

**FERTILITY DIFFERENTIALS IN WESTERN PROVINCE OF  
KENYA BY DIVISION**

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**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE DEGREE OF  
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## DEDICATION

This thesis is dedicated to:

My Dear late father

Alexander Wabende Walela (R.I.P.)

who will never see the results of his efforts.

My darling Mother


Juliana Wabende

For encouragement and support.


## DECLARATION

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

Wabende Mulwale Michael

Signed:  .....

This thesis has been submitted for examination with my approval as the University supervisor.

Supervisor:  ..... 5/11/19  
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I alone remain responsible for any errors in this thesis.

## **ABSTRACT**

The main objective of the study was to find out factors that have contributed to persistently high fertility in Western province. The study was based on the 1989 census results. The study also looked at fertility in relation to socio-economic, Cultural and demographic factors. Fertility differentials by the afore mentioned factors was examined at provincial, district and divisional levels.

The method of data analysis was Coale and Trussel P/F ratio technique was applied to estimate fertility levels in this study.

The study's finding revealed that the level of fertility in the province is on the decline. This is when compared to 1979 census results. The estimation of total fertility rate by divisions revealed that rates ranged between six and seven children per woman. At district and divisional level, the rates depicted a uniform pattern albeit slight differences.

The findings also revealed that women with secondary level of education registered lower fertility compared to those with primary level, and those with no education level. However, women with no education registered high fertility rates than those with primary level of education.

The study also found out that women who use treated, clean water (piped) registered low rates of fertility.

Employed women (wage earners) had lower rates than unemployed and non wage earners. The reason could be that the employed women are able to purchase birth control devices.

According to the findings, women residing in urban centres recorded lower fertility rates than those in rural areas. This is because they benefited from urban based facilities which are inadequate in rural areas.

The women in monogamous unions recorded higher fertility rates than those in polygynous unions although the difference was minimal. The reason attributed to this could be due to the sleeping arrangements associated with both unions. While in a monogamous union the husband is constantly with his one wife, therefore higher chance to conceive, in polygynous union, he has more than one wife.

On ethnicity, the three main communities in the province namely the Luhya, the Teso and the Kalenjin registered almost the same fertility rates. This could be attributed to shared beliefs and customs that are related to reproduction. The slight differences could be as a result of distinct behaviours of each particular group.

Married women registered higher fertility rates than the single, separated, divorced and widowed categories.

The study recommends that both physical and social infrastructure to be distributed equally in both rural and urban areas so as to reduce the gap between the two regions. Amenities such as schools, hospitals, piped water, e.t.c., if properly distributed would have an impact on fertility levels in the province. Employment and education opportunities should be made more available for both males and females as they are likely to have great influence on fertility levels.

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## LIST OF ACRONYMS

BLY	-	Birth in the last one year
CBS	-	Central Bureau of Statistics
DHS	-	Demographic and Health Survey
KMEAN	-	An adjustment factor in Cole and Trussel P/F ratio demographic Techniques. The entire mean of $P_i/F_i$ is used as an adjustment factor
KA	-	An adjustment factor where the mean of $P_2/F_2$ and $P_3/F_3$ is used as an adjustment factor.
PSRI	-	Population Studies and Research Institute
UNFPA	-	United Nations Fund for Population Activity
CEB	-	Children Ever Born

## CHAPTER ONE: GENERAL INTRODUCTION

### 1.0 INTRODUCTION

The recent fertility decline in Kenya was very much unexpected, a real contrast to what earlier Kenyan experts predicted using the previous annual growth of 3.8 per cent according to the 1979 census estimates. Most of these experts (Caldwell 1987, 1990, Sindiga 1985) citing factors such as cultural practices which encourage many children, predicted a bleak future for any drop in fertility. The recent drop therefore, can be viewed as the onset of fertility decline in Kenya.

The decline is an optimistic scenario to many Kenyans especially policy makers and in particular demographers who were totally alarmed by the previous growth rate of 3.8 per cent and which was rated the highest in the world. The rate has dropped from 3.8 to 3.3 per cent according to provisional results of the 1989 census (Kenya Population Dynamics UN 1993; CBS 1990, Muganzi, 1994). This decline was realised after a long period of high fertility despite efforts made by the government to reduce fertility levels through programmes such as family planning which was dismissed by Frank and McNicholli (1986) as a total disaster.

Much of the decline occurred in the 1980s and onwards. This period experienced both economic and political changes that must have had an effect on the social life of the people especially the reproductive behaviour. The decline in fertility levels in Kenya can be either attributed to the increased levels of contraceptive use which increased from 7 per cent between 1975-77 (Kenya Fertility Survey) to 17 per cent in 1984 (Kenya Contraceptive Prevalence Survey), 27 per cent in 1989 (Kenya demographic and health survey) and 33 per cent according to the Kenya demographic and health survey (KDHS) 1993, or attributed to the high cost of living associated with economic changes that affected household purchasing

powers. According to Caldwell (1982) the economic changes reduce the utility of children to parents and hence the onset of fertility decline. Therefore, the drastic changes in levels of fertility can be attributed to the falling economic conditions which have placed children as liabilities other than assets. Studies in relation to fertility decline and economic decline have not been carried out (Fertility in relation to Economic decline) but there is ample evidence of drastic fall in total fertility rate. The Kenya Fertility Survey 1977-78 estimated the total fertility rate at 8.2 children per woman. This reduced to 6.7 (1989 census) and 5.4 according to KDHS (1993).

The decline was much more pronounced in some parts of the country than others. According to KDHS, 1993 significant declines were realised in Central province (35 per cent drop), Nairobi (26 per cent drop) and Western province (2 per cent decline). The Coast province realised a decline of 4 per cent. Although Western province recorded decline of 2 per cent it still sustain the highest total fertility rate in the whole country of about 6.40 children per woman. And among the districts in Western province Bungoma has the highest total fertility rate of 9.1 followed closely by Busia, (7.2) and Kakamega (7.0).

## **1.1 BACKGROUND INFORMATION TO THE STUDY AREA.**

### **1.1.0 GEOGRAPHICAL BACKGROUND**

Western province comprise of 6 districts namely, Kakamega, Bungoma, Busia, Vihiga, Mt. Elgon, Teso, and Lugari. Previously the province comprised of only three districts, but due to population pressure, Vihiga, Teso ,Mt Elgon and Lugari districts were created for ease of administration. The province lies within the Lake Victoria Basin bordering Nyanza Province to the south, Rift Valley to the east and north, and the republic of Uganda on the western side.

The land rises from 1200 m in the lake region to 2000 m in central parts of the province to over 4000 m to the north in the region of Mt. Elgon . With this difference in altitude the province has variations in climatic conditions, vegetation and soils, for example, from swampy type of vegetation around the lake to equatorial type of vegetation in the Mt. Elgon zone.

The province is one of the wettest parts of the country, receiving rainfall almost the whole year. The amount of rainfall ranges between 900 mm to 2400 mm and having two distinct rainy seasons; one stretching from March to July (long rainy season) and the other from August to October. With this kind of climatic conditions the province relies on agriculture.

### **1.1.1 DEMOGRAPHIC PROFILE**

The province has some unique demographic characteristics. It exhibits especially high population growth rates but with marked variations at district level. Bungoma district exhibits one of the highest growth rate of 3.65% in the country, which is more than the national figure of 3.3% (Bungoma District Development Plan 1994/96) with the highest total fertility rate of 9.1 children per woman. It is followed by Busia with a growth rate of 3.5%, Vihiga, 2.98% and Kakamega, 2.8%. The variation between Bungoma and Kakamega districts in terms of population growth rates is intriguing because the districts share a lot in common, both in geographical and cultural heritage.

The province being in the lake region is affected by diseases such as malaria, dysentery which is associated with untreated water and intestinal worms. There is a high infant mortality rate in the province, a rate of about 101 per 1000 live births. The main causes of this is malnutrition associated with low income and malaria (associated with



conditions around the lake). The province's crude death rate is one of the highest in the country, a rate of 12.7 per 1000 people compared to the national figure of 10.6. At district level infant mortality rate is highest in Busia with a rate of 111 per 1000 live births, which is one of the highest in the country. The lowest infant mortality rate is that of Bungoma district. Similarly, the crude death rate is lowest in Bungoma and highest in Busia (CBS Kenya 1996).

The province has a total population of 2,544,329 people; Kakamega has 1,163,525, Bungoma, 679,146 including Mt. Elgon, Busia, 401,658 including Teso and Vihiga has 530,373 people. It was been predicted that by the year 1996 the old Kakamega district will have a population of 1,269,972. Bungoma's population will rise to 945,077, Vihiga's to 580,554 and Busia's population will rise to 534,405. The majority of the population is below the age of 15 years, accounting for more than 50% of the total population. This puts the dependency ratio at about 1:3.307 (CBS Kenya 1996). This ratio is very high, such that economic development is curtailed as much of the earnings are spent on child caring and education. The pressure on land is at an alarming point, and is clearly evident in Vihiga district which has a population density of 1,015 people per square kilometre, and rated the highest in the country (District Development Plan 1994-96).

### **1.1.2 SOCIO-ECONOMIC FEATURES**

Agriculture is the mainstay of the economy in the province accounting for more than 75% of the income generating activities. This is as a result of adequate rainfall in the province which is received almost throughout the year.

The province is suitable for both food and cash crops. Cash crops such as sugarcane, Tobacco, coffee, cotton and tea. They are both grown on large and small scale.

Major food crops are maize, beans, millet, sorghum, cassava, sweet-potatoes, and groundnuts. Maize is the major food crop grown in the province. According to the 1992 Agricultural report, the province received more than 500,000 tons of maize (District development plan 1994-96).

Industrialization in the province is at its take off stage. The notable industries in the province are paper milling in Webuye, Sugar factories in both Nzoia and Mumias, and a tobacco processing plant at Malakisi. There are other small processing plants scattered in different parts of the province mostly dealing with processing of tea , coffee and sugarcane.

Employment wise, the four major factories are the main sources of employment apart from the informal sector (juakali) and the Government.

On education, the province had an estimated figure of 1962 primary schools and 331 secondary schools (Ministry of Education report 1992). The enrolment for the primary section was more than half a million while secondary was almost 70,000. Due to high population growth rate in the province, a rate of 3.5%, there is a need for more school to meet the demand.

On the side of health, the province has about 312 health facilities. Each district in the province has at least one district hospital. There is only one general hospital in the province. Apart from health facilities that are run by the government, there are also facilities that are manned by church organisation, Non-governmental, and private organisations. Due to population pressure, these facilities are inadequate hence the need for more of these facilities. More so, the ratio of Doctor/population is very uneven, for example in Busia district the ratio of Doctor/population is 1:155656. Its also estimated that the nearest health facility is 4 Km away in the district. These could be reasons for the high infant mortality rate which is estimated at 111 per 1000 live births according to 1989 census results.

### 1.1.3 CULTURAL BACKGROUND

Despite the difference in the language ,the three major ethnic groups in western province namely Luhya, Teso,and Kalenjin share a lot in common due to the socio-cultural interaction.

Traditionally in the three communities, the basic land holding unit was the extended family which consisted of grandparents,parents ,married sons and other dependents. The right of ownership was inherited and being patrilineal/patrilocal , inheritance passed from father to son .In these three communities sons were more valued than daughters, although both sexes were desired. For example ,in Tesoland when a man who had no male heir died ,his property was taken over by his brother or his brothers sons(Busia district socio-cultural profile ) .This practice was also found among both the Luhya and Kalenjin communities.

The important social unit in the three communities was the clan .The senior most member of the clan was its spokesman .Concerning the institution of marriage ,the three communities regarded it with great value. It was fulfilment of ones major goal in life .The organization of marriage and courtship was carried out by the entire members of the extended family if not the whole clan. The wife therefore became a member of the entire clan.

Being patrilineal it was necessary for each household to have a son as inheritance only passed on from father to son.This is one of the reasons why polygyny was much encouraged in these communities .It was seen as the way of getting a son if the first wife had none. Apart from that, polygyny was also a means of getting many children. Children in these societies were looked at in many ways; first,as a source of labour,secondly,for continuity of the lineage; and thirdly,for security in old age. A man who had many wives and children was very much respected in these societies as it was sign of how wealthy one was in the society.

Although children were much valued, the health of the mother and her well being was also respected. In these societies, there were regulations that controlled the sexual behaviours of the members. These regulations helped to control frequent childbearing thus protecting both the mother and the child. For example, a man abstained from having sex with a breast-feeding mother for a minimum of two years. The long duration of abstinence gave men an allowance to have many wives in order not to break the abstinence period.

The other method which was used to enforce birth control was social pressure. A woman who gave birth frequently was summoned before women villagers and scorned and the husband was never invited to attend social gathering. It was also forbidden for a woman to give birth at the same time as her daughter (grandmothers effect).

The introduction of christianity, education and industrialisation, have affected these noble values. Individualism has replaced the community factor in that everybody fends for himself and his immediate family members. Nuclear type of family has replaced extended family. Polygamy no longer act as a birth control method. Rather, its best viewed as competition between co-wives. The reason given being, more children a wife has, earns her respect in the homestead. Abstinence which went for a minimum of two years can now as low as only three months.

With these changes in these societies there is a tendency for fertility to go up.

## **1.2 STATEMENT OF THE PROBLEM**

According to the preceding census results ( 1979, 1989) and Kenya demographic and health survey results (1993) Western province can be rated as a high fertility area. Although the general fertility trend in the country reveal that fertility is declining, the changes in western province can be termed as insignificant. From the 1979 census results the province

registered one of the highest rates in the country, with a total fertility rate of 8.03. When compared to the 1989 census rate of 7.6, even though the province registered fertility decline, the rate is still the highest in the country on the provincial level.

The Kenya demographic and health survey of 1993 also revealed that the changes in fertility in other parts of the country especially, Central and Nairobi were much more pronounced than western province. While central province registered 35 percent and Nairobi 26 percent, Western province only registered 2 percent fertility drop KDHS (1993)

Bungoma district, one of the three districts that formed western province prior to the 1989 census, has been the highest fertility area in the whole country. This is according to the last two census 1979 and 1989. The other two districts, Kakamega and Busia only exhibited rates slightly lower than that of Bungoma. According to 1979 census results Bungoma district had an estimated total fertility rate of 9.0 while Kakamega and Busia had of 8.8 and 7.73 respectively. This trend did not change in 1989. Bungoma still exhibited a rate of 8.1 while Kakamega and Busia had rates of 7.1. The three district therefore, are in the rank of high fertility areas in the country.

The questions that comes in ones mind are, Is the province inhabited by the most fertile people in the whole country?, or are the people so ignorant of the effect of high population on the available resources?. And are the causes for persistently high fertility in the province, naturally determined or due to other factors?. If the latter then what are these factors that have contributed to the fertility situation in the province?, and what determines the differences in the levels of fertility in the province?.

This study therefore, attempts to find out factors that contribute to the differences in fertility levels and moreover factors that sustain high fertility in the province.

### **1.3 GENERAL OBJECTIVE**

The study set out to examine the factors that sustain high fertility in Western province based on the 1989 census results.

### **1.4 SPECIFIC OBJECTIVES**

- (1) To estimate fertility levels in Western province.
- (2) To analyse the effect of cultural factors (Ethnicity, marital union, etc) on the total number of children.
- (3) To examine the effect of socio-economic factors (education, economic activity, etc) on the total number of children.
- (4) To examine the relationship between demographic factors (marital status) and the total number of children.

### **1.5 JUSTIFICATION OF THE STUDY (RATIONALE)**

The Kenya government embarked on a decentralisation process placing the district as the focus for rural development. The major aim of the programme is to identify the priorities of the people, mobilisation of resources in the district and project implementation. The government's main objective was to involve local people in development activities in their respective districts and to decentralise decision making process (Republic of Kenya, District focus for rural development 1983). This gives the District Development Committee the responsibility for rural development - planning and co-ordinating, project implementation and management of development resources.

It's quit logical that the above (Planning, management and implementation) cannot be carried out before one has the knowledge on the population distribution and composition in

general within the province and in the district in particular, down to division and location levels. Therefore, such a study provides knowledge useful for policy makers for proper decision making in the process of planning, implementation and management of services such as health, education and family planning based on the priorities of different regions of the province or districts.

## **1.6 SCOPE AND LIMITATIONS**

This study is based on the 1989 census fertility information. The study covers all the Divisions in the province: Vihiga district has 5, Kakamega 11, Bungoma 7 and Busia 7. The newly created districts of Mt. Elgon, Teso and Lugari-Malava are part of the old districts that made up Western province before the 1989 census was carried out.

One major limitation is that census results are never 100% accurate due to mis-reporting and under enumeration as a result of poor communication.

Moreover, the 1989 census did not cover the issue of religion and contraceptive use, these two being some of the major determinants of fertility differential.

## **1.7 SUMMARY**

This chapter includes, the definition and description of the problem, objectives of the study, study justification, scope and limitation and the background information to the study.

The main aim of this study is to estimate fertility levels and differentials in the province. The importance of the study is clearly stated in the study justification. Scope and limitation states the coverage of the study and problems that might face the study.

The background information gives the picture of the study area in terms of socio-economic, demographic and environmental aspects.



## **CHAPTER TWO:**

### **LITERATURE REVIEW AND THE THEORETICAL FRAMEWORK**

#### **2.0 Introduction**

The rapid population growth in world especially in the developing countries has been a big concern. This has meant that the resources available cannot be enough for the fast growing population. This fear for the rapid population growth has prompted many studies and programmes in fertility to be carried out in trying to curb the menace. Programmes such as family planning have been launched world-wide with the support of developed nations with the aim of reducing high population growth rates.

