THE INFLUENCE OF WOMENS' ACTIVITIES

ON INFANT AND CHILDHOOD MORTALITY IN

EMBU DISTRICT

A Case Study Of Two Sub-Locations.

BY

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DECLARATION

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

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This Thesis has been submitted for examination with my approval as a University supervisor.

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Dr. E.H.O. Ayiemba

11/9/92

DEDICATION

To

My late father Heshbon Nyaga Machera whose encouragement gave me strength till his death on 10-3-92

and

to my beloved mother Madres Muthanje Nyaga Machera for everything.

ABSTRACT

The first task of this study was to examine mortality differentials in Embu district by Divisions. It then looks at the influence of women groups activities on infant and childhood mortality in Embu district using data collected from Karurumo and Kigumo sub-locations in Runyenjes division of Embu district.

For the mortality differentials, 1979 Kenya population census data was used and the differentials were evaluated according to maternal education, marital status, and place of residence.

The primary data was collected from two sub-locations namely Karurumo and Kigumo of Kyeni south location of Embu District. This study was designed to ascertain whether the activities carried out by women have an impact on infant and child mortality. The focus was on women belonging to a womens' group aged between 15-49 years.

A total of four hundred (400) women were interviewed, two hundred from each sub-location. Out of a total population of 546 households, 400 households were chosen and from every household only one eligible woman was interviewed. In this study multi-stage cluster sampling was used as a sampling design.

The hypotheses adopted in this study were meant to show the relationship between womens' activities and infant and child mortality. For example hypotheses that state that `Education is negatively related to infant and child

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mortality' or 'duration the respondent has been in the group is negatively related to infant and child mortality' were tested. The influence of womens' activities on infant and childh mortality is given by adopting variables which come as a result of women being involved in the group. e.g If women benefit in formal or informal education during the group activities, does this education benefit influence the infant and childhood mortality of this woman.

Using Brass-Trussell method to analyze the 1979 census data, mortality differentials were calculated while data collected from the field was analyzed by descriptive statistics (frequencies and percentages) and regression model based on Preston-Trussell approach.

The findings of this study have confirmed that major infant and child mortality differentials among various divisions of Embu district maybe explained in the context of socio-economic status of the women with Siakago division having the lowest infant and child mortality, followed by Runyenjes and finally Gachoka division. The descriptive statistics have shown that socio-economic characteristics of women may vary from one sub-location to another and so may the trend of infant and child mortality. The growth monitoring and promotion programme which takes place only in Karurumo sub-location may have a positive influence on child survival over the time. Majority of the respondents indicated that the Growth monitoring and promotion programme has a positive influence on the health of their children.

Multivariate regression analysis has shown that there is a marked relationship between the ratio of observed to expected deaths of children (mortality index) and the duration a woman stays in a womens' group. The significance of this relationship can be understood in the sense that, the more a mother stays in a womens' group the more she is likely to benefit for a longer period of time. Some of the group benefits such as frequency of receiving money, health and agricultural education benefits, and groups' influence on the health of children all showed a marked relationship with infant and childhood mortality. Other findings are discussed in the contents.

The implications of the findings of this study to the policy making process is that education of mothers, whether formal or informal is crucial in reducing the levels of infant and child mortality. From the analysis of the secondary data, levels of infant and child mortality reduce according to the level of education, that is, infant mortality for mothers with secondary+ education is lower than those with either primary education or no education at all. Similary, from the analysis of the primary data, benefits of health and agicultural education gained by women from the group act reduce infant and child mortality. Therefore policy makers should consider major improvements in maintaining and promoting the education of women. Women groups need to be fully considered in the policy making process,

policies affecting women need to be clearly stipulated, those

unregistered groups need assistance to register since it is important for the government to have an updated record of the number of functional women groups existing and the current membership. This will help in better planning.

Women groups should be used to disseminate vital information such as health, agricultural, contraception and family planning education since more women are likely to benefit from ideas shared in the group. It can therefore be concluded that, women groups' activities to a large extent reduce infant and childhood mortality. It is also apparent from this study that socio-economic status of the mother, and some demographic variables such as age of the mother influences the level of infant and childhood mortality.

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CHAPTER ONE

GENERAL INTRODUCTION

1.1 INTRODUCTION

Positive interest has been stimulated and internationally expressed concerning women's involvement and integration in the process of world development. We therefore cannot afford to ignore the role played by women in any development process be it economic, social, cultural, or demographic.

During this decade, women in Kenya have been actively involved in social and economic development. This has brought about the formation of "women groups" now widespread in the country. A lot of work has been done by women through these groups towards improving standards of living in their homes and in the communities they live in. For example, they have been involved in income generating projects, health projects, water projects, child care projects, and so on.

The projects the women engage in are of benefit not only to them but also to their families. They promote health, nutrition, education, agriculture, sanitation, and general environmental standards. Therefore this study will establish whether these activities carried out by women influence infant and childhood mortality.

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In developing countries, micro-level studies are inclined to finding out the basic factors that may affect child survival at the household level. Many factors have made child survival an important area of study in third world countries.The infant mortality rate is an important index often cited as an indicator of general health and welfare.
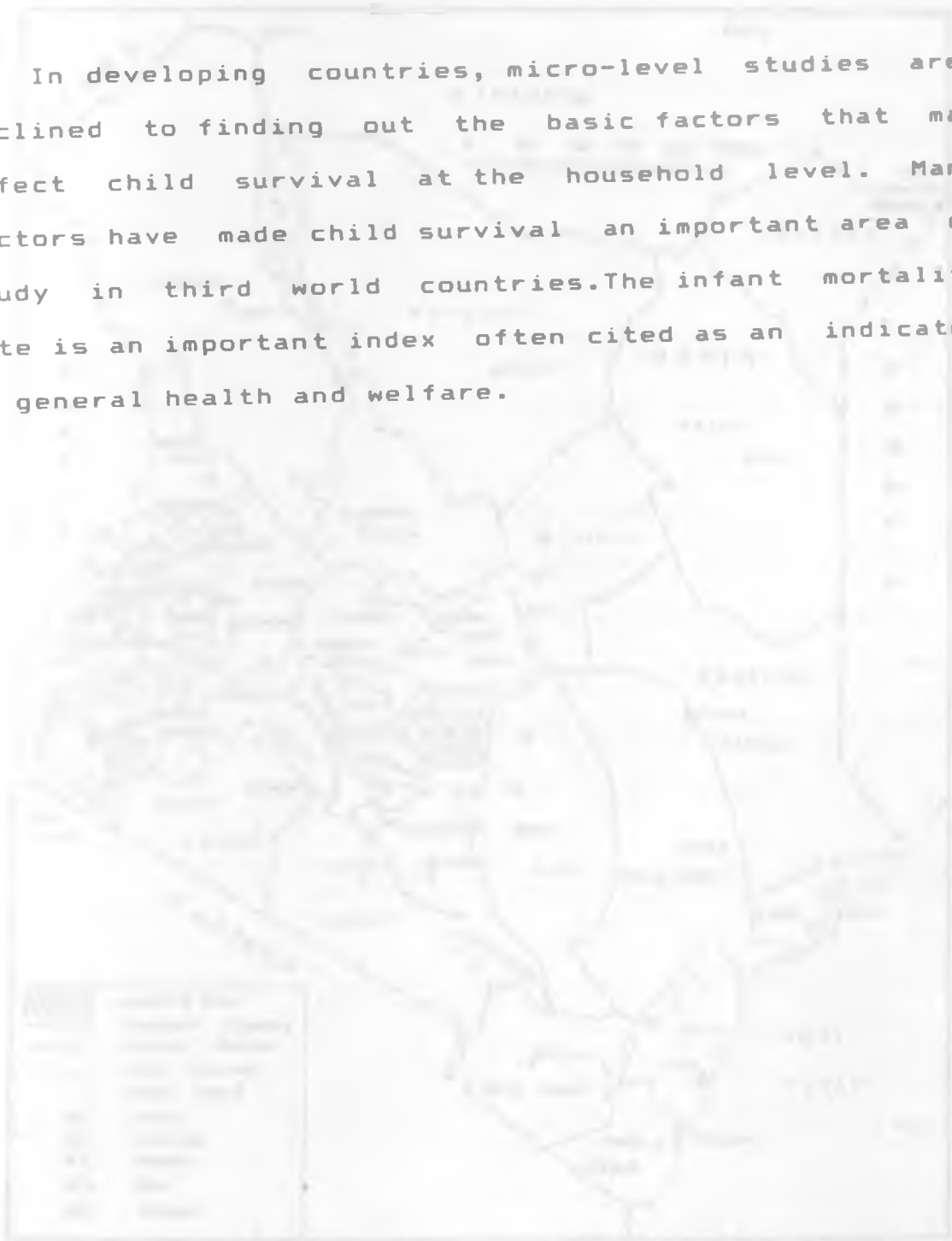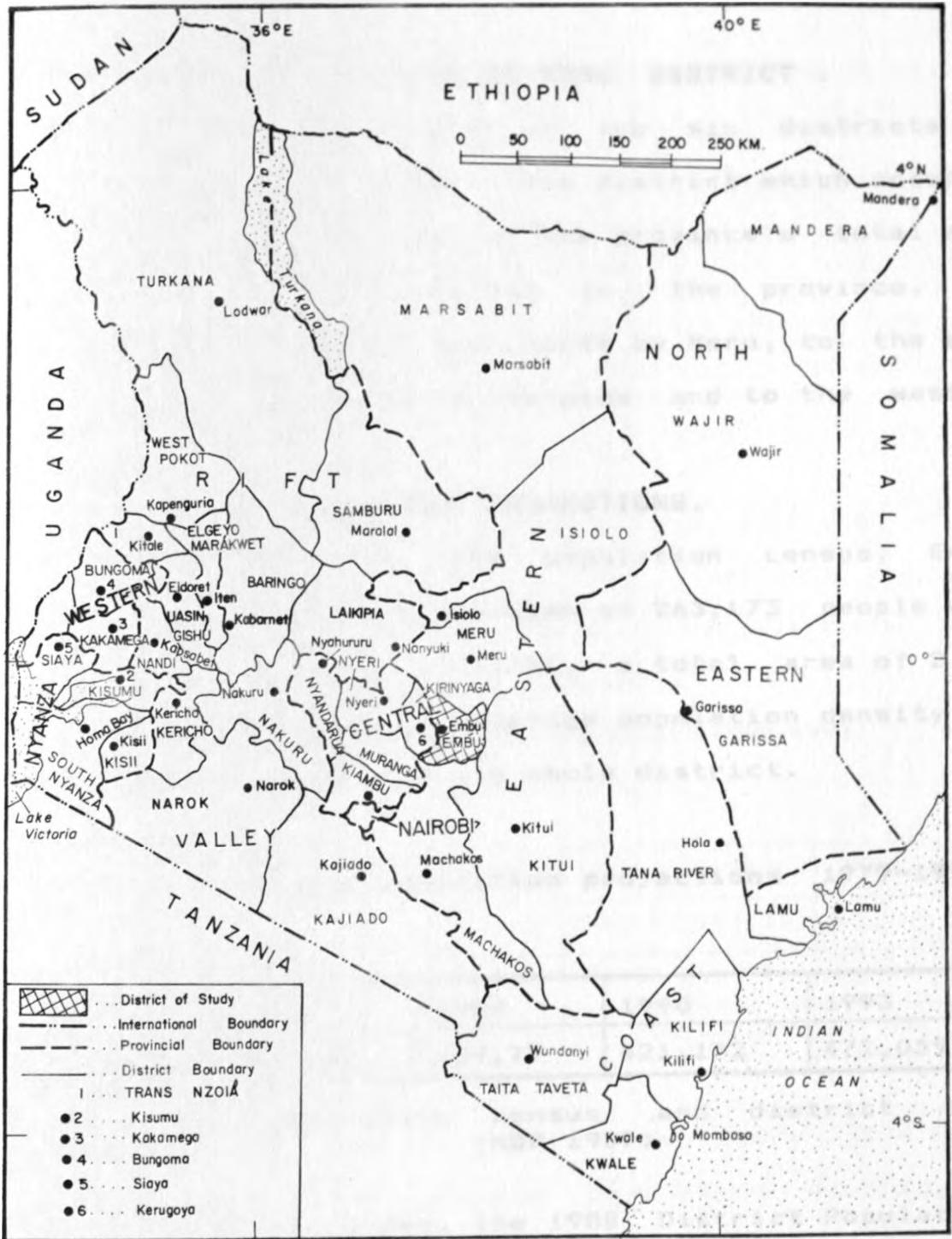
Fig. 1 : LOCATION OF EMBU DISTRICT IN KENYA.

Source : Embu D.D. Plan, 1989/93

1.2 BACKGROUND INFORMATION ON EMBU DISTRICT .

Embu District is one of the six districts of Eastern Province of Kenya. The district which occupies an area of 2714 sq.km out of the province's total area of 154,540 is the smallest in the province. The district is bordered to the north by Meru, to the east by Kitui, to the south by Machakos and to the west by Kirinyaga.

1.2.1   BASIC POPULATION PROJECTIONS.

According to the 1979 population census, Embu district had a total population of 263,173 people with an annual growth rate of 4.18%, a total area of 2,714 sq.km, and this gave an average population density of 97 persons per sq.km for the whole district.

Table 1.1 District population projections 1979-1993.

Year	1979	1988	1990	1993
Population	263,173	389,77	421,172	472,059

Source: 1979 population census and district Data Handbook (RDP 1987)

As table 1.1 shows, the 1988 District Population was 389,797. This is projected to grow at an average rate of 3.9% per year over the plan period to reach 472,059 in the year 1993.The average population density is now 144 persons per 1 sq.km.This projected growth

rate is based on the assumption of moderately declining
levels of mortality and fertility.

Table 1.2   Population distribution by division : 1979

DIVISION	POPULATION	% SHARE
Runyenjes	148,131	55.6
Siakago	38,230	14.4
Gachoka	79,812	29.9
Total	266,173	100.0

The division population projections for each year of the
plan period are given in Table 1.3. These projections are based
on each divisions' percentage share of the districts' 1979
population total shown in table 1.2 above.

Table 1.3 Population Projections by Division :1988-1993.

DIVISION	1988	1989	1990	1991	1992	1993
Runyenjes	219,456	228,144	237,120	246,382	255,933	265,769
Siakago	56,520	58,758	61,070	63,456	65,915	68,449
Gachoka	113,821	118,327	122,982	127,786	132,339	137,841

As Table 1.2 and 1.3 above show, there is a high
positive correlation between population distribution
and land productivity. Runyenjes division, the high
agricultural potential area covers only 16.4% of the
districts' total area but is inhabited by 56.3% of the
districts' total population.Siakago division which is

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of marginal agricultural potential covers 28.7% of the districts' total area but has the least population, only 14.5% of the districts' total. Gachoka division, whose agricultural potential varies from medium in the upper parts to marginal elsewhere in he division is inhabited by only 29.2% of the districts' total population although it occupies the largest part of the district's total area of 7.8% .

Within the divisions, Kagaari north has the largest population followed by Ngandori.Both locations are in Runyenjes division while Mbeti north location in Gachoka has the least population.

Table 1.4   Population   distribution   by   division   and
location 1988.

PLACE	TOTAL. POP.	AREA SQ. KM	PERSONS SQ.KM
Runyenjes Division	219,456	446	492
Kagaari North Location	32,684	79	414
Kagaari South Location	28,983	70	414
Ngandori Location	29,212	46	635
Nginda Location	28,066	44	638
Siakago Division	56,520	779	73
Gachoka Division	113,821	1,294	88
Mbeti North Location	12,224	132	93
Mbeti South Location	8,150	88	93
Embu Municipality	22,878	24	953
TOTAL	389,797	2,714	144

Source: Population Estimation based on 1979 population

census proportions.

1.2.2 INFANT MORTALITY IN EMBU DISTRICT.

The infant mortality rate in the district declined from 83 deaths of children aged less than one year per every 1,000 live births in 1983 to 53 deaths per 1,000 live births in 1987. This signifies major achievements in health programmes related to ensuring child survival. This compares favourably with the national infant mortality rate of 92 deaths per 1,000 live births. The district rate is expected to decline further to 48 deaths per 1,000 live births by the end of the next plan period as the immunization programmes are intensified to cover as many families as possible in the district. The immunization coverage rate rose from about 50 % to 74 % over the previous plan period and was expected to reach 90 % by the year 1990. (District Development Plan 1983-89)

1.2.3 COMMUNITY DEVELOPMENT IN EMBU DISTRICT .

This programme promotes reliance on self-help spirit to solve community -based problems. It entails people initiating projects with the use of their own resources and out of a desire to contribute them to promote change. The governments' role in this process is mainly in the registration of self-help groups, projects, provision of grants to enhance their status, and to offer training and guidance where necessary. The department has encouraged NGO'S to assist this

programme.Other government departments also participate through field extension services to the community. These multi-sectoral approaches to the development of communities are in line with the principles of District Focus For Rural Development. Source: District Development Plan 1983-89

1.2.4 WOMEN'S DEVELOPMENT PROGRAMME IN EMBU DISTRICT

This programme covers the planning and implementation of women groups projects. The department of social services attaches great importance to the contribution women make toward the socio- economic development of the country. The objective of the department is to support, improve, and harness women's self-help initiatives by providing technical assistance and leadership training in order to make women's contribution a significant part of the economy. During the 1984-88 plan period there were between 296 and 313 women groups, with a total membership of 11,823. They were undertaking a wide range of socio-economic activities such as farming, home improvement, livestock rearing, development of residential and business premises, handicraft, tailoring and knitting. Out of a total of 313 groups in the whole district, 115 groups are in Runyenjes Division with 4,384 members and 2,235 members in Siakago and 5,204 members in Gachoka.

