the four districts had low fertility as expected. The mean number of children was lowest in Kisii-Nyamira and Bungoma (1.2) for the two districts, followed by Taita-Taveta (1.3) and then finally by Nyeri (1.5).

In this study, it is hypothesised that marital status is positively related to fertility, such that, the currently married women are more likely to have higher fertility than the formerly married and the never married women. According to the above results, this hypothesis is accepted in all the four districts.

The results for the formerly married women in Kisii-Nyamira and the currently married women in Nyeri, Taita-Taveta and Bungoma districts are not in line with the conventional expectations; whereby, the currently married women were expected to have high fertility due to more frequent exposure to sex, while the formerly married women were expected to have low

fertility because they experience interrupted sex lives due to separation, divorce or being widowed.

The possible explanations for the reversal of results, whereby the formerly married women in Kisii-Nyamira had high fertility, while the currently married women in Nyeri, Taita-Taveta and Bungoma had low fertility are:-

i) The formerly married women in Kisii-Nyamira probably started childbearing at very young ages and had closely spaced birth intervals hence, by the time they separated, divorced or became widowed, they already had many children.

ii) The currently married women had low fertility in Nyeri and Taita-Taveta because of the high contraceptive prevalence rates in the two districts. As a confirmation, the cross tabulation results of children ever born and ever use of any method of family planning shown in table 2.10 of this study show that the women who used modern methods of family planning in Nyeri (44.3%) and in Taita-Taveta (40.0%) had low fertility.

In Bungoma on the other hand, polygamy must have contributed to the low fertility among the currently married women because of its role in facilitating long birth intervals, particularly through the promotion of long duration's of breastfeeding and abstinence.

Mean number of living children

According to the Table 3.7 below, in all the four districts, women had moderate fertility, and the mean number of living children was higher in Bungoma (5.1), followed by Kisii-Nyamira (4.6), then by Taita-Taveta (4.0) and finally by Nyeri (3.6).

Table 3.7. **Distribution of women by mean number of living children**

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
NUMBER OF LIVING CHILDREN	MEAN	N	MEAN	N	MEAN	N	MEAN	N
LIVING CHILDREN	3.6	201	4.0	175	4.6	338	5.1	377

Therefore, the hypothesis that women whose children survive are more likely to have lower fertility than those whose children die was accepted in all the four districts.

4.2.3. Desired family size.

Mean number of children ever born and desired family size

In this study it is hypothesised that the higher the desired family size the higher the fertility. Data in the above table indicate that the desired family size was positively related to fertility in all the four districts.

Table 3.8. **Distribution women by mean number of children ever born and desired family size**

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
DESIRED FAMILY SIZE	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**	**MEAN**	**N**
0 or 1	4.3	6	3.6	5	10.0	4	5.0	5
2 or 3	2.5	94	3.3	47	3.9	116	5.2	121
4 or 5	4.3	94	3.7	97	4.7	213	4.8	208
>5	5.8	12	5.8	34	6.5	37	5.8	81

As shown in Table 3.8, women who desired to have less than two children had moderate fertility in Nyeri, Taita-Taveta and Bungoma district. The mean number of children was lowest in Taita-Taveta (3.6), followed by Nyeri (4.3), then by Bungoma (5.0), but in Kisii-Nyamira district they had high fertility and the mean number of children was (10.0). Women who desired to have between 2 and 3 children had lower fertility in Nyeri and Taita-Taveta and moderate fertility in Kisii-Nyamira and Bungoma. The mean number of children was (2.5) and (3.3) for Nyeri and Taita-Taveta, (3.9) for Kisii-Nyamira and (5.2) for Bungoma districts respectively.

On the other hand, the women who desired to have between 4 and 5 children had moderate fertility in all the four districts with the mean number of children being higher in Bungoma (4.8), followed by Kisii-Nyamira (4.7), then by Nyeri (4.3) and then finally by Taita-Taveta district (3.7). In Taita-Taveta and Bungoma districts, the women who desired to have 6 or more than 6 children had moderate fertility and the mean number of children was the same in the three districts (5.8), but in Kisii-Nyamira, they had high fertility and the mean number of children was (6.5). Therefore, the above stated hypothesis was accepted in all the four districts.

4.2.4. Proximate Determinants

Mean number of children ever born and ever use of any method

Table 3.10 above shows that the use of modern contraceptives was positively related to fertility in Nyeri district only, and that in Nyeri women who had low fertility used traditional and modern methods of family planning had low fertility, while in Taita-Taveta, Kisii-Nyamira and in Bungoma, women who never used any method, those who used traditional and modern methods of family planning had moderate fertility.

Table 3.9. Distribution of women by mean number of children ever born and ever use of any method.

	NYERI		TAITA-TAVETA		KISII-NYAMIRA		BUNGOMA	
METHOD USED	MEAN	N	MEAN	N	MEAN	N	MEAN	N
NEVUSED	4.9	39	3.6	73	4.7	154	4.8	215
USEDTRAD	2.0	24	4.2	18	4.4	52	5.2	60
USEDMOD	3.4	143	4.3	92	4.8	164	5.6	140

Therefore, the hypothesis that use of modern methods of contraceptives is positively related to fertility was accepted in Nyeri district only.