Most studies on fertility have concentrated on determinants, levels, differentials and the consequences of high fertility. Studies based on levels and differentials world-wide have revealed a related sequence; it has been revealed that the differences in fertility levels is as a result of socio-economic, demographic, cultural and Environmental factors.

##### **2.1.0 Studies Carried outside Kenya**

The studies carried outside Kenya reveal quite a similarity with the findings in Kenya. Most of these studies found that education, occupational status, income, ethnicity/nationality, region, types of marriage, and residence are either positively or negatively related to fertility levels.

Henin (1986) looking at fertility and mortality trends and differentials in Africa viewed education as the major factor affecting fertility, both directly and indirectly. Basing on the already assumed hypothesis that as the number of years of education increase, especially mothers education, fertility levels decline. He found out that 1 to 3 years of schooling do increase fertility, even more than no schooling. This finding was evident in

countries such as Benin, Cameroon, Ivory Coast and Senegal. Above three years of schooling, fertility begins to drop. This change, can be attributed to change of attitude towards big family size. In his earlier study in Tanzania, Henin (1973), found out that more years of education result in lower fertility irrespective of their religious affiliations.

Vavra (1975) in a study in Ghana asserts that education is related in one way or another to all fertility determinants. He found that education leads to the emancipation of women and this puts an emphasis on the quality instead of quantity of children. He concluded that since the burden of child rearing falls entirely on parents, they are forced to have manageable family size.

Aiswoth M, Beegle and Nyamete(1995) assessing the effect of maternal education on fertility regulation argued that education influences fertility through other ways. These are, knowledge and exposure to modern technology, female decision making autonomy, control over own family resources .They argued that with education especially the woman's, one becomes open towards new ideas including the idea of reducing the number of children through better knowledge of contraceptive use and by using effective productive health to minimise high mortality rate.They further argued that education raises the opportunity cost of women's time in rearing children which raises the price of children as well as the wage that women can earn in the work force.

Leobner and Driver (1973) argued that maternal education has a negative correlation with fertility. They point out that most educated women are more likely to have a smaller number of children than the uneducated ones. They also tried to associate education and contraceptive use. They found that contraceptive users were especially women with education.

Holsinger and Kasarda (1976) summarising the effect of education on fertility assert

that education can influence fertility through changes in attitude, values and beliefs about family size. Secondly, it operates through other variables such as residence, contraceptive use, income and occupation to have an effective interaction with fertility levels.

However, according to world fertility survey of 1986 the effect of education can not be uniform between different countries. This due to the different meaning the level of educational attainment has to the different population.

The demographic and health surveys carried in most African countries recently have also revealed that education has an inverse effect on fertility. According to the Tanzanian DHS results of 1996 women with no education registered higher rate of 6.8 compared to primary 6.5 and secondary 5.3. This was not the case in Burundi, Cameroon, and Nigeria. In these three countries, even though there an inverse relation between fertility and education, their case differ with the Tanzanian one. In their case no education registered lower rates than primary education. Secondary education registered the lowest rates.

Study by Shapiro and Tambashe (1994) of women in Kinshasa, Zaire found higher fertility among women with primary schooling, but lower fertility among women with no schooling. This is because women with primary schooling is observed have short breastfeeding intervals.

Related to fertility are income and occupation. These two are also related to education especially occupational status. Demographers have had different opinions regarding the relationship between fertility vis-a-vis occupation and income. McCabe (1974) carried out a study in Zaire and found out that there is a positive correlation between fertility, income and occupation. The study revealed that an increase in family income has an effect on fertility levels. Higher income, he argued, enables one to purchase birth control devices, medical facilities, better diet and residence.

According to the world fertility survey report of 1986 women who work in modern sector tend to have lower fertility than women who work in traditional, agricultural sector and women who do not work. This is attributed to the demanding nature of work in modern sector, hence women get less involved in child bearing and care. The finding also show that both the type of job a woman performs and setting in which she performs it may have some impact on the extent to which work affect childbearing.

Baker (1960) argues that the poor have larger family size than the rich because the latter have a higher preference for other goods and higher quality children, a factor which would act against the desire for large family size. High income families spend more per child than low income families. This therefore, implies that the demand for quality children in rich families is higher than the quantity demand. Bakers argument does not carry the day in most African traditional settings where children are valued in terms of, source of security and labour, and therefore, a large number of children signifies the wealth of the homestead. Children in this context are an expression of satisfaction in one's life. His argument however, is in line with that of Meulier (1975) who argues that children's contribution is so insignificant in terms of labour production. She asserts that children have a negative economic value in peasant agriculture. Her argument, like that of Baker leaves a lot to fill the puzzle. It appears that she based her conclusion on the Western mode of economy where having more children was a burden to economic prosperity.

In most African Societies, the number of children is more associated with the income. Most communities prefer a large number of children as they help a lot in the production and marketing of farm products. The argument oftenly put forward is that, many children mean a surety for old age security, source of labour and a source of pride.

Caldwell (1976) carried out a study among Yoruba people in Nigeria and found out

that the Yoruba people do not perceive themselves as being disadvantaged for having a large family. His finding is in line with the above general view that children are needed for labour and for security in old age. He quotes the Yoruba saying:

**"More hands grow more food"**

The changing world leaves no room for the pro-natalist. Although in most cases, people in most African societies still feel that there is a need for more children, the burden for rearing them might force a reduction in the number. Caldwell (1980) basing on his wealth flow theory analyses the effects of modernisation on the family. He argues that in the traditional setting parents preferred many children for the purpose of labour force and security in their old age. All these have been affected by the economic changes. The prevailing conditions in the world today leave no room for large families as the caring and rearing of children is seen as a burden than an asset. In this theory therefore, children neither provide security nor labour as they are most of the time away either in school or place of work.

In his earlier research findings, Caldwell argued that major reasons for high fertility in least developing regions can be attributed to the rationale that simple peasants do not understand the economic realities of their own lives. This is because, they are subjected to their cultural controls that make them have a negative attitude towards birth control devices.

However, in his the later findings, Caldwell evaluates the value bestowed on children in African Society. He argues that peasant's main reason for having large families is for economic purposes and in this respect, they do understand the economic realities affecting them. He goes further to point out that, the need for more children has a cultural blessing in many of these societies.

He writes:

**"In Sub-saharan Africa the position is that there is an abhorrence of small family sizes, children mean a continuity in the generation hence perpetuation of the lineage"**

This was in conflict with the earlier findings. Becker (1960) and Mincer (1963) argue that employed mothers have to divide their time between working and child caring. In this situation they tend to prefer a more profitable of the two (work and child caring) and most prefer the former. The more time one spends at her place of work the less time she has for childbearing and rearing.

Bloom (1986) researching on American working women concludes that, professional working women are most likely to have delayed childbearing until after their 27th birthday, whereas women managers and executives are most likely to be childless. He further asserts that women who marry later for example after 27th birthday get more pay mostly due to higher educational attainment.

Tuladher, Shoenkel and Fisher (1982) working on differential fertility in rural Nepal observed that the husband's occupation is related to income and affects fertility inversely. They concluded that fertility of people holding managerial positions as company executives is lower than that of those holding low cadre employment. They argue that breast feeding is lower among women with working husbands as a result of high use of contraceptives, this has a depressing effect on fertility.

Cho, Crabill and Bogue (1982) found out that in U.S.A. different ethnic groups exhibit different fertility rates. They noted that the American Indians were the most fertile of the so called non-white racial group and the Japanese had the lowest. The reason being most the American Indians dwell in rural areas and also due to low educational and

economic status. The whites were found to have the lowest fertility levels.

In many African societies children are regarded as God's blessing, and therefore polygamy is seen as means to achieve this blessing. Osei-Mensah (1982) researching on plural marriages and fertility differentials in Nigeria among the Yoruba argues that due to deep sense of emotional security derived from membership in a large family, Yoruba women bear as many children as are possible. He further asserts that in polygamous unions there is a high degree of segregation with each wife and her children constituting a semi-autonomous unit, hence, the number of children mean too much to a mother because she depends on her children for labour in the farms and security in the old age. The traditional set up in this community, he concludes, promotes the kind of attitudes.

Henin (1986) found out that women in monogamous marriages exhibit higher fertility than those in polygamous ones due to the frequent exposure to sexual intercourse in the latter. He also found out that the fertility of separated women is lower than those in marital unions.

On fertility differential by residence, Knowles (1982) found out that, in Thailand after the transition, it appears that the difference between rural-urban fertility levels considerably declined. He argued that the transition affected all areas of the society with factors such as education and income playing a minimal role. This was reflected in the participation of the least educated women and the poorest couples in a move towards smaller families.

Osei Mansah (1982) argues that among the Yoruba, the rural-urban differential is quite unclear as some urban centres exhibit high fertility levels than rural and vice versa. He points out that those moving to urban centres do not relinquish their cultural beliefs and values, therefore, those moving from high fertility areas tend to continue with the same trend.

Mosk (1980) found out that in Sri Lanka there is a slight difference between rural and urban fertility . He attributes the differences to a lower proportion of married fecund women in urban centres. He argues that the availability of job opportunities for women in urban centres delays age at marriage and in addition creates a role of conflict between motherhood and work.

In Ghana ,according to the demographic and health survey of 1993, urban women have lower fertility than rural women . This is attributed to the fact that they have better knowledge and accessibility to contraceptives than rural women. It was found out that the percentage of urban women who were aware of contraceptive methods was 98 compared to 88 of rural women. The total fertility rate for women who reside in urban areas was 3.99 while rural women registered 6.4.

This was also the case with Nigeria and Zambia. In Nigeria urban women registered total fertility rate of 5.03 while rural women registered a TFR of 6.33 ,and in Zambia urban women registered 6.6 while rural women 7.12. The reason given is that urban dwellers marry later and are more likely to use contraceptives. Another reason is that they recognise earlier the advantage of a small family than rural people since urbanisation tends to create an atmosphere favourable to the small family ideals as well as to behavioral patterns conducive low fertility. However the difference can not uniform as the stage of urbanisation differ. Some urban areas exhibit characteristics of rural life especially in developing countries hence there is a slight difference in fertility .(DHS Zambia , Nigeria)

### **2.1.1 Studies carried out in kenya**

There is little difference between findings in other parts of the world and those in Kenya concerning fertility differentials. In Kenya differences in fertility levels between



regions have been affected by ethnicity, urbanisation, education, marital status, contraceptive use and partly religion. Of these, the major factor associated with fertility differentials is ethnicity. Different ethnic groups have different beliefs and values which define the reproductive ways of the members of that given ethnic group.

Ocholla-Ayayo (1991), dwells much on cultural factors that bring about the differences in fertility levels. He argues that the differences in fertility rates among different ethnic groups in Kenya is a consequence of cultural values and beliefs that affect each ethnic group.

Anker and Knowles (1980) sum up that, while studying fertility differentials in Kenya one should take ethnicity as the point of departure. Any fertility differential study without ethnic consideration in Kenya is incomplete work . It has been found that the Luhya and the Luo community have high fertility levels than the Kikuyu due to the prevalence of polygamy and early age at marriage among these two communities.

Muinde and Mukras (1979) found out that in areas where polygamy is practised in Kenya for example among the Luo and Luhya women compete for more children in order to gain favours from the husband and also respect from members of the society. They argue that this competition is due to the realisation that their existence in the family is a function of the number of children one is capable of bearing.

This analogy is not in agreement with the findings of Anker and Knowles (1980). Where as Muinde and Mukras argued that polygyny has a positive effect on fertility, Anker and Knowles found out that there is an inverse relation between fertility and polygyny. In a polygynous union there is less frequency of sexual intercourse and its easier for polygynous couples to follow the sexual practices such as abstinence during lactation period , as the man has an alternative sexual partner. Polygynous marriage has rules that control the husband

when to have sex and with which wife, this practice has an inverse effect on fertility. Ocholla-Ayayo(1982) concurs with above findings of Anker and Knowles. On the same note he argues that the sleeping arrangement in a monogamous union result into higher coital frequency and hence high fertility unlike in a polygamous union where a man has to move from one wife to the other giving each wife equal chance. This type of arrangement reduces the chances of conception.

Education is one of the most important factor of social change. Studies have shown that education especially women's can be positively or negatively related to fertility depending on the educational levels. The studies reveal that when educational level increase fertility declines. However, education affects fertility not only by direct ways such, influencing attitude and preferences with respect to smaller family size but also through other channels such as delaying marriage or proper use contraceptives.

Ochola-Ayayo (1991) giving the examples of Bungoma and Kakamega argues that even though these districts have high literacy levels they still sustain high fertility levels. He points out that although there is evidence that education plays a major effect on fertility, education as a differential factor should be considered along with several other factors for example ethnicity, religion, and income. Henin (1979), considered female educational level in kenya and noted that women with primary education had the largest number of children. He argues that primary education makes women more conscious of the importance of hygiene and other basic requirements which help the survival of children and prevent foetal wastage. As years of schooling increase, fertility declines (Henin 1979, 1980, Ayayo 1991).

Kwendo (1992) asserts that education increases parents preference for consumable items not related to children and reduces preferences for more traditional life styles which include a large family size. It also increases effective contraceptive use, women's income-

earning potential and late age at marriage. In his study in Western province, he found out that education has little effect on suppressing fertility especially in Kakamega, a district with quite a number of good girl schools.

Anker and Knowles (1980) sum up the effect of education on fertility as:-

- (1) Education increases parent's relative preference for consumable items not related to children and reduce preference for more traditional life style which include a large family size.
- (2) Education increases ones willingness to accept new products and to use outlined procedure more effectively.
- (3) Education increases women's income earning potential and thereby increases the opportunity cost of their withdrawing from labour force in order to care for children.

The inverse relation to fertility is contradicted by Schultz (1973) who argues that high education attainment will mean high income and therefore, a couple is able to maintain a large family hence education is positively correlated with fertility.

On marital status, Kwendo, (1992) found out that married women exhibit the highest fertility rates followed by the widowed, and then divorced/separated. He found out that in Bungoma district fertility for the single mothers was quite high, at least five, children, a factor attributed to the breakdown of traditional norms and values, such as strong regard for virginity.

A study by Gazana (1985) on fertility levels and differentials in Nairobi found out that differentials by marital status exist in Nairobi. Widowed and divorced exhibit high fertility

followed by currently married. While the lowest is that of never married. He goes further to assert that African marriages have been said to be characterized by high levels of polygyny and frequent remarriage for the widowed and this contributes to high fertility. Kalule-Sabiti (1984) found that the proportion married among the population, the level of contraceptive use and post-partum lactational infecundability account for much of the observed marital fertility differential. He points out that urbanisation and education have had an effect on lactation and breast feeding thus, giving way for high fertility.

Anker (1985) found significantly lower fertility among Kenya mothers working away from home in rural areas. However, there was no relation found between employment and fertility if work was performed at home or near the home. He argues that employment and income gives women alternative security other than children.

Ann-Magritta and Juma (1989) did a study in Bungoma on women, child-bearing and nutrition, and found out that the desire for more children is still prevalent in the district, To achieve this polygamy is the order of the day, They write:

**"Most of the male adult population is polygamous and pro natalistic attitudes are strong in the district"**

Age at marriage is early and most marriages in the district remain stable and permanent favouring high fertility trends. They argue that traditional birth control practices such as breast-feeding, post-partum abstinence and grandmothers effect have indeed disappeared and this give room for high fertility.

From the literature review we note that the increase or decrease in fertility is determined by socio -economic ,cultural demographic and environmental factors. However,

these factors differ in strength from one region to another. This to say that ,one factor may have more influence on fertility in one region and less in another. For example ,developed countries are more influenced by the socio-economic factors eg, education, income, whereas in most developing countries,especially African region cultural factors have a lot of influence on fertility.

## **2.2 Theoretical framework.**

Demographers up to date have not come up with a clear theory explaining fertility. Most theories used are borrowed from sociology and economics. Economists have been on the forefront explaining the changes in fertility levels. Most economic theories, for example, the household theory as propounded by Becker (1965) and Schultz (1971) take childbearing as any other usual activity but not a priority. They compare children to other commodities with utility, and therefore, if parents choose to have children they must have weighted the psychic rewards from bearing and rearing children against the rewards from other activities such as business if undertaken instead. Schultz (1971) argued that the opportunity costs of having children will differ for each couple, depending on the resource constraints they face. Since child rearing may take more time than more profitable venture that can change one's lifestyle, many couples opt for fewer children. The argument put forward by the economists is that children limit the labour force participation of the mother. The mother is more likely to wish to work in cases, where her income potential is higher than childbearing which only can offer psychological satisfaction. Most educated mothers with high income potential will tend to favour a high paying employment, than having more children.

Mincer (1993) whose argument is in line with the above analogy concludes that as family income increases the couple tend to give greater emphasis to activities that can

generate more income instead of child bearing which is time wasting and uneconomical.