1.2.5 GENERAL WELFARE TRENDS IN EMBU DISTRICT

Overall the district population is better off in most respects now than at the beginning of the last plan period between 1983 and 1988.Infant mortality rates dropped over this period as did child mortality rates. Cooperative membership increased which enabled many more people to benefit and improve their welfare through cooperatives.Harambee contributions increased as did school enrolment for both males and females. Consumption levels rose (although this varied with food production levels determined by climatic conditions) and use of the district's health facilities. These factors have been noted in all the divisions of the district and although the rates of improvement may vary between the divisions due to differing aggro-ecological conditions and level of development, nevertheless the overall levels achieved are encouraging and the same trend can be expected to continue over the next plan period. Source: District Development Plan 1983-89

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1.3 STATEMENT OF THE PROBLEM

In Karurumo sub-location of Embu district, women
are actively involved in locally mobilised groups
known as "women groups". Through these groups they
carry out several activities such as farming and
livestock keeping, water projects, building rental and
residential buildings among others. However the most
striking aspect of their activities is the local
monthly weighing of their children below five years
through what is known as the "growth monitoring
programme (GMP)".Every village in the sub-location has
a venue where women take their children for weighing.
They have a weighing scale and all the necessary
material. Most women can do the weighing without
assistance though there are those who are appointed to
assist the illiterate ones. No study has been done to
determine the effect of women groups and the growth
monitoring programme on infant and child mortality in
the area. This study therefore aims at establishing
the relationship between women groups activities,
including the growth monitoring and promotion programme
and the level of infant and child mortality in selected
parts of Embu District. In doing so, differentials in
infant mortality levels by causes will also be
established and regional comparison given.

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1.4 OBJECTIVES OF THE STUDY

(1)   To estimate infant and child mortality at
        district and divisional levels using the 1979
        population census data for Embu district. This
        information will provide infant and child
        mortality estimates for the district.

(2)   Outline and explain child mortality
        differentials by education of mother, place of
        residence, and marital status in Embu district
        using results of the 1979 Kenya population
        census data.

(3)   To investigate the effect of women groups'
        activities on infant and childhood mortality
        using data collected from Karurumo and Kigumo
        sub-locations, of Kyeni south location of Embu
        District.

(5)   To determine the impact of the growth
        monitoring programme on infant and childhood
        mortality.

1.5 JUSTIFICATION .

Mortality studies are of major significance in
health planning and provision of health services. It is
also important to know whether the participation of
women in groups would help in reducing infant and child
deaths. If this is the case then there is need for
policy that encourages mobilisation of women groups

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throughout the country.

This study will also be an evaluation of the growth monitoring programme which is a government of Kenya/UNICEF programme aimed at ensuring child health is upto date. If its influence is positive, then this is of importance to policy makers since it can be introduced to other parts of the country and elsewhere in the developing countries where mortality is high.

1.6 SCOPE AND LIMITATIONS .

This study will take place in Embu District, Eastern Province, Kenya. Primary data will be collected from two sub-Locations in Runyenje's Division, Kyeni South Location. The respondents will be women aged between 15 to 49 years. The 1979 Census data will also be used to examine infant and childhood mortality differentials by mothers' Socio- Economic determinants upto Divisional Level.

Due to limited finances, only a small sample was covered. Memory and recall lapses were a major setback in stating the number of children ever born and children dead, the duration one has been in a group, among other things. The actual influence of women's activities may be difficult to determine in statistical terms as some components of socio-economic status cannot be accurately measured.

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CHAPTER TWO

2.1 *LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK*

2.1.1 *Studies on women in Kenya*.

Gatara & musyoki (1985) in their study found that Kenya women have along tradition of participation in community development.As far back as 1950, for example , women were encouraged to join clubs and mobilize their energies for self and community improvement. In the traditional society, there was division of labour in which women were assigned important roles in the family preservation and management, socialization and care of children, food production,and service inputs during family and communal festivals, rites and ceremonies.Collective response was also witnessed in matters related to the welfare of the family and community members, for example , childbirth, marriage, and in times of illness and death. It is this traditional division of labour and collective action that has survived extreme rapid social change to form a basis for one of the most dynamic vehicles for rural development in Kenya-"the women group networks". The rapid social change that our society has undergone has seen more men migrating to towns to work in the modern sector leaving more women to become household-heads in

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the rural areas. Thus women's roles have changed, no longer confined to childbearing and rearing, food production, food processing and preparation, but they cut across roles that were traditionally located to men. Today, women clear land, plant, weed, harvest, undertake food processing and preparation, fetch water and collect firewood, manage the home, and in addition, actively participate in community affairs.

Gatara & Musyoki (1985)stated that, here in Kenya, women particulary during post independence period (1963 onwards) mobilized themselves in what is now commonly referred to as **women groups**, that sharply contrast from traditional collective action in several respects. First, the groups are formalised as most of them are registered with government and/or a non-governmental organization.

Secondly, each group has a management committee which is comprised of a chairperson, secretary, a treasurer and member representatives.This committee is charged with the overall administration of the group's activities. Thirdly, women groups today are to a large extent, undertaking business oriented activities, while at the same time responding to family and community needs.

At this point, it is important to note that women through the groups have been involved in programmes

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and projects of demographic importance. Some of these projects/programmes are accountable for the demographic transition that has taken place in Kenya as concerns fertility, mortality, and migration.

Kichamu(1986) studied infant and child mortality differentials by mothers age, marital status, place of residence. He found that mortality levels decreased as mothers level of education increased and that child mortality for widowed mothers is highest, followed by divorced and separated.The child mortality for single mothers is lower than those for the married mothers in most of the cases considered. This may be due to cultural norms, level of education and socio-economic status.

2.1.2 *Literature of mortality in developing nations.*

Mosley & Chen (1984), found that in the developed countries of the world over 97% of all children survive through the pre-school years. By contrast in many poor countries 20 to 25% of children die before reaching their fifth birthday, resulting in an estimated 15 million deaths annually.Many of these deaths are preventable with available health technology. A rising global awareness of the unrealized potential for improving health conditions has led national governments and international agencies to re-evaluate

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health service strategies. Community- based programmes have been seized upon by the international health community as the key strategy to make health services accessible, affordable, and socially acceptable.Yet only two kinds of community level initiatives are currently undertaken by most health ministries. The first is to extend curative and preventive services to communities through the use of minimally trained paramedical personnel. The second is to concentrate on making a few simple but effective health technologies widely accessible . The latter course of action has particulary captured the attention of the international donor community because of its economy, potential effectiveness in saving lives and ease of implementation has been at the forefront in the global promotion of a " child survival revolution" based on what is referred to as the GOBI-FF strategy, an acronym for Growth monitoring, Oral rehydration therapy for diarrhoea, breast feeding, Immunization, Food supplements,and Family planning. Recently, this concentration of attention and resources on the delivery of a few technologies to the general population has increasingly come under question (Mosley;1983, Misra;1983, UNPD;1983; Chen; 1984).

Caldwell (1983) The primary concern is that such a strategy is so strongly supply oriented that it tends

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to ignore the social constraints to demand for and effective use of health services. This criticism is particulary opposite with respect to efforts to improve child survival. The social factors that constrain families use of new technologies may well be the same factors that pre-dispose to higher risks of infant mortality . If so, then limited technology-oriented health intervention programme may be far less cost effective than their promoters anticipate in the absence of broader development efforts including investment in education, particulary for women and in improved economic opportunities for families. The debate on appropriate program priorities highlights the problems that the international development community faces in trying to determine the best mix of strategies to promote child health.

Chowdhury (1981) states that during the last forty years, the mortality of the developing nations has declined dramatically. The decline is generally believed to have resulted from widespread use of insecticides,vaccination, programs and antibiotics(Nolestein,1953:Stolnitz 1956).

Mortality levels in the developing countries however are still significantly higher than those of developed nations. The recent mortality data from developing countries indicate that there are two

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distinct mortality patterns. Although both reflect a decline in mortality, in one pattern, mortality reached a moderately low level, with life expectancy over 60 years and then started levelling off. In the other pattern, the decline was only to a moderate level, with life expectancy of around 50 years and after that, the decline has slowed markedly (Chen 1981a: Gwatkin 1980).

Infant mortality in countries of the second category is two to three times higher than in the countries of the first category and four to five times higher than for the industrial nations. The first pattern characterizes mortality in the countries of East Asia, including China, several countries of Latin America (e.g Cuba), and Sri-lanka in South Asia. The second pattern was seen in the countries of tropical Africa and South Asia. The effort to bring about further decline in mortality in countries of the second category where the mortality decline has slowed must begin with a thorough review of existing health and development programs in these countries. To accomplish such a review, some programme variables of health policies like education of women, primary health care policies, and fertility control as determinants of recent changes in fetal infant and child mortality should be emphasised.

In some countries it has already been documented that the mother's education is directly related to her children's survival. However the mechanism through which this factor operates have yet to be ascertained.

In many developing countries health care services have been extended in rural areas with attention to appropriate technology as well as to the participation of the community. It was expected that such programs would reduce mortality.

Fertility control programs are expected to ensure better child health because they regulate proper timing and spacing of pregnancies. However acceptors of these programs may selectively be from a low mortality group. This kind of selectivity may result in the proportion of children in that group being reduced. Hence the overall infant mortality rate in the population may exhibit little or no change. Fertility control programs have been in existence in all the developing countries. A proper evaluation of fertility control programs in relation to change in infant and child mortality is needed to justify the inclusion of such programs in maternal and child health packages.

Caldwell & McDonald (1981) showed that education of women controlling other correlated factors in general showed an inverse with infant and child mortality. Education probably changes both the familial and the

maternal factors and reduces malnutrition and infection among infants i.e the educated may give up traditional cultural practices and may employ traditional birth attendants at the time of delivery. Food preparation and feeding procedures for the infant may be safer with respect to infections. More educated women are less likely to practice detrimental food taboos, either during their pregnancies or during the illness of their infants.However, educated women do appear to breast feed less frequently, which may again expose the infants to malnutrition and infection. However the studies by Adlakha & Suchidran, 1981; and Kohli & Al-amain, (1981) did not find the effect of education on child mortality in some of the Asian countries.

Lincoln & Chen et al (1981) in their paper showed how modern medical technologies can reduce the infant and child mortality in developing countries through the immunization and treatment programs. The authors presented empirical data from Bangladesh showing that immunizing the mother against tetanus during pregnancy can prevent the deaths caused by tetanus during the neonatal period and reduce overall deaths by half.

Rahman et al (1981) also presented data indicating that treating diarrhoeal cases by glucose-electrolyte fluid during diarrhoea can reduce the cases of fatality from 20% to 2% and may produce a significant

effect in reducing the childhood mortality.

Thomas Merrick (1981) showed that piped water in urban Brazil also reduces infant mortality for those who use it.

Allman & Rohde (1981) stressed the effect of fertility control programmes in several developing countries.

Delgado Herman (1981) indicated that nutritional changes in the population are also associated with changes in fetal, infant and childhood mortality and should be included in the analytical framework when studying infant and childhood mortality. In the rural settings of developing countries the socio-economic programmes such as education, industrialization e.t.c, may significantly reduce infant and child mortality in the long run. However the short run impact of such programmes is likely to be small. Simplified but effective health technologies such as immunization or treatment have the responsibility of producing immediate reduction in infant and child mortality provided the nutritional status of the population is adequate. If the population is inadequately nourished the impact may be moderate, in part dependent on how poorly nourished the population is. In order to acquire the desired level of infant and child deaths, improvement of nutritional of those who are

malnourished beyond a critical level is a prerequisite for effective immunization and treatment programs. Hence feeding programs aimed at minimizing the number of low birth weight babies and babies who have low physical growth below a critical limit along with the modern health technologies, will make an impact on the infant and child mortality in the short run in those countries where infant and child mortality still remains high.

Meegama (1986) noted that in the municipality of Colombo, infant mortality was at a very high level at the beginning of this century due to high death rate from neonatal tetanus. Infection of the naval of the infant by dirt during separation of the umbilical cord contributed to the high prevalence of neonatal tetanus. Improper feeding habits and unsanitary environments resulted in convulsion and digestive disorders. Traditional feeding habits often had ill-effects on the lives of infants and small children. Breast feeding was also limited since most mothers were badly paid workers who had no time to breast feed their infants regularly. Infants were weaned too early and fed on the cheapest type of condensed milk, a tin which was made to last four days in tropical conditions and dirty crowded environments. However, factors which led to a decline in mortality in Sri-lanka were

improvements in quality of drinking water and
sanitation. Better nutrition, improvements in
sanitation and the provision of uncontaminated water
led to a decline in diarrhoeal diseases.

Ware (1984) notes that reported years of schooling
particulary at primary levels, must not be well
correlated with reading ability. Beyond that, Ware
mentions one study in Africa which reveals that even
final year teacher trainees knew only a little more
about child nutrition than the illiterate mothers of
malnourished children.

IUSSP (1984),in a summary of the proceedings of the
during the world population conference held at
Bucharest and the international conference on
population held at Mexico city in 1984 have stressed
the importance of integrating population variables into
the development process.The first recommendation
adopted in mexico in mexico city stressed the need to
formulate development plans and policies on the basis
of such an integrated approach.

IUSSP (1984), stated that until recently, most of
the development planners had given attention to only
one side of the integration process i.e to take into
account the consequences of Population growth for
economic and social planning. Studies on population,
responding to planning activities are initiated in

order to determine planning strategies.The other side
of the integration process is where consideration is
also given to development plans and programmes which
affect population factors;and planning decisions on
inter and intra-sectoral allocation of resources based
on such considerations had received much less
attention. In particular very few planning exercises
had involved studies which examine the likely
demographic outcome of specific development projects.

IUSSP (1984), stated that the reasons for
relative scarcity of project-level demographic studies
reflect historical circumstances.Development projects
are initiated in order to improve directly social and
economic conditions of the population. Therefore on
rare occasions where surveys have been initiated ,
attention is given to monitoring the degree to the
objective of achieving the primary goal of improving
the social and economic have been realized. Analysis of
the demographic effect of development projects is an
indirect analysis where one examines the effect of a
development project on social and economic conditions
of the population and secondly one traces the effect of
those changes on demographic factors such as fertility.
Approximately 97% of the world's development budget is
spent on programmes unrelated to population.

And development programmes in most cases can be pro or anti-natalist since such programmes by altering the social and economic conditions of the population will have a determinate effect on fertility decisions such as family size, spacing, age at marriage, and contraceptive behaviour.Therefore planners and policy makers have a choice to decide from the alternative development projects based upon their projected fertility effect and whether such effect on fertility is consistent with the national population policy goals. However in order to facilitate such consideration it is necessary to establish the nature and the extent of the demographic effect of development projects. And secondly in order to make it possible for policy makers to make use of such knowledge they will also need an understanding of the process through which a specific development project results in a determinate demographic behaviour.

Bhattacharyya (1989) stated that development projects can be classified according to the socio-economic characteristic of the target population,their welfare goals or how the benefits are distributed to the population.For example, one might consider a development project directed to the rural and urban population or both. Selecting a development project based upon the characteristics of the target population

will contain the elements of the proximate determinants where changes will be observed in order to explain changes in fertility. Development projects maybe classified according to whether the projects are directed to raising the level of income or are primarily oriented to improving the social or welfare conditions of the population.

The conceptual framework for assessing demographic consequences may not be very different for projects primarily oriented to improving the status of health or education and those oriented to raising income. In the case of the integrated area development programmes where a large number of different types of development projects operate on a group of population the conceptual framework may be more difficult. Finally, development projects may also be classified according to the way a derived benefit is enjoyed by a very small proportion of the population, the development project may not result in as significant a change as would have been the case were the benefits flowing from it evenly distributed. The conceptual framework to capture the distributive aspect of socio-economic change leading to demographic change may be different. e.g According to a recently published United Nations study, review of the relevant literature on the demographic impact of development projects suggests that the rural

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electrification fertility relationship is the most commonly researched problem.(U.N. 1988 ch.1)

Samoza (1980) after analyzing the causes and levels of infant and child mortality in Colombo found that infant mortality is higher among the chidden of women with lower education compared with those having higher education within the age groups of women. He also found out that there was relatively high infant mortality for mothers between 25 and 30 years old and an increasing infant and child mortality for older mothers. For young mothers infant mortality reached its lowest level for mothers around the age of 25 and 30 years. The age of the mother could have an influence on neonatal mortality, the older through mother the higher the probability of her being anaemic or suffering from such diseases as diabetes, heart attack, etc. Such conditions could have an influence on the health of the unborn child (Meegama 1980). Further infant mortality was found to be higher for males than for females (Somoza 1980)

D'souza and Chen (1980) also found that there was higher male than female mortality shortly after birth in a rural area in Bangladesh. The higher mortality rates during neonatal period are consistent with the overwhelming evidence that male biological risk of death is higher than female. Although the biological

explanation in sex mortality differential among infants is accepted in many quarters and fairly convincing, cultural aspects could also lead to sex differentials in infant and child mortality.

D'souza & Chen (1984) noted that son preferences in prenatal care, feeding patterns, intra-family food distribution and treatment of illness favour male children in Bangladesh and this could lead to sex mortality differentials.

In Kenya several studies have been conducted on infant and child mortality with interesting results.

Mott (1979) estimated infant and child mortality using Brass' indirect procedure. Ordinary least squares technique was used to find out the variables that significantly determine infant mortality.

Kibet (1981) also used Brass' indirect procedure and ordinary least squares method to study differential mortality in Kenya using 1979 census data. While Mott found that infant mortality was associated with parity, educational attainment of the mother, urbanization and type of marriage, Kibet found out that childhood mortality was mainly influenced by women's education, malaria prevalence, per capita agricultural land and population density.

Nyamwange (1982) used Brass', Sullivan's and Trussell's indirect procedures to study factors that influence child mortality in administrative wards in Nairobi. He further used ordinary least squares method to determine the variables that influence child mortality in Nairobi using the 1979 census data. His major finding was that immigration from high mortality areas and literacy rates were the major factors influencing child mortality in Nairobi.