The summary of the above results show that in Taita-Taveta, Kisii-Nyamira and in Bungoma districts, contraceptives are mainly used for child spacing but not for birth control. However, contrary to the expectations, traditional methods of family planning thrive most in Nyeri and have shown a big impact on fertility control in the district.

A plausible explanation for the high use of traditional methods of family planning in Nyeri a bigger proportion of the residents belong to the Catholic denomination which preaches against the use of modern methods of family planning, but promotes natural methods of family planning. As a confirmation, the 1993 KDHS results for Nyeri district show that (43.3%) of the respondents were Catholics, while (56.7%) belonged to Protestant and other Churches.

In conclusion, according to Kaufman et al (1992), for successful population growth control and family planning programme, improvements in quality, especially in method mix, providers' level of knowledge, and the quality and quantity of information provided to users will likely improve contraceptive continuation, client satisfaction and women's health.

Therefore, there is need to adopt and implement such an approach in Kenya in order to increase contraceptive prevalence rate.

4.2. The relationship between the dependent and independent variables

A simple linear regression model was fitted using the SPSSPC, with the children ever born as the dependent variable. The nine independent variables included in the study were education level, respondents work status, respondents income, age of respondents, age of respondents at first birth, marital status, number of living children, desired family size and ever use of any method.

Table 4. OLS Estimates of the Determinants of children Ever Born

DISTRICT	NYERI	TAITA-TAVETA	KISII-NYAMIRA	BUNGOMA
Variables	Coeff. Sig.T	Coeff. Sig.T	Coeff. Sig.T	Coeff. Sig.T
Socio-economic factors				
Education				
SECHIG	- 4.76 0.0000	-2.81 0.0000	-4.02 0.0000	-3.99 0.0000
PRIED	- 3.77 0.0000	-1.63 0.0044	-2.47 0.0000	-2.82 0.0000
NOED (**Ref.cat.**)	7.4 0.0000	5.74 0.0000	7.2 0.0000	7.85 0.0000
Respondents work status				
CURRWOR				0.88 0.0062
CURRNWOR **(Ref.cat.)**				4.59 0.0000
Respondents incomes				
ECAFWOR				0.78 0.0000
ENCAFWOR (Ref. Cat)				4.69 0.0000
Demographic factors				
Age of respondents				
AGEC	5.651 0.0000	5.342 0.0000	6.348 0.0000	7.00 0.0000
AGEB	1.826 0.0000	2.676 0.0000	2.872 0.0000	2.776 0.0000
AGEA (Ref.cat)	1.661 0.0000	1.691 0.0000	2.017 0.0000	2.068 0.0000

Age of resp. at first birth				
AGE4	-1.424 0.2251	-1.073 0.2922	-0.524 0.5287	-4.571 0.0065
AGE3	-1.668 0.1210	-1.689 0.0341	-0.511 0.4000	-2.272 0.0623
AGE2	-0.736 0.4836	-0.285 0.7123	-0.094 0.8671	-1.256 0.2948
AGE1 (Ref.cat)	4.60 0.0000	4.80 0.0000	4.892 0.0000	6.714 0.0000
Marital status				
CURRMAR	2.23 0.0000	2.83 0.0005	3.78 0.0000	4.13 0.0000
FORMAR		2.37 0.0286	2.81 0.0002	2.67 0.0000
NEVMAR (Ref.cat)		1.33 0.0883	1.23 0.0172	1.23 0.1514
Desired family size				
Desired family size				
CHILD1		-2.19 0.0438	3.46 0.0135	
CHILD2	-1.91 0.0000	-2.45 0.0000	-2.66 0.0000	
CHILD3		-2.08 0.0000	-1.84 0.0001	-0.65 0.0383
CHILD0 (Ref.cat)	4.43 0.0000	5.79 0.0000	6.54 0.0000	5.45 0.0000
Proximate determinants				
Ever use of any method				
USEDTRAD	-2.91 0.0000			
USEDMOD	-1.52 0.0002			0.74 0.0253
NEVUSED (Ref.cat)	4.95 0.0000			4.88 0.0000

Table 4 above shows the results of the relationship between the dependent and each of the independent variables. The variables and their categories are shown in column 1 of the table. The coeffients for each category are shown against each figure and below them indicate the significant T for the category. Two variables; Number of children dead and time to get to source had missing correlations, hence are not included in the analysis. Thus, as shown in the table, nine variables were found to have some correlation and were included in the analysis. In addition, work status and respondent's incomes had correlations only in Bungoma district, while ever use of any method and frequency of intercourse had correlations in Nyeri and Bungoma districts only.

From the regression coefficients indicated in Table 3, the mean number of children by various factors were computed as illustrated for the mean number of children by level of education for Nyeri district. Since education was represented in the regression by the following set of dummy variables defined as; PRIED and SECHIG, the fitted values for the regression were:-

1. $Y1 = b0 + b1\ Priedi + Sechigi,$

2. Hence, for this case,

$b0 = 7.4$

$b0 + b1 = 7.4 - 3.77 = 3.63$

$b0 + b2 = 7.4 - 4.76 = 2.64$

Therefore, the interpretation of these results is that in Nyeri, the mean number of children for women with no education was 7.4, while those who had primary and secondary and

above education had 3.77 and 4.76 children less than those with no education or in other words, they had 3.63 and 2.64 children respectively.