Leibenstein (1980) argues that the salient thing people seek in the modern world is profit maximisation and every action is determined by its utility, as he wrote:

**"Our central notion is that people behave in the same way they would if they applied rough calculation to the problem of determining the number of births they desire and such calculation will depend on balancing the satisfactions or utilities to be derived from an additional birth as against the costs both monetary and psychological of having an additional child..."**

**(Leibenstein, 1958, pg 318)**

He explains the relationship between social influence groups and tastes. He points out that economic changes do have greater influence on the families social status than social changes. As a consequence of this change in the social status, taste changes not only for children but for goods that compete with children. He points out that children are seen as goods that parents can derive utility, both as productive agents, source of pleasure and as a potential source of security. However, he notes that the costs that are associated with children can be divided into direct and indirect. Direct costs being expenses occurring from the maintenance of the child such as feeding, clothing and general upbringing until the child can fend for itself. Indirect costs imply opportunities foregone due to the existence of an additional child such as the inability of the mother to work if she must attend to children, lost earnings during the gestation period or the lessened mobility of parents with large family responsibility. Robinson (1979) argues in the same line saying that parents begin to prefer higher quality children and fewer of them. This is in relation to the income and the opportunity cost due to child care. Child care is becoming expensive hence parents prefer a manageable family size.

Easterlin came up with an economic frame work that explains fertility. He points out the three factors in which fertility determinants work.

1. Demand for children
2. The potential output of children
3. The cost of fertility regulation

In his framework he tries to rationalise that if fertility regulation were to cost less, how many children would a couple prefer? And what about if there is no deliberate limitation of children, how many children would a couple have ?. Lastly, what if there is cost on regulation, how many children would one prefer? He argues that the potential output of children will depend on child survival from babyhood to adulthood. Parents will tend to limit the number of children depending on whether those already born survive. He further points out that the socio economic development may force a household to redefine its situation regarding the number of children it would wish to have. While income can negatively affect fertility in western countries it may be a positive factor in most African societies.

The economic theories in general were based on western mode of living and little did it take into account the African Situation. Jones (1976) in his paper Economic and Social Support for high fertility: Conceptual framework, argues that fertility theories and models, if they are to help very much in understanding and in particular measuring the strength of factors influencing fertility, must be designed with the particular consideration for cultural, social and familial setting in mind. He goes on to assert that cultural values of a given society should be looked into from historical point of view of that particular society and not economic prosperity.

In most African societies a household does not only consist of father, mother and children but also members of extended family. In this case therefore, one cannot seek for

fewer and quality children while at the same time helping other relatives who could be even more than the desired number of children one would have wished to have. The issue of child rearing in many African societies does not lie on the couple but on the entire extended family members. Therefore, child rearing cannot be taken as a burden because its shared among family members .

In these societies children play a vital role in a homestead. Many children will mean enough labour force and enough security in the old age. Therefore, in analysing fertility one has to combine several factors that affect human society. These may include environmental, economic and socio-cultural, and to some extent, psychological.

Davis and Blake (1956) came up with a theoretical model that could explain the determinants of fertility. Their model points out that social, demographic and economic factors affect fertility through intermediate variables. Intermediate variables are defined as those through which social, economic, cultural and environmental factors affect fertility (Bongaarts, 1978). Their major characteristic is that they affect fertility directly. They proposed a set of eleven intermediate variables as follows.

- (1) Factors affecting exposure to intercourse (intercourse variable)
  - (a) Those governing the formation and dissolution of unions of the reproductive period: Age at Entry into sexual unions
- (2) Permanent celibacy: proportion of women never entering sexual unions
- (3) Amount of reproductive period after or between unions : When unions are broken by divorce, separation and desertion : When unions are broken by death of husbands
  - (b) Those governing the exposure to intercourse within unions
- (4) Voluntary abstinence



- (5) Involuntary abstinence (from impotence, illness, unavoidable but temporary separations).
- (6) Coital frequency (excluding periods of abstinence)
  - (II) Factors affecting exposure to conception (conception variable)
- (7) Fecundity or infecundity, as affected by involuntary cause
- (8) Use or non use of contraception
  - (a) By mechanical and chemical means
  - (b) by other means
- (9) Fecundity or infecundity as affected by voluntary causes (eg sterilization, subscision, medical treatment etc)
  - (III) Factors affecting gestation and successful parturition (Gestation variables)
- (10) Foetal mortality from involuntary causes
- (11) Foetal mortality from voluntary causes.

They concluded that the eleven variables are found in any given society and change in any of them would have an impact on fertility. The effect of each of these variables is either negative or positive and that the effect these variables is not necessarily the same in all communities.

Bongaarts (1978) tried to refine the Davis and Blake, (1956) model. He tried to make it simpler and clear by showing the relationship between the variables and fertility. He came up with 8 proximate (intermediate) variables through which background variables affect fertility.

He grouped the 8 into 3 broad categories

**(I) Exposure factors**

1. Proportion married (i.e unstable marital unions) refer to proportion of women in reproductive age that engage in sexual intercourse frequently.

**II Deliberate marital fertility control factors**

2. Contraception - Any deliberate parity-dependent practice including abstention and sterilisation undertaken to reduce risk of conception
3. Induced abortion  
Refers to deliberate interruption of the normal gestation course

**III Natural marital fertility factors**

4. Lactational infecundability - following a pregnancy a woman remain infecundable (unable to conceive until normal pattern of ovulation is restored).  
This period is enhanced more through intensive breastfeeding
5. Frequency of intercourse this refers to rate of intercourse or mostly referred as coital frequency
6. Sterility- includes cases where a couple becomes sterile before a woman reaches menopause for reasons other than contraceptive sterilization.
7. Spontaneous inter-uterine mortality - refers to pregnancies that end in a spontaneous abortion or still birth.

8. Duration of the fertile period. A woman is able to conceive for only a short period of approximately 2 days in the middle of the menstrual cycle when ovulation takes place.

Both Bongaarts(1978) and Davis and Blake(1956) models dwelt a lot on the proximate determinants (intermediate variables). As defined earlier they are through which social, cultural, economic, psychological and environmental factors affect fertility. Bongaarts argues that background variables, for example education (which is a socio-economic factor), can only affect fertility through contraceptive use or age at marriage.

Another sociologist by the name Freedman (1962) came up with a model which was based on one developed earlier by Davis and Blake but more flexible that can be applied in different socio-cultural setting. Unlike Bongaarts (1978) and Davis-Blake (1956) which dwelt more on the relationship between fertility and intermediate variables. Freedman's model clearly explains the inter-relation between background variables and fertility either through intermediate variables or direct relation. In this model, he places environmental factors as the prime mover to any change that might occur to other background variables which in turn affect fertility. Suffice to say, that any change occurring on the environment as a factor affects other factors too and in the end affects fertility positively or negatively. This therefore brings us to a conclusion that different environments nurture conditions favourable or unfavourable to fertility levels.

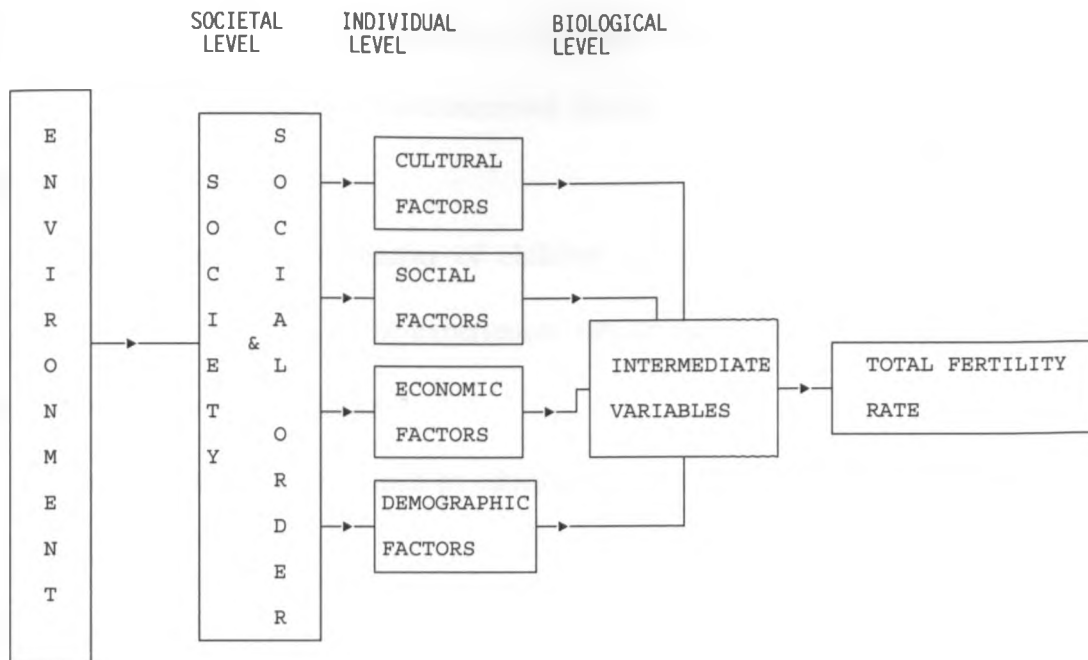
In this model, Freedman goes further to argue that the effect of environmental factors on the intermediate variables is controlled by the norms of that particular society. Therefore, the cultural set up of a particular community defines ways and means of fertility control. The inclusion of norms about family size and intermediate variables, the framework was designed with particular consideration for cultural, social and family setting of different

socio-cultural groups. This framework therefore, can be used to explain fertility behaviours of different people in different environments bearing in mind that different environmental conditions mould different socio-cultural settings.

Ocholla-Ayayo (1982, 1991) argues that each society depending on its social structure and traditional ideologies, evolves reproductive practices and, norms as well as supportive religious doctrines, moral codes, beliefs, sex habits that affects fertility. In a Kenyan setting, for example, differences in fertility levels between regions characterised by ethnicity is more culturally determined than socio-economic.

The study of fertility requires a multifaceted approach. This will include the biological determinants, social structure, and cultural patterns of that particular community, for example, belief systems and attitude towards children. These too are controlled by the environment of that particular place. In this study no single theory outlined in the foregoing theoretical review is applied. Instead a framework was applied. The framework was preferred due to its flexibility to explain the working of the societal structures (economic, social, cultural and demographic) in relation to fertility. Therefore the study of fertility is a combination of the above factors.

Fig: 2.1 Conceptual framework



Adapted from ABC model(1986)

### 2.3 Theoretical statement

Western province situated in a specific environment has developed social ,cultural and economic factors that are likely to affect its fertility levels.

### 2.4 Conceptual hypotheses

- (1) Socio-economic factors are likely to affect the total fertility rates.
- (2) Demographic factors are likely to affect the total fertility rates.
- (3) Cultural factors are likely to affect the total fertility rates.

### 2.5 Definition of concepts

The key concepts below are defined only in such away that enable their relations with independent variable (TFR) tenable.

(1) Fertility differential:

This refers to the differences in fertility levels as they are affected by social, economic, cultural and environmental factors.

(2) Total Fertility Rate:

This is the average number of children a woman would have at the end of her reproductive period if she experiences similar age specific fertility rates of the time.

(3) Socio-Economic Factors:

This refers to variable such as education, income, place of residence, occupational status.

(4) Cultural Factors:

In this study this refers to types of marriage and ethnicity.

(5) Demographic Factors:

In this study, this refers to marital status.

## 2.6 Definition of operational concepts

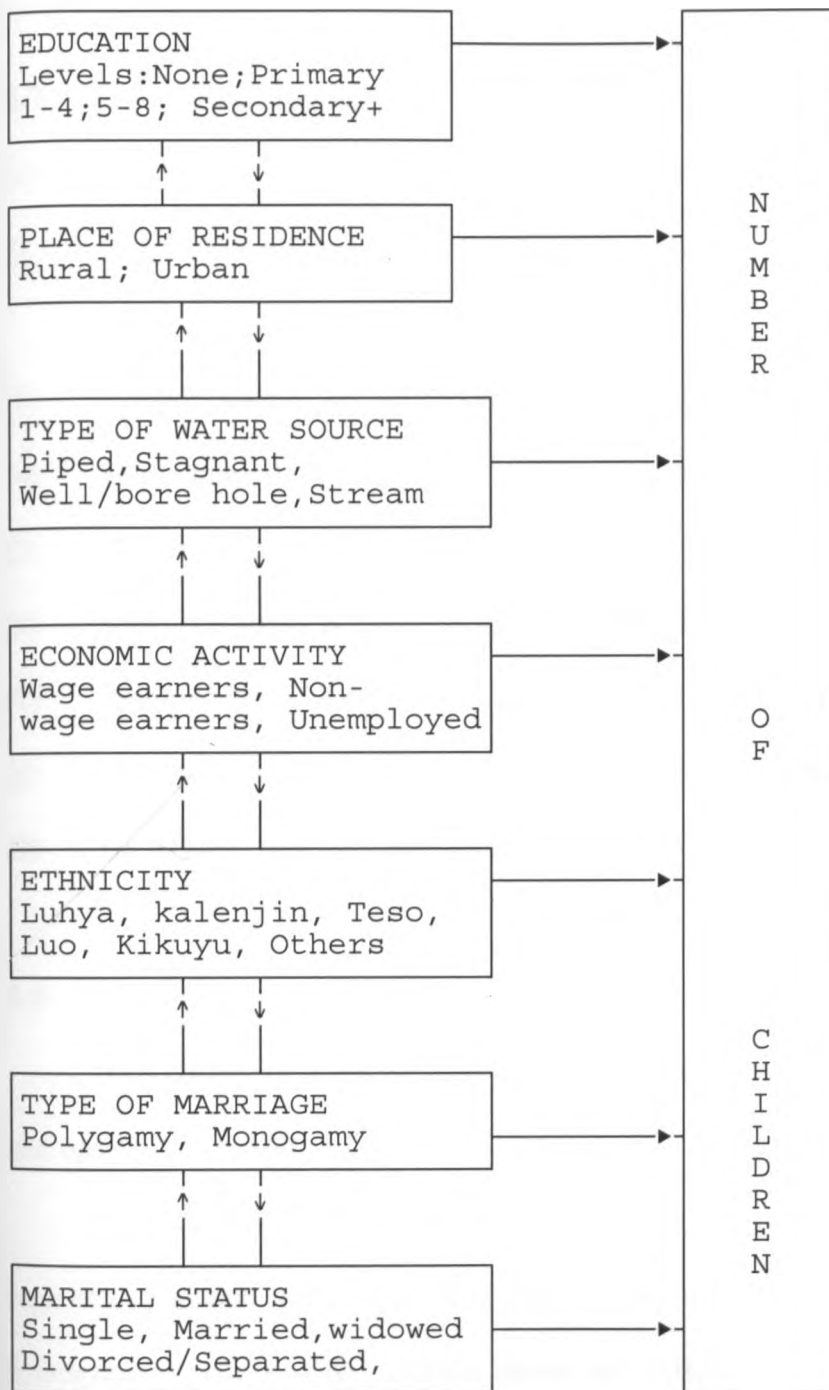
- Education: It refers to formal schooling. During the 1989 census the question that was asked was the number of year completed in school.
- Place of Residence: Refers to whether one resides in rural or urban areas.
- Economic Activity: Refers to whether one was involved in any activity whether employed, unemployed or self employed.
- Ethnicity: Refers to different communities classified by shared language, beliefs, moral codes and values. In most cases they share a geographical area. Another term used for ethnicity is tribe.

Type of Marriage: Refers to marital union, whether polygamous or monogamous.

Marital Status: This refers to whether during the census one was married, single, divorced or widowed.

Types of water source: Refers to whether during the census ones source of water was piped, river, well etc.

**Fig: 2.2 Operational framework**



In the framework in figure 2.2, the intermediate variables are assumed to be functional. This is not indicated due to the nature of the data used. The data used in this study was census data and questions asked in the 1989 census did not touch on the intermediate variables such



as ,the age at marriage or contraceptive use .

## **2.7 Operational hypotheses**

- (1) 1-4 years level of Primary Education are likely to affect the total number of children.
- 2) Due to the differences in traditional beliefs and customs, each community in the province is likely to affect fertility differently.
- (3) Urban residence is likely to have an effect on the total number of children.
- (4) Single marital status is likely to affect the total number of children .
- (5) Married status is likely to have an effect on the total number of children.
- (6) Separated status is likely to affect the total number of children.
- (7) Employment is likely to have an effect on the total number of children
- (8) Monogamous union is likely to an influences on the number of children.
- (9) Un treated type of water source is likely to affect the total number of children.

## **2.8 Summary**

This chapter presents the literature review, theoretical framework, hypotheses of study and operational model.

In the literature review, it was stated that socio-economic factors (education, income etc) environmental factors, cultural factors (marital union, religion ethnicity etc) and demographic factors (age, marital status etc) influence fertility differences. Education especially female education, residence, ethnicity and work status contribute a lot towards fertility differentials.

In Kenya, ethnicity as stated in the literature review is a major factor that influence fertility differentials.

This chapter also outlines theories of fertility. These are economic theories, sociological theories (frameworks) and demographic frameworks.

Other models such as Davis-Blake and Bongaarts are also discussed. These two models put a lot of emphasis on the effect of the intermediate variables and fertility.

Freedman's framework was also discussed in the Chapter. The framework borrows a lot from Davis-Blake but it includes norms which are culturally determined making the model both socio-economic, cultural and demographic.

## CHAPTER THREE:

### SOURCES OF DATA AND METHODS OF ANALYSIS

#### 3.0 Introduction

The study aims to find out factors that bring about persistently high fertility in Western province and also the effect of socio-economic, cultural, and demographic factors on fertility. This chapter discusses source of data and methods of data analysis. Coale and Trussel P/F ratio method is applied in determining of fertility levels in the province.