Kichamu (1986) used Trussel's procedure to estimate child mortality using the 1969 and 1979 population censuses. He also examined fertility and mortality patterns in central province using the 1982 and 1983 vital registration data. The study showed that there were socio-economic and environmental differentials in mortality in Kenya. Further the study showed that measles, diarrhoea, and respiratory diseases were the major causes of death.

Ondimu (1987) used Trusell's technique to estimate child mortality levels and differentials in Kenya using the Kenya Contraceptive Prevalence Survey data. He found that socio-economic and regional differentials exist in levels of child mortality in kenya. He also found that attendance of mother to maternity clinics is the most important factor explaining the variations in child mortality.

Anker & Knowles (1977) and Kibet (1981) correlated infant and child mortality with urban population, female literacy, malaria cases, kilometres of roads, population density and number of beds per 1000 population using 1969 and 1979 census respectively. Anker and Knowles measured the infant and child mortality by considering the life expectancy at birth e(0) while Kibet used the probability of dying at age 2, q2. Both of them used Brass estimation technique to obtain their levels. Using multiple regression, Kibet found that malaria and mother's education were the two major factors affecting child mortality.

Bunyasi (1984) while studying seasonality and patterns of causes of death in Kenya found that the three leading groups of diseases which cause death are:- infective and parasitic diseases, diseases of the respiratory system and circulatory diseases. He further found that (using multiple regression analysis) environmental factors such as (rainfall, relative humidity, temperature and morbidity) influenced mortality to a certain extent. The three causes were responsible for 55% of the total deaths.

2.1.3 *Maternal factors in determining infant and child mortality .*

2.1.3a(i) **Health factors**

(i) Health care

U.N (1985)7 Para/150,in their study assessed that, the vital role of women as providers of health care both inside and outside the home should be recognized taking into account the following; the creation and strengthening of basic services for the delivery of health care with due regard to levels of fertility and infant and maternal mortality and the needs of the most vulnerable groups and the need to control locally prevalent endemic and epidemic diseases.Governments that have not already done so should undertake in cooperation with the WHO and UNFPA , plans of action relating to women in health and development in order to identify and reduce risks to women's health and to promote the positive health of women at all stages of life, bearing in mind the productive role of women in society and their responsibilities for bearing and rearing children. Women's participation in the achievement of health for all by the year 2000 should be recognized since their health knowledge is crucial in their multiple roles as health providers and health brokers for the family and community, and as informed consumers of adequate and appropriate health care

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2.1.3a (ii)   Health Education

Health education should be geared towards changing those attitudes and values and actions that are discriminatory and detrimental to womens' and girls' health. Steps should be taken to change the attitudes and health knowledge and composition of health personnel so that there can be an appropriate understanding of women's health needs. A greater sharing by men and women of family and health care responsibilities should be encouraged.Women must be involved in the formulation and planning of their health education needs. Health education should be available to the entire family not only through the health care system but also through the appropriate channels and in particular the educational system. To this end governments should ensure that information meant to be received by women is relevant to womens' health priorities and is suitably presented.

2.1.3a (iii)   Child Care.

Women 2000 (1988), stated that almost all cultures profess respect for women and motherhood.But there is a widespread notion that the woman who cooks and cleans, farms and fetches and carries for her family and bears and cares for children is not working, even though the activity and the very considerable effort involved is universal and universally visible.Child care consists

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of many activities that are of great significance towards the survival of the child right from the time of birth. In the rural areas most of the child care chores are undertaken by the mothers unlike in urban areas where babies are left with "maids" during working hours if the mother is employed in the modern sector.

UNESCO 1990, in their study concluded that, **breastfeeding** is of crucial importance to the growth and survival of the child. Babies fed on breast milk have fewer illnesses and less malnutrition than babies who are fed on other foods.Bottle feeding, especially in poor communities, is therefore a serious threat to the lives and health of millions of children. Many mothers lack confidence in their own ability to breast feed.They need the encouragement and practical support of fathers, health workers, relatives and friends, women's groups, the mass media, trade unions and employers. **Malnutrition** and **Infection** hold back the physical and mental development of millions of children.In Embu district malnutrition ranked No. 4 on the list of leading causes of death among children under five years

UNICEF (1988) Stated that to avoid malnutrition children between the ages of six months and three years should be weighed every month. If there is no weight gain for two months, something is wrong. Breast milk

alone is the best possible food for the first four to six months. By the age of four to six months, the child needs other foods in addition to breast milk. A child under three years needs food five to six times a day.A child under three years of age needs a small amount of extra fat added to the family's ordinary food. All children needs foods rich in vitamin A. After an illness, a child needs extra meals to catch up on the growth lost during illness and finally talking, playing, and showing love are essential for a child's physical, mental,and emotional growth. So far all these factors on **malnutrition** needs the knowledge and attention of the mother. **Immunization** is another factor of crucial importance to the growth and survival of the child. Without immunization, an average of 3 out of every 100 children born will die from whooping cough. One more will die from tetanus .And out of every 200 children, one will be disabled by polio.However children can be protected against these diseases by vaccines.But when the service is not available, many of the infants who need it are not brought for the full course of immunizations.It is therefore essential that all parents know why, where, and how many times their infants should be immunized.If the health service does not provide immunization parents should ask for it through their community organizations. Other factors of

major consideration are **Diarrhoea** and **Coughs** and
Colds . Diarrhoea causes dehydration, which kills
approximately 3.5 million children every year.
Diarrhoea is also a major cause of child
malnutrition.The main causes of diarrhoea are poor
hygiene and lack of clean drinking water.Coughs and
Colds can become pneumonia which kills approximately 2
to 3 million children each year.

2.1.3a (iv) Growth Monitoring

UNICEF (1987) observed that improvements in the
physical growth of children over time are among the
best indicators of achievement on the social and human
side of development. Growth monitoring is not passive
or automatic but requires effective participation and
understanding of the principals involved. It makes
demands of its participant , but when properly
conducted, it gives a sense of control encouraging
active participation in primary health care and
creating a demand for responsive services. In Embu
district the programme involves weighing of children
under 5 years of age by trained community volunteers
and mothers under the supervision of the ministry of
health and F.F.H.C staff.The weight is plotted on a
road to health card. On spot counselling is done either
to reinforce positive growth or help the mother work
out a solution to help the child grow well. Growth

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monitoring thus helps detect hidden malnutrition.

2.1.3.b Economic factors

2.1.3b(i) Source of Income

United Nations (1985) Para/154, stated that Women
should have access to and control over income to
provide adequate nutrition to themselves and to their
children. Also governments should foster activities
that will increase awareness for the special
nutritional needs of women; provide support to ensure
sufficient rest in the last trimester during pregnancy
and while breastfeeding; and promote interventions to
reduce prevalence of nutritional diseases such as
anaemia, in women of all ages, particulary young women,
and promote the development and use of locally produced
weaning foods. It is vital to note income is a major
prerequisite to proper nutrition and consequently on
the health status of the whole family.

2.1.3b(ii) Women in Decision Making.

UNICEF (1988),in their plan of operation in Embu
District stated that Embu women do most of the
agricultural work, the cash crop income is mostly under
the man's control. If there is any casual labour hired
it is mostly on the man's cash crop garden. Women,
however have the control over the subsistence crops,
supplying families with food and selling the surplus to
earn an additional small income. Embu women make many

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of the household decisions but very few financial decisions. The Embu District Women Development Committee was started in 1976 but only became operational in 1984. The committee is a Sub-Committee of Embu DDC. Divisional Women Development Committee are active, but only few Locational Women Development Committees are operational.The women's participation in decision making is therefore minimal.

2.1.3.c Demographic factors

Bose A.B. (1986) identified the varios maternal demographic factors that were a threat to child survival.

2.1.3c(i) Age of the Mother.

It has been well established that maternal age and birth order have a direct bearing on the health of and survival of the infant.Investigations on mortality showed that infant death rates were highest for mothers under 20 years of age. These studies found that the lowest death rates were in the age group 25-29 years and also that young mothers less than 20 years are at a greater risk than others in delivering babies of low birth weight.

2.1.3c(ii) Birth Order

The Pan-American projects revealed lower levels of infant mortality rates among babies of first order than babies of second and third orders.These studies recorded high mortality rates when the average birth intervals were narrow.Similar findings were observed by a study of 142,071 thousand live births registered on New York city by the health department.

2.1.3c(iii) Birth Spacing

UNICEF/WHO/UNESCO (1990) found that birth spacing is one of the most powerful ways of improving the health of women and children. Births which are "too many or too close" or to women who are "too old or too young " are responsible for approximately one third of all infants deaths world wide.If today's knowledge about timing of births is to fulfil its potential for saving lives and improving health, then **family planning** services will have to be made available to all.

2.2 SUMMARY OF THE LITERATURE REVIEW

Kenya has experienced a dramatic decline in mortality of infants and children. This decline has been largely due to factors associated with government actions on improved medical technology, disease control, and increased availability of medical

facilities. However researchers argue that economic factors have also made an important contribution towards reducing mortality rates after the second world war. The decline has not been uniform in all parts of the country, there have been variations from one region to another due to differentials in socio-economic, environmental, cultural and demographic factors.

ICC Symposium (1979) found that there is generally high infant mortality among the rural child population. This is one of the reasons for the high birthrate amongst the poorest families based on the hope that some children will survive. High illiteracy and malnutrition rates are also prevalent in this group and basic services if they exist have little impact. Women most of whom are also mothers form a large proportion of the population and their role in development entails direct benefits for the children. In rural areas, women often work in fields and in many countries constitute a majority of the agricultural labour force. In addition, chores such as fetching water, which are time and energy consuming are part of their daily routine.

In some countries more than a quarter of all rural households are headed by women. In these situations mothers are forced to assume responsibilities for work which is normally performed by fathers. It must be

recognized that the involvement of more mothers in labour force, especially in modern sector deprives the family of love and care so necessary for proper child rearing and development.

It is now quite clear that the contribution of the mother to the survival of the child is of crucial importance. Therefore, since no such a study has been done in Embu district, the findings will be of major use to policy makers and to anyone interested in the development of the region, to the scholars , and also to the women in the country and elsewhere in the world.

2.3 THEORETICAL FRAMEWORK

The crude death rate of the worlds' population is about 11 per 1000 live births. Life expectancy at birth is about 61 years. Of course these are only averages permitting variability. Generally the higher a country's level of economic development, the lower its crude death rate and the greater its life expectancy. In the developed countries these figures are about 12 per 1000 and 57 years. (Population Reference Bureau).

Although mortality levels are currently higher in the developing countries than in the developed countries since 1920, mortality has declined very rapidly in the former countries. The causes of this

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rapid decline are different from those for the more gradual decline experienced by the developed countries.

The crude death rate of the global population is about 11 deaths per 1,000 live births. Life expectancy is about 61 years. countries vary considerably, but in general the more developed a country, the lower the mortality rate.

Historically the major causes of high mortality have been famines and food shortages, epidemic diseases, wars and poor living conditions.

2.3.1 *The demographic transition theory*

The above theory explains better the trend of mortality decline over the time. This theory explains how mortality in the developed countries has declined from a situation of high birth rates and high death rates to one of low birth rates and low death rates. This theory markedly has three stages of transition. The first stage was that of *high death rates and high birth rates.* Currently both the developed and the developing nations of the world have passed this stage. The second stage is that of *low death rates and high birth rates.* This stage is characteristic of the situation in the developing countries of the world like many African, Asian and South American countries Such

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as Kenya, India,and Brazil. The third stage is that of *low birth rates and low death rates*. This stage is characteristic of the developed countries of the world like the United States of America, Britain, Switzerland, France, and Germany to mention but a few.

Mortality has declined as countries industrialise. The factors causing mortality to drop in the developed countries in the nineteenth and twentieth centuries were generated internally by improvements in levels of living.

Since 1920, mortality has declined rapidly in the developing countries. These declines have been caused primarily by the public health measures and medical technology imported from the developed countries. As overall levels of mortality drop, the proportion of deaths due to infections and parasitic diseases decreases sharply and the proportions of deaths due to degenerative diseases (such as cancer and heart diseases) increases.

The three major factors related to differences in mortality are sex, age and socio-economic status (SES). Females outlive males because they are biologically superior and because of differences in their lifestyle and utilization of medical care. After childhood (ten to fourteen years) mortality rates increase gradually

until age 45-54 years and then increase sharply. SES is inversely related to mortality because of differences in working conditions, lifestyle, and utilization of health care technology.

Infant mortality rates vary inversely with a country's level of modernisation. Death during the first few days following birth seems unpreventable despite existing medical technology. But infant mortality during that period can be reduced greatly by changes in nutrition, the environment and health care delivery system.

1.9.2 *Economic development theories as related to mortality trend*

2.3.2 (a) Rostow's stages of Economic Development

Professor W.W. Rostow sought an historical approach to the process of economic development. He distinguished five stages of economic growth. These are (1) the traditional society; (2) the preconditions for take off; (3) the take off; (4) the drive to maturity; (5) the age of mass consumption.

In the first stage, Rostow notes that the social structure of the traditional society was hierarchical in which the family and clan connections played a dominant role. Political power was concentrated in the regions, in the hands of the landed **aristocracy**

supported by a large retinue of soldiers and civil servants. Agriculture happened to be the main source of income of the state and the nobles, which was dissipated on the construction of temples and other monuments, on expensive funerals and weddings and on the prosecution of wars. This stage of development has been criticised in that it is not essential for development. This is because some nations such as the United States, Canada, New Zealand, and Australia were born free of traditional societies and they derived the preconditions from Britain a country already advanced. However, for those countries that evolved through traditional societies, such as Britain, countries of Eastern Europe, Asian and African countries *experienced high mortality at this time and high fertility. This period coincides with the first stage of the demographic transition theory.*

The second stage is a transitional era in which the pre-conditions for sustained growth are created. The preconditions for sustained growth were created slowly in Britain and Western Europe, from the end of the 15th and the beginning of the 16th centuries when the medieval age ended and the modern era began. The process of creating preconditions for take off briefly involved spreading of economic progress, broadening education to suit the needs of modern

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activity, encouraging new types of enterprising in pursuit of profit to modernization, widening the scope of commerce, and of manufacturing enterprise. Consequently, the spread of modern education brought about a gradual transformation in thought, knowledge, and attitude of the people.

Lastly, under the influence of a powerful international demonstration effect, people wanted the products of modern industry and modern technology itself. *It is probably at this stage that mortality began to decline due to improved technology in medicine and environmental maintenance and sanitation. However it is likely that fertility continued to be high due to improved diet and less deaths.*

The following step is the Take-off stage, which is described as the 'great watershed' in the life of the society "when growth becomes its normal condition......, forces of modernization contend against the habits and institutions. The value and interests of the traditional society make a decisive breakthrough; and compound interest gets built into the society's structure." In another fashion Rostow defines the take-off "as an industrial revolution, tied directly to radical changes in the methods of production, having their decisive consequence over a relatively short period of time."

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The fourth step is The Drive to Maturity and Rostow defines it "as the period when a society effectively applied the range of (then) modern technology to the bulk of its resources." It is a period of long sustained economic growth extending well over four decades. New production techniques take the of the old ones. According to the demographic transition theory this is probably when mortality becomes completely low and fertility begins to decline as more people begin to plan their families to fit in the economy.

The last phase is The Age of High Mass-Consumption which is characterised by the migration to the suburbia, the extensive use of the automobile, the durable consumers' goods and household gadgets. In this stage, "the balance of attention of the society is shifted from supply to demand, from problems of production to problems of consumption and of welfare in the widest sense." However three forces are discernible that tend to increase welfare in the post-maturity stage. *First*, the pursuit of national policy to enhance power and influence beyond national frontiers. *Second*, to have a welfare state by a more equitable distribution of national income through progressive taxation, increased social security and leisure to the working force. *Last*, decisions to create new commercial centres and leading sectors like cheap automobiles,

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houses, and innumerable electrically operated household devices etc. On population issues such a society will have stable low fertility and low mortality. Historically, the United States was the first to reach the age of high mass consumption in the 1920's, followed by Great Britain in the 1930's, Japan and Western Europe in the 1950's and the Soviet Union after the death of Stalin.

Most developing countries are still in the second and third stages of economic growth where deaths are declining and fertility ranges high in some while in others it is declining.

The characteristics most strongly related to the risk of infant mortality are the infants birth weight, sex, and birth order and characteristics of the mother such as her age, whether she has experienced reproductive loss before, her SES, and her marital status at the time of the birth.

Mortality will continue to decline in most developing countries as levels of living increase and as infectious diseases are brought under control. However future reductions in mortality will be minimal in the developed countries.

In the developing world, there is now clear there is now clear evidence of differentials in child survival rates associated with the education of

mothers. Data from latin America (Behm, 1976; Haines and Avery, 1978), Africa (Caldwell, 1979; Farah and Preston, 1982), and Asia (Cochrare, 1980, Caldwell and McDonald, 1981) all show a negative relationship between the extent of maternal education and the level of child mortality, although the amount of education required to produce a significant reduction in mortality varies from culture to culture.

Evidence of a relationship between womens' roles and mortality of their children is much harder to obtain to obtain and to interpret. For a start, while educational levels do not regress and normally remain constant once women have attained maturity, womens' roles may vary greatly overtime and data on current status may bear little relationship to the situation at the time when the death occurred or when the child's health first began to decline. For this case it is not possible as in the case of education to make use of data gathered in vast range of fertility surveys that are now available. To study the relationship between womens' roles and the mortality of their children, one should ideally have data for each child extending from birth to age five or to death where that came first.

Women may perform economic activities within the home, in the informal sector, outside the home, in such occupations such as farm labourer, petty trader or

domestic worker in other households (in which cases it may be possible to take young children along) or in the formal sector in the factories and offices where children are clearly not allowed. From this point of view it is not the occupation that is of importance but the circumstances in which it is carried out. Womens' economic activities will have a negative impact on child care only where the activity is incompatible with simultaneous child bearing or where the mother lacks access to another person able to take care of the child.