This data shows that in Nyeri, women who had no education had high fertility, while those who had primary and secondary and above education had low fertility, although the fertility of women who had secondary and above education was lower than those with primary education. In the following comparative discussion below, all the other factors and their dummies for each of the four districts were interpreted in a similar way.

4.3.1. Socio-economic factors

Education

Generally as Table 4 shows, in Nyeri, Kisii-Nyamira and Bungoma districts, the women who had no education had high fertility, though the mean number of children was higher in Bungoma (7.85), followed by Nyeri (7.4) and then by Kisii-Nyamira (7.2), while in Taita-Taveta, the women who had no education had moderate fertility and the mean number of children was (5.70). On the other hand, the women who had secondary and above education in Nyeri, Taita-Taveta and Kisii-Nyamira had low fertility. The mean number of children was lowest in Nyeri (2.64), followed by Taita-Taveta (2.93) and finally by Kisii-Nyamira (3.18). In Bungoma women in this category had moderate fertility where the mean number of children was (3.86).

In all the four districts, however, women who had primary education had moderate fertility, although Nyeri had a lower mean number of children (3.63), followed by Taita-Taveta (4.11), then by Kisii-Nyamira (4.73) and finally by Bungoma (5.03). As the results in the table

reveal, differences between these categories of education were found to be significant in all the four districts.

Respondents work status

According to Table 4, in Bungoma, the women who were in formal employment had 0.88 child more than those who were not in any formal employment, and the mean number of children for women who were in formal employment was (5.47) while for the women not in any formal employment was (4.59). Being either in formal employment or not in any formal employment was found to be significant.

Respondent's income

Women who earned cash for work in Bungoma had 0.78 children more than those who earned no cash for work. The mean number of children for women who earned cash for work was (5.47) compared to (4.69) among women who earned no cash for work. Respondents who earned cash for work and those who earned no cash for work were significant.

4.3.2. Demographic factors

Age of respondents

According to Table 4, in all the four districts, women who were aged between 35 and 49 years as expected had high fertility, whereby the mean number of children was higher in Bungoma (9.08), followed by Kisii-Nyamira (8.365), then by Nyeri (7.31) and finally by Taita-Taveta (7.03). On the other hand, women who were aged between 25 and 34 years had moderate fertility in Taita-Taveta, Kisii-Nyamira and Bungoma districts, but had low fertility in

Nyeri. The mean number of children was higher in Kisii-Nyamira (4.89), followed by Bungoma (4.84) then by Taita-Taveta (4.37), while in Nyeri the mean number of children was (3.49). As expected, in all the four districts, women who were aged between 15 and 24 years had low fertility. The mean number of children was lowest in Nyeri (1.66), followed by Taita-Taveta (1.69), then by Kisii-Nyamira (2.02) and finally by Bungoma (2.07). Differences in fertility in all the three categories were significant in all the four districts.

Age of respondents at first birth

As Table 4 shows, in Nyeri, Taita-Taveta and Kisii-Nyamira, women whose age at first birth was less than 15 years had moderate fertility, but had high fertility in Bungoma. The mean number of children was higher in Kisii-Nyamira (4.89), followed by Taita-Taveta (4.80) and then by Nyeri (4.60), while in Bungoma the mean number of children was (6.71).

In all the four districts, women whose age at first birth was between 15 and 19 years had moderate fertility. The mean number of children was higher in Bungoma (5.46), followed by Kisii-Nyamira (4.80), then by Taita-Taveta (4.52) and finally by Nyeri (3.86).

Women whose age at first birth was between 20 and 24 years had low fertility in Nyeri and Taita-Taveta and the mean number of children was lower in Nyeri (2.93) than in Taita-Taveta (3.11), but in Kisii-Nyamira and Bungoma districts they had moderate fertility and the mean number of children was slightly higher in Bungoma (4.44) than in Kisii-Nyamira (4.38). However, women whose age at first birth was between 25 and 49 years had moderate fertility in Taita-Taveta and Kisii-Nyamira, whereby the mean number of children was higher in Kisii-Nyamira (4.37) than in Taita-Taveta (3.73), but in Nyeri and Bungoma they had low fertility and the mean number of children was lower in Bungoma (2.14) than in Nyeri (3.18). The

differences in fertility was only significant in Bungoma district among women whose age at first birth was between 25 and 49 years and in Taita-Taveta among women whose age at first birth was between 20 and 24 years.

Marital status

As shown in Table 4, the currently married women in all the four districts had moderate fertility. The mean number of children was however lower in Nyeri (4.02), followed by Taita-Taveta (4.16), then by Kisii-Nyamira (5.01) and finally by Bungoma district (5.36). Similarly, the formerly married women in Taita-Taveta, Kisii-Nyamira and Bungoma districts had moderate fertility, but the mean number of children was lower in Taita-Taveta (3.70), followed by Bungoma (3.90) and finally by Kisii-Nyamira (4.04). On the other hand, the never married women in all the four districts had low fertility as expected. The mean number of children was lowest in Kisii-Nyamira and Bungoma (1.23) for the two districts, followed by Taita-Taveta (1.33) and then finally by Nyeri (1.79).

The difference in fertility between the currently married and formerly married women were significant in all the four districts, while the differences between the never married and the formerly married were significant in Kisii-Nyamira district only.