#### 3.1 Sources of data

This study based on information from the 1989 Kenya Population Census which was carried out nationwide and believed to have enumerated all persons residing in Kenya at that time. The main objectives of the 1989 census were:

- (1) To provide information on the composition and distribution of the population
- (2) To collect information on current trends and levels of fertility, mortality, and migration.
- (3) To ascertain the current rate and pattern of urbanization.
- (4) To determine the size and composition of the labour force and information on social amenities available.

Although the 1989 census was more elaborate than the previous ones, it had also problems such as under-enumeration which is a problem of most census in developing countries. Some areas were not covered due to poor condition of roads and also the due to remoteness of some areas.

The data on occupation and work status was distorted according to CBS results. Those enumerated were either employed or unemployed regardless of job specification and categories, for example whether one was a teacher or doctor they were all grouped together.

This made impossible for the data for analysis. The census also did not touch on the important aspect of fertility such as intermediate variables for example, age at marriage, contraceptives etc.

Since this study focuses on Western province, information on the province, including the newly created districts of Mt. Elgon, Vihiga and Teso which were part of the old districts during and before the census was used. Women in the reproductive age between 15-49 was the target group of this study.

Major questions asked in the census were demographic (sex, age, marital status, birth place, number of children ever born and orphaned) socio-economic (literacy level, economic activities, residence, status of tenure of the main residential structure, construction material of the main sewage disposal, source of lighting and main source of water) and then cultural questions (tribe).

### **3.2 Demographic technique**

The demographic technique used in this study is Coale and Trussell P/F ratio technique. The method is used to determine the levels of fertility in the Province.

#### **Rationale of the method**

Coale and Trussell P/F ratio method seeks to adjust the level of observed age specific rates which are assumed to represent the true age pattern of fertility.

Measures of average parity equivalent (F), comparable to the reported average parities (P), are obtained from period fertility rates by cumulation and interpolation. The ratio of average parities (P) to the estimated parity equivalent (F) are calculated age group by age group and an average of the ratio obtained for younger women is used as an adjustment factor by which all the observed period fertility rates are multiplied.

### Data required

- (1) Number of children ever born
- (2) The number of children born during the year preceding the survey or census classified by five year age group of mother or the number of registered births in the time of the census classified by five year age group of mother.
- (3) The total number of women in each five year age group.
- (4) Total population if the birth rate is to be estimated.

When computing, there are a number of stages to be followed:-

### Step (1)

To calculate the reported average parities P(1)

$$\frac{\text{CEB}}{\text{WPOP}} = \frac{\text{Children Ever Born}}{\text{Total women Population}}$$

### Step (2)

Calculation of a preliminary fertility schedule from information on births in the past year or from registered births

f(i) - Fertility of women in age group (i)

Births in last year preceding the census

Total women population

### Step (3)

Calculation of cumulated fertility schedule for a period

What is done here is that the computed rates in step (2) are added up from  $f(i)$  to  $f(ii)$

Therefore, 
$$Q(i) = \sum_{j=1}^i f(j) \dots$$

Multiply the result by five if the population is classified in a five year age group.

$$Q(i) = 5 \sum_{j=0}^i f(j)$$

### Step (4)

Average parity equivalent which were denoted by  $F(i)$  are assumed by interpolation using parity rates  $f(i)$  and cumulative values  $Q(i)$  calculated in the previous steps.

Coale and Trussel proposed fitting a second degree polynomial to three consecutive values of  $Q(i)$  and estimating the average parity of women of an age group within the range by evaluating the integral of the polynomial in actual application. Therefore,  $F(i)$  is obtained as  $F(i) = Q(i-1) + a(i)f(i) + b(i+1) + c(Q7$  for  $i = 1, 2, 3, 4, \dots, 6$

$$\text{and } F(7) = Q(6) + a(7) * f(6) + b(7) * f(7)$$

values of the parameter  $a, b$  and  $c$  above were estimated by using least - squares regression to fit equation.

**Table 1: Coefficient for Interpolation between cumulated fertility rates to the estimated parity equivalent**

Age group	Index (i)	a(i)	b(i)	c(i)
15 - 19	1	2.531	-0.188	0.0024
20 - 24	2	3.321	-3.321	0.161
25 - 29	3	3.265	-0.627	0.0145
30 - 34	4	3.442	0.563	0.0029
35 - 39	5	3.518	-0.763	0.0006
40 - 44	6	3.862	-2.481	-0.0001
45 - 49	7	0.392	2.608	

Source: UN Manual x 1983 pg. 34

### Step (5)

When age specific fertility classified rates have been calculated from births in 12 months period classified by age of mother at the end of the period they are specific for unorthodox age groups that are shifted by six months. A fertility schedule for conventional five year age group  $f(i)$ , can be estimated by weighing the rates referring to unorthodox age group according to the following formula:

$$f^+(i) = (1-w(i)) * f(i) + w(i) * f(i+i)$$

where  $f(i)$  and  $f^+(i)$  are respectively the unadjusted age-specific fertility rates and  $w(i)$  is the weighing factor calculated as:

$$w(i) = \frac{x(i) + \frac{y(i) \times f(i)}{Q(7)} + \frac{Z(i) f(i+i)}{Q(7)}}{Q(7)}$$

The values of  $x(i)$  and  $Z(i)$  were obtained by fitting equation above by least squares regression, to the same model cases used in deriving the coefficient presented in Table 1 No. weighing factor is needed for  $i=7$  as child bearing is assumed to cease after age 50.

Therefore,  $f^+(7) = (1-w(6)) f(7)$

**Table 2: Coefficient for calculation of weighing factors to estimate age-specific fertility rates for conventional age-group from age-group shifted by six months**

Age group	Index(i)	x(i)	y(i)	z(i)
15 - 19	1	0.031	2.287	-0.114
20 - 24	2	0.068	0.999	-0.233
25 - 29	3	0.094	1.219	-0.977
30 - 34	4	0.120	1.139	-1.531
35 - 39	5	0.162	1.739	-3.5926
40 - 44	6	0.270	3.454	-2.492

Source: UN Manual x 1983 pg. 34

### Step (6)

Adjustment of period fertility schedule the ratio  $P(i)/F(i)$  are calculated. If,  $P2/F2$  and  $P(3)/F(3)$  are reasonably consistent either of them can be used as an adjustment factor for the period fertility rates. If they are not very similar a weighted average of the two can be used. However, if the ages of women are believed to have been pushed up or down then the mean of all the  $P(i)/F(i)$  ratio can be used.

Once an adjustment factor has been chosen only an adjusted fertility schedule is computed by multiplying the fertility rates for conventional age group  $f^*(i)$

$$f^*(i) = K f(i)$$

The total fertility rate is calculated as

$$TFR = 5 \left[ \sum_{i=1}^7 f^*i \right]$$

$$1 = i(i)$$



## Application of the Coale and Trussel P/F ratio method

**Table 3: Total Fertility results using Coale/Trussel P/F ratio (Bungoma District)**

The table below shows the population of women by age group, number of children ever born (CEB) and births in the last twelve months preceding the census.

Age Group	Number of Women	Children Ever Born (CEB)	Number of Births (BLY)
15-19	43162	10185	15944
20-24	32171	52990	13977
25-29	26264	92343	10745
30-34	19445	99704	6928
35-39	14480	100024	4446
40-44	11166	89455	2012
45-49	8736	73907	880
<b>TOTAL</b>	<b>155424</b>	<b>518608</b>	<b>54932</b>

**Table 4: Calculated Total Fertility Rate Using P/F Ratio Method**

Using the Coale and Trussel P/F Ratio Method the TFR arrived at for Bungoma District is shown in the table below.

Age Group	P(i)	f(i)	Q(i)	F(i)	P/F	fx
15-19	0.2360	0.36940	1.84700	0.8792	0.2684	0.41889
20-24	1.6471	0.43446	4.01929	3.1550	0.5221	0.42563
25-29	3.5159	0.40912	6.06487	5.2881	0.6649	0.40691
30-34	5.1275	0.35629	7.84630	7.1496	0.7172	0.35284
35-39	6.9077	0.30704	9.38152	8.7955	0.7854	0.29933
40-44	8.0114	0.18019	10.28247	9.8264	0.8153	0.16568
45-49	8.4601	0.10073	10.78614	10.6688	0.7930	0.08795

Due to inconsistency of P<sub>2</sub>/F<sub>2</sub> and P<sub>3</sub>/F<sub>3</sub> the mean of the two in this study was used as the adjustment factor. ( $K_a$ ) as indicated in the results shows that the total fertility rate was calculated using the mean of the above P/F ratios as the adjustment factor. Also in the analysis, the mean of the entire P<sub>i</sub>/F<sub>i</sub> ratio was used as the adjustment factor ( $K_{mean}$ ),

basing on the assumption that the ages of women are believed to have been pushed up or down. It is believed that the mean of the ratios takes care of the inconsistency in the age of mothers.

**Table 5: Adjustment Fertility rate results using both adjustment factors Ka**  
**( $\frac{P/F_2 + P/F_3}{2}$ ) and mean ( $\frac{P/F_1 + P/F_2 + \dots + P/F_7}{7}$ )**

$f^*(ka)$	$f^*(k \text{ mean})$
0.24860	0.27325
0.25260	0.27765
0.24149	0.26544
0.20940	0.23017
0.17764	0.19526
0.09833	0.10807
0.05219	0.05737
TFR = 6.4	TFR = 7.03

TFR =  $5 [\sum_{i=1}^7 f^*i]$  i.e the sum of  $f^*(ka)$  or  $f^*(k \text{ mean})$  multiplied by five.

## CHAPTER 4

### ESTIMATION OF FERTILITY LEVELS AND DIFFERENTIALS IN WESTERN PROVINCE

#### 4.0 Introduction

This chapter looks at the estimates of fertility levels in the Province up to the divisional level, using the total fertility rate (TFR) as the index. As mentioned above in chapter 3, the demographic technique used is the indirect Coale and Trussel P/F ratio method to obtain the total fertility rate. The 1989 census results by CBS applied Gompertz relational method to obtain the TFR in provincial and district level.

#### 4.1.0 General Description of the Study Population

According to the 1989 census, Western Province had a total of population of 2,544,329 with a female population of 1,330,401 which accounted for 52.3% of the total population. Women in the reproductive age group (15-49) constituted 22.3% of the total population. Within the bracket of the reproductive age the most fertile age group was 20-34 which accounted for 49.4 percent of the total number of the reproductive age group.

The data on the children ever born (CEB) and birth in the last twelve months (BLY) was marred by misreporting in the age group 15-19 whereby the number of CEB is less than births in the last twelve months. In this age group (15-19), majority of the women are either unmarried and without children and therefore CEB and births in the last twelve months should be almost the same or, CEB which describes birth history of women over a period of time should be more than births in the last one year (current fertility).

**Table 6: General Distribution of Women in the Reproductive age group 15-49 and Births the last 12 months in Western Province**

Age Group	Population size	Percentage	No.of births last 12 months	Percentage
15 - 19	151,614	26.7	52390	28.2
20 - 24	115,782	20.7	48255	26
25 - 29	93,798	16.4	36290	19
30 - 34	70,952	12.5	23567	13
35 - 39	54,426	9.6	14731	8
40 - 44	43,454	7.6	7093	4
45 - 49	37,364	6.5	3486	2
<b>TOTAL</b>	<b>567,364</b>	<b>100.0</b>	<b>185812</b>	<b>100.0</b>

Source: CBS, 1989 Census

The majority of women in the reproductive age are in the age group 15-34. This age group had the highest percentage of births in the last one year.

As mentioned earlier, misreporting in the age group 15-19 clearly shows in the table above. The table shows that there are more births in the age group 15-19 than 20-24 and this is not always the case. The explanation for this is that young mothers tend to give wrong answers especially the number of children they have but give satisfactory answers on births in the last twelve months. Sometimes the head of the household can claim to be the mother to all members of the household including grandchildren hence distorting the number of children ever born to women in the household.

#### 4.1.1 Education

Education plays a very vital role in any given society. It is the main agent of change in all aspects of life. In demography, education affects all factors that contribute to demographic change, for instance, fertility change is greatly influenced by levels of

education. Preceding findings as indicated in the literature review reveal that education has an inverse effect on fertility. Birth control (use of contraceptives) depends largely on the level of education, especially the mother's education.

The table 7 shows that half (50%) of women in reproductive age group 15-49 completed primary level of education followed closely with those with no education, accounting for 30%. These two categories sustain high fertility rather than reduce it. Higher levels of education (secondary and above) account for only 17.8 percent. This is probably the reason why fertility remains high in the Province.

#### **4.1.2 Economic Activity (work Status)**

This variable gives the picture of the standard of living in the province. The economically active people, especially those engaged in business, commercial farming or employed are in a position to have a balanced diet and accessibility to contraceptives. This group therefore is likely to have a negative effect on fertility.

Economic activity as a variable has been classified into three categories; salaried (wage earners), non-salaried and the unemployed. The majority of women in the Province belong to non salaried group. This category comprise of those in private business, farming e.t.c (those engaged in self employment). This category accounts for 81.61%. The salaried category accounted for 13.06 percent.

#### **4.1.3 Residence**

The urban population in the Province is very small. Compared the rural population of 2356324 ,urban population is only 188005. Therefore the population is predominantly rural. The major urban centres in the Province are Kakamega, Bungoma,

Webuye, Busia and Vihiga, each has a total population below 100,000. Other urban centres exhibit characteristics of rural life. Out of 567,390 women in the reproductive age, 94.31 percent reside in rural areas whereas 5.7 percent reside in Urban centres.

#### **4.1.4 Type of Water Source**

The province still suffers from the inaccessibility to treated water (piped). The majority of the population depends on either boreholes/wells or river water. Piped water in the Province accounts for only 13.45%. On District level, Busia District is the least supplied with piped water (8.2 %) while Bungoma had the most with 22.3% and Kakamega 10.5%. The population that depends on either boreholes or wells is 42.7% followed closely by those who depend on river/streams 34.4% (computed from 1989 census).

The water borne diseases are rampant in the province because poor supply of treated water. This could be probably the reason for high infant and child mortality rate in the province especially in Busia District where the infant mortality rate is as high as 111 children dying per thousand live births.

**Table 7: Percentage Distribution of Women in the Reproductive Age Group 15-49 by Socio-economic factors.**

**Education Status**

Education Status	Female Population	Percentage
None	174,167	30.86
Primary		
STD 1-4	60,158	10.66
STD 5-8	229,144	40.6
Secondary +	100,962	17.88
<b>TOTAL</b>	<b>564,431</b>	<b>100.0</b>
<b>Economic activity</b>		
Salaried	53,696	13.06
Non-Salaried	333,453	81.61
Unemployed	21,871	5.32
<b>TOTAL</b>	<b>411,020</b>	<b>100.0</b>
<b>Residence</b>		
Rural	534,985	94.3
Urban	32,405	5.7
<b>TOTAL</b>	<b>567,390</b>	<b>100.0</b>
<b>Type of water source</b>		
Stagnant/Surface	20,688	3.6
Borehole/Well	242,261	42.7
River/Stream	222,788	39.3
Piped	75,780	13.4
Others	5,873	1.0
<b>TOTAL</b>	<b>567,390</b>	<b>100.0</b>

source: computed from 1989 census data.

#### 4.1.5 Marital Status

The marital status has been classified into married, single, widowed and separated/divorced. Married women account for a large percentage of the total population of women in age group 15 - 49 (66 %) followed by singles (30 %), widowed (1.95 %) and separated/ Divorced (20 %) (table 8).

**Table 8: Percentage Distribution of Women in the Age Group 15-49 by Demographic factors**

Marital Status	Female Population	Percentage
Married	373,091	66.0
Single	170,644	30.14
Widowed	11,051	1.95
Separated/Divorced	11,323	2.0
TOTAL	566,109	100.0

Source: computed from 1989 census data.

#### 4.1.6 Marital Union

The majority of the married women in the reproductive age group (15-49) were in monogamous union accounting for 83.3 percent while those in polygamous unions were 16.8 percent.



#### 4.1.7 Ethnicity

Western Province is predominantly occupied by the Luhya ethnic group. Except for a number of urban areas, most of the rural areas in the province are inhabited by the Luhya. Out of the district population of 316,570, the Luhya comprise more than three quarters of the total population (93.8%). In the rural areas, the Luhya account for 95.8%. Other ethnic groups in the district only account for 6.2%.

During the 1989 census, the then Bungoma and Busia District, although predominantly occupied by the Luhya community, were also inhabited by the Sabao, the Teso and other ethnic groups. (These two communities occupy the present Mt. Elgon and Teso districts respectively).

According to the 1989 census, the Kalenjin occupied two Divisions accounting for 9.3 percent of the female population. The Teso who occupy the present Teso district which was part of Busia district comprised 27.9 percent of the total population while the Luhya comprised 60.9 percent.

Other tribes in the province are the Luo and the Kikuyu mostly found in urban centres involved in business or employment. In general, the breakdown of the ethnic groups in the provinces is: 85.4% Luhya, 5.8% Teso, 3.1% Kalenjin and 2.95% Luo. (Table 9)

**Table 9: Percentage Distribution of Married Women in the Age Group 15 - 49 by Cultural factors**

<b>Marital Union</b>	<b>Female Population</b>	<b>Percentage</b>
Monogamous union	310,546	83.2
Polygamous union	62,545	16.8
<b>TOTAL</b>	<b>373,091</b>	<b>100.0</b>
<b>Ethnic group</b>		
Luhya	483,427	85.4
Luo	16,728	3.0
Kikuyu	5,484	1.0
Teso	33,010	5.8
Kalenjin	17,624	3.1
Others	9,835	1.7
<b>TOTAL</b>	<b>566,109</b>	<b>100.0</b>

Source: computed from census data 1989.