A great deal of confusion has been generated by the tendency to equate work for all women with paid employment outside the home and therefore to label all other women as non-workers despite their indispensable contribution to the household.(Rogers 1980; Ware 1981;) In reality, in developing countries almost the only women who do not have to perform hard labour are those who live in households wealthy enough to support domestic servants or to provide mechanical and electrical alternatives.(Lindenbaum et al., 1983). However, in the demographic literature the discussion of the relationship between womens' work and child mortality has almost always focused on paid employment outside the home which is believed to be a possible cause of child neglect and child malnutrition due to

the abandonment of breastfeeding

The involvement of women in income generating activities and other self-help activities is also a major step towards integration of women in the process of world economic and social development. Through women group projects around the world a lot has been achieved in the fields of agriculture, adult education, family planning, child care, and learning of major skills. Some of these activities have been very important in the process of demographic transition where major drops in mortality and fertility have been witnessed in some of the developing nations.

Infant mortality is a product of interaction of several factors socio-economic, biological, environmental, and infra-structural. All these factors are closely linked with poverty of families, general backwardness and underdevelopment of areas and communities (A B Bose, 1986).

From the evidence gathered from previous studies mortality can considered as the product of the incidence of disease and case fatality. The only ways to reduce mortality are either to reduce the incidence of morbid conditions or to reduce the risk of dying from a certain disease.

e.g studies have shown that infant mortality is inversely related to mothers level of education,

residence, and marital status(Kichamu 1986).

Evidence has also shown that mothers' demographic factors like parity, age, birth interval, and birth order,are likely to influence infant and childhood mortality. Some Socio- Cultural studies have shown that some cultural prohibition what a pregnant mother should eat will affect the birth weight and consequently the health of the newborn.

There are several existing theories and literature that explains how demographic parameters such as mortality, and fertility have dropped from high to low overtime. This study will go further to investigate how the womens' activities perceived through group work and projects influence infant and child mortality.

1.9.3 Gaps in the literature reviewed

Gatara and Musyoki (1985) in their study give a detailed account of the evolution of the women group movement in Kenya in post and pre independence days. This study helps us understand the role that informal women groups played such as socialisation and care of children, food production and service inputs during family and communal festivals, rites and ceremonies. Though these authors have taken us to the post independence Kenya where there are now forma; groups that are registered in a government or non governmental

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system, the study does not go further to explain the demographic implications of the women's groups. This particular study, will try to fill this gap in that the information gathered from women group members will be used to statistically analyse whether there is any marked significance between women group activities and infant and child mortality.

The study carried out by Kichamu (1986) found that infant and child mortality differentials by mothers age, marital status, place of residence and found that mortality levels decreased as mothers level of education and that child mortality for widowed mothers is highest, followed by the divorced and separated. Kichamus study had a purpose which is a major objective of this study. In this study mortality differentials for the divisions in Embu District will be established, the differentials will be looked at by place of residence, education and marital status, whereas Kichamu looked at differentials by mothers age, residence and marital status.

The study done by Mosley and Chen (1984) revealed the need for improved health technology. They found that over 97% of all children born to developed countries survive through pre-school years where as only 20-25% survive in developed countries. However they did not state the role women may play in improvig

the mortality of their children in the developing countries. This study particularly views the participation of women in the mortality transition in Embu district. The finding inerated will give a broad picture of what is and what may happen in the developing countries.

Caldwell (1983) criticised Mosley and Chens' (1983) study and stated that though the supply of improved health technology may be made available, there are likely to be social factors that constrain families from using new technologies, and that these same constraints may well be the same factors that pre-dispose them to higher risks of infant mortality. Caldwell states that, broader development efforts which includes investment in education, particularly for women and in improved economic opportunities to families.

Caldwell's view strenghens the hypothesis stated in this study that "education of women is negatively related to infant and child mortality". He also agrees with Kichamu (1986) findings that mothers education may help reduce infant and child mortality. Therefore this study will try to investigate into whether the education a woman gains in the group has an impact on infant mortality.

Chowdhury (1981) like Mosley and Chen (1983) seem

to believe that the decline of mortality in developing countrieshave resulted from widespread use of insectcides, vaccination programes and anti-biotics. Chowdhury's findings fail to show us the limitations social and cultural factors would pose to such a decline despite the technology just like Caldwell (1983) criticised Mosley and Chen (1983).

Caldwell and MacDonald (1981) showed that education of women showed an inverse with infant and child mortality. This conforms with Kichamu's (1986) findings and also concurs with the objectives of this study. However Ware (1984) disagrees with this notion and states that, reported years of schooling particulary at primary levels, must not be well correlated with reading ability. Ware mentions one study in Africa which reveals that even final year teacher trainees knew only a little more about child nutrition than the illiterate mothers of the malnourished children. Though the importance of mothers education has been cited by these authors none has tried to show the effect of mixing the educated mothers and the illiterates ones in a group. This study will find out if the illiterate mothers benefit in education from the group and how this affects infant and child mortality.

Delgado Herman (1981) found that nutritutional changes in the population are also associated with

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changes in fetal, infant and child mortality. This study seeks to find whether the activities carried out in the group help improve the nutritional status of the children and child health in general.

The summary of the proceedings of the world population conference held in Bucharest (1984) noted that development projects are initiated inorder to improve directly social and economic conditions of the population. Therefore on rare occasions where surveys have been initiated, attention is given to monitoring the degree to which the objective of achieving the primary goal of improving the social and economic conditions have been realized. Analysis of the demographic effect of development projects is an indirect analysis where one examines the effect of a development project on social and economic conditions of the population and secondly one traces the effect of those changes on demographic factors such as fertility and mortality. These findings, give a basis of this study in that, most of the activities women are performing contribute to social and economic changes in their enviroment, Some women groups are also directly involved in development projects, however, analysis of the effect of the se activities can only be done indirectly by examining their effect on social and economic conditions of the population and thus

tracing the impact of these changes on infant and child mortality. For example the impact of the growth monitoring and promotion programme may not be measured directly, but by tracing its impact on the children one maybe able to measure its influence on infant and child mortality.

Studies done in Kenya by Mott (1979), Kibet(1981), Nyamwange (1982), Kichamu(1986), Ondimu(1987), all were geared towards establishing the socio-economic differentials in infant and child mortality in Kenya by considering factors that affect the incidence of infant and child mortality. Among other factors mothers' educational attainment, type of marriage, place of residence, malaria prevalence, and population density mainly account for infant and childhood mortality. These studies failed to establish what roles the women are actually playing in reducing or increasing infant mortality. For example how can a woman without education benefit from the one with education ?. And they also failed to show if informal education is important in reducing infant and child mortality.

In conclusion, this study as stated in the objectives will estabish which of the conditions that result from the womens' activities negatively affects infant and childhood mortality.

2.4 THEORETICAL STATEMENT

Women's activities/projects are likely to influence infant and childhood mortality.

gure 2.1 Theoretical model
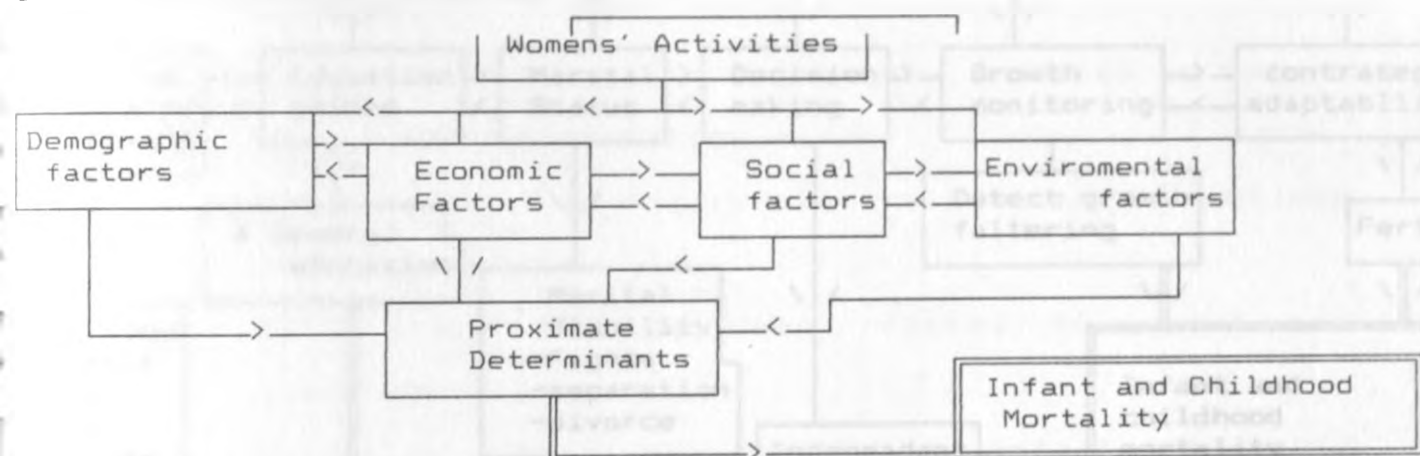
Source: Adopted from Mosley & Chen (1984)

2.5 CONCEPTUAL HYPOTHESIS

1 . Improved standards of living are likely to influence infant and childhood mortality.

2 . General Education is likely to influence infant and childhood mortality.

3 . Marital status factors are likely to influence infant and childhood mortality.

4 . Decision making factors are likely to influence infant and childhood mortality.

5 .Growth monitoring factors are likely to influence infant and childhood mortality.

6 . Contraception factors are likely to influence infant and childhood mortality.

Figure 2.2 Operational Model


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                          ┌──────────────────┐
                          │ Womens' Activities│
                          └──────────────────┘

   \ /           \ /          \ /          \ /          \ /                    \ /
┌──────────┐   ┌──────────┐  ┌─────────┐  ┌─────────┐  ┌──────────┐      ┌────────────┐
│Improved  ├─>─┤Education ├─>─┤Marital ├─>─┤Decision├─>─┤Growth    ├─>─┤contracepti│
│standards ├─<─┤gained    ├─<─┤Status  ├─<─┤making  ├─<─┤monitoring├─<─┤adaptability│
│of living │   └──────────┘  └─────────┘  └─────────┘  └──────────┘      └────────────┘
└──────────┘     \ /                                       │                    \ /
   \ /         ┌────────────┐                        ┌──────────────┐        ┌──────┐
┌──────────┐   │ * General  │                        │Detect growth │        │Ferti │
│Provision │   │  education │                        │faltering     │        └──────┘
│of basic  │   └────────────┘                        └──────────────┘
│needs     │                 ┌─────────────┐            \ /           \ /
│-food     │                 │Marital      │        ┌──────────────────┐
│-clothes  │                 │Stability    │        │Infant and        │
│-shelter  │                 │-Fights      │        │childhood         │
│-money    │                 │-separation  │        │mortality         │
└──────────┘                 │-divorce     │        └──────────────────┘
                             └─────────────┘
                                ┌─────────────┐
                                │Independent  │
                                │decision     │
                                │making       │
                                └─────────────┘
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Source: Adopted from Mosley & Chen: 1984

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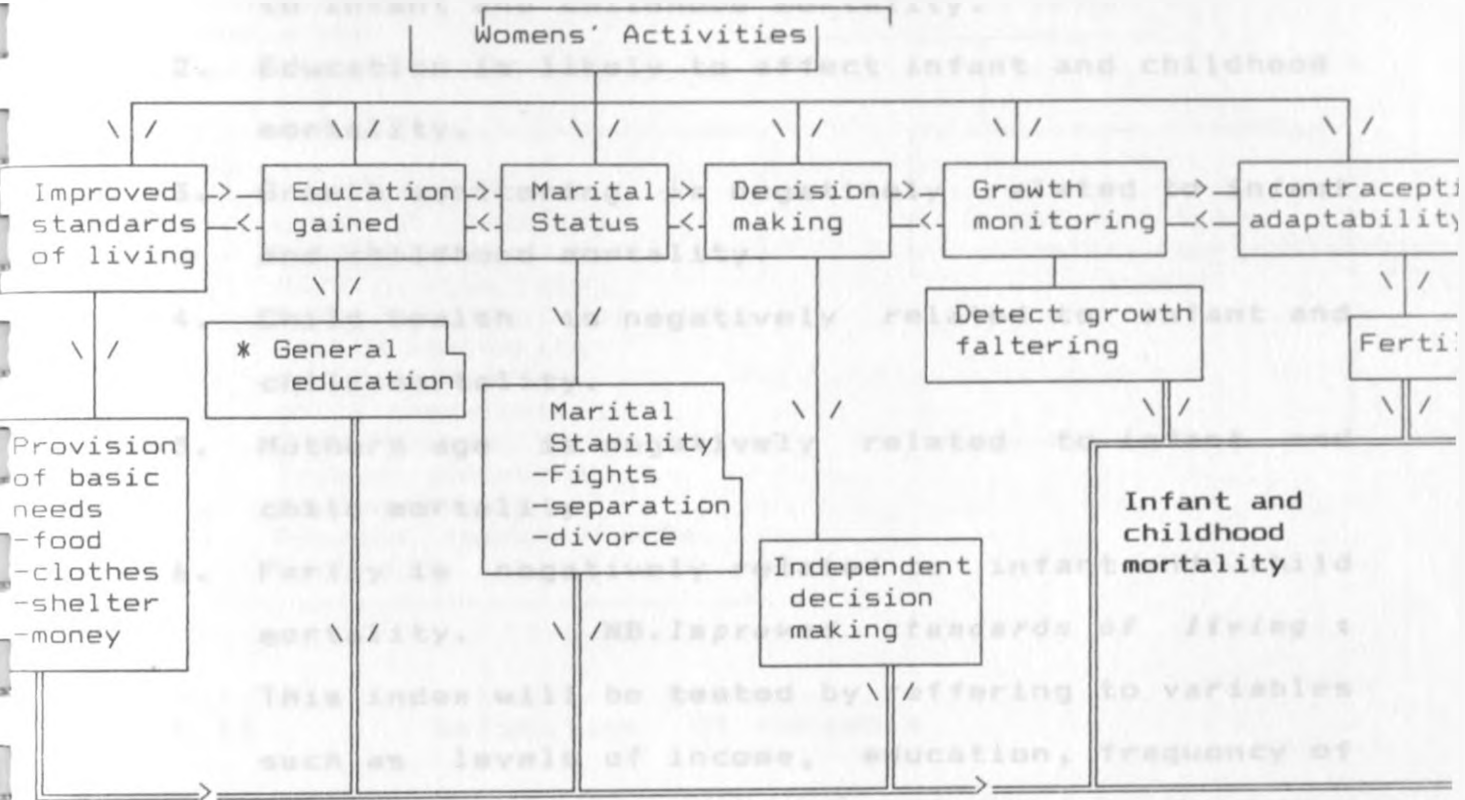
2.6 OPERATIONAL HYPOTHESIS

1. Improved standards of living are negatively related to infant and childhood mortality.

2. Education is likely to affect infant and childhood mortality.

3. Growth monitoring is negatively related to infant and childhood mortality.

4. Child health is negatively related to infant and child mortality.

5. Mothers age is negatively related to infant and child mortality.

6. Parity is negatively related to infant and child mortality.   NB.*Improved standards of living :*

This index will be tested by reffering to variables such as levels of income, education, frequency of receiving cash and other materials which contribute to the standards of living.

Figure 2.3   Dependent and independent variables

```
┌─────────────────┐                    ┌─────────────────┐
│ Independent      │                    │ Dependent       │
│ variables        │                    │ Variables       │
└─────────────────┘                    └─────────────────┘
        \ /
         │                                      │
   ┌─────┴──────────────────┐          ┌────────┴──────────────┐
   │ Level of education     │          │ Infant and child      │
   │ Availability of food   │          │ mortality (Mortality  │
   │ Marital stability      │          │ index)                │
   │ Indepedent decision making        │                       │
   │ Growth monitoring      │          │                       │
   │ Contraception use      │          │                       │
   │ Child immunization     │          │                       │
   │ Breastfeeding period   │          │                       │
   │ Type of toilet         │          │                       │
   │ Source of water        │          │                       │
   │ Spouses' change of role │         │                       │
   │ Fertility              │          │                       │
   └────────────────────────┘          └───────────────────────┘
```
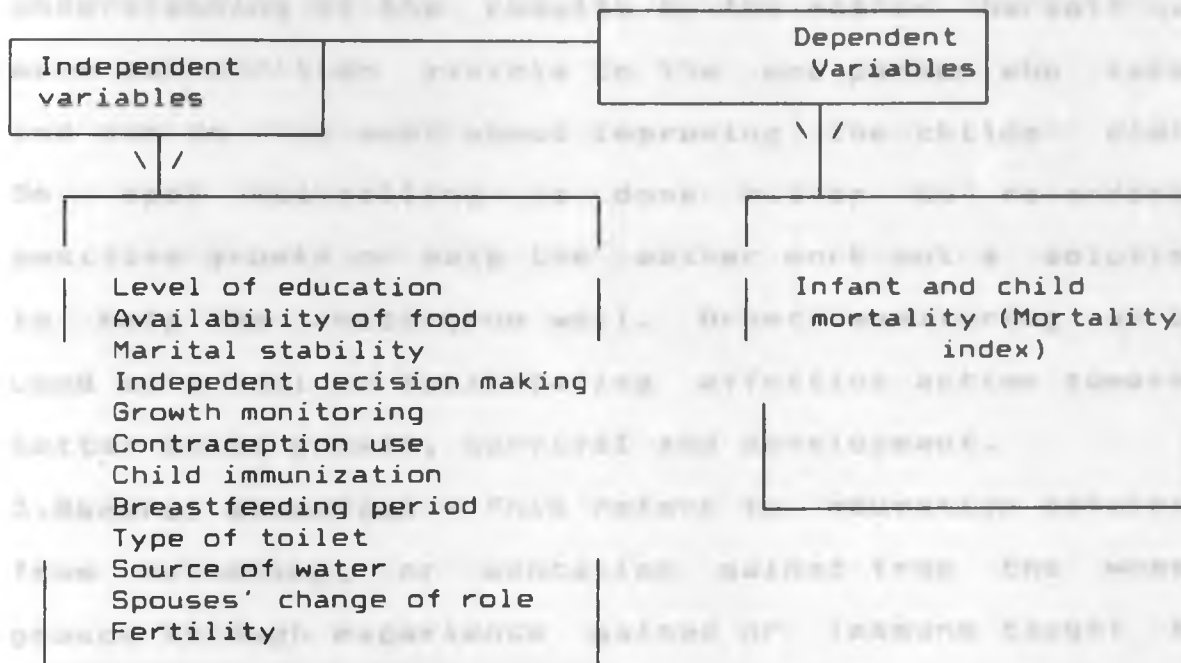
2.13   Definition of concepts

1. **Womens' Activities** – This concept refers womens'
group   dynamics,which   will   include   all **activities**
carried out by women in   the groups e.g **agricultural**
projects, livestock projects, educational and health
activities,   building   projects,   home   improvement
projects, cash giving projects etc.