4.3.3 Desired family size

Desired family size

As shown in Table 3, women who desired to have less than two children had moderate fertility in Nyeri, Taita-Taveta and Bungoma district. The mean number of children was lowest in Nyeri (4.43), followed by Bungoma (5.45), then finally by Taita-Taveta (5.79), and in Kisii-

Nyamira district (6.54). Women who desired to have between 2 and 3 children had moderate fertility in Taita-Taveta and high fertility in Kisii-Nyamira. The mean number of children were (3.60) and (9.0) for Taita-Taveta and Kisii-Nyamira districts respectively.

On the other hand, the women who desired to have between 4 and 5 children had moderate fertility in Kisii-Nyamira with the mean number of children being (3.88), but had low fertility in Nyeri and Taita-Taveta districts. The mean number of children was lower in Nyeri (2.52) than in Taita-Taveta (3.34).

In Taita-Taveta and Kisii-Nyamira district, the women who desired to have 6 or more than 6 children had moderate fertility but the mean number of children was higher in Kisii-Nyamira (4.70) than in Taita-Taveta (3.71).

The differences in fertility by the various categories of the desired family size were significant in all the cases indicated in all the four districts.

4.3.4. Proximate determinants

Ever use of any method

According to Table 4, women who used traditional methods of family planning had low fertility in Nyeri. The mean number of children was (2.04). On the other hand, women who used modern methods of family planning had low fertility in Nyeri and moderate fertility in Bungoma. The mean number of children was (3.43) in Nyeri and (5.62) in Bungoma. Women who had never used any method of family planning had moderate fertility in Nyeri and Bungoma, but the mean number of children was higher in Nyeri (4.95) than in Bungoma (4.88). Use of traditional, modern and never use of any method were significant both in Nyeri and Bungoma.

CHAPTER FIVE

DETERMINANTS OF CHILDREN EVER BORN IN NYERI, TAITA-TAVETA, KISII-NYAMIRA AND BUNGOMA DISTRICTS

5.1: Determinants of fertility

As shown in table 4 and the subsequent discussion of the relationship between the dependent and independent variables, the following variables; education, respondents work status, respondents earnings, age of respondents, age of respondents at first birth, marital status, desired family size and ever use of any method were found to have a significant relationship with the dependent variable.

Prior to the selection of the final model for each of the four districts, the models in table 8 in the appendix were used to determine the variables, which were retained in the final models. The models show all the variables with their dummies and the order in which they were included in the regression. The asterisks indicate the dummies, which were significant at 0.05 level.

The dependent variable, mean number of children, standard deviations, number of cases and the four districts are given in table 4 below.

Table 5. Dependent variable, mean number of children, standard deviations, number of cases and the four districts

Dep.Var	Mean	Std.Dev	No.of.cases	District
v201	3.558	2.328	206	Nyeri
v201	4.000	2.402	183	Taita-Taveta
v201	4.684	2.794	370	Kisii-Nyamira
v201	5.125	3.180	415	Bungoma

According to table 5 above, the mean number of children ever born was lowest in Nyeri (3.558), followed by Taita-Taveta (4.000), then by Kisii-Nyamira (4.684) and finally by Bungoma (5.125). The number of cases utilised in the regression was lowest in Taita-Taveta (183), followed by Nyeri (206), then by Kisii-Nyamira (370) and finally by Bungoma (415).

5.2. Analysis of the determinants of fertility in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma districts

The multiple regression results for the four districts are shown in table 6 below. The results were obtained using the SPSS package and fitting of the model was undertaken using enter method. All the variables included in the model were related to total children ever born at 0.05 level of significance.

For each of the four districts, the models were fitted by first adding the background variables, which are indicated as demographic variables in the conceptual framework, and regressing them against the dependent variables - children ever born. Model two was developed by adding the socio-economic variables to the demographic variables. When the desired family size was added to the demographic and socio-economic factors model three was developed. Finally, in developing model four, the proximate determinant was added to the demographic, socio-economic and desired family size and regressing them against children ever born, the independent variables included in each model were regressed against the dependent variable, children ever born.

In the regression, age of respondents and age of respondents at first birth were included in the regression as continuous variables. Desired family size was included in the regression as a categorical variable as opposed to continuous variable since desired family size was given in

actual numbers, while some respondents gave non-numeric responses like any number, gods plan and don't know.

Table 6 below shows the coefficients of regression and the order in which the variables were included in the regression models.

Table 6. **The coefficients of Regression and the order in which the variables were added in the regression model**

NYERI

Variables	Model 1	Model 2	Model 3	Model 4
Demographic variables				
Age of respondents	0.311 0.0000	0.284 0.0000	0.283 0.0000	0.277 0.0000
Age of respondents at first birth	-0.243 0.0000	-0.223 0.0000	-0.216 0.0000	-0.218 0.0000
Socio-economic factors				
Education level				
PRIED		-1.186 0.0005	-.1.147 0.0008	-1.068 0.0016
SECHIG		-1.483 0.0000	-1.411 0.0001	-1.258 0.0004
Proximate Determinants				
USEDTRAD				-1.076 0.0004
USEDMOD				-0.604 0.0048
Constant	-1.415	0.285	-0.206	0.407
R^2	0.76618	0.78592	0.79119	0.80584