#### **4.2 Fertility levels in the province**

According to this study's results there is a clear indication that fertility rates in Western Province are not so high. The results show changes in total fertility rate between 1979 Census and the 1989 census. Compared to the other parts of the country, for example Central, Eastern and Nairobi Provinces, the fertility decline in western Province might not be significant. Using Coale and Trussel P/F ratio technique, the total fertility rate by division ranged between 5.6 and 7.3. The point to note is that there is uniformity in the levels of fertility in the province especially Bungoma and Busia district where TFR lies within the range of 6 and 8. There is a slight difference when it comes

to Kakamega District and present Vihiga district which exhibited lower rates as low as 5.

The lowest rate in the province was found in Kakamega Municipality with a TFR of KA 4.8, KMEAN 5.6 and the highest being Tongareni in Bungoma with a TFR of 7.3. At district level, Bungoma registered the highest fertility with total fertility rate of 7.04 followed by Busia (6.75) and Kakamega (6.71).

#### 4.2.1 Fertility levels In Bungoma District By Division

There is little variation between divisions in Bungoma apart from Cheptais in the slopes of Mount Elgon (a division in the recently created Mt. Elgon District) with a TFR of 6.8(KA) 7.2 (KMEAN). However, Cheptais only has a higher rate if KA is applied ( $KA = P_2/F_2 + P_3/F_3/2$ ) but when Kmean is applied ( $Kmean = P_1/F_2 + P_2/F_2 + P_3/F_3 + \dots + P_7/F_7$ ). Tongareni which lies in the settlement scheme has the highest rate of 7.31, the highest in the Province.

Another feature in Bungoma district is that divisions within the slopes of Mt. Elgon District exhibit higher fertility levels than the low altitude parts of the District. This can be attributed to lower contraceptive use, (a factor which can be as a result of strong traditional beliefs that support high fertility), another reason is poor social and physical infrastructure such as schools, health facilities and roads . This region is predominantly occupied by the Kalenjin community. According to Bungoma district development Plan (1994-96), Mt. Elgon Divisions, Kapsokwony and Cheptais had the lowest secondary school enrolment. By 1993, Kapsokwony had 317 girls on secondary school while Cheptais had only 297. The low enrolment can be another reason for high

fertility rates in Mt.Elgon area. Fertility in the lower parts of the District are a bit lower than Mt. Elgon region except for Tongareni. (Table 10).

**Table 10: Fertility levels in Bungoma district by divisions**

Division	K (a)	K(mean)
Tongareni	6.4	7.3
Webuye	6.2	7.0
Kimilili	6.3	7.1
Kapsokwony	6.7	7.2
Sirisia	6.4	7.0
Cheptais	6.8	7.2
Kanduyi	6.4	6.9

Source: Computed from Census data 1989

$$K_a = P_2/F_2 + P_3/F_3/2.$$

$$K_{mean} = P_1/F_1 + P_2/F_2 + P_3/F_3 + \dots + P_7/F_{7/7}.$$

The division with urban centres such as Webuye, Kanduyi and Kimilili recorded almost similar fertility rates as rural based Divisions. This implies that urbanization has little effect on fertility in Bungoma District. From the literature review, urbanization has an inverse effect on fertility. This has not been reflected in fertility levels in Bungoma.

#### 4.2.2 Fertility Levels In Busia District

According to 1989 census results (CBS, 1996) using the Gompertz Relational Model, Busia District had a total fertility rate of 7.1 which is one child less than Bungoma but same as Kakamega. The figure arrived at using the Coale/Trussel P/F ratio for Busia was 6.75. The reason why there is a difference between Gompertz relational

model and Coale/Trussel is that while in this study the target group ranged between 15 - 49, CBS applying Gompertz model used ages 12 - 49, the age that was targeted during the census. This increased the number of children ever born and births in the previous 12 months.

The division with the highest TFR was Butula with a TFR of 7.1, followed by Nambale with a TFR of 7.0. Busia District is inhabited by two distinct ethnic groups, the Luhya and the Teso. The divisions inhabited by the Teso (Amukura and Amagoro) recorded lower fertility rates than those inhabited by the Luhya. Both Amagoro and Amukura had almost the same rates, the rates 6.7 and 6.2 respectively. This can be explained in terms of shared beliefs and norms.

The total fertility rate in the Luhya dominated divisions was lowest in Funyula (6.3) while highest in Butula (7.1). The reason for the differences between the Luhya and the Teso in levels of fertility is due to the distinct socio-cultural practices that control the reproductive behaviour of individual communities. For example, most members of the Luhya community advocate for polygynous type of marriage and wife inheritance. It has been argued that polygamy bring about competition between co-wives who take it that by marrying more women the husband wants more children hence one gets as many children as possible (Busia District social cultural profile 1986).

The other reason why there is a difference between the two communities in Busia could be due to environmental factors. The majority of the Luhya community occupy the lower part of the District, bordering the lake. This is a malaria prone area hence high infant mortality rate. The area also suffers from high incidence of malnutrition (district development plan 1994-96). Malnutrition in this region can be attributed to low standards of living and apart from that to strong traditional beliefs some of which are against a

better diet. For example, in Samia, some fruits and vegetables are withheld from children who are malnourished because it is believed that such foods will make the child weaker ( Busia District Socio-cultural profile). Therefore, with high infant mortality, there is a tendency of having many children so as in cases of some dying there is a probability of some surviving to old age. In this respect high fertility acts as a safety net Table 11.

**Table 11: Fertility Levels by administrative Divisions in Busia District**

Division	K(a)	K(meam)
Amukura	6.3	6.7
Butula	6.9	7.1
Nambale	6.6	6.9
Funyula	6.2	6.3
Budalangi	6.3	6.4
Amagoro	6.3	6.1

Source: Computed from Census data 1989.

#### 4.2.3 Fertility Levels in Kakamega District

Kakamega district was the largest in area in the Province at the time the 1989 census was carried out with a total of 13 divisions. Since the 1989 census, the district has undergone boundary alterations. Two more districts, Vihiga and Lugari/Malava have been carved out of the old district.

According to the 1989 census results (CBS 1996) based on Gompertz relational model, the district had a total fertility rate of 7.1, same as that of Busia but less than Bungoma by one child using the Coale and Trussel P/F ratio, the district had a total fertility rate of 6.7. According to the findings of the fertility levels by divisions in the

Province in general, Kakamega Divisions exhibit the lowest rates . Using the Coale and Trussel P/F ratio, the district had a total fertility rate of 6.7. Fertility levels in the district do not depict the uniformity as witnessed in Busia district and partly in Bungoma. While in Busia the fertility levels were between 6 and 7.1, Kakamega rates range between 5.6 to 7.2. Another point to note is that, unlike Bungoma district where the effect of urbanization is insignificant, the effect is depicted in Kakamega district in that the Municipality division has the lowest TFR in the whole Province. The reason being that the municipality division is only composed of Kakamega town and it's immediate surrounding, while the urban divisions in Bungoma comprise more rural regions than urban. The municipality division therefore benefit from urban facilities such good medical facility, accessibility to family planning and maternal health care facilities.

The division in the district with the highest fertility rate was Lurambi (7.2) and the lowest being Municipality (5.6). Another interesting point is that part of the former District which is now Vihiga District inhabited by the Maragoli and Banyore sub-ethnic groups exhibited lower fertility rates than other parts of the district. This can be attributed to pressure on land and the awareness of the effects of population pressure. The divisions in the new district (Vihiga) registered TFR ranging between 6.0 - 6.6 in Emuhaya the remaining division Hamisi and Vihiga having TFR of 6.5 and 6.5 respectively.

Butere, Mumias, Khwisero and Lurambi which lie on the Western part of the District recorded the highest TFR rates, Lurambi had the highest TFR of 7.1 in this region.

Shinyalu and Ikolomani recorded rates of 6.7 and 6.6 respectively.

Malava/Kabras recorded fertility rate of 6.7. Lugari Division which lies in the settlement area exhibited rates similar to those of rural Kakamega. This finding is in line with Osiemo (1986) findings that migrants do not discard their old reproductive behaviour in their new settlements.

**Table 12: Fertility Levels by Divisions in Kakamega District**

<b>Division</b>	<b>Ka</b>	<b>Kmean</b>
Mumias	6.7	7.0
Khwisero	5.9	6.6
Sabatia	5.2	6.1
Ikolomani	6.0	6.6
Lurambi	6.6	7.2
Shinyalu	5.9	6.7
Vihiga	5.7	6.5
Emuhaya	5.8	6.6
Hamisi	5.7	6.5
Butere	6.5	6.9
Lugari	5.9	6.9
Malaba/Kabras	6.2	6.7

Source: Computed from Census data 1989.

#### **4.3 Fertility Differential by Levels of Education in Western Province**

Education plays a vital role in any society for example as an agent of social change in the society . Demographers have found out that education has an inverse effect



on fertility. According to studies carried out on education, for example, Cochrane (1979), Holsinger and Kasarda (1976) and Henin (1979), an increase in education level especially mothers education has an inverse effect on fertility.

It has been noted that early primary education positively affects fertility. Total fertility is higher in this category than that of no education. The argument put forward is that women with primary education are conscious of the importance of hygiene and nutritional care and hence susceptible to contraception than those with no education at all. According to demographic health surveys findings in Nigeria and Cameroon reveal that women with no education registered high fertility than those with primary level of education. More years in school affects the number of children per woman in that, higher education opens other avenues making marriage and procreation as not the only occupation for women but part of the many activities. Anker and Knowles (1980) found that fertility in rural Kenya was negatively related to education after five years of schooling. In the same line of argument Osiemo (1986) found that secondary education for girls in Kenya is a prerequisite for a fertility decline. That is, it reduces early marriage, early pregnancy and family life preoccupation.

According to findings of this study, the fertility rate for women with primary level of education is higher than secondary level in the whole Province. Women with secondary education recorded TFR of 5.6 while primary level had TFR of about 7.0. The only difference between earlier findings is that, in this study TFR of those with no education was found to be higher than for those with early primary education (1-4 years of schooling).

Fertility differential by education in Bungoma district reveals similar findings with that of the province as a whole. Women with no education have higher TFR than those with basic schooling (1-4 years of schooling). As indicated earlier, this therefore diverts away from what is generally perceived that women with basic education have a higher TFR than those with no education. Women with no schooling have a TFR of 8 while those with basic education recorded TFR of 7.6. There is a big difference between women with secondary level of education and those with primary and no education. The TFR for women with secondary level in the district is 5.6. We can then conclude that schooling does not have an effect on fertility until the secondary level.

The reason why women with no education registered the highest total fertility rate both at provincial and district level could be that they do not understand the negative effect of a high population on the available resources. Secondly, this group of people is normally very religious and therefore, having more child births is a sign of God's blessing. Lastly, many children a woman has is a way of pleasing the husband and the entire clan, hence, it is a source of retaining the husbands love.

On the other hand women with secondary education registered the lowest rates, this is because, more years at school makes one aware of other important things other than child bearing and also they are aware of the negative effect of population. Secondary school education also delays marriage as one spends more years at school and after school trying to find a job before getting married. This whole process will take her up to mid 20's before getting married. From the findings one can conclude that education can either positively or negatively affect fertility depending on the level of education.

The case of Bungoma applies to also Kakamega and Busia Districts where TFR for women with no schooling is higher than that of women with basic schooling. Women with no formal education registered a total fertility rate of 7.7 in Kakamega and 7.8 in Busia while those with basic education registered 7.2 in both Kakamega and Busia. As the number of years of schooling increases fertility decreases. Women with completed primary level of education have lower fertility than those with incomplete primary education and also those with no schooling, but higher than those women with secondary education and above. (Table 13)

**Table 13: Total Fertility Rate by Level of Education**

<b>Education level</b>	<b>K(a)</b>	<b>K(mean)</b>
<b>Western Province</b>		
None	7.3	7.6
Primary		
STD 1-4	6.5	6.8
STD 5-8	6.8	7.1
Secondary	4.8	5.6
<b>Bungoma</b>		
None	8.0	8.2
Primary		
STD 1-4	7.6	7.4
STD 5-8	7.2	7.4
Secondary		
Form 1-4	5.5	6.1
Form 5+	2.2	3.4
<b>Kakamega</b>		
None	7.8	8.2
Primary		
STD 1-4	7.2	7.4
STD 5-8	6.6	7.4
Secondary	5.0	5.6
<b>Busia</b>		
None	7.5	7.6
Primary		
STD 1-4	7.2	6.4
STD 5-8	6.7	6.9
Secondary	5.4	5.5

Source: Computed from Census data 1989

#### 4.3.2 Fertility Differentials By Marital Status In Western Province

The majority of women between the age of 15-49 were married. This implies that the institution of marriage is very much valued in the province. As mentioned earlier, the married category accounts for 66% of the total female population aged 15-49 in the province. The single category ranks second followed by the separated/divorced and lastly the widowed. Total fertility rate for women who were married by the time of the census was 7.7 while, those who were single had a TFR of 3.4. Women in married category had the highest fertility rate followed closely with the widowed. The reason for the above is that there is a high level of coital frequency in marriage life than in single status.

The high fertility rate among the widowed women can be attributed to high level of wife inheritance, a practice that is rampant in the province especially in Bungoma and Busia districts. A widow is taken over by a relative of the deceased to take care of the deceased family, have children on behalf of the deceased. In most cases, the widow is not only visited by one relative but many and so she ends up having more children than she desires. The TFR for the widowed was 6.2 (Ka) 7.3 (Kmean), separated/divorced had a TFR of 5.9 (Table 14).

In Bungoma district, the majority of women in the age group 15 - 49 were married. They accounted for 66.4 percent while the single women accounted for 29.7 percent. This shows that the institution of marriage in the District is highly respected. Magritta and Juma (1989) found that in Bungoma District, majority of women get married and stay in marriage all their remaining life time. The married women in Bungoma have a TFR of 8 which is the highest. The single women have the lowest the reasons being

that majority in this category are still in school ,also since they are not married there no obligation to have children as in the married life. The total fertility rate for the single was 3.2 (Kmean) while the TFR for the widowed is 6.17 and separated and Divorced was 5.8.

The total fertility rate for the married women was very high in both Busia and Kakamega District with a TFR of 7.6 in kakamega and 7.8 in Busia. The category with the lowest TFR was the single status Table 14.

**Table 14: Total Fertility rate by Marital Status in the Province**

	<b>K(a)</b>	<b>K(mean)</b>
<b>Western Province</b>		
Single	2.7	3.4
Married	6.4	7.7
Widowed	6.2	7.3
Divorce/Separated	5.0	5.9
<b>Bungoma</b>		
Single	2.8	3.2
Married	6.7	8.0
Widowed	6.0	6.2
Divorce/Separated	4.0	5.8
<b>Kakamega District</b>		
Single	2.8	3.4
Married	6.3	7.6
Widowed	6.1	7.2
Divorce/Separated	4.8	5.3
<b>Busia District</b>		
Single	2.8	3.3
Married	6.8	7.8
Widowed	6.7	7.5
Divorce/Separated	5.2	6.0

Source: Computed from Census data 1989.

#### 4.3.3 Fertility Differentials by Marital Union

This variable is classified into only two categories, polygynous and monogamous types of marriage. The majority of the women during the 1989 census were in monogamous unions (83.2 %) while the rest were in polygynous unions. In this study,

we found that women in a monogamous marriage have slightly higher TFR than those in polygamous marriages. The TFR for women in monogamous marriage was 7.83 while for those in polygynous marriage was 7.30.

The difference is so minimal and yet percentage wise, monogamous union takes more than three quarters of all married women aged 15 - 49. This then clearly shows that polygyny contributes a lot towards high fertility in the Province.

From previous findings, for example, Mukras and Muinde (1979) found that in a polygamous home women tend to compete to get more children so as to gain favours from their husbands, more so, a woman with many children not only got favours from the husband but also from the entire family. On the other hand, Ocholla-Ayayo (1991) points out that women in monogamous unions have higher fertility rate due to the sleeping arrangements. In a polygamous marriage, a husband has a diverse area to go to while one in a monogamous union has no other options but one. Hence, the degree of intercourse per woman in a monogamous union is higher than that in a polygamous union. Another reason is that taboos which guided a couple such as post partum abstinence are not seriously followed in a monogamous union and this increases the rate of conception.

On the District level for example in Busia, the trend is quite similar to that of the Province. Women in polygynous unions have a lower TFR than those in a monogamous union the TFR being 6.4 and 6.7 respectively.

The TFR for women in a monogamous marriage in Kakamega District was a little bit higher than those in polygynous marriage with rates of 6.4 and 6.2 respectively. However rates of Bungoma show that there is a big difference between monogamous marriage and polygynous one. Women in monogamous marriage registered a TFR of 8.2



while polygamous marriage having a TFR of 6.2. Apart from the rates in Bungoma ,the above findings show that the rates are almost the same although women in monogamous marriage are more in numbers. This is clearly depicted in Kakamega district where women in monogamous marriage outnumber those in polygamous marriage by a big margin, but the difference in the TFR for both categories is not quite big. This is a clear indication that polygamy contributes a lot in fertility levels in the Province.