2.**Growth monitoring programme** –This is a programme that
involves monthly weighing of children below five years.
It is a community based programme that plays a vital
role in early detection and prevention of child
malnutrition. Most child malnutrition is not detected

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even by mothers but regular monthly weighing and the understanding of the results by the mother herself can make malnutrition visible to the one person who cares and can do the most about improving the childs' diet. On spot counselling is done either to re-enforce positive growth or help the mother work out a solution to help the child grow well. Growth monitoring can be used as a tool in *facilitating* effective action towards better child growth, survival and development.

3.**General education** - This refers to education obtained from schooling, or education gained from the women groups through experience gained or lessons taught by other group members or guest lecturers, on education gained from women groups the study will look at whether the respondent has benefited on such matters as importance of breastfeeding, family planning , child health etc.

4.**Improved standards of living** - This refers to the change in the economic and social status of the woman and her family from the benefits achieved from the womens'group.

5.**Marital status** - This will refer to those women who are single, married, widowed, divorced or separated.

6.**Decision making** - This concept will refer to the womans' capability in deciding things and acting upon them without depending on anybody.

7.Contraception acceptability – This concept refers to whether contraception use is acceptable to the woman.

8.Infant and Childhood mortality – Infant mortality refers to deaths of children aged between *0 to 1 year* and childhood mortality refers to deaths of children between *1 year and 5 year*

CHAPTER THREE

METHODS OF DATA COLLECTION AND ANALYSIS

3.1   METHODS OF PRIMARY DATA COLLECTION AND ANALYSIS

3.1.1   Introduction.

This section is a descriptive phase of the process of data collection and that of the results gathered. As the major objective of this study was to find out the influence of womens' activities on infant and childhood mortality, the major focus in the field was on the women and only those who were involved in one womens' group or another in particular. In one of the sub-location there was a bias on women who participate in the growth monitoring programme.

3.1.2   The comparative nature of the study

The data collected in the two sub-locations differs in some respects. The women interviewed in Karurumo sub-location were those belonging to a womens' groups and participating in the growth monitoring programme at the same time. Those women interviewed from Kigumo sub-location belonged to a womens' group but were not participating in the growth monitoring programme. The data collected from these two sub-location will be used to compare whether the growth monitoring programme

has had any effect on the mortality level of the women in the two sub-locations.

3.1.3 The growth monitoring and promotion programme(GMP)

Improvement of the physical growth of the children over time are among the best indicators of achievement on the social and the human side of development. Growth monitoring is not passive or automatic, but requires effective participation and understanding of the principals involved. It makes demands of participants, but when properly conducted it gives a sense of control encouraging active participation in primary health care and creating a demand for responsive services.

The main use of growth monitoring is that it helps the mother to play an active role in the health of her child by providing positive feedback and re-enforcement of appropriate actions to promote growth.

Growth monitoring helps early growth faltering to be detected and rectified by the mother before serious malnutrition occurs.

3.1.4 Social Organization.

Several homes are grouped together to form a sub-unit. Each sub-unit has an elder appointed by the sub-chief as well as a traditional birth attendant who registers births and deaths in the sub-unit. There is a

youth winger who helps the chief and the community in daily activities. A sub-location is made up of a number of sub-units and is headed by a sub-chief who is appointed by the District Commissioner. A location is made up of a number of sub-locations headed by a Chief. For any community based programme the recognition, understanding and cooperation of the chief is crucial as he facilitates communication within the community.

3.1.5 Methodology of data collection

This research was designed to ascertain the role played by women in influencing infant and childhood mortality .The focus was on women aged between 15-49 years. The data was collected from two sub-locations in Embu District.These are Karurumo and Kigumo sub-locations in kyeni south location of Runyenje's Division,Embu District. A total of four hundred women were interviewed.

Special emphasis was laid on the growth monitoring programme (GMP). This is a programme whereby women,organised in groups weigh their children on a monthly basis and fill in the weights on the growth monitoring charts.This programme was going on in Karurumo sub-location.Therefore two hundred women were interviewed from this sub-location. The data obtained from this region will help us find out if this

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programme has had any effect on the infant and child mortality in the region.This will help us compare the results obtained from the two sub-locations on the basis of the effects of this programme as an event solely organised and managed by the women.

A background of the child mortality in Embu District is also outlined in this thesis using the 1979 Kenya census data.This is an overview of the mortality in the district.

The choosing of the sample size was determined by the availability of enough funds and adequate time. However both were not sufficient, therefore the sample was restricted to four hundred respondents, two hundred from each sub-location. The method of sampling used in this study was multi-stage cluster sampling. In this strategy each sub-location was divided into eight strata, a village made up of several households and from each stratum all the households were listed. This propcedure was carried out for every stratum in the two sub-locations.

3.1.6   Sampling design

In this procedure a strategy known as the multi-stage cluster sampling technique was used.

Two sub-locations were selected well in advance. Karurumo sub-location was selected on the basis that it is the only place where the growth monitoring programme is taking place. The other sub-location was selected randomly from the others using the table of random numbers.
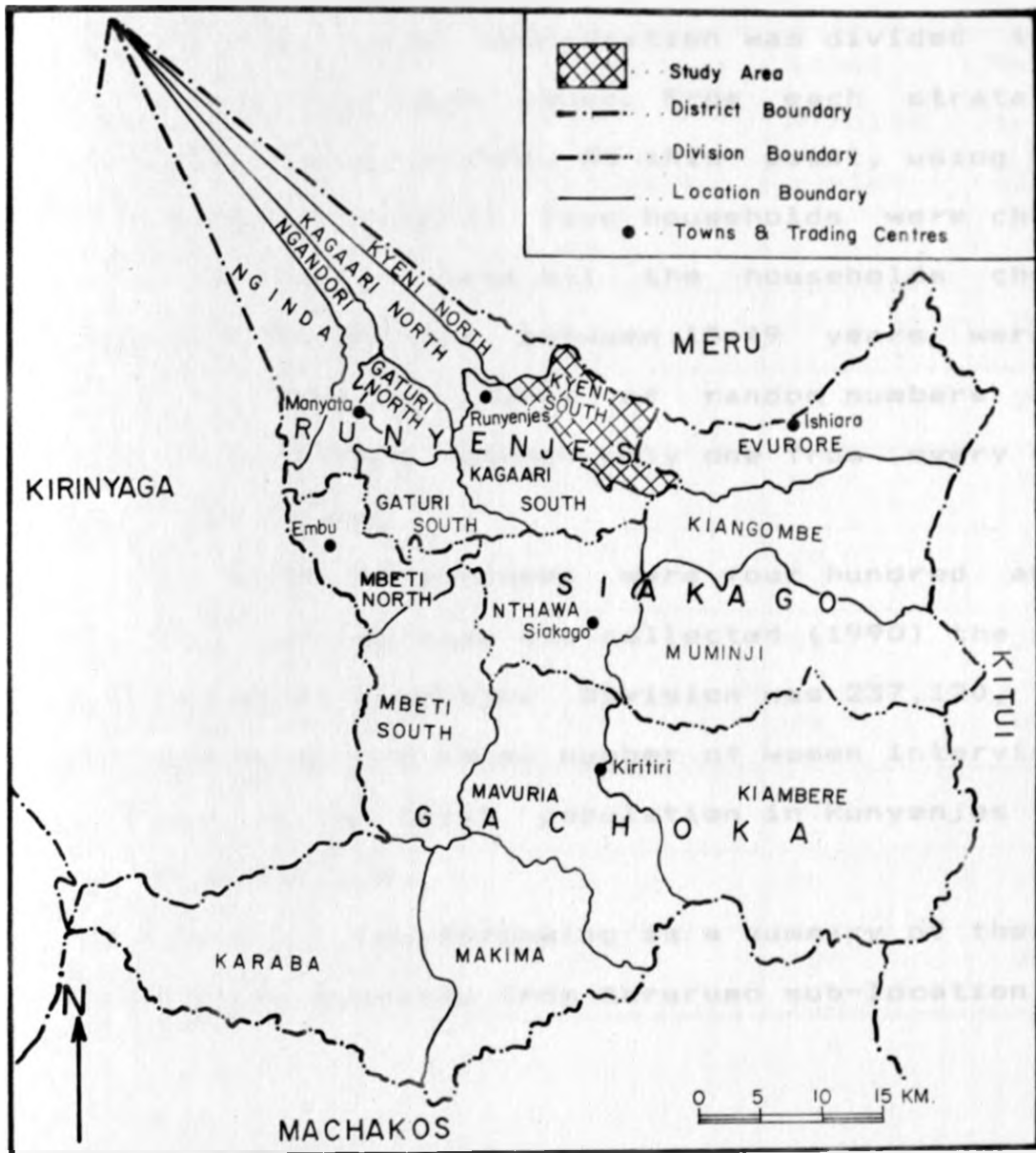
Fig. 6 : LOCATION OF STUDY AREA.

Source Embu DD Plan, 1989/93

The next stage involved dividing each sub-location into strata. Each sub-location was divided into eight strata as mentioned above. From each strata all the households were listed. At this point, using table of random numbers,twenty five households were chosen from each stratum. From all the households chosen all eligible women aged between 15-49 years were listed. Finally using the table of random numbers and from every strata were chosen only one from every household was interviewed.

The women interviewed were four hundred and since by the time the data was collected (1990) the projected population of Runyenjes Division was 237,120, therefore the sample size (total number of women interviewed) as a ratio to the total population in Runyenjes division is 400/237,120.

For example the following is a summary of the complete information gathered from Karurumo sub-location:-

Table 3.1   Clusters defined in Karurumo sub-location

Cluster Number	Cluster name	Number of households	Total H/holds chosen	Respondents per cluster
1	Kararari	32	25	25
2	Kanjau	36	25	25
3	Ngambari	26	25	25
4	Kagumori	40	25	25
5	Kinthithe	36	25	25
6	Kamavindi	39	25	25
7	Gacico	27	25	25
8	Kavai	38	25	25
Total	8 Clusters	272	200	200

3.1.7   Methods of data collection

The data was collected by means of a questionnaire.
The questionnaire was prepared before dispatching to
the field. The questionnaire used in this study was
divided into ten sub-parts. The brief cotents of each
sub-part are as follows :

Part one : mainly bore   questions   seeking   the
respondents background e.g date of birth,
level of education, religion, standards of
living e.t.c.

Part two : this section dealt with the respondents'
womens' group activities e.g   when the
respondent joined the womens' group, the
activities her group is involved in, and
her attitude towards the group in general.

Part three : dealt on   the respondents'   marital
status and how the   group **activities**
have affected her marital status.

Part four : dealt with the reproduction and infant
and child   mortality background of
the respondent   and how these events
are connected to her being in the
group.

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Part five : is on the contraception background of the respondent.

Part six : is on respondents' child health.

Part seven: is on the respondents' decision making behaviour and to what extent the group has influenced her decision making.

Part eight: is on the respondents' demographic behaviour e.g her parity, age at marriage, age at first birth, e.t.c.

Part nine : is on the growth monitoring programme.

Part ten : is on the respondents' benefits from the women group.

The questionnaire was detailed and was printed in English language.

3.1.8 Recruiting and training of Field Assistants
This study involved four field assistants who were recruited and trained on the process of collecting field data. The training involved translating every question on the questionnaire into the local language (Kiembu) . While in the field the assistants posed the questions in Kiembu and filled in the response on the

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already coded questionnaire. The data collection took a period of two months, one month in each sub-location.

3.1.9   Problems Encountered in General

1. The funds provided were not adequate, this posed a limitation in choosing sample size . This also affects the quality of data in that a bigger sample than the one chosen would have been more error free.

2. Most respondents were not being found in their homes this is mainly because during the time when the survey took place people were busy harvesting and clearing the lands for planting and most of this work is carried out by women.

3. Memory lapse was a major set back . Most respondents could not recall the number of births they had and those with children dead had difficult in remembering how many children have died.

3.1.10 Data Processing and Analysis

The data entry and analysis was done by computer using the Statistical package for Social Scientists (SPSS). Since the questionnaire was already coded the process of data entry was straightforward. The qualitative analysis was done according to the chosen methods.

3.2 THE STATISTICAL ANALYSIS OF THE PRIMARY DATA

3.2.1   Outline of the Methodology Used

The method to be used in the analysis is the ordinary least squares multiple regression. The dependent variable is the ratio of observed deaths to expected deaths (Mij2 - mortality index). The mortality index was calculated for every mother in the sample. **3.2.2   Multivariate regression analysis**

This technique of data analysis is used to estimate coefficients of mortality determinants by the variable of interest when some other variables are controlled.   The   form   regression equation is as follows :

$M_{ij} = A + \Sigma\Sigma B_i * X_{ij} + E_i$

where :

A = the constant

B_i = the regression coefficient for the indepedent variable i

E_i = the error term assumed normally distributed (after weighting factor by number of births) with mean zero.

X_{ij} = variable

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M_{ij} = mortality index for the ith woman in the jth category.

The computation of the regression coefficients of the equation and the correlation coefficients can be accomplished by using

either the matrix techniques or a computer. Because of the greater amount of data it is neccesary to use computer facilities. Hence the SPSS (statistical package for social scientists) available in the computer at the Population Studies and Research Institute was used to obtain regression coefficients and other statistical measures needed in the analysis. The package also produces the best relationship for variables when step-wise regression is used.

$$S^2_{Bi} = \frac{S^2}{(1-R^2_i)(N-1)S^2_i}$$

Here R^2 = is the squared multiple correlation when the ith independent variable is considered the dependent variable and the regression equation between it and the other independent variables is calculated. A large value of R^2_i indicates that the ith independent variable is almost a linear function or a combination of the indepedent variables. The proportion of variability not explained by the other variables as before, $1-R^2_i$. This quantity is usually called the *Tolerance*. As can

be seen from the equation above, for a fixed sample and standard error S, the smaller the tolerance the larger the standard error of the coefficient. Small tolerance values can also cause computational problems for the regression solutions.

3.2.3   Application of the Trussel-Preston method .

This method entails the calculation of *mortality index for each woman* and this is used as the dependent variable in a regression analysis. Accordindg to Trussel and Preston (1982) the mortality index used relates both the observed mortality experience of the ewoman and her expected mortality experience. The expected number of deaths was first calculated by multiplying each womans'number of births by the expected proportion of deaths. This ratio was initially used as an index of mortality experience for each mother through the analysis. In order to solve the estimated proportion of children dead, selected standards of mortality are supposed to be taken from the Coale and Demney model life tables. Since the appropriate life table for this rural set of Kenyan population is not available, another procedure to estimate the proportion of dead children was used. Values of q(1), q(2), q(3), q(5), q(10), q(15) and q(20) for the division in which the sub-location lies were instead used. The values were calculated from the

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1979 Kenya population census. These values provide the best possible estimate available for the analysis.

The index of mortality M_{ij} used in this analysis for woman i can be represented by $M_{ij} = D_i / B_i * PD_j$

Where D_i = reported number of children dead for each woman i

B_i = reported number of children ever born for woman i

PD_j = estimated proportion of dead children for women in group j (in this analysis this has been replaced by the q(x) as stated above)

The index of mortality above is also equivalent to the ratio of the proportion of children dead for woman i divided by the proportion of dead children for all women in the age group i. For all women, this mortality ratio is used as the dependent variable in the regression equation;

$M_{ij} = A + B_1 * X_{i1} + \ldots + B_i * X_{ij} + \ldots + B_n * X_{nj} + E_i$

In this case E_i is the difference between the true mortality ratio and estimated mortality ratio for woman i. Unfortunately, in the equation the variance of the mortality index M_{ij} is known to differ over age because younger women have fewer births than older women. On average the number of births result in larger variances for the proportion dead for the younger women. This

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consistent change in the variance over age means that when all women are included in the equation, the assumption of equal variances for residuals E_i does not hold. In fact the variance of each individual is a function of the common variance and the variance of the mortality index.

Therefore if all variables in the regression equation are divided by the standard error (S.E, the square root of the variance) of the mortality for each woman i, the inequality of the variances of the residuals should be removed. This results in the following equation:

$$M_{ij}/S.E = A/S.E + B_1 * X_{i1}/S.E + \ldots + B_1 * X_{ij}/S.E + B_n * X_{in}/S.E + E_i/S.E$$

To this equation denote $Y_i = M_{ij}/S.E$, $Z_{i1}/S.E$, $Z_{ij} = X_{ij}/S.E$,

then the equation becomes

$$Y_i = a + B1*Z_{i1} + \ldots + B_i * Z_{ij} + \ldots + B_n * Z_{in} + e_i$$

$$Var(e_i) = Var(e_i/S.E) = 1/S.E^2 (var(e_i))$$

Since the variance of e_i is known to be related to the index, this weighting has the effect of removing the inequality. In solving the equation it is the variance that is minimized.