TAITA-TAVETA

Variables	Model 1	Model 2	Model 3	Model 4
Demographic factors				
Age of respondents	0.342 0.0000	0.347 0.0000	0.348 0.0000	0.346 0.0000
Age of respondent's at first birth	-0.328 0.0000	-0.306 0.0000	-0.308 0.0000	-0.301 0.0000
Marital Status CURRMAR	0.843 0.0261	0.843 0.0226	0.848 0.0229	0.710 0.053
Number of living children CHLIVE	-0.665 0.0898	-0.806 0.0377	-0.840 0.0361	-0.891 0.0242
Socio-economic factors				
Respondents income				
ECAFWOR		0.766 0.0521	0.793 0.0501	0.797 0.0450
Proximate Determinants				
USEDTRAD				0.603 0.0423
USEDMOD				0.463 0.0076
CONSTANT	0.540	-0.321	-0.321	-0.387
R^2	0.80607	0.82119	0.82199	0.83085

KISII-NYAMIRA

Variables	Model 1	Model 2	Model 3	Model 4
Demographic variables				
Age of respondents	0.384 0.0000	0.383 0.0000	0.373 0.0000	0.373 0.0000
Age of respondents at first birth	-0.306 0.0000	-0.303 0.0000	-0.295 0.0000	-0.300 0.0000
Marital status				
CURRMAR	0.421 0.0373	0.419 0.0420	0.417 0.0407	0.467 0.0227
Number of living children				
CHLIVE	-0.511 0.0031	-0.527 0.0026	-0.513 0.0029	-0.483 0.0054
Desired Family size				
Desired family size				
CHILD2			-0.510 0.0042	-0.507 0.0050
Proximate determinants				
Ever use of any method				
USEDTRAD				0.314 0.0416
CONSTANT	-0.612	-0.468	0.033	0.014
R^2	0.89119	0.89311	0.89735	0.89858

BUNGOMA

Variables	Model 1	Model 2	Model 3	Model 4
Demographic variables				
Age of respondents	0.416 0.0000	0.415 0.0000	0.415 0.0000	0.416 0.0000
Age of respondents at first birth	-0.413 0.0000	-0.387 0.0000	-0.386 0.0000	-0.389 0.0000
Desired Family Size				
CHILD2			-0.322 0.0582	-0.351 0.0374*
Proximate determinants				
Ever use of any method				
USEDTRAD				0.556 0.0016
CONSTANT	0.525	0.165	0.360	0.159
R^2	0.86461	0.86647	0.86773	0.87115

Therefore, the significant determinants of children ever born in the four districts are summarised in table below.

Table 7. **The determinants of children ever born in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma districts**

Variable	NYERI	TAITA-TAVETA	KISII-NYAMIRA	BUNGOMA
DEMOGRAPHIC VARIABLES				
Age of respondents	Age of respondents			
Age of respondents at first birth	Age of respondents at first birth			
Marital status		CURRMAR	CURRMAR	
No. of children dead		CHLIVE	CHLIVE	
SOCIO-ECONOMIC VARIABLES				
Education level	PRIED			
	SECHIG			
Respondent's income		ECAFWOR		
Desired family size				
CHILD2			CHILD2	CHILD2
PROXIMATE DETERMINANTS				
Ever use of any method	USEDTRAD	USEDTRAD	USEDTRAD	USEDTRAD
	USEDMOD	USEDMOD		

According to the multiple regression analysis obtained from the four models in each of the four districts shown in table 6 and the summary of the same results indicated in table 7, demographic factors were the main determinants of fertility, followed by socio-economic factors, then the desired family size and finally by the proximate determinants.

The following discussion highlights factors, which were found to significantly explain differences in fertility whereby, the demographic determinants were; ages of respondents and age of respondents at first birth in all the four districts. Currently married women and number of living children explained differences in fertility in Taita-Taveta and Kisii-Nyamira districts only. The socio-economic factors which explained differences in fertility were secondary and above education and primary education in Nyeri and, respondents income in Taita-Taveta district. On the other hand, the desired family sizes that explained differences in fertility was a desired family size of between 4 and 5 children in Kisii-Nyamira and Bungoma districts. Finally, the proximate determinants of fertility were use of traditional methods in all the four districts and use of modern methods in Nyeri and Taita-Taveta.

Therefore, as expected the factors found to be significant in explaining differences in fertility are namely; age of respondents and age of respondents at first birth, education level and ever use of any method explained differences in fertility in all the four districts. Marital status and the number of living children explained differences in fertility in Taita-Taveta and Kisii-Nyamira districts, while and respondent's income explained difference in fertility in Taita-Taveta district only. Finally, desired family size explained differences in fertility only in Kisii-Nyamira and Bungoma districts. Contrary to the expectations, respondents work status was found not to be significant in explaining differences in fertility in all the four districts.

5.3. Discussion of results

The below multiple regression results were discussed under the four main categories that determine fertility as outlined in the operational framework.

5.4. Demographic determinants of fertility

Age of respondents

As Table 6 shows, fertility was higher in Bungoma followed by Kisii-Nyamira, then by Taita-Taveta and finally by Nyeri. The coefficient was larger in Bungoma 0.42, followed by Kisii-Nyamira 0.37, then by Taita-Taveta 0.35 and finally by Nyeri 0.28.

The results show that in all the four districts there was a positive relationship between age and fertility, therefore the hypothesis was confirmed.