**Table 15: Total Fertility rate of Women Aged 15 - 49 by Type of Marriage in Western Province**

<b>Marital Union</b>	<b>K(a)</b>	<b>K(mean)</b>
<b>Western Province</b>		
Monogamous	6.5	7.8
Polygamous	6.3	7.3
<b>Kakamega District</b>		
Monogamous	6.4	7.8
Polygamous	6.2	7.1
<b>Bungoma District</b>		
Monogamous	6.7	8.2
Polygamous	6.8	6.2
<b>Busia District</b>		
Monogamous	6.7	8.0
Polygamous	6.4	7.9

Source: Computed from Census data 1989.

#### 4.3.4 Fertility Differentials By Ethnicity

Ethnicity plays quite an important role in fertility levels in Kenya. Kenya is made up of different ethnic communities and it has been found out that differential in fertility levels in Kenya has a lot to do with the ethnic factor. As mentioned above in the

Literature Review (chapter 2), ethnicity factor is an important start off in fertility studies in Kenya. Anker and Knowles (1980) argued that fertility analysis in Kenya would be incomplete if ethnicity as a factor was not taken into consideration.

This analogy is in tune with the anthropological debate that every ecological niche produces its own cultural structures. These cultural systems control individuals' behaviour both biological and social. Ocholla-Ayayo observed that in every society there are established customs, beliefs and norms which are supposed to direct or regulate marriage and family institutions. He goes on to argue that society regulates and sanctions the cohabitation of couples and their consequent fertility performance and achievements. Therefore every ethnic group has its unique reproductive behaviour which are in tune with the cultural set-up.

Although Western Province is predominantly occupied by the Luhya community, the ethnic factor in relation to fertility is very visible. The major tribes in the Province and Luhya, Teso, Kalenjin and Luo. Although the Luhya occupy more than three quarters of the province, they have a TFR which is lower than that of the Teso and Kalenjin. While the Luhya community exhibited a TFR of 6.83 (Kmean), the Teso and the Kalenjin have a TFR of 7.13 and 7.27 respectively. This can be explained in terms of variation in traditional beliefs and practices between the communities and secondly, because of the low fertility rate in Kakamega which is predominantly Luhya community.

The Luo who make up almost 3 percent of the population had a TFR of 6.51 while the Kikuyu registered a TFR of 4.8. The other remaining ethnic groups combined realised a total fertility rate of 6.74. We can argue that the Kikuyu have a lower rate because they are mostly urban based and have a higher accessibility to medical facilities hence a higher contraceptive use.

Bungoma district which has the highest TFR in the country according to 1989 Census, the Luhya recorded a TFR of 7.1 which is slightly lower than that of the Kalenjin (Sabaot). The TFR for the Kalenjin was 7.5 while Teso who are placed third numerically in the district recorded a TFR of 6.7.

Unlike in Bungoma district, the Luhya registered higher TFR in Busia district (9.5). The Luo although numerically third placed in the district exhibited higher fertility rate higher than the Teso who are second in numbers in the district. The reason could be that the Luo who are migrants in Busia did not discard their traditions which support high fertility, bearing in mind that they migrated from a high fertility area. The TFR for the Luo and the Teso was 7.1 and 7.0 respectively. The Kalenjin recorded TFR of 7.0 while the Kikuyu 6.9. In Kakamega district the Luhya, the largest ethnic group, had a TFR of 7.1 followed by Luo (6.7) then Teso and Kalenjin who are very few in the district.

**Table 16 : Total Fertility Rates by Ethnicity in The Province**

<b>Ethnic group</b>	<b>K(a)</b>	<b>K(mean)</b>
<b>Western Province</b>		
Luhya	6.2	6.8
Luo	6.1	6.5
Teso	6.9	7.1
Kalenjin	7.1	7.3
Kikuyu	4.6	4.8
Others	6.0	6.2
<b>Kakamega District</b>		
Luhya	6.7	7.1
Luo	6.3	6.7
Teso	6.3	6.6
Kalenjin	6.0	6.5
Kikuyu	4.9	6.2
Others	5.9	6.2
<b>Bungoma District</b>		
Luhya	6.9	7.3
Luo	6.3	6.5
Teso	6.7	7.2
Kalenjin	7.4	7.5
Kikuyu	5.0	6.0
Others	5.8	6.0
<b>Busia District</b>		
Luhya	7.1	9.5
Luo	7.1	7.1
Teso	7.0	7.1
Kalenjin	6.8	7.0
Kikuyu	6.0	6.9
Others	6.6	7.0

Source: Computed from Census data 1989.

#### **4.3.5 Fertility Differentials by Economic Activity**

The data on occupation in the 1989 Census was mixed up, hence it was not analyzed. The only data that made sense was the economic activity. In this case, we have categorized the variable into three classes. Women aged 15-49 who were wage earners, those who were non wage earners and then those who were unemployed. Wage earners comprise of working women (employed). Non-wage earners comprise those engaged in personal enterprises (income generating activities), and the unemployed comprise of job seekers and people with no work (students are in this category).

According to 1989 census results on labour force, out of 14 million people aged 10 years and above, 9.3 million (66 percent) were economically active. In Western province, 12.1 percent were economically active and majority were in rural areas. According to these results, female population in Western province are more active than the male population 12.7 percent and 10.4 percent respectively. The majority of the female population in the Province who are economically active are without formal education. 40% of female aged 10 and above had no formal education and as indicated earlier in the findings this category had the highest TFR in the province.

**Table 17: Percentage Distribution of the Economically Active Population by Sex and Education in Western Province**

Education level	Male	Female	Total
None	22.9	40.0	31.7
STD 1-4	21.3	15.8	18.5
STD 5-8	34.9	30.8	32.8
Form 1-4	18.4	12.2	15.2
Form 5-6	1.6	0.4	1.0
University	0.5	0.1	0.3
Not stated	0.5	0.6	0.5
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: CBS 1989 Census.

The economically active population in most cases have better income and can afford sufficient food and medical facilities. According to this study's categories, the TFR for wage earners was the lowest. This category with a TFR of 6.3 comprise of mostly educated women who reside in urban centres and with the knowledge of fertility control. The TFR for non wage earners was found to be the highest. The majority in this category worked in family holdings mostly farmers based in rural areas and few businessmen in urban centres hence the residence factor affects them, the TFR for this category is 7.4. The unemployed who account for 5.32% had the TFR of 6.3 their total fertility rate is the same as that for wage earners

On the district level, wage earners still exhibited the lowest total fertility rate which was 6.6 in Bungoma, 6.1 in Busia and 5.0 in Kakamega. The non wage earners exhibited the highest total fertility rate, Bungoma District having 7.1, Busia 7.2 and Kakamega with 6.8. The unemployed registered more or same TFR with the wage earners.

The low TFR among wage earners clearly shows that women who are employed have other pre-occupation apart from childbearing and caring. It's been found out that a small family size gives one an opportunity to indulge in other economically viable activities that would increase their living standards. Housewives have the tendency of pleasing their spouses and one way is through having the number of children their husbands desire. The unemployed women mostly youths either at school or dropped out of school are idle most of the idle time and this gives room for them to indulge in behaviour that get them into motherhood when still young. This is the reason why there TFR was more or same as that of wage earners (Table 18).

**Table 18: Total Fertility Rate by Economic Activity in Western Province.**

<b>Economic Activity</b>	<b>K(a)</b>	<b>K(mean)</b>
<b>Western Province</b>		
Wage earners	5.2	6.3
Non wage earners	7.0	7.4
Unemployed	5.6	6.3
<b>Bungoma District</b>		
Wage earners	5.7	6.6
Non wage earners	7.2	7.7
Unemployed	6.1	6.6
<b>Busia District</b>		
Wage earners	5.5	6.2
Non wage earners	7.2	7.3
Unemployed	6.1	6.3
<b>Kakamega District</b>		
Wage earners	5.0	5.0
Non wage earners	6.8	6.8
Unemployed	5.3	5.3

Source: Computed from Census data 1989.

#### 4.3.6 Fertility Differential By Residence

The majority of women in the Province reside in rural areas that is 94.29 percent of the total population of women aged 15 - 49. The total fertility rate in rural areas was higher than that of urban areas. The reason can be attributed to better accessibility to medical facilities and high contraceptive use in urban centres when compared to rural areas. In Kakamega district, the difference between rural and urban in terms of total fertility rate is quite wide. The TFR for urban residents was 5.89 while that for rural residents was 7.1. Although the difference in Busia was not as wide as that of Kakamega, still urban dwellers exhibited low fertility rates than their rural counterparts. The total fertility rate for urban residence in Busia was 6.6 while rural dwellers registered TFR of 7.1.

The same sequence applies in Bungoma District and like in Kakamega, the difference in TFR between rural and urban residence is quite big in Bungoma District. While the rural residence exhibited a TFR of 7.4, urban residents registered a TFR of 5.7 children per woman. Ocholla-Ayayo (1991) using the 1979 census results found that urban fertility is lower than rural fertility due to constraints imposed by urban life which places grater strains on parents in their efforts to provide food, health-care, housing and education for their children. Rural areas are endowed with plenty of food grown in their own farms and life is much relaxed. This gives rural residents the impetus to have more children. Also as mentioned earlier, more children are viewed in terms of enough labour force and protection. Anker and Knowles (1980) also found out that there is an inverse correlation between fertility and urbanization.(Table 19)



**Table 19 : Total Fertility Rate by Area of Residence by District**

<b>Residence</b>	<b>K(a)</b>	<b>K(mean)</b>
<b>Bungoma District</b>		
Rural	7.1	7.4
Urban	5.2	5.7
<b>Kakamega District</b>		
Rural	6.7	7.1
Urban	5.3	5.9
<b>Busia District</b>		
Rural	7.1	7.1
Urban	6.4	6.6

Source: Computed from Census data 1989.

#### **4.3.7 Fertility Differential By Source of Water**

The 1989 census question on the source of water was to find out where the population of a particular place get their drinking water. The water sources were stagnant surface, boreholes/wells, rivers/streams, piped or other sources. This variable influences mortality because many causes of death are water borne diseases. Western and Nyanza Province are prone to water borne diseases because the sources of water in the two Provinces are mostly untreated. Mortality is one of the determinants of fertility and hence the inclusion of this variable in the study. It's been found out that in areas where there is high mortality, fertility will also be high.

The majority of the people in the Province get their water from boreholes or wells, river/streams being the second major source of water. These two types of water source are untreated, and this could be the source of waterborne diseases. Only 13 percent of the population use piped water which is a very small percentage compared to the

population of the Province.

The TFR for those who use untreated water for example river/streams, Boreholes/wells and stagnant surface water is quite high compared to those who use piped water. This can be explained in terms of high infant mortality in these areas which prompt people to give birth to more children for survival purposes. The TFR for those using boreholes/wells was 7.3, which was the highest. The least TFR was piped water 6.4, while stagnant/surface water had a TFR of 7.0.

In Bungoma District the TFR for those using stagnant /surface water is higher than for those using other type of water source. The TFR for those using stagnant/surface water is 7.3, for those using boreholes/wells 7.2, those using stream/river is 7.0 and those using piped water is 5.9.

In Busia District, those whose source was stagnant/surface had the highest TFR of 7.6 followed by those whose source of water was boreholes/wells with a TFR of 7.2 and those who were using piped water had a TFR of 6.6. By and large, those whose source of water was untreated had a high total fertility rate.

**Table 20: Total Fertility Rate by Type of Water Source in the Province**

Province/District	K(a)	K(mean)
<b>Western Province</b>		
Stream/River	6.9	7.2
Piped	5.8	6.4
Stagnant/Surface	6.8	7.0
Borehole/Well	7.0	7.3
Others	6.1	6.6
<b>Bungoma District</b>		
Stream/River	7.3	7.2
Piped	7.2	7.5
Stagnant/Surface	7.0	7.3
Borehole/Well	5.9	6.7
Others	6.4	7.0
<b>Busia District</b>		
Stream/River	6.4	7.6
Piped	7.1	7.2
Stagnant/Surface	7.3	7.2
Borehole/Well	6.5	6.6
Others	7.2	7.1
<b>Kakamega</b>		
Stream/River	6.7	7.2
Piped	6.8	7.2
Stagnant/Surface	4.8	7.1
Borehole/Well	5.5	6.1
Others	5.1	6.0

Source: Computed from Census data 1989.

The TFR for Kakamega District according to differential by source of water shows the same sequence to that of Busia district. Like Busia ,stagnant water source had the highest TFR [7.2].Bungoma district had a slight difference where by borehole/well had the highest TFR. Generally, those using untreated water still had the highest TFR just like in the other Districts.

#### **4.4.0 Fertility Differential By administrative Divisions.**

The divisions in the province as shown earlier exhibited quite similar rates ranging between 6 and 7 children per woman. The effect of socio-economic, cultural, environmental and demographic factors on fertility revealed similar trend with minor differences in some parts of the Province. In this section the effects of the above factors (socio-economic, cultural e.t.c) on fertility are analyzed by divisional levels. Due to the limitation in the data, the study shall only examine the effect of type of marital union, marital status and education on fertility.

#### **4.4.1 Fertility Differentials by Type of Marital Union**

The difference in fertility levels by marital union in most of the divisions in the province takes a similar trend to that of district level where women in monogamous union exhibit higher rates than those in polygamous union. This similarity applies to most of the divisions in the province except Tongareni division in Bungoma district and Sabatia in Vihiga district where the TFR for women in polygamous union is higher than those in monogamous union. The TFR for women in polygamous union in Tongareni was 8.6 and 7.5 in Sabatia compared to those in monogamous union which was 8.3 and 6.7 respectively however this difference is not very pronounced. Tongareni division had the highest TFR for Women in polygamous union in the Province as well as for those in monogamous union. Kakamega Municipality has the lowest, 6.0 for women in polygamous union and 6.7 for those in monogamous unions.

The rates in Bungoma district ranged between 7.9 and 8.3 for women in monogamous and 6.85 and 8.6 for women in polygamous union. We note that there is a big difference between the lowest and the highest TFR ranges among polygamous unions

than monogamous unions in the district. This could be the reason why the district has continuously remained with the highest total fertility rate in the Country.

In Busia district, Butula division has the highest TFR for monogamous union (7.9) while Nambale had the highest TFR among women in polygamous union (7.4). Generally, TFR for women in monogamous union is higher than that of women in polygamous union.

divisions in Kakamega district (including the present Vihiga district) exhibit similar rates like Bungoma and Busia where the TFR for women in monogamous union was higher than those in polygamous union except in Sabatia division. The rates in the district range between 6.7 (Municipality) and 8.2 (Malaba/Kabras) for women in monogamous union and 6.0 (Municipality) and 7.9 (Shinyalu) for polygamous union.

The above finding is in line with the earlier assertion that women in monogamous union exhibit higher rates (TFR) than those in polygamous union. The reason given is that the sleeping arrangement in monogamous union encourages high coital frequency (Table 22 ).

Table 21 : Total Fertility Rates By marital union By Division

Divisions	Monogamous		Polygamous	
	K(a)	K(mean)	K(a)	K(mean)
Bungoma District	6.8	8.2	6.8	6.5
Tongareni	6.9	8.3	6.8	8.6
Webuye	6.7	8.3	6.7	7.7
Cheptais	7.0	8.3	6.8	7.6
Kanduyi	6.6	7.9	6.4	7.4
Kapsokwony	6.3	7.9	7.5	7.7
Kimilil	6.7	8.3	6.7	7.9
Sirisia	6.6	8.1	6.5	6.9
Busia District	7.7	8.0	6.4	6.9
Butula	7.0	7.9	5.2	6.2
Funyula	6.3	7.1	5.9	6.5
Nambale	6.8	7.8	6.6	7.4
Amukura	6.5	7.6	6.5	7.3
Amagoro	6.5	7.9	6.1	7.1
Budalangi	6.5	7.3	7.2	7.3
Kakamega District	6.4	7.8	6.2	7.1
Hamisi	6.1	7.6	6.3	6.6
Malaba/Kabras	6.5	8.3	6.0	7.0
Ikolomani	6.4	7.9	5.5	6.2
Sabatia	5.6	6.7	6.2	7.5
Khwisero	6.1	7.6	6.0	7.0
Mumias	6.8	7.9	6.3	7.2
Butere	6.7	7.8	5.3	7.0
Lurambi	6.6	8.0	6.3	7.4
Emuhaya	6.0	7.5	5.5	6.6
Vihiga	6.2	7.7	5.5	6.6
Lugari	6.5	8.0	6.0	7.7
Shinyalu	6.7	8.2	6.8	7.9
Municipality	5.3	8.7	5.4	6.0

Source: Computed from Census data 1989.

#### 4.4.2 Fertility Differentials By Marital Status

This variable had a lot of limitation in that, in some divisions, the population especially for widowed is very low therefore the findings can be unconvincing. This reason why the analysis on widowhood was not carried out in some divisions.

As explained earlier in the chapter, the variable is divided into single,

divorced/separated, married and widowed. The majority of the women in the province were married (66 %) followed by single (30 %). Married women had the highest TFR in most of the divisions followed by widowed. The singles registered the lowest, as low as 2.0 (Kakamega Municipality).

The highest TFR (8.5) for married women was found in Tongareni division in Bungoma district. These findings show that divisions in Bungoma district registered higher rates ranging between 7.7 and 8.5. The reasons attributed to the high rates in the district are, traditional values bestowed on children, and that most marriages survive divorce (Magritta Jensen and Juma 1989).