3.2.4 Testing of Statistical Significance

This is used to determine the goodness of fit between the sample mean and the population mean. The t-

statistics is calculated as:

$$t = x-u/s*sqrt(n-1)$$

where s = is the sample standard deviation

n = sample size

n-1 = degrees of freedom

To use the t-test the following conditions must be fulfilled:

(1) The variable should be an interval measure

(2) The form of the distribution should be normal

The null hypotheses for the t-statistics is:

H_o: bo= b1=b2=b3=.........bn=0 against alternative hypothesis

H_o: bo≠b1 ≠2 ≠b3 ≠.........≠bn≠0

If the computed t-value is greater than the table value at a given number of degrees of freedom and level of significance then you reject H_o and accept H_1.

However, from the computer print out one can directly test the hypothesis with the following conditions;

If the observed significance level is less than the test level (usually 0.01, 0.05, 0.1 etc) we reject H_o and accept H_1. If the observed significance is greater than the test levels, we reject H_1 and accept H_o.

3.2.5 Problems of multiple regression

Multi- collinearity which is defined as the inter-

correlation of indepedent variables is a major problem with multiple regression. This condition usually arises when independent variables overlap. Their individual influence and effects on the dependent variables become unreliable. The greater the overlap of independent variables, the lower the reliability of the regression coefficients.

The inter- correlation of the explanatory variables is measured by the simple correlation coefficient between the variables. Assumptions of the ordinary least squares method that the disturbance terms are (i) normally distributed with zero expectation and (ii) homoscedastic i.e they have same variance violated.

3.2.6 How problems of multiple regression are overcome in this study

In this study multi-collinearity could arise where the dummy variables each representing the presence or absence of a characteristic are all included in the regression and the dummy include all possibilities. For example, suppose the regression includes the dummy variables representing education of mother i.e where d is 1 when mother has no education and 0 if otherwise, so that no education = 1, std 1 to 4 = 0, std 5 to 8 = 0, form 1 to 2 =0 and form 3 to 4 = 0. If all the dummy variables of education are included in the regression, there will be perfect multi-collinearity. In such a

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case, one of the dummy variables must be dropped to avoid this problem of linear dependence(Intriligator,1978). Since the sample was selected by simple random sampling, variance of error term is normally distributed. The normality assumption may not present a critical problem because the sample considered in this study (400 women)was larger than the required number by standards. The criteria is that the sample size should be greater or equal to thirty.

3.2.7 The Dummy Variable Technique

The categorical variables are introduced into the regression by means of dummy variables. A dummy variable is any variable in an equation that takes on finite number of values for the purpose of identifying different categories of a nominal variable.

3.2.8 Interpretation of results obtained by dummy variable Technique

For a N- category variable, one category is selected and called the reference category. For each of the (N-1) other categories, a dummy or indicator variable is defined taking the value 1 for individuals falling in that category and zero otherwise (R.A. Little, 1980). For example, if we choose No Education as the reference category and define N-1=4 as:

Standard 1 to 4   1   1 to 4 years of education
(MatE1)   =   0   Otherwise

Standard 5 to 8   ┌──1   5 to 8 years of Education
(MatE2)   =   └──0   Otherwise

                      ┌──1   8 to 9 years of education
Form 1 to 2   =   └──
(MatE3)

Form 3 to 4   ┌──1   10 to 11 years of Education
(MatE4)   =   └──0   Otherwise

The factor maternal education is represented in the

regression analysis by a set of dummy variables defined

in this case as   MatE1, MatE2, MatE3 and MatE4.   To see

the effect of this note that the fitted values from

this regression are:

 $Y_i = b_0 + b_1* MatE1_i + b_2* MatE2_i + b_3* MatE3_i + b_4*$

$MatE4_i$ where values

       $MatE1_i$, $MatE2_i$, $MatE3_i$, $MatE4_i$ are the values of

$MatE1$, $MatE2$, $MatE3$, $MatE4$ for respondent i.

     For individuals with no education,

     $MatE1_i = MatE2_i = MatE3_i = MatE4_i = 0$ Hence the

predicted mean is

             $(Y_i/MatE=2) = b_0$ The intercept of the

regression. For individuals with 1 to 4 years of

education   MatE1=1 and MatE2=MatE3=MatE4=0; Hence   the

predicted mean is

     $(Y_i/ MatE=2)=b_0+b_1$

     Similarly for other categories of education we

obtain predicted means as   follows;

$(Yi/MatE =3) =bo+b2$

$(Yi/MatE =4) =bo+b3$

$(Yi/MatE =5) =bo+b4$

Hence the intercept bo is the fitted mean for the reference category and the _slope bj_ is the difference in the fitted mean between category j+1 and the reference category. Two or more factors can be included with each factor having a reference category.

3.3   SECONDARY DATA ANALYSIS

3.3.1   Methods of Data Analysis

3.3.2   Brass-Trussell Technique

This method was developed by Brass (1968) and later modified by Trussell (1975).

3.3.3   Brass Method

Brass (1968) developed a method of transforming statistics on proportion dead among children ever born into infant and child mortality probabilities. This was later modified by Trussell in 1975.

According to Brass, taking proportions of children dead of women in a standard age- group D(i) would after multiplication by a factor which depends on the fertility function yield values of the life table (qx) mortality rates. The equation is written in this form.

$(qx) = k(i) * D(i)$

where the multiplier K(i) is meant to adjust for non-mortality factors determining the variable D(i).

3.3.4 Trussell's Technique.

Trussell improved the Brass technique by introducing a set of multipliers by the same means but using data generated from the model fertility schedules developed by Coale and Trussell. This technique requires children ever born (CEB) and children dead (CD) classified by the age of mother. We also require the female population (FPOP) classified by the five year age-group.

The probability of dying at age (x) is given by the formula

$$q(x) = K(i) * D(i)$$

for x = 1, 2, 3, 5, 10, 15, and 20.

while i = 1, 2, 3, 4, 5, 6, and 7 representing the age groups 15-19 -------20-24----45-49.

$$K(i) = a(i) + b(i) p(i)/p(2) + p(2)/p(3)$$

where a(i), b(i), and c(i) are Trussell's coefficients for estimating child mortality.

$$P(i) = CEB (i)/ FPOP(i)$$

and

$$D(i) = CD (i)/ CEB(i)$$

for the age group (i).

In this technique, an assumption made in its development that the risk of dying of a child is a function only of the age of the child and not of other

factors such as mother's age or the child's birth
order.

3.3.5 How to calculate q(x)

The probability of dying at age (x), q(x), which is
a measure of infant and child mortality developed by
Brass and improved by Trussell requires the following
information.
(a) Children Ever Born (CEB) classified by five year
age groups. (b) Number of Children Dead (CD)
classified by five year age-group of the mother.
(c) The total number of women (FPOP) irrespective of
the marital status of the mother.

3.3.6 The calculation procedure.

Stage 1

The average parity of the woman is calculated as
p(i)
where (i) = 1, 2, 3, ----7 and p(1) is the parity for
women aged 15-19 and p(2) for women aged 20-24 etc.
The formula used is :

$$p(i) = CEB (i)/ FPOP (i)$$

where CEB (i) denotes the number of children ever born
in age group (i) and FPOP (i) is the number of women in
the ith age group irrespective of their marital status.

Stage 2

To calculate the proportion of children dead for each age group of the mother. The proportion of children dead D(i) is defined as the ratio of reported dead to reported children ever born like below:-

   D(i) = CD (i)/ CED (i)

where CD(i) is the reported number of children dead in the ith age group and CEB (i) is the number of children ever born in the ith age group.

Stage 3

The multipliers are calculated. Values used to calculate the multipliers are shown on the table below.

Table 3.3 **Coefficients for estimation of child mortality multipliers when data is classified by age of mother.**

Age Group	(i)	a(i)	b(i)	c(i)
15-19	1	1.1415	-2.707	0.7663
20-24	2	1.2563	-0.5381	- 0.2637
25-29	3	1.1851	0.0633	-0.4177
30-34	4	1.1720	0.2341	-0.4272
35-39	5	1.1865	0.3030	-0.4452
40-44	6	1.1746	0.3314	-0.4537
45-49	7	1.1639	0.3190	-0.4435

Source: Manual X " Indirect Methods for Demographic Estimations." New York.

The multiplier denoted by K(i) is computed as

   $K(i) = a(i) + b(i) * p(1)/p(2) + c(i) *$

p(2)/p(3)

where $a(i)$, $b(i)$ and $c(i)$ are constant coefficients in the ith age group and $p(1)$, $p(2)$ and $p(3)$ are average parities for age groups 15-19, 20-24, -----45-49.

Stage 4

$q(x)$ which is the probability of dying is calculated as

$$q(x) = K(i) * D(i)$$

where $x = 1, 2, 3, 5, 10, 15,$ and 20. The Trussell method helps in measuring the level of infant and child mortality in terms of $q(x)$. Other measures such as infant mortality rate$_1q_0$, child mortality rate$_4q_1$ and life expectancy e_0 can be used. This measures all functions of life tables. Trussells $q(x)$ is an important in construction of a life table.

3.3.7. How to construct a life table

A statistical model used to measure mortality of a hypothetical population is known as a life table. A life table also provides a description of the most prominent aspects of the state of human mortality (Kpedekpo 1982). It can be used to estimate the infant and child mortality rate and the life expectancy at birth which is used as a measure of mortality level of a society. The first step in constructing a life table

is to calculate the mortality levels corresponding to
the values of q(x) obtained above.

3.3.8 To calculate mortality levels.

Linear interpolation is used in calculating mortality
levels . e.g given two points (x_1y_1) and (x_2y_2), if a
point (x,y) lies in between them as demonstrated
below :-

_____^_____^_____^___
       (x_1y_1) (x,y)
(x_2y_2)

$$\frac{y_2 - y_1}{x - x_1} = \frac{x_2 - x_1}{y - y_1}$$

implying that,

$$x - x_1 = \frac{(y - y_1)*(x_2 - x_1)}{y_2 - y_1}$$

therefore,

$$x = x_1 + \frac{(y - y_1)*(x_2 - x_1)}{x_2 - x_1}$$

if,

$$x_2 - x_1 = 1$$

Then,

$$y_1 + y_2 *(x - x_1) - y_1 *(x - x_1)$$
$$= (1 - (x - x_1)* y_1 + (x - x_1)* y_2$$

In this computation:

$$x = p(x)$$

$$x_1 = lower \ l(x)$$

$$x_2 = upper \ l(x)$$

$$y_1 = lower \ mortality \ level$$

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$$y_2 = \text{upper mortality level}$$

After getting the values of $l(x)$ other values of the Life table can be obtained as follows.

$_np_x$ = the probability of surviving between age x and $x + n$

$$= \frac{l_x +_n}{l_x}$$

$_nd_x$ = number of person years lived between age x and $x + n$

$$= l_x - l_x +_n$$

where:

$$_1L_0 = 0.3 * l_0 + 0.7 * l_1$$

$$_4L_1 = 1.3 * l_1 + 2.7 * l_4$$

$$_5L_x = 5 * ($$

$l_x + l_x + _5$)/2   for x = 5, 10, 15,------70.

$$L_{75} = l_{75} * \log_{10} * 175$$

T_x = the total person years lived from age x

$$= T_x +_n +_nL_x$$

$_nq_x$ =

probability of dying between age x and $x +_n$

$$= 1 -_np_x$$

e_x = expectation of life at age x

Now using the same technique the mortality estimates at divisional level can be calculated. In the analysis of mortality differentials, the estimates used are, $_1q_0$ for the infant mortality,

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$_4q_1$ for child mortality, q_2, q_3, and q_5 are the probability of dying at age 2, 3, and age 5 respectively. Another index to be used is e_0 for life expectancy at birth.

CHAPTER FOUR

MORTALITY ESTIMATES AT DISTRICT LEVEL.

This section will outline the differential in infant mortality $_1q_0$, child mortality $_4q_1$, and life expectancy at birth e_0, q_2 which is a more accurate measure of infant and child mortality will also be given, also to be outlined are probability of dying at age 3 (q_3), and q_5 the probability of dying at age five. Using the Trussell's technique as analyzed above the following results were obtained.

Table 4.1   Infant and child mortality rates, probability of dying at age x (q_x), and the life expectancy at birth e_0, of the divisions in Embu District.

Area	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
EMBU DISTRICT	76.2	47.9	82.9	104.5	135.7	56.2
Runyenjes	82.5	53.8	63.7	83.5	106.3	54.8
Gachoka	86.8	57.9	98.5	119.9	154.1	53.8
Siakago	77.4	48.8	112.	5.9	205.7	56.0

According to the information on table 2.1, infant

mortality for the whole district is lower than either of the divisions. However q_2 for the district is higher than for Runyenyenjes division. Like infant mortality e_0 is highest for the whole district.

Table 4.2 **Infant and child mortality rates, probability of dying at age (x) (q_x),and life expectancy at birth e_0, for Embu District by place of Residence.**

Place of Residence	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
Urban	71.8	44.0	88.9	91.7	118.6	57.2
Rural	76.8	48.2	82.2	105.6	136.6	56.2
Rural and Urban	76.2	47.9	82.9	104.5	135.7	56.2

Infant mortality $(_1q_0)$ for women living in all urban areas of Embu district is 71.8 deaths per 1000 live births while the life expectancy at birth for children born to those women is 57.2 years. For rural areas the infant mortality is higher which is 76.4 deaths per 1000 live births whereas life expectancy e_0 is lower at 56.2 years. The higher life expectancy in urban areas can be explained by the availability of certain facilities which are lacking in the rural areas such as medical and education amenities.

Child mortality $_4q_1$ for urban areas is 44.0 deaths per 1000 for rural is 48.2 deaths per 1000 live births. The probability of dying at age five q_5 is the highest which is 118.6 deaths per 1000 live births for urban areas and 136 deaths per 1000 live births for all rural areas in the district.

Table 4.3   Infant and child mortality, probability of dying at age x (q_x), and life expectancy e_0 for Embu district by level of education

Level of education	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
No education	91.6	62.5	112.5	125.5	154.6	52.7
Primary education	65.2	38.3	73.0	89.6	106.9	58.8
Secondary+ education	36.0	143.7	45.6	40.1	46.4	66.2

For the marital status differential, infant mortality for Embu district is highest for those women who have no education, followed by those with primary education and finally those who have secondary+ education have the lowest infant mortality. The probability of dying at age two q_2 follows a similar

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trend for the whole district as shown in table 2.3 as does the life expectancy at birth e_0 .

Table 4.4 Infant and child mortality, the probability of dying at age x (q_x), and life expectancy at birth (e_0) for Embu district by marital status

Marital status	$_1q_0$	$_4q_0$	q_2	q_3	q_5	e_0
Single	71.5	43.7	55.5	107.6	148.1	57.3
Married	75.9	47.7	85.5	100.6	132.2	56.3
Widowed	141.1	113.6	164.6	204.1	201.5	42.9
Divorced or Separated	90.2	61.1	99.2	140.3	148.7	53.0

Infant mortality is highest for women who are widowed followed by those who are divorced or separated, then those who are married and lastly those who are single. The trend for q_2 is similar with the children born to the widowed women having the highest probability of dying at age two and for those who are single having the least probability. The trend for e_0 is a similar one.

4.1 MORTALITY ESTIMATES AT DIVISIONAL LEVELS

4.1.1 Mortality differential by place of residence

Table 4.5 Infant and child mortality rates, probability of dying at age x (q_x), and life expectancy at birth e_0, in Runyenjes Division by place of residence.

Place of Residence	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
Urban	82.5	53.8	63.2	63.3	99.4	54.8
Rural	92.5	53.8	83.7	83.7	116.4	44.8
Urban and Rural	90.5	53.8	63.7	83.5	106.3	48.8

The differences in infant mortality for Runyenjes division by place of residence are higher compared with the ones for the district. Infant mortality is higher in rural areas than urban areas of Runyenjes. Child mortality also is higher for rural areas than urban areas. The probability of dying at age two (q_2) is highest for women in the rural areas 83.7 deaths per 1000 live births, followed by those in urban areas with 63.2 deaths per 1000 live births. However the

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probability of dying at age five (q_5) for urban areas is 99.4 deaths for urban areas and 116.4 deaths for rural areas.

Table 4.6 Infant and child mortality, probability of dying at age x (q_x), and life expectancy at birth e_0, for Gachoka division by place of residence.

Place of residence	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
Urban	24.8	6.4	31.1	28.9	25.7	69.4
Rural	72.6	44.8	89	93.9	120.6	57
Rural and Urban	86.8	57.9	98.5	119.9	154.1	53.8

The trend of infant and child mortality for Gachoka division is as follows. Infant mortality is lowest in urban areas with 24.8 deaths per 1000 and highest in rural areas with 72.6 deaths per 1000 live births. Child mortality (q_5), is also lowest in urban areas with 25.7 deaths per 1000 live births and 120.6 in rural areas. The probability of dying at age two (q_2), is very high for rural areas compared with the urban areas.

Table 4.7   Infant and child mortality, probability of dying at age x   (q_x), and life expectancy at birth e_0 for Siakago division by place of residence.

Place of residence	${}_1q_0$	${}_4q_1$	q_2	q_3	q_5	e_0
Urban	77.6	49.3	58.7	145.1	111.9	55.9
Rural	79.5	51	112.4	167.8	206.2	55.4
Rural and Urban	77.4	48.8	112.1	85.9	205.7	56.0

For Siakago division, infant mortality is lower for urban areas than for rural areas. Life expectancy is lower for children born to rural women than for urban areas.   However the probability of dying at age five (q_5) is very high in rural areas and lower in urban areas.The following is the life table for the total population in Siakago division.

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4.1.2 MORTALITY DIFFERENTIAL BY EDUCATION

Table 4.8 Infant and child mortality, probability of dying at age x (q_x), and life expectancy at birth e_0 for Runyenjes divion by level of Education.