Age of respondents at first birth

Age at first birth was higher in Nyeri, followed by Taita-Taveta, then by Kisii-Nyamira and finally by Bungoma.

The coefficient was larger in Bungoma 0.3, followed by Kisii-Nyamira and Taita-Taveta both 0.3, and finally by Nyeri district. Since there was a negative relationship between age at first birth and fertility in all the four districts, the hypothesis that the lower the woman's age at first birth the higher the fertility was accepted

Marital status

The currently married women in Taita-Taveta and Kisii-Nyamira districts had more children than the never married women. In Taita-Taveta they had 0.7 and in Kisii-Nyamira 0.5 more children than the never married women. The coefficient was larger in Taita Taveta compared to Kisii- Nyamira.

In order to control fertility, as a policy strategy, there is need to target the currently married women and particularly more important, the never married women in the family planning campaigns so that the currently married women can reduce their desired family sizes and, the never married to have a preconceived small ideal family sizes prior to getting into marriage or childbearing.

This can be achieved through intensified education on family planning and the underlying advantages of small families, increased provision and availability of a variety of family planning devices at reasonable distances from where the users can choose the type of method they wish to use. This should be backed with dispensers who are well educated, trained and informed so that confidentiality can be maintained and that only the right messages and advice are given to the users and the potential users as well.

The results indicate that there was a positive relationship between marital status and fertility in Taita-Taveta and Kisii-Nyamira therefore the hypothesis was confirmed in all the two districts.

Number of living children

Number of living children determined children ever born in Taita-Taveta and Kisii Nyamira districts only, where the women whose children were alive had in Taita-Taveta 0.8 and in Kisii-Nyamira 0.5 children fewer than those women whose children died. The results confirmed the hypothesis that the women whose children survive are more likely to have lower fertility than those whose children die.

5.5. Socio-economic determinants of fertility

Education:

In Nyeri district only, women who had secondary and above education and those who had primary education had fewer children than those with no education. But women who had secondary and above education had even fewer children than those who had primary education or no education.

Women who had secondary and above education had 1.3, children fewer than those with no education, while women who had primary education had had 1.1 children less than the women with no education.

These results show that in Nyeri district, an increase in female education had a significant effect in lowering fertility. The results further show that in Nyeri district, there was a negative relationship between education and fertility confirming the hypothesis that education is negatively related to fertility in Nyeri district.

5.6. Desired family size

Women who desired to between 4 and 5 children had in Kisii-Nyamira 0.5 and in Bungoma 0.4 children fewer than the women who desired to have less than 2 children.

The hypothesis that the desired family size is positively related to fertility was rejected in Kisii-Nyamira and Bungoma districts.

5.7. Proximate determinants of fertility

Ever use of any method

Women who used traditional methods had in Taita-Taveta 0.6, in Kisii-Nyamira 0.3 and in Bungoma 0.6 children more than those who never used any method, while in Nyeri they had 1.0 children fewer than those who never used any method of family planning. Therefore, the effect of contraceptives in determining fertility was accepted in Nyeri and rejected in Taita-Taveta, Kisii-Nyamira and Bungoma districts.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1. Summary

The objectives of the study were:

To examine and compare the socio-economic and demographic factors that affect fertility. Specifically, this study estimated the effect of socio-demographic factors on overall fertility in Nyeri, Taita-Taveta, Kisii-Nyamira and Bungoma districts. In addition, the study attempts to draw some policy lessons if any from the findings.

Chapter four and five presented a detailed comparative discussion of the results in line with the above objectives by use of cross tabulations, bivariate regression and finally multiple regression.

Presented below is a comparative summary of the main findings, conclusion and recommendations.

6.2. Summary of major findings

In this section, the discussion of the findings are based on the results of the mean number of children ever born, bivariate and multiple regression which were used to test the hypotheses of the study.

According to the computed mean number of children and education, the hypothesis that education is negatively related to fertility was accepted in all the four districts. The results of multiple regression further confirmed the hypothesis.

The other hypothesis was that there is a negative relationship between formal employment and fertility, whereby it was expected that the women who are in formal employment would most likely have lower fertility than those who are not in formal employment. The mean number of children ever born and respondent's occupation results rejected the hypothesis in Taita-Taveta, Kisii-Nyamira and Bungoma districts and accepted it in Nyeri district. The bivariate regression results also rejected the hypothesis in Bungoma.

The hypothesis that there is a negative relationship between the women's income and fertility was accepted in Taita-Taveta and rejected in Nyeri, Kisii-Nyamira and in Bungoma as shown by the mean number of children and income results. The bivariate regression results also rejected the hypothesis in Bungoma.

In all the four districts, the computed number of children ever born and age of women as well as the multiple regression results accepted the hypothesis that the age of the woman is positively related to fertility.

The results of the mean number of children ever born and the woman's age at first birth and multiple regression accepted the hypothesis that the lower the woman's age at first birth the higher the fertility.

It was also hypothesised that marital status is positively related to fertility, such that, the currently married women are more likely to have higher fertility than the formerly married and the never married women. The findings of this study supported the hypothesis. The mean number of children analysis revealed that in all the four districts the never married women had low fertility compared to the formerly married and the currently married women. The currently married women in all the four districts had moderate fertility. The mean number of children

among the currently married women was however lower in Nyeri (4.0), followed by Taita-Taveta (4.1), then by Kisii-Nyamira (5.0) and finally by Bungoma district (5.4).