In Busia district, Butula division registered the highest TFR of 8.14. Married women had the highest TFR followed by the widowed and then the single. The six divisions in the district although exhibited high marital fertility rates, the rates were lower than marital fertility in Bungoma district. Marital fertility in the Divisions was about 7 children per woman, widowed fertility ranged between 5 to 7 children, divorced/separated exhibited rates between 4.6 and 6.0 while singles had rates between 2 and 3.8.

In Kakamega district, fertility rates for the widowed were slightly higher than rates for marital fertility in most of the divisions. However, these findings should be researched further as data on widowhood was not sufficient enough to give appropriate conclusion. The highest TFR for widowed is 8.9 while the marital fertility is 8.2. The singles had TFR ranging from 2.0 (Municipality) and 3.2 (Vihiga). The total fertility rates for separated/divorced ranged between 4.0 (Khwisero) and 6.4 (both Mumias and Malaba/Kabras). Table 23.

**Table 22: Total Fertility Rates By Marital Status By Districts Division**

Division	Single k(a) K(me)	Married K(a) K(me)	Widowed K(a) K(me)	Separ/Divor K(a) K(me)
Bungoma				
Tongareni	2.5 3.0	6.8 8.5	5.2 7.2	4.9 6.2
Webuye	2.4 3.1	6.6 8.1	6.1 6.5	4.6 5.4
Kimilili	2.5 2.8	6.6 8.2	6.8 7.1	4.1 5.2
Kapsokwony	3.5 3.8	7.0 7.9	6.7 8.7	6.7 8.0
Sirisia	2.7 3.4	6.6 7.9	6.2 8.9	5.4 6.1
Cheptais	2.4 3.0	6.9 8.1		4.0 5.8
Kanduyi	2.3 2.9	6.5 7.7	6.1 6.	4.1 5.6
<b>BUSIA</b>				
Butula	3.4 4.4	7.0 8.1		5.9 6.0
Amukura	2.1 2.8	6.5 7.5	4.9 5.6	5.6 6.5
Nambale	3.1 3.6	6.7 7.7	7.2 7.1	5.4 6.2
Funyula	3.7 3.7	6.2 6.9	4.5 5.8	5.7 5.6
Budalangi	3.8 3.9	6.5 7.2	5.2 7.5	5.7 6.1
Amagoro	2.5 3.3	6.3 7.6	6.9 9.3	4.7 5.9
<b>KAKAMEGA</b>				
Butere	2.7 3.1	6.5 7.7	6.9 7.7	4.8 4.3
Mumias	3.1 3.7	6.7 7.7	8.4 8.3	5.1 6.4
Khwisero	2.8 3.4	6.2 7.5	4.9 6.3	4.0 5.1
Sabatia	2.6 3.2	5.6 7.1	4.8 7.4	5.3 6.6
Ikolomani	2.8 3.3	6.3 7.7		4.7 5.8
Hamisi	3.0 3.8	6.1 7.5	6.6 7.8	5.6 6.1
Vihiga	3.2 3.4	6.3 7.7	9.4 7.2	4.9 5.1
Malaba/ Kabras	2.2 2.8	6.4 7.9	6.6 8.5	4.8 6.4
Lugari	2.9 3.9	6.3 7.9	5.9 8.9	5.5 6.2
Lurambi	2.5 3.6	6.5 7.9	5.2 7.1	4.5 4.8
Emuhaya	2.1 2.7	6.9 7.5	5.6 6.9	4.9 6.3
Shinyalu	2.6 3.6	6.6 8.2	6.2 7.7	4.2 5.8
Municipality	1.9 2.0	5.3 6.6	4.3 5.2	6.0 6.3

Source: Computed from Census data 1989.



#### 4.4.3 Fertility Differential by Education Level

Diverting from the long held notion that women with basic schooling exhibit high fertility rates than those with no schooling, the TFR of women with no schooling was higher than that of women with basic education. This appeared in all the divisions. The long held notion is that women with basic education are aware of the basic hygiene and nutritional conditions therefore susceptible to conception. An increment in the level of education has an inverse effect in fertility.

This study's findings reveal that women with no education in the province had TFR ranging from 6.5 to 8.4 while those with 1 - 4 years of schooling exhibited rates between 5.5 and 7.7. Cheptais division in Bungoma had the highest TFR for women with no education while Tongareni has the highest rate for women with 1 - 4 years of schooling.

As the level of education increases, the TFR reduces. Women with 5 - 8 years of schooling had lower rates than the first two categories with the highest rate in both Tongareni and Mumias. Women with higher level of education exhibited lower rates than the rest of the categories. The argument put forward is that they spend more years in school hence marry at later age and more so, education enable them to be aware of the consequences of large families. Those with no education exhibited rates in the tune of 7 children and above, the TFR for women with secondary and above level of education was between 4 and 6.

In Bungoma district, the TFR for women with no schooling was highest in Cheptais division followed closely by Tongareni. The lowest was in Kanduyi division

(7.7). The rates in the administrative divisions in the district were almost the same, approximately 8 children per woman. There was a slight difference between rates for women with no schooling and women with primary education. The TFR for women with 1 to 4 years schooling was lowest in Kanduyi division (6.4) and highest in Tongareni. According to this findings therefore, primary education has little or no effect on fertility at all in the district.

The effect of education was felt at secondary level of education where rates reduce as far as 5.2 (Kapsokwony). Cheptais Division, although the TFR for women with secondary level of education was lower than no schooling the difference was not as big as the difference in other divisions. The rates were 7.0 for secondary level while 8.4 for no educational level. The rest of the divisions exhibited rates between 5 and 6 for secondary level of education.

Butula division had the highest TFR 7.9 for women with no education in Busia district. In this district, there is a clear indication that with an increase in education level, fertility reduces. For example in Butula, TFR for women with no schooling is 7.9, those with 1-4 primary schooling was 6.8, 5 - 8 years of schooling the TFR was 6.9 and then the TFR dropped further to 5.5 for women with secondary level of education. Unlike Bungoma district where there was a slight difference between the TFR of women with primary level of education and those with no education, in Busia, the difference was clear between the levels of education vis-a-vis the total fertility rate. Total fertility rates for secondary education range between 4 in Amukura to 5.7 in Amagoro.

Total fertility rates in Kakamega revealed similar sequence to that of Busia where fertility levels reduce as the level of education increases. Among women with no

schooling, Lugari had the highest TFR of 8.0 and the lowest 6.5 was found in the Municipality division. TFR for primary level of education ranged between 5 and 7 children per woman while rates for secondary level of education ranged between 4 and 6 children per woman. In Mumias division, the TFR for women with no schooling and those with primary level of education was almost the same. Therefore we can conclude that education has a depressing effect on fertility only at secondary level of education, basic education has no effect on fertility. Another point to note according to these findings was that primary level categories (1 - 4 years and 5 - 8 years ) exhibited similar rates. The difference occurs when the number of years in schooling increases.

**Table 23: Total Fertility Rates by Education Levels by District's Divisions**

Division	None k(a) K(me)	Primary 1-4 K(a) K(me)	Primary 5-8 K(a) K(me)	Secondary K(a) K(me)
Bungoma	8.0 8.2	7.6 7.4	7.2 7.4	5.2 6.1
Tongareni	8.0 8.4	7.4 7.7	6.9 7.4	5.1 6.2
Webuye	7.1 7.8	7.1 7.3	6.8 7.2	5.9 5.9
Kimilili	6.9 7.8	6.7 7.1	6.9 7.4	5.0 5.8
Kapsokwony	7.7 7.9	7.1 7.5	6.7 7.3	4.5 5.2
Sirisia	7.4 7.8	7.4 7.5	6.7 6.9	5.3 6.2
Cheptais	7.9 8.4	6.4 6.6	6.9 7.3	5.7 7.0
Kanduyi	7.4 7.7	6.4 6.4	6.6 7.0	5.0 5.7
BUSIA	7.5 7.6	7.2 6.4	6.7 6.9	5.4 5.5
Butula	7.7 7.9	7.3 6.8	6.4 6.9	5.0 5.5
Amukura	7.0 7.3	6.1 6.1	5.8 6.3	4.6 4.2
Nambale	7.2 7.5	6.5 7.0	6.3 6.8	5.0 5.5
Funyula	6.6 6.6	5.5 6.1	6.2 6.5	5.1 5.5
Budalangi	6.8 7.0	6.7 6.1	6.1 6.0	4.7 4.6
Amagoro	7.3 7.7	6.0 6.5	6.1 6.5	5.7 5.7
KAKAMEGA	7.8 8.0	7.2 7.2	6.6 6.9	5.0 5.6
Butere	7.5 7.6	6.3 6.7	6.5 6.7	5.4 5.7
Mumias	7.5 7.7	7.4 7.0	6.4 7.4	4.9 5.6
Khwisero	7.0 7.6	6.0 6.6	6.0 6.5	4.3 5.2
Sabatia	7.0 7.1	6.3 6.6	5.5 6.2	4.5 5.5
Ikolomani	7.2 7.4	6.6 6.9	5.8 6.4	5.6 4.5
Hamisi	7.2 7.5	5.7 6.5	5.7 6.5	4.4 5.3
Vihiga	7.1 7.6	6.6 6.9	6.4 6.7	4.6 5.6
Malaba/ Kabras	7.1 7.6	6.3 6.8	6.3 7.1	5.0 5.8
Lugari	7.4 8.0	6.2 6.9	6.2 6.8	4.3 5.4
Lurambi	7.5 7.9	6.8 7.0	6.4 7.0	5.0 5.9
Emuhaya	6.8 7.5	6.6 7.0	5.8 6.5	4.7 5.6
Shinyalu	7.0 7.6	5.7 6.5	6.0 6.7	4.3 5.3
Municipality	6.0 6.5	5.5 5.5	5.4 6.0	3.4 4.1

Source: Computed from Census data 1989.

## CHAPTER 5

### SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.0. Introduction

This chapter gives the summary, conclusion and recommendation of the study. Due to the nature of the data (Aggregated) only the demographic technique (Coale and Trussel P/F ratio) was applied to estimate the levels and differential by socio-economic, demographic, cultural and environmental factors. The environmental factor acted as a silent variable on which other factors operate to influence fertility.

The study based on 1989 census result. There were errors in the data on children ever born and births in last twelve months within the bracket of 15-19 years. Within this age group it appears that women during the census gave conflicting answers on the number of children they have ever had and births in the last twelve months. The results show that, births in the last twelve months were more than children ever born, which should not be the case. Children ever born which is actually a birth history for a period of time should be more than current fertility [births in the last twelve months]. This misreporting appeared nearly everywhere in western province data in the age group 15-19.

#### 5.1. Summary of the findings

One of the objectives of the study was to estimate fertility levels in western province both on district and divisional level. On district level, when compared to the 1979 census result there is a significant decline as TFR for the three districts has declined from 9 to 7 in Bungoma, 7.7 to 6.8 Busia and 8.8 to 6.7 in Kakamega.

According to the results on the levels in the province by divisions, Bungoma divisions exhibited rates that were higher than Busia and Kakamega, hence putting general levels of fertility in the district higher than the sister districts. This could be due strong attachment to children, poor implementation family planning programme, negative attitude towards the family planning programme and perhaps the strong attachment to traditional practices such as polygamy. Total fertility rates in Bungoma ranged between 7-8 while in Busia and Kakamega rates were 7 and below.

The difference in fertility levels by divisions between the districts is not much pronounced. The range between the lowest and the highest between the divisions is so minimal. This then brings us to conclude that fertility levels and pattern in the province is taking a uniform trend.

The second objective was to examine the effect of socio-economic factors on fertility, using the 1989 census data. As mentioned earlier in the third chapter, the method used to arrive at the fertility rates was the Coale/Trussel P/F ratio. Under socio-economic factors the following hypotheses were examined.

- (1) 1-4 years primary education level is likely to affect the total number of children.
- (2) Urban residence is likely to have an effect on the total number of children
- (3) Employment is likely to have an influence on the number of children per woman.
- (4) Untreated type of water source is likely to affect the total number of children.

The findings on education show that , women with no schooling had the highest TFR on provincial, district and divisional level. The total fertility rate for women with no education was 7.6 for the province, Kakamega district 8, Bungoma 8.2 and Busia 7.6. The difference between primary level and no education is quite significant although previous findings found that TFR for basic primary education was more than no schooling. As the level of education increases fertility is affected inversely. Secondary education level as evident from the study findings had low rates at different levels. For example, on provincial level, secondary level category registered only a TFR of 5.6 while primary 1-4 had a TFR of 6.8, primary 5-8 a TFR of 7.1 and none category a TFR of 7.6. Therefore education is either positively or negatively related to fertility depending on the level of education.

On economic activity wage earners and unemployed registered the lowest TFRs while non-wage earners registered the highest on provincial level. At district level, the above trend is repeated whereby unemployed category exhibited similar rates as the wage earners. Non-wage earners registered the highest rates.

The total fertility rate by women who resided in rural areas during the time of the census was found to be much higher than for those residing in urban centres. In the three districts, rural residing women had a TFR of 7 and over while urban residing had a TFR of 6.6 in Busia, 5.9 in Kakamega and 5.8 in Bungoma. This clearly shows that urban residence is inversely related to fertility.

On differential by water source, the untreated water such as stream/river, stagnant/surface and borehole/well registered higher rates of 7 and above while treated (piped) water registered a lower TFR of only 6.4. This is also evident with findings on district level. The untreated water source in all the three districts registered rates of 7 and

above while treated was less than 7. The untreated water is associated with high morbidity rate hence high infant and child mortality rate. As mentioned infant and child mortality is related to fertility as the latter acts as safety net against the former.

The third objective was to examine the relationship between fertility and cultural factors. Under this category, we examined ethnicity and types of marriage. The hypotheses examined were:

- (1) Due to differences in belief systems and customs, each ethnic community in the province is likely to affect fertility differently.
- (2) Monogamous union is likely to have an effect on the number of children.

According to this study's findings women in monogamous unions exhibited higher rates than those in polygamous union. Monogamous union category exhibited rates of 7.8 in the province as a whole, while in the district it went up to 8.2 in Bungoma and 8 in Busia. In Busia and Bungoma there was a clear difference between the types of marriage in terms of TFR while in Kakamega there was a slight difference.

Anker and Knowles (1980) argued that ethnicity should be the first and foremost factor when one studies fertility in Kenya. In this study ethnicity factor as a predictor of fertility is clearly depicted. On provincial level, the Luhya who are the majority exhibited low rates than the Teso and the Kalenjin. The Kalenjin registered the highest TFR of 7.3 followed by Teso 7.1. The Kikuyu community registered the least. At district level, in Kakamega district the Luhya who are the majority registered the highest rate. The same applied to Bungoma and Busia. In Busia the TFR for the Luhya was as high as 9.5, followed



by the Teso, then the Luo. In all the three districts the Kikuyu exhibited lowest rates.

The fourth objective was determine the effect of demographic factors on the total number of children in the province. The only demographic factor that was analyzed in this study was the marital status. Under this category the following hypotheses were examined:

- (1) Single marital status is likely to have an effect on the number of children.
- (2) Married status is likely to have an effect on the total number of children.
- (3) Separation is likely to affect the total number of children.

Using the demographic methods mentioned earlier, this study found out that, the single women registered the least TFR while married category had the highest in nearly all levels provincial, district and divisional. In all levels again widowed women registered TFRs which were so close to married women. This could be because most women in the province after joining widowhood they are inherited by relatives of the deceased husband hence they do not stop childbearing and secondly at the time they become widows they already have a large family.

## **5.2. Conclusion**

The general observation from the study findings is that the levels of fertility in the province depicts similar trend, this is to say, there is slight difference between divisions in the province in terms of fertility rates. The fertility rates in the province range between 5.6 and 7.3 children per woman. The study found out that rates in Bungoma were higher than

the rates in Busia and Kakamega. While the lowest rate in Bungoma was 6.9 (Kanduyi division) and the highest was 7.3 (Tongareni), the lowest in Busia was 6.1 (Amagoro) and the highest 7.1 (Butula). Kakamega rates were highest in Lurambi (7.2) and lowest in the Municipality division. A party from Kakamega Municipality, all rates range between 6.0 and 7.3 children per woman. These rates although with slight difference between the divisions, reveal that some divisions will realise fertility decline faster than others.

The study's findings have revealed that education has an inverse effect on fertility. As the level education increases fertility declines. From the findings no schooling level registered high fertility than primary while secondary school level registered the lowest. This brings us to conclude that secondary level of education is inversely related to fertility while no education is positively related to fertility. Therefore increase in both primary and secondary enrolment would influence fertility decline.

On marital status, married category registered higher rates than other categories such as single, separated and therefore positively related to fertility. Since married category was the majority in numbers, there is a possibility that significant fertility decline in the province is yet to be felt.

The three major ethnic groups namely the Luhya, Kalenjin, and the Teso exhibited more or less the same fertility rates. This can be explained in terms of shared beliefs and norms that control reproductive behaviours. These shared traditions are as a result of acculturation. At provincial level the Teso and Kalenjin exhibited rates that were higher than that of the Luhya though less in numbers compared to the Luhya. This can be explained in terms of distinct characteristics that are unique to each individual community. This therefore brings us to the conclusion that, apart from the shared traditional systems, each community

has unique characteristics that make it different from the other. This unique characteristics have influence on the reproductive system of that particular community.