Level of education	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
No education	72.2	44.4	80.2	104.2	118.3	57.3
Primary education	54.6	29.4	62.6	68.2	89.9	61.3
Secondary education	33.0	11.9	32.9	40.8	48.5	67.1

As table 2.6 shows infant mortality for mothers with no education is highest followed by those with primary education and the least for those with secondary education. This clearly states the negative effect education has on infant mortality. It can therefore be argued that education is an important tool in fighting the incidence of infant mortality. Life expectancy is higher for children born to mothers with secondary + education. For this division e_0 for children whose mothers have secondary+ education is 67.1 years compared to 57.3 for those children born to mothers with no education at all. For children whose

mothers have attained primary education e_0 is 61.3
years.

The probability of dying at age five is highest for
those children whose mothers have no education 118.3,
followed by those whose mothers have primary education
89.7, and 48.5 for those whose mothers have secondary+
education. q_2, which is a more accurate measure of
infant and child mortality also depicts the same trend
for this division, where q_2 is 80.2 for mothers with no
education, 62.8 for primary educated mothers and 32.9
for mothers with secondary + education.

Table 4.9   Infant and child mortality, probability of
             dying at age x (q_x), and life expectancy
             at birth e_0,for Gachoka division by level
             of Education.

Level of education	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
No education	80.5	49.2	137.9	143.9	179.4	55.2
Primary education	78.1	51.9	89.7	112.6	121.3	55.7
Secondary +	77.5	49.7	62.4	40.1	37.7	55.8

Infant mortality in this division is lowest for
women with secondary 77.5, followed by those with
primary+ education 78.1, and the highest incidence of
infant mortality is for those women with no education
which is 80.5.   The trend for q_2 is as follows,whereby
the probability of dying at age two 137.9 for those
women with no education, 89.7 for women with primary
education and 62.4 for those with secondary+ education.
The probability of dying at age five also depicts a
similar trend. The trend for e_0 shows that e_0 for

women with no education is lowest, followed by those with primary education, and finally children born to women with secondary+ education have the lowest life expectancy of 55.2 years.

Table 4.10 Infant and child mortality, the probability of dying at age x (q_x), and life expectancy at birth e_0, for Siakago division by level of education.

Level of education	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
No education	117.9	90.4	39.9	156	223	47.2
Primary education	53.9	23.9	79.9	119.9	158	58.6
Secondary+ education	39.3	16.9	39.1	32.1	86.5	65.4

Infant mortality is highest for women with no education, followed by those with primary education and lastly those with secondary+ education. The probability of dying at age five for children in

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Siakago division is highest of the three divisions with 223 deaths per 1000 live births for women with no education, 158 for those with primary education and 86.5 for those with secondary+ education. Similarly this division has the lowest e_0 for women with no education which is 47.2 years.

4.1.3 Mortality differential by marital status .

Table 4.11   Infant and child mortality,   probability of
            dying at age x (q_x), and life expectancy
            at birth e_0, for Runyenjes division by
            Marital status.

Marital Status	$_1q_2$	$_4q_1$	q_2	q_3	q_5	e_0
Single	82.5	53.8	51.5	66.7	104.5	54.7
Married	82.5	53.8	65.4	80.8	103.7	54.7
Widowed	93.0	63.9	90.5	89.2	155.0	52.4
Divorced or separated	82.5	53.7	73.4	122.9	135.2	54.7

Infant mortality is highest for the widowed 93.0

and similarly q_2 is highest for the same category of women. q_2 for the widowed women is 90.5 deaths per 1000 live births and the probability of dying at age five q_5 is 155 deaths per 1000 live births. However the differences in e_0 is slight for the categories of women, with the children born to the widowed having the least life expectancy at birth of 52.4 years while all the other groups have an e_0 of 54.7 years.

Table 4.12 Infant and child mortality, probability of dying at age x (q_x), and life expectancy at birth e_0 for Gachoka division by Marital status

Marital Status	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
Single	78.6	50.2	51.9	120.5	188.3	55.7
Married	85.9	57.1	103.7	117.5	148.9	53.9
Widowed	139.9	112.3	214.8	178.9	223.5	43.1
Divorced or Separated	100.2	71.2	127.2	142.5	156.5	50.9

For this division, infant mortality is highest for the widowed women, followed by the divorced or separated, married and, those who are single respectively. The probability of dying at age two (q_2) is also highest for women who are widowed, followed by the divorced or separated, married and the single respectively. Life expectancy is highest for those children whose mothers are single, followed by those of the married women, then for the divorced or separated, and finally for those belonging to the divorced women.

Table 4.13 Infant and child mortality, probability of dying at age x (q_x), and life expectancy at birth (e_0), for Siakago division by Marital status.

Marital status	$_1q_0$	$_4q_1$	q_2	q_3	q_5	e_0
Single	75.7	50.1	116.5	222.4	172.1	56.2
Married	75.3	48.1	108.5	135.3	204.1	56.3
Widowed	78.6	47.6	211.2	300.5	265.3	55.6
Divorced or separated	76.3	48.1	141.4	186.1	182.0	56.1

In this division infant mortality is highest for those women who are widowed with 78.6 deaths per 1000 live births followed by those who are divorced or separated with 76.3, followed by the single and the married coming last. The trend for q_2 is more consistent with the widowed having the highest q_2, followed by the divorced or separated, then those who

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are married and lastly those who are single. The differences in life expectancy are slight as shown in the table 4.13.

Infant mortality for Embu District is 76.2 deaths per 1000 live births and child mortality is 47.9 deaths per 1000 live births. Among the three divisions Gachoka has the highest infant mortality, followed by Runyenjes and finally Siakago with the lowest. The trend for child mortality for the divisions is similar (refer table 4.1)

CHAPTER FIVE

DESCRIPTIVE ANALYSIS OF THE RAW DATA

5.1 ANALYSIS OF SELECTED VARIABLE (FREQUENCIES AND PERCENTAGES

The following are selected variables from the study done in karurumo sub-location. In this section only analysis of a few variables will be provided in tabular form, the rest will be given in the appendix.

In the process of studying the impact of womens' activities on infant and child mortality, several variables cannot be ignored. For example, studies done in the past have shown that the mothers' education is negatively related to the education of her children. Kichamu (1986) found that child mortality levels decreased as mothers level of education increased. Therefore this study was concerned in finding out the education situation of the group women and the highest level of education attained. Apart from the formal education attained in the schooling system women groups impart different types of education to the women which in one way or the other contributes to the knowledge of the participant and consequently affects the mortality of her children.

Table 5.1   Those women in   Karurumo who ever   attended
school.

Attended school	Frequency	Percent %
Schooling	81.5	163
No schooling	18.5	37
Total	100.0	200

This distribution depicts that majority of the women in this sub-location have ever attended school 81.5 % and only 18.5% have never attended . Therefore, this is a clear picture to show that all women irrespective of their literacy status are invo ved in women group activities.

Table 5.2 Highest level of education attained by women in Karurumo.

Education level	Frequency	Percent %
No education	35	18.1
Primary	126	63.0
Secondary +	36	17.5
No response	3	1.5
Total	200	100.0

The above table shows the levels of education attained by the women interviewed in Karurumo sub-location. Majority of the women had primary education 63.0% , 17.5% had secondary education and above, and 18.1% had no education.

Table 5.3 Those women in Kigumo who ever attended school.

Attended school	Percent	Frequency
Schooling	79.5	159
No schooling	20.5	41
Total	100.0	200

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Compared to Karurumo, this sub-location has fewer women who have ever attended school. As the above table shows those women who have had no schooling are 20.5% and those who have ever gone to school are 79.5%.

Table 5.4   Highest level of education attained.

Education level	Frequency	Percent %
No education	33	16.5
Primary	128	64.0
Secondary +	34	17.0
No response	5	2.5
Total	200	100.0

According to the above table, those women who have attained primary education in Kigumo are more than Karurumo i.e 64.0%, 17.0% have attained secondary and above yet only 16.5% who have never attended school.

The level of education may influence a mothers' awareness and knowledge in matters contributing to the general welfare of the family. For example an educated mother is likely to make sure that her family uses a more hygienic type of toilet than a mother who is not educated. However most women groups have a system of educating their members on different matters which directly or indirectly affect their families. In the

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course of the survey the women were asked in both sub-
locations wether the group imparts education to them.

Table 5.5   Women   in   Karurumo   who   benefited   in
education from the womens' group.

Education benefits	Frequency	Percent
Benefited	120	60.0
Not benefited	80	40.0
Total	200	100

It is important to note that the kind of education
imparted by the group could be such as agricultural
and livestock farming, child care, contraception,
importance of breastfeeding and immunization, pre-natal
care, means of savings, etc. This kind of education is
taught by guest lecturers invited from outside or by
group members who are conversant on the subject.
N.B.: *This information was collected through the*
questionnaire from the respondents.

Table 5.6   Women   from   Kigumo   who   benefited   in
            education from   the womens' group.

Education benefits	Frequency	Percent
Benefited	121	60.5
Not benefited	79	39.5
Total	200	100

The   response on forms   of education   obtained from
the   for this   sub-location   was   as for   Karurumo   sub-
location. (*See under previous table*)

There may   also be   a relationship   between type of
toilet   used and   level of   education.   This   is simply
because as stated earlier a mother who   is educated will
be   more   conscious   of   the   health   standards   of   her
family.   For example a mother with no   education might
see no   harm in her children   using the bush to   dispose
their   faeces whereas a mother   with education might be
aware   that   a   toilet is   better   to prevent   spread of
diseases and   conserve environmental   cleanliness.   The
tables   below   will show   the type   toilet used   in each
sub-location.

Table 5.7 *Type of toilet used in Karurumo sub-location*

Toilet type	Frequency	Percent %
Flush	2	1.0
Pit	197	98.5
Bush	1	0.5
Total	200	100.0

Table 5.8 *Type of toilet used in Kigumo sub-location.*

Toilet type	Frequency	Percent %
Flush	0	0
Pit	200	100
Bush	0	0
Total	200	100.0

Group activities have also enabled some become more independent in the area of decision making. This is mainly as a result of the education imparted in the group and also through working closely with different

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people who have been exposed to a variety of studies. Independent decision making gives the mother a more secure sense of freedom in that she can be left alone to make more complex decisions such as financial matters.

Decision making may also vary with the level of education of the woman. Where the husband is the household head, the wife will be entrusted to make major decisions according to her level of education.

Table 5.9   Women   who   can   make   decisions   without   husband's   interference   in   Karurumo   sub-location

Decision making	Frequency	Percent
Can make decisions	145	72.5
No making decisions	54	27.0
No response	1	0.5
Total	200	100.0

Table 5.10   Women who feel the group has enabled them
make   more   decisions   than   before   they
joined in karurumo sub-location

Decision making	Frequency	Percent
Benefited	89	44.5
Not benefited	107	53.5
No response	4	2.0
Total	200	100.0

Table 5.11   Women   who can   make   decisions without
husband's   interference   in   Kigumo   Sub-
location

Decision making	Frequency	Percent
Can make decisions	145	72.5
No making decisions	49	24.5
No response	6	3.0
Total	200	100.0

Table 5.12 Women who feel the group has enabled them make more decisions than before they joined in Kigumo Sub-location

Decision making	Frequency	Percent
Benefited	83	41.5
Not benefited	110	55.0
No response	7	0.5
Total	200	100.0

Some economic factors such as income, savings, and investments are generally new phenomena before joining the group but after joining the woman may benefit from either of these. Some women groups have income generating projects such as bee-keeping, goat-keeping, cattle rearing, poultry keeping, commercial and rental buildings, etc. The income obtained from these projects is shared among group members and some of it may be used in expanding the projects or starting another. The money is shared in a systematic manner from one womens' group to another. In some groups a member is given money at the end of every month until each one of them receives and they start all over again. In other groups a member may receive cash once every two or three months and so on. However there are

some groups that specifically have one objective of raising money, not from projects but from their pockets. For example, they may decide to contribute twenty shillings every month and the overall contribution is given to one member and this is done until each member gets a chance. As a result, some of those women who are in groups have acquired a source of income. In some groups, members have benefited materially, e.g by getting water tanks, roofing iron sheets, livestock, utensils etc. The tables below gives the distribution of how women have benefited economically from the two sub-locations.

Table 5.13 How respondent benefits from the group (Karurumo)

Benefits	Frequency	Percent %
Given cash	138	69.0
" utensil	32	16.0
" livestock	13	6.9
Literacy	12	6.0
Health education	5	2.5
Total	200	100.0

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Table 5.14 How respondent benefits from the group (Kigumo)

Benefits	Frequency	Percent %
Given cash	134	67.0
" utensil	48	24.0
" livestock	8	4.0
Literacy	4	2.0
Health education	6	3.0
Total	200	100.0

Some groups emphasise the importance of having a savings account and the necessity of investing to its members. There   fore during the survey some members confirmed   that they opened savings accounts after joining the group not out of pressure but after learning the necessity of doing such a thing from the group.

Table 5.15 Account opened before or after joining group (Karurumo)

Account	Frequency	Percent %
Before	95	47.5
After	101	50.5
No response	4	2.0
Total	200	100.0

Table 5.16 Account opened before or after joining group (Kigumo)

Account	Frequency	Percent %
Before	117	58.5
After	83	41.5
Total	200	100.0

Marital stability is negatively related to infant and child mortality. Kichamu (1986) found that child mortality for widowed mothers is highest followed by the divorced and separated whereas for married mothers is not as high.

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In some instances group activities have been found to contribute either to marital stability or instability. There are cases where homes have broken after husbands have mistreated their wives because of being involved in group activities. Consequently, some marriages have been saved after the mother joining the group maybe because provides a source of income, shelter,food, and emotional support. There are also cases where husbands have changed their roles of providing for the family after the wife joins the group.

Table 5.17   Cases where marriage has broken because of group matters (Karuruao)

Marital Problems	Frequency	Percent %
No problems	194	97.0
Fights	1	0.5
Separation	5	97.0
Total	200	200

Table 5.20   Cases   where husband has   changed his roles
            because of group matters (Kigumo)

Changed Roles	Frequency	Percent %
Yes	7	3.5
No	184	92.0
No response	9	4.5
Total	200	100.0

Group activities have also been known to affect
other factors such as contraception, breastfeeding, and
immunization though not directly but indirectly.
Previous studies have proved that if a mother has
successive pregnancies and thus having close birth
intervals, then she has a higher probability of her
children dying in infancy and childhood than a mother
who adequately spaces her children. Therefore
contraception helps in birth spacing and some groups
advise their members to assess the need of taking
contraception seriously. During the survey though some
women were already on contraception some admitted that
they started contraception after joining the group.

Table 5.21 Women's view on contraception

View	Frequency	Percent
Acceptable	167	83.5
Not acceptable	30	36.0
No response	3	1.0
Total	200	100.0

*Table 5.22 Women who have benefited from family
            planning and birth spacing from the group.*

F.P/Birth spacing	Frequency	Percent
Benefited	121	60.5
Not benefited	76	38.0
No response	3	1.5
Total	200	100.0

Breastfeeding and immunization are important
factors in determining child survival. Some of the
groups studied showed that women were taught the
importance of breastfeeding and immunization. *(Tables for*

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these are available in the appendix)

    As an activity that is destined to lower infant and
child mortality in Karurumo sub-location, the Growth
Monitoring Programme from this survey has been so far
successful. This programme fully involves the
attention of the mother in monitoring the growth of her
children. Most women are taking two children each for
the weighing, then one child and few take three
children as shown below.

*Table 5.23 Number of children taken for growth
monitoring per woman*

No. of children	Frequency	Percent
1	119	59.5
2	72	36.0
3	9	**4.5**
Total	200	100.0

Table 5.24 Participant's response on the effect of the programme

Response	Frequency	Percent
Positive	169	84.5
Negative	31	15.5
Total	200	100.0

5.2 SUMMARY OF THE CHAPTER

Several socio-economic, demographic and
environmental factors cannot be separated from
the womens' activities. In one way or the other
they may relate positively or negatively to infant
and child mortality. For example, during several
of their activities education on various issues is
gained. Education on such issues such as child
care, contraception, immunization, may directly or
indirectly contribute infant and child mortality.
Some groups provide a source of income to its
members and with money available the member can buy
foodstuffs, shelter, clothing, medical, etc. for
her family thus influencing infant and child
mortality. Some activities involve giving water
tanks, roofing materials and this provides clean
water for consumption and this may directly

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influence infant mortality.

Some activities have contributed to marital stability whereas others have contributed to marital instability. Most of these provisions made through the womens' activities affect infant and child mortality directly or indirectly. To make an adequate assessment of womens' activities on infant and childhood mortality, one will have to first look at the nature of the project and how the women are involved into it. Then it would be important to assess how women are benefitting from such a project and finally look at how these benefits affect the mortality of her children.

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CHAPTER SIX

RESULTS OF REGRESSION ANALYSIS

6.1 INTRODUCTION

Factors which come as a result of a woman being involved in a womens' activities are what can be said to have a direct or indirect impact on infant and child mortality. In this section we are going to assess the effect of these factors on infant and child mortality using a multivariate regression analysis. A micro analysis will be carried out using data collected from both Kigumo and Kerurumo Sub-locations.

6.2 DEFINITION OF VARIABLES IN THE REGRESSION ANALYSIS

The categories defined below were found to significantly affect the mortality index (ratio of observed to expected deaths per woman) when considered with the reference categories.

6.2.1 Demographic factors

(i) AMOT - refers to age of the mother. The age of the mother was recorded in years.

(ii) BAJB - refers to births the woman had after joining the group

(iii) Mij - Mortality index (ratio of observed to expected deaths)

6.2.2 Women Group factors

(iii) DRG - refers to the duration respondent has been in the group

(iv) FRCASH3 - frequency in receiving cash from the group. *This category receives once in two months*. The category *once a year* was considered as the reference category with dummy variable O.