Similarly, the formerly married women in Taita-Taveta, Kisii-Nyamira and Bungoma districts had moderate fertility, but the mean number of children was lower in Taita-Taveta (3.7), followed by Bungoma (3.9) and finally by Kisii-Nyamira (4.0). On the other hand, the never married women in all the four districts had low fertility as expected. The mean number of children was lowest in Kisii-Nyamira and Bungoma (1.2) for the two districts, followed by Taita-Taveta (1.3) and then finally by Nyeri (1.5). The multiple regression results further confirmed the hypothesis.

According to the computed mean number of children results, the hypothesis that the women whose children survive are more likely to have lower fertility than those whose children die was accepted in all the four districts. The multiple regression results also confirmed the results in Taita-Taveta, Kisii-Nyamira and in Bungoma but rejected in Nyeri district.

According to the mean number of children and desired family size results, the hypothesis that the higher the desired family size the higher the fertility was rejected in Kisii-Nyamira and Bungoma. But the multiple regression results rejected the hypothesis in Taita-Taveta, Kisii-Nyamira and Bungoma districts and accepted in Nyeri district.

The results of the mean number of children by ever born and use of any method accepted the hypothesis in Nyeri district. Multiple regression results accepted the hypothesis in Nyeri and rejected it in Taita-Taveta, Kisii-Nyamira and Bungoma districts.

6.3. Recommendations

1. There is need to continue the promotion of female education through increased enrolments in schools and colleges and their sustenance to the highest levels possible. This is because this study and other researches have indicated that female education is a very important factor in reducing fertility through several effects among others; increased contraceptive use, reduced desired family size, reduced exposure period to the risk of conception due to the raised age at marriage and age at first birth and, shortened duration of reproduction as a result of the number of years invested in education.

2. There is need to intensify family planning campaigns and improve the accessibility of contraceptives by having them located near the users as well as increase the available options of methods to choose from. It is therefore, recommended that as an entry point, appropriate interventions and counselling on reproductive health be in place in schools to gradually enlighten the students on the importance of small families, which will double as a prevention of teenage pregnancies, hence lower their fertility. This approach in the long run will lead to overall reduction in fertility.

3. Male involvement in family planning should be intensified so that family planning becomes a joint effort between spouses to reduce family sizes.

4. Cultural aspects greatly hinder family planning campaigns; therefore, it is recommended that cultures of the various districts should be well understood prior to the initiation of

family planning activities to reduce the low use of contraceptives and subsequently, the failure rates where contraceptives are used. This could be achieved by devising culture specific approaches, specific to each district, which will remove the myths, attached to the use of contraceptives and make them acceptable and hence increase the contraceptives prevalence rates.

6.4. Areas for further research

1. Using the same or different data set the same study should be undertaken and control for age.

2. Using the same or different data set a comparative study on the socio-cultural determinants of fertility in the four districts be undertaken with specific inquiry particularly on the effect of the following cultural factors:-

   (a) Sons preference (b) Religion (c) Marital union (d) The role of husbands in determining fertility and

   (e) The husbands/partners ideal family size.

3. There is need for an intense comparative study on the determinants of contraceptive use in the four districts.

4. A study on the effect of income and occupation on fertility in the four districts should be carried out whereby the effect of the two factors should be critically analysed.

5. A similar study using the same or different data set and applying a different model should be carried out.

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APPENDIX

Prior to the selection of the final model for each of the four districts, the models in table 8 were used to determine the variables, which were retained in the final models.

Table 8. Models for Selecting Variables to be retained in the final Regression models

NYERI

Variable	Model 1	Model 2	Model 3	Model 4
DEMOGRAPHIC				
Age of respondents.	0.311 0.0000*	0.284 0.0000*	0.283 0.0000*	0.277 0.0000
Age of resp at 1st birth	-0.243 0.0000*	-0.223 0.0000*	-0.216 0.0000*	0.277 0.0000*
Marital status CURRMAR	0.426 0,0736	0.451 0.0499*	0.423 0.0687	0.332 0.1688
FORMAR	-0.474 0.2675	-0.504 0.2323	-0.426 0.3150	-0.405 0.3253
Number of living children CHLIVE	0.606 0.2629	0.442 0.3988	0.584 0.2688	0.480 0.3498
SOCIO-ECONOMIC				
Education level PRIED		-1.1186 0.0005*	-1.147 0.0008*	-1.068 0.0016
SECHIG		-1.483 0.00000*	-1.411 0.0001*	-1.258 0.0004
Respondent's work status CURRWOR		0.018 0.9155	0.111 0.5866	0.124 0.5313
Respondent's Incomes ECAFWOR			-0.195 0.3176	-0.224 0.2364
DESIRED FAMILY SIZE				
Desired family size CHILD1			0.434 0.4405	0.721 0.2023
CHILD2			0.104 0.7793	0.320 0.3868
CHILD3			0.377 0.2900	0.619 0.0808

PROXIMATE DETERMINANTS				
Ever use of any method USEDTRAD				-1.076 0.0004
USEDMOD				-0.604 0.0048
CONSTANT	-1.415	0.285	-0.206	0.407
R^2	0.76618	0.78592	0.79119	0.80584