Employment is inversely related to fertility, this can be attributed to the fact that most employed women are educated and are aware of the effects of high fertility. Secondly, they are in a position to acquire and properly apply contraceptives. On the other hand, non employed who are mostly rural dwellers, are controlled by traditions that support high fertility. This study also found out that urban residence is inversely related to fertility. This is because women residing in urban centres benefit from social amenities associated with urban life style i.e., health care centres, family planning centres and also influenced by social groups. This influences their perception on the number of children.

The findings on differential by water source level clearly shows that untreated water source is positively related to fertility. Therefore, unless the province is supplied with treated water there is a clear indication that the infant mortality would increase and this could influence high fertility. High percentage of untreated water in province is one reason for high infant and child mortality.

### **5.3. RECOMMENDATIONS**

#### **For policy makers**

- 1) From the findings, education has an inverse effect on fertility, therefore increase in both primary and secondary enrolment is recommended. Expansion in schools, for example, in Mt. Elgon area where both primary and secondary school enrolment is low and

number of schools are inadequate, is advised.

- 2) Since rural areas are inadequately served with both social and physical infrastructure, for example, hospitals, schools and other educational facilities, good roads and family planning centres, which are related to fertility, this study recommends that the government tries to narrow down the gap between the rural and urban centres in terms of infrastructures and other socio-economic facilities.
  
- 3) The study also recommends that family planning awareness programmes be enhanced. In areas where these programmes are already operational, the government should expand them, and in areas where they do not exist, such programmes should be set up. The programme officers on their part should target both women and men to encourage them to plan their families. The officers should also target secondary school and college students. Targeting such groups will create a sustainable awareness.
  
- 4) The study also found out that the unemployed women were positively related to fertility as most of them could not afford contraceptives and most of the time they are unoccupied hence high propensity to indulge in sexual intercourse. The study therefore recommends that more employment opportunities to be created to absorb the unemployed youths. Apart from that, policy makers should create more vocational training centres to prepare most of the unemployed to venture in self employment.

### **For further research**

- 5) A similar research should be carried out using statistical methods to estimate the strength of each of the variables used in this study. This study did not use the statistical methods due to limitations in the data.
  
- 6) The study recommends further research to ascertain the relationship between environmental factors, mortality and fertility in the region. This is because, from the findings, there is a clear indication that fertility is positively related to the untreated source of water which is an environmental factor. This study found out that the TFR for those using stagnant/borehole water and stream/river water is higher than those using piped water.
  
- 7) A socio-cultural survey be carried out in the province to find out reasons that bring about differentials in the fertility between regions basing on ethnicity factor. In this study we found out that the Kalenjins and the Teso, though less in number compared to the Luhya, registered higher fertility than the Luhya.

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# APPENDIX

## FERTILITY LEVELS

Result Table: Fertility levels in Bungoma District by Division

Bungoma District

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2360	0.36940	1.84700	0.8792	0.2684	0.41889	0.24860	0.27325
1.6471	0.43446	4.01929	3.1550	0.5221	0.42563	0.25260	0.27765
3.5159	0.40912	6.06487	5.2881	0.6649	0.40691	0.24149	0.26544
5.1275	0.35629	7.84630	7.1496	0.7172	0.35284	0.20940	0.23017
6.9077	0.30704	9.38152	8.7955	0.7854	0.29933	0.17764	0.19526
8.0114	0.18019	10.28247	9.8264	0.8153	0.16568	0.09833	0.10807
8.4601	0.10073	10.78614	10.6688	0.7930	0.08795	0.05219	0.05737

TF Value is: 6.40

TFR 7.036

Result Table: Tongareni

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.1921	0.35810	1.79050	0.8507	0.2259	0.40622	0.23631	0.27179
1.5469	0.43553	3.96817	3.0936	0.5000	0.42925	0.24970	0.28719
3.5002	0.42348	6.08557	5.2761	0.6634	0.42181	0.24538	0.28222
5.2589	0.37194	7.94525	7.2199	0.7284	0.36791	0.21402	0.24615
7.3183	0.31532	9.52186	8.9229	0.8202	0.30684	0.17850	0.20529
8.7345	0.18117	10.42772	9.9718	0.8759	0.16656	0.09689	0.11144
9.4019	0.10021	10.92877	10.8120	0.8696	0.08717	0.05071	0.05832

TF Value is: 6.36

TFR 7.31

Result Table: Webuye

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2287	0.38923	1.94617	0.9299	0.2459	0.43911	0.23978	0.26896
1.5237	0.43970	4.14465	3.2763	0.4651	0.43060	0.23514	0.26375
3.4036	0.41610	6.22515	5.4277	0.6271	0.41588	0.22710	0.25473
5.0418	0.38424	8.14636	7.4017	0.6812	0.38047	0.20776	0.23304
6.7498	0.31804	9.73655	9.1173	0.7403	0.31099	0.16982	0.19048
7.7667	0.20287	10.75093	10.1930	0.7620	0.18415	0.10056	0.11279
8.6210	0.13136	11.40774	11.2547	0.7660	0.12034	0.06572	0.07371

TF Value is: 6.23

TF 6.98 -  
7.00

Result Table: Kimilili

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2481	0.35435	1.77176	0.8407	0.2952	0.40407	0.25145	0.28537
1.6594	0.42695	3.90652	3.0524	0.5437	0.41740	0.25975	0.29478
3.6024	0.39679	5.89045	5.1393	0.7010	0.39314	0.24465	0.27765
5.3234	0.33261	7.55349	6.9113	0.7702	0.32772	0.20394	0.23145
6.2577	0.27204	8.91370	8.3999	0.8640	0.26403	0.16431	0.18647
8.1686	0.15297	9.67853	9.3171	0.8767	0.14151	0.08806	0.09994
8.8978	0.07512	10.05414	10.9665	0.8928	0.06296	0.03918	0.04446

TF Value is: 6.26

TFR 7.1

Result Table: Kapsokwany

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2569	0.36954	1.84770	0.8809	0.2916	0.41758	0.25139	0.27206
1.6623	0.43112	3.00329	3.1303	0.5310	0.42556	0.25619	0.27727
3.6117	0.43517	5.17915	5.3669	0.6730	0.43140	0.25971	0.28106
5.2261	0.34847	7.92150	7.2134	0.7245	0.34742	0.20915	0.22635
6.9962	0.35063	9.67466	9.0179	0.7758	0.34236	0.20610	0.22305
8.9936	0.18841	10.61669	10.1521	0.7874	0.17252	0.10386	0.11240
8.5511	0.10038	11.11859	11.0017	0.7773	0.08688	0.05230	0.05660

TF Value is: 6.69

TFR 7.2

Fertility levels in Busia District by Divisions

Result Table: Busia District

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.3217	0.35427	1.77136	0.8434	0.3814	0.40237	0.26118	0.27325
1.8064	0.41037	3.82321	3.0111	0.5999	0.39999	0.25964	0.27163
3.4831	0.37557	5.70105	4.9878	0.6983	0.37323	0.24227	0.25346
4.8985	0.32822	7.34216	6.7134	0.7297	0.32338	0.20991	0.21967
6.3659	0.25968	8.64056	8.1384	0.7822	0.25322	0.16437	0.17196
7.1875	0.16157	9.44838	9.0190	0.7969	0.14862	0.09647	0.10093
7.5204	0.09857	9.94123	9.8263	0.7653	0.08743	0.05675	0.05937

TF Value is: 6.4

TFR 6.75

Result Table: Amukura

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.3258	0.36531	1.82655	0.8724	0.3734	0.41282	0.24880	0.26548
1.6828	0.41067	3.87991	3.0662	0.5488	0.40138	0.24190	0.25813
3.3371	0.38717	5.81575	4.0829	0.6565	0.38534	0.23224	0.24782
4.8240	0.33832	7.50735	6.8541	0.7038	0.33418	0.20141	0.21491
6.3042	0.27765	8.89561	8.3528	0.7547	0.27175	0.16378	0.17477
6.9483	0.18032	9.79719	9.2830	0.7485	0.16310	0.09830	0.10489
7.3566	0.12413	10.41782	10.2731	0.7161	0.11498	0.06930	0.07394

TF Value is: 6.28

TFR 6.7

Result Table: Butula

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.3644	0.35261	1.76304	0.8354	0.4362	0.40296	0.27866	0.28631
2.0067	0.43054	3.91574	3.0700	0.6537	0.41864	0.28950	0.29745
3.7000	0.37548	5.79314	4.0727	0.7294	0.37328	0.25813	0.26522
5.0615	0.34016	7.49395	6.8479	0.7391	0.33462	0.23140	0.23775
6.5385	0.25747	8.78131	8.2990	0.7879	0.24863	0.17194	0.17665
7.6783	0.13981	9.48033	9.0860	0.8451	0.12874	0.08903	0.09147
7.6989	0.09442	9.95244	9.8420	0.7822	0.08360	0.05781	0.05940

TF Value is: 7.07

TFR 7.1

Result Table: Funyula

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.3129	0.33936	1.69681	0.8046	0.3889	0.38771	0.25374	0.25814
1.7655	0.40967	3.74515	2.9265	0.6033	0.39962	0.26153	0.26648
3.4693	0.37538	5.62205	4.9166	0.7056	0.37090	0.24274	0.24733
4.6833	0.30506	7.14733	6.5650	0.7134	0.29944	0.19597	0.19968
5.9473	0.23887	8.34169	7.8819	0.7546	0.23264	0.15225	0.15513
6.6377	0.14605	9.07194	9.7143	0.7617	0.13550	0.08868	0.09036
6.9335	0.07678	9.45583	9.3663	0.7403	0.06535	0.04277	0.04358

TF Value is: 6.19

TFR 6.30

Fertility levels in Kakamega District by Divisions

Result Table: Kakamega

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2189	0.33107	1.77136	0.8434	0.3814	0.40237	0.26118	0.27325
1.5758	0.40037	3.82321	3.0111	0.5999	0.39999	0.25964	0.27163
3.3831	0.37557	5.70105	4.9878	0.6983	0.37323	0.24227	0.25346
4.9799	0.32822	7.34216	6.7134	0.7297	0.32338	0.20991	0.21967
6.6703	0.25968	8.64056	8.1384	0.7822	0.25322	0.16437	0.17196
7.7422	0.16157	9.44838	9.0190	0.7969	0.14862	0.09647	0.10093
8.2052	0.09857	9.94123	9.8263	0.7653	0.08743	0.05675	0.05937

TF Value is: 6.4

TFR 6.75

Result Table: Municipality

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.3217	0.35427	1.77136	0.8434	0.3814	0.40237	0.26118	0.27325
1.8064	0.41037	3.82321	3.0111	0.5999	0.39999	0.25964	0.27163
3.4831	0.37557	5.70105	4.9878	0.6983	0.37323	0.24227	0.25346
4.8985	0.32822	7.34216	6.7134	0.7297	0.32338	0.20991	0.21967
6.3659	0.25968	8.64056	8.1384	0.7822	0.25322	0.16437	0.17196
7.1875	0.16157	9.44838	9.0190	0.7969	0.14862	0.09647	0.10093
7.5204	0.09857	9.94123	9.8263	0.7653	0.08743	0.05675	0.05937

TF Value is: 4.79

TFR 5.6

Result Table: Mumias

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.3751	0.37755	1.88777	0.9001	0.4168	0.42879	0.28159	0.29432
1.9571	0.42534	4.01449	3.1723	0.6169	0.41317	0.27134	0.28359
3.6383	0.38748	5.95188	5.2237	0.6965	0.38388	0.25210	0.26349
5.0503	0.32483	7.57605	6.9476	0.7269	0.32060	0.21054	0.22006
6.5086	0.26988	8.92543	8.4102	0.7739	0.26281	0.17259	0.18039
7.4750	0.15906	9.72074	9.3042	0.8034	0.14666	0.09631	0.10067
7.7667	0.09452	10.19333	10.0831	0.7703	0.08274	0.05434	0.05679

TF Value is: 6.69

TFR 7.0

Result Table: Khwisero

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2352	0.30172	1.50859	0.7103	0.3310	0.34750	0.23915	0.26681
1.6473	0.39360	3.47658	2.6921	0.6119	0.38408	0.26433	0.29475
3.4785	0.34793	5.21621	4.5499	0.7645	0.34436	0.23699	0.26427
5.0275	0.29911	6.71178	6.1631	0.8157	0.29042	0.19987	0.22288
6.8565	0.19114	7.66746	7.2937	0.9401	0.18573	0.12782	0.14253
7.7692	0.12542	8.29454	7.9921	0.9721	0.11710	0.08059	0.08987
7.9993	0.06404	8.61476	8.5400	0.9367	0.05377	0.03700	0.04126

TF Value is: 5.93

TFR 6.6

FERTILITY DIFFERENTIALS IN WESTERN PROVINCE

Result Table: Differential by Educational levels: no education level

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.5723	0.40328	2.01641	0.9655	0.5927	0.45604	0.31487	0.33090
2.2072	0.42809	4.15687	3.3127	0.6663	0.41443	0.28615	0.30070
3.8409	0.39114	6.11255	5.3746	0.7146	0.38852	0.26825	0.28190
5.2067	0.33805	7.80281	7.1486	0.7284	0.33407	0.23066	0.24240
6.8025	0.28081	9.20685	8.6693	0.7847	0.27362	0.18892	0.19853
7.7751	0.16733	10.04349	9.6111	0.8090	0.15431	0.10654	0.11197
8.1602	0.09711	10.52902	10.4158	0.7834	0.08481	0.05856	0.06154

TF Value is: 7.27

TFR 7.6

Result Table: Primary(1-4)

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2159	0.35505	1.77525	0.8441	0.2558	0.40359	0.25734	0.27049
1.7787	0.41985	3.87450	3.0489	0.5834	0.40925	0.26095	0.27428
3.4824	0.37702	5.75958	5.0332	0.6919	0.37605	0.23978	0.25203
4.8931	0.35027	7.51092	6.8350	0.7159	0.34635	0.22084	0.23212
6.7309	0.28359	8.92886	8.3911	0.8021	0.27537	0.17558	0.18455
7.7221	0.16199	9.73880	9.3431	0.8265	0.14951	0.09533	0.10020
8.2105	0.08480	10.16280	10.0640	0.8158	0.07245	0.04619	0.048506

TF Value is: 6.48

TFR 6.8



Result Table: Secondary

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.1246	0.35427	1.77136	0.8434	0.1747	0.34394	0.17299	0.20260
1.0580	0.41037	3.82321	3.0111	0.3976	0.38558	0.19393	0.22713
3.8323	0.37557	5.70105	4.9878	0.6082	0.38494	0.19361	0.22675
4.4207	0.32822	7.34216	6.7134	0.6919	0.31541	0.15864	0.18579
5.6706	0.25968	8.64056	8.1384	0.7304	0.24176	0.12159	0.14241
6.5770	0.16157	9.44838	9.0190	0.7630	0.14220	0.07152	0.08376
7.0831	0.09857	9.94123	9.8263	0.7576	0.07641	0.03843	0.04501

TF Value is: 4.75

TFR 5.6

Fertility Differentials in Western Province by Ethnicity

Result Table: Luyha

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.2343	0.34408	1.72038	0.8434	0.2871	0.39185	0.24231	0.26631
1.6300	0.41868	3.81379	3.0111	0.5470	0.40995	0.25350	0.27861
3.4606	0.38787	5.75316	4.9878	0.6898	0.38504	0.23810	0.26168
5.0347	0.33320	7.41914	6.7134	0.7429	0.32849	0.20313	0.22325
6.7281	0.27014	8.76985	8.1384	0.8154	0.26313	0.16271	0.17883
7.7833	0.16259	9.58282	9.0190	0.8489	0.14997	0.09274	0.10192
8.2091	0.09202	10.04292	9.8263	0.8262	0.08015	0.04957	0.05447

TF Value is: 6.21

TFR 6.8

Marital Union

Result Table: Monogamous Union

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.9071	0.48250	2.41252	1.1629	0.7754	0.54353	0.31617	0.38306
1.0590	0.45216	4.67332	3.7903	0.5432	0.43137	0.25093	0.30401
3.6780	0.40148	6.68071	5.9305	0.6202	0.39820	0.23163	0.28063
4.2420	0.34246	8.39300	7.7337	0.6778	0.33816	0.19671	0.23832
6.9673	0.28053	9.79563	9.2579	0.7526	0.27339	0.15903	0.19267
8.0901	0.16867	10.63900	10.2129	0.7922	0.15635	0.09095	0.110189
8.4900	0.09394	11.10870	1.09991	0.7719	0.08073	0.04696	0.05689

TF Value is: 6.46

TFR 7.8

Result Table: Polygamous Union

p(i)	f(i)	q(i)	F(i)	ratio(i)	f+	f* (Ka)	K(mean)
0.8347	0.47576	2.37878	1.1473	0.7275	0.53630	0.31932	0.36898
2.0938	0.43806	4.56909	3.7151	0.5636	0.41621	0.24782	0.28636
3.6220	0.38384	6.48827	5.7743	0.6273	0.38007	0.22630	0.26149
4.9771	0.32203	8.09842	7.4810	0.6653	0.31756	0.18908	0.21849
6.5076	0.26015	9.39918	8.9014	0.7311	0.25333	0.15084	0.17429
7.4217	0.15538	10.17611	9.7800	0.7589	0.14429	0.08591	0.09927
7.8046	0.08794	11.61583	10.5131	0.7424	0.07541	0.04490	0.05188

TF Value is: 6.32

TFR 7.3