*Denotes significance at 0.05level

TAITA-TAVETA

Variable	Model 1	Model 2	Model 3	Model 4
DEMOGRAPHIC				
Age of respondents.	0.342 0.0000*	0.347 0.0000*	0.348 0.0000*	0.346 0.0000*
Age of resp at 1st birth	-0.328 0.0000*	-0.306 0.0000*	-0.308 0.0000*	-0.301 0.0000*
Marital status CURRMAR	0.843 0.0261*	0.843 0.0226*	0.848 0.0229*	0.710 0.0535*
FORMAR	0.402 0.4242	0.285 0.5650	0.245 0.6254	0.2600.5984
Number of living children CHLIVE	-0.665 0.0898	-0.806 0.0377*	-0.840 0.0361*	-0.891 0.0242*
SOCIO-ECONOMIC				
Education level PRIED		0.529 0.0585	0.516 0.0770	0.482 0.0935
SECHIG		0.002 9940	-0.009 0.9786	-6.180 0.5949
Respondent's work status CURRWOR		-0.512 0.1878	-0.530 0.1723	-0.603 0.1229
Respondent's Incomes ECAFWOR		0.766 0.0521*	0.793 0.0501*	0.797 0.0450*
DESIRED FAMILY SIZE				

Desired family size CHILD1			-0.120 8165	-0.221 0.6704
CHILD2			0.146 0.5965	0.141 0.6040
CHILD3			-0.006 0.9816	-0.004 0.9881
PROXIMATE DETERMINANTS				
Ever use of any method USEDTRAD				0.603 0.0423*
USEDMOD				0.463 0.0076*
CONSTANT	0.540	-0.321	-0.321	-0.387
R^2	0.80607	0.82119	0.82199	0.83085

*Denotes Significance at 0.05 level

KISII-NYAMIRA

Variable	Model 1	Model 2	Model 3	Model 4
DEMOGRAPHIC				
Age of respondents.	0.384 0.0000*	0.383 0.0000*	0.373 0.0000*	0.373 0.0000*
Age of resp at 1st birth	-0.307 0.0000*	-0.303 0.0000*	-0.295 0.0000*	-0.300 0.0000*
Marital status CURRMAR	0.421 0.0.0373*	0.419 0.0420*	0.417 0.0407*	0.467 0.0227*
FORMAR	0.235 0.3762	0.251 0.3498	0.238 0.3694	0.292 0.2714
Number of living children CHLIVE	-0.511 0.0031*	-0.527 0.0026*	-0.513 0.0029*	-0.483 0.0054*
SOCIO-ECONOMIC				
Education level PRIED		-0.034 0.8235	-0.072 0.6383	-0.114 0.4565
SECHIG		-0.171 0.3564	-0.246 0.1854	-0.291 0.1239
Respondent's work status CURRWOR		-0.358 0.5183	-0.341 0.5322	-0.283 0.6041

Respondent's Incomes ECAFWOR		0.160 0.7726	0.149 0.7851	0.082 0.8808
DESIRED FAMILY SIZE				
Desired family size CHILD1			0.871 0.0760	0.792 0.1073
CHILD2			-0.510 0.0042*	-0.507 0.0050*
CHILD3			-0.349 0.0353*	-0.321 0.0551
PROXIMATE DETERMINANTS				
Ever use of any method USEDTRAD				0.314 0.0416*
USEDMOD				0.044 0.6863
CONSTANT	-0.612	-0.468	0.033	0.014
R^2	0.89119	0.89311	0.89735	0.89858

* Denotes significance at 0.05 level

BUNGOMA

Variable	Model 1	Model 2	Model 3	Model 4
DEMOGRAPHIC				
Age of respondents.	0.416 0.0000*	0.415 0.0000*	0.415 0.0000*	0.416 0.0000*
Age of resp at 1st birth	-0.413 0.0000*	-0.387 0.0000*	-0.386 0.0000*	-0.389 0.0000*
Marital status CURRMAR	0.238 0.4885	0.221 0.5209	0.221 0.5202	0.322 0.3456
FORMAR	-0.046 0.9078	-0.071 0.8600	-0.050 0.9011	0.018 0.9647
Number of living children CHLIVE	-0.243 0.2268	-0.228 0.2570	-0.226 0.2615	-187 0.3474
SOCIO-ECONOMIC				
Education level PRIED		0.037 0.8365	0.057 0.7552	0.109 0.5479

SECHIG		-0.261 0.2262	-0.236 0.2733	-0.215 0.3314
Respondent's work status CURRWOR		-0.288 0.2512	-0.293 0.2490	-0.309 0.2185
Respondent's Income ECAFWOR		0.217 0.375	0.210 0.3978	0.174 0.4775
DESIRED FAMILY SIZE				
Desired family size CHILD1			-0.368 0.5054	-0.342 0.5337
CHILD2			-0.322 0.0582	-0.351 0.0374*
CHILD3			-0.237 0.1273	-0.253 0.1050
PROXIMATE DETERMINANTS				
Ever use of any method USEDTRAD				0.556 0.0016*
USEDMOD				0.047 0.7360
CONSTANT	0.525	0.165	0.360	0.159
R^2	0.86461	0.86647	0.86773	0.87115

* Denotes significance at 0.05 level