(v) EBEN2 - Those women who have benefited in health education from the group. Category considered as the reference category with the dummy variable O was 'academic education'.

(vi) EBEN5 - Those women who have benefited in agricultural education from the group. The reference category was 'academic education' with dummy variable O.

(vii) GAHC - 'Group activities' impact on the health of the children has been positive. The reference category was 'no impact' taking the dummy variable.

Table 6.1   Mean and standard deviation for regression
variables

VARIABLE	MEAN	STANDARD DEVIATION
AMOT	31.916	7.420
FRCASH3	0.234	0.424
GAHC2	0.371	0.484
EBEN2	0.094	0.292
EDBEN5	0.435	0.497
BAJG	1.811	1.655
DRG	3.014	2.449
Mij	0.005	0.016

6.3.   DISCUSSION OF THE RESULTS

The regression analysis is reported in tables 5.2 and
5.3. The means and standard deviations have been
reported in table 5.1 above. Stepwise regression was
used to analyze the data and every variable was put
into the equation in some sequence. The order of
inclusion of variables was determined by the computer.
Each of the additional variables was brought into the
equation at separate stages on the merits of the amount
of the unexplained variation on mortality it accounted
for. At each stage of the regression analysis, the

SPSS package printed an analysis of variance tables giving the regression coefficients, residual sum of squares, and the t- statistics.

Table 6.2   Regression variables for equation 1

VARIABLE	1	2	3
BAJG	-0.03985	-0.31103	-0.31668
AMOT		-0.5665	-0.64456
DRG			-0.80598
Constant	0.002	0.01875	0.01889
R²	0.172	0.231	0.698

**Note: The level of significance was taken as 0.05.

     Table 6.2 gives the basic results of multi-variate regression.

In the first equation three variables were included , these are births after joining group, age of the mother and duration respondent has been in the group. The equation obtained can be summarized as follows:

Equation 1.

$Mij = 0.01889 - 0.3166(BAJG) - 0.6445(AMOT) - 0.8059(DRG)$

     From the above equation it is strongly evident that variables such as age of the mother, the duration a

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woman has been in a group and births got after joining the group are all negatively related to the ratio of observed to expected deaths of children.

From studies done previously, the mothers age has proved to affect infant and child mortality negatively or positively. For example children born to very young mothers below 15 year, are at a higher risk of dying than those children born to mothers who are older between 15- 45 years. This finding has also been reported by other studies (KDHS, 1989, Ondimu, 1987, Kandeh, 1979) Likewise children born to very old mothers over 45 years, have a higher risk of dying before they are five years old. The results of this study therefore shows that infant and child mortality of the women interviewed was to a large extent affected by the age of the mother, in this case the mothers' age was viewed as factor that lowered infant and child mortality.

The duration a respondent has been in the group is another factor that helps to reduce mortality. The focus of this study was on the influence of womens' activities on infant and child mortality. Therefore the duration a woman stays in a group is of crucial importance in that all the activities a woman is likely to benefit from in a group take a lot of time to materialise. It would not be useful for woman to join

a group and quit after a month or so because most of the activities involve a lot of time and the womans' participation as well. In the long run the group members can start realising the benefits they have had from the group. For example, from the information gathered in this study most women reported that some groups engage in activities which can be termed as 'long term,' these activities are such as the growth monitoring programme. For a mother to realise the benefits of such a programme, it is important that she continue weighing her children for the stipulated period. Likewise for the income generating projects such as building rental and residential houses, cattle, goat and bee-keeping projects, and on a participants need to be in the project for a long for her to realize the benefits of such projects especially on the survival of her children.

The births a woman gets after joining the group according to the regression analysis affect the ratio of observed to expected deaths negatively. From the data gathered in this study majority of the women interviewed stated that they first learnt of contraceptive methods, birth spacing and family planning from the women group (See appendix II). Also several admitted that they learnt the importance of lengthy breastfeeding, immunization,

and general child health and child care education from the group. Therefore it is likely that a woman who gives birth after joining the group is likely to be more equipped with child care knowledge and thus practise it on her child who has lower risks of dying now than before the mother joined the womens group. From this point of view, if all women who give birth after joining the group utilised the knowledge they acquire from the group then, this factor is likely to have a negative effect on infant and child mortality.

From equation one the variable *duration respondent has been in the group* is very significant in this study because the major objective was to find the influence of womens' activities on infant and child mortality. The total variation in mortality index (infant and child mortality) explained by all the variables is 69.8%. This is shown by the row R^2 in table 5.2 above. At this point we decided to do further regression to find out how the group benefits explain the relationship there is between these benefits and the mortality index. The regression analysis is reported in the table below:

Table 6.3   Regression variables for equation 2

Variable	1	2	3	4	5
AMOT	0.76191	0.78334	0.78400	0.77859	0.7619
FRCASH3		0.65591	0.74942	0.81831	0.8374
GAHC2			0.62754	0.6919	0.7475
EDBEN2				0.89725	0.1149
EDBEN5					0.4979
Constant	0.01755	0.01934	0.02298	0.02362	0.02551
R^2	0.249	0.3264	0.4866	0.5987	0.6234

**Note:The level of significance was taken as 0.05.
After this was done the following equation was
obtained.

Equation 2.

$$M_{ij} = 0.0251 - 0.7619(AMOT) - 0.8374(FRCASH3) - 0.7475(GAHC2) - 0.1149(EDBEN2) - 0.4979(EDBEN5)$$

After obtaining this equation it was now
evident that the age of the mother still had a
negative impact on the mortality index.

The frequency of receiving cash once in two months
also has a negative impact on the mortality index.
However this variable is likely to vary from one group

to another depending on the amount given to each member. From this study it is likely that those women who received money once in two months got a large sum which is good enough to create an impact on the survival of their children. This variable also highlights to us the importance of money to the mother. In most instances women are left out in the area of decision making in family matters especially where money is concerned. However the results obtained in this study show us that the money a woman gets from the group projects is of crucial benefit to the survival of their children.

Some group activities significantly affect the health of the children and this has a negative impact on infant and child mortality. It is important to realize that the health of the child determines whether the child is going to survive or not. A childs' good health is a positive indicator that the chances of survival are higher than a child of constant poor health. Therefore if group activities enhance the health of the child, then this variable is likely to affect infant and child mortality. In this case projects which are likely to improve the health of children such as the growth monitoring and promotion programme, income generating activities, welfare projects and education in general are of great

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importance in this finding.

Education variable is a broad category. In this study the objective was to find out what education benefits women get from the group. After regressing this variable against the mortality index it was found that the benefit of health education (EDBEN2) has a negative impact on mortality index. Health education is very important to every mother . This type of education includes all aspects of health measures which need to be taken during pregnancy (ante-natal), after giving birth (post-natal), child care and child health (importance of balancing the diet, lengthy breastfeeding and immunization), and general hygiene measures which a mother needs to know. So it is no wonder that this variable significantly affects infant and child mortality. Most women groups invite guest lecturers such as nutritionists, nurses/midwives, doctors, teachers, social workers, and politicians to educate them on various issues beneficial to them.

The other education variable is agricultural education, coded as (EDBEN5). This variable has a negative effect on mortality index. Like health education, agricultural education is likely to have a negative impact on infant and child mortality the reason being that women are taught what to plant, its nutrition usefulness, and how to plant it to ensure

good production. Famine, which leads to hunger in the past and currently accounts for a large number of infant and child mortality in most developing countries. However studies previously done have showed that women produced most of the food consumed in the third world countries. This kind of education is given by quest lecturers or by some group members who are more enlightened. The total variation in mortality explained by all the variables included in the equation above is about 62%.

6.4. SUMMARY OF THE CHAPTER

The effect of selected variables on the ratio of observed to expected deaths per individual mother has been looked at. The main findings were that the age of the mother and the duration has been in the group were found to be very significant in affecting the ratio of observed to expected deaths. Also, births after joining the group were found to be very significant in affecting mortality index as explained earlier.

Further regression showed that variables such as health education and agricultural education significantly affect the ratio of observed to expected deaths. Also, in the same equation the frequency of receiving cash once in two months and promotion of health of children were found to be significantly affecting the ratio of observed to expected deaths of

children. The highest variation in mortality index explained by all the variables is 69.8% in equation 1. This is expected because the equation contains the variable duration of staying in the womens' group.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 SUMMARY AND CONCLUSIONS

The study sought to fulfil two major purposes. The first task was to outline the child mortality differentials by division in Embu district using Coale-Trussel Technique on the 1979 Kenya Population Census data. This involved Construction of life tables For the district and for each of the divisions by the differentials of education of mother, marital status, and rural - urban residence. Probabilities of dying before age one (infant mortality) i.e between age 0 and 1 (1q0)**, and the probability of dying between age 1 and 5 years (4q1), the probability of dying at age 2 (q2), and finally life expectancy at birth were calculated.

The study also undertook a descriptive analysis of the raw data from Karurumo and Kigumo sub-locations whereby simple descriptive statistics of frequencies and percentages were given followed by a comparative analysis of the results.

Finally, linear multiple regression was used to test the combined effect of the indepedent variables on the ratio of observed to expected deaths per individual mother respectively.

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Briefly, the objectives of the study were:

(1)   To estimate infant and child mortality at district and divisional levels using the 1979 population census data for Embu district.

(2)   Outline and explain child mortality differentials by education of mother, place of residence, and marital status in Embu district using results of the 1979 Kenya population census data.

(3)   To investigate the effect of women groups' activities on infant and childhood mortality using data collected from Karurumo and Kigumo sub-locations, of Kyeni south location of Embu District.

(4)   To draw a comparative analysis of the raw data using simple descriptive statistics to assess the situation existing in the two sub-locations and the implication on infant and childhood mortality.

(5)   To determine in the impact of the growth monitoring programme on infant and childhood mortality.

It is important to mention here that there were several problems encountered in the collection of the raw data. The problems of absence from the place of

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interview were several due to the nature of the season when the survey was conducted as mentioned in chapter 1. This problem was overcome by making a repeat visit after enquiring when the respondent was likely to be at home. Problems of memory lapse was common especially in reporting number of children dead and mothers' age. This problem was overcome by asking a question which would help the respondent recall, the questionnaire was designed to cater for these problems.

The following were the major finding of the study:

In chapter 3 the findings show that infant mortality for Embu district was 76.2 deaths per 1000 live births as per the 1979 census data. Child mortality was 135.5 deaths per 1000 live births.

For the three divisions Gachoka division has the highest infant mortality (86.8/1000), followed by Runyenjes (82.5/1000), and finally Siakago with (77.4/1000).

Siakago has the highest child mortality (207.7/1000), followed by Gachoka (154.1) and Runyenjes has the least child mortality of (106.3/1000).

Infant mortality for urban areas in Embu is 71.6/1000 and 76.8/1000 for rural areas. Child mortality is 118 for urban and 136.6/1000 for rural areas.

By level of education infant mortality for the

whole district is lowest for secondary+ education category (36.0/1000), then followed by the primary education category and lastly the no education category. The trend for child mortality is a similar one.

By marital status, infant mortality is highest for the widowed category, followed by the divorced and separated and the married category has the least infant mortality.

By place of residence, infant mortality for Runyenjes division is for both rural and urban areas whereas child mortality is higher for the rural category than the urban category.

For Gachoka division infant mortality is higher for the urban category than for the rural category and similarly child mortality for this division is higher for urban category than for rural category.

By level of education for Runyenjes, the no education category has the highest infant and child mortality, followed by the primary education category and finally the secondary+ education category.

For Siakago division the trend of infant and child mortality is similar to the one of Runyenjes division and similarly for Gachoka division.

By marital status, for Runyenjes division, the widowed category has the highest infant mortality rate

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while all the other categories have a similar infant
and child mortality.

For Gachoka division, the widowed category has the
highest infant and childhood mortality and least for
the married.

7.2 IMPLICATION OF THESE FINDINGS

Infant and child mortality in Embu district are
lower for urban areas than for rural areas. In the
urban areas there is a good distribution network of
health centres than in the rural areas. The
communication network is also better in urban areas
than in rural areas.

The findings also show that there is a significant
drop in infant and child mortality as the level of
education increases. Education influences the mothers'
standards of living, actions and decision making. A
mother who is educated is more equipped with knowledge
on child health, child care and so on than a mother
who has no education.

Married women derive economic and emotional
security from the marriage institution and this gives
them a conducive environment for bringing up their
children than those who are widowed.

In chapter 4, the data obtained from Kigumo and
Karurumo sub-locations was analyzed using descriptive
statistics.

(i)   Majority of the women interviewed either had primary education or no education at all. Out of 400 women only 70 had secondary education.

(ii)   More women benefited in education, both formal and informal from the women's group. Only a few said they did not benefit. 241/400 benefited in education.

(iii)   Majority of the women use the pit latrine, (397/400).

(iv)   Women who can make major decisions without the husbands interference (243/400) .

(v)   The women who feel that the group has enabled them make decisions independently since they joined group, 172/400.

(vi)   Over half of the women benefit in money form from the group, 272/400.

(vii)   80/400 women have benefited in utensils.

(viii)   22 /400 women have benefited in livestock.

(ix)   16/400 women have benefited in literacy.

(x)   11/400 women have benefited in health education.

(xi)   Almost half of the women opened bank accounts after joining the group.

(xii)   Majority of the women 377/400 reported that the group did not interfere with

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their marital stability.
e.g.13/400 reported fights and only 10/400
reported separation because of group
matters.

(xiii)   In the sub-location (Karurumo) where GMP
is conducted 169 reported that the effect
of the programme is positive.

(xiv)   Only 31/400 reported the effect of the
programme to be negative.

In chapter five certain variables were used in
multiple regression to find out how they affect the
ratio of observed to expected deaths.
The following findings were arrived at:-

(i)   The duration a woman has been in a group
shows significant negative effect on
infant and child mortality.

(ii)   The births a woman gets after joining the group
have a negative effect on infant and child
mortality.

(iii)   Age of the mother has a negative effect on
infant and child mortality.

(iv)   The frequency in which cash is received affects
infant and child mortality.

(v)   Group activities that affect the health of
children have a negative effect on infant
and child mortality.

(vi)   Health education learnt in the group affects infant and child mortality.

(vii)   Agricultural education learnt in the group affects infant and child mortality.

7.3   RECOMMENDATIONS FOR POLICY MAKING

1. Education for women in Embu district should be encouraged in all the divisions since the level of education a woman attains shows a significant drop in infant and child mortality.

2. Action to improve standards of living in the rural areas should be taken, for example, more health centres need to be constructed and communication network should be improved.

3. The institution of marriage need to be safeguarded as much as possible since married women portrayed a lower infant and child mortality. Probably social workers, marriage therapists, and counsellors in this case can extend their services intensively on the marriage institution to save the marriages which are likely to break.

4. Women groups need to be fully considered in the policy making process, policies affecting women groups need to be clearly stipulated, those unregistered groups need assistance to register because it is important for the government to have an updated record of the number of functional women

groups existing and the membership.

5. Women groups should be used to disseminate vital
   information such as health education, agricultural
   education, contraception and family planning and so
   on since more women are likely to adopt ideas which
   are shared as a group by other group members.

6. Women should be advised to join women groups and
   avoid dropping out after a short period because
   most of the benefits are likely to have an impact
   after a long time. Similarly women should be
   advised not to drop projects they have started on
   after a short time because most projects' impact
   are felt after a long time.

7. More emphasis should be put on the growth
   monitoring and promotion programme. The
   effectiveness of this programme may take a longer
   time to be realized but its objectives are geared
   towards lowering infant and child mortality.

7.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Women are good agents of socio- economic
development. Women, especially in the rural areas of
the developing countries perform major tasks which
cannot be ignored in the current social, economic and
political situations sweeping across the third world
countries.

Women can be viewed differently according to

different disciplines that exist, for example, a demographer will see the womans' important role in increasing or decreasing fertility, affecting infant and child mortality etc., the sociologist on the other hand sees the womans' role in holding the family unit together thus creating cohesiveness in the society, the political scientist sees women as majority of the voters thus playing a vital role in electing a good or bad government, whereas the economist sees the woman as a tool of production in the farm where she plants, weeds, reaps, stores, cooks and so on. So generally a woman is a 'jack of all trades'.

However, only recently scholars have started venturing into research issues affecting women. A lot has yet not been researched on regarding womens' organizations, projects, and groups whether in urban or rural areas. Following are recommendations for further research on the subject of women based on the findings of this study:-

(1) There is need to study the reasons why women join a group and after a short time drop out 'discontinuation'. The results showed that those women who stay in a group for a longer time are likely to benefit on issues which affect the mortality of their children,

therefore the longer they stay in a group the better.

(2)   There is need to carry out a study to establish wether groups which give their members money have women experiencing lower infant and child mortality, if so, what amount of money is significant and how frequently should it be given.

(3)   I would strongly recommend that researches concerning women need to commence at sub-locational level because most women are adversely affected by socio-economic problems and those who are victims of high infant and childhood mortality reside in the rural areas.

7.5 CONCLUSION

According to the findings of this study it can be concluded that women groups' activities are likely to influence infant and childhood mortality. Therefore it is important that women are encouraged to join into groups that will carry out activities that will have a positive impact on the demographic, social, and economic welfare of their families.

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47. Women 2000 (1986): The United Nations System; No.2

48.   Women 2000 (1990): Review and Appraisal 1990;No.2

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the status of Women; No.3

A1.1   QUESTIONNAIRE

<u>Identification.</u>

Sub-location....................

Cluster Number...................

Household Number..................

Name of Household head................

<u>Part One</u>

<u>1. RESPONDENTS BACKGROUND</u>

1.1   In what year and month were you born

Month............

Dont Know.....

Year.........

DK...........

1.2 How old were you at your last birthday

Age in completed years...........

1.3 Have you ever attended school

Yes.........1

No..........2

1.4 What was the highest level of school you ever attended?

Primary...............1

Secondary.............2

Higher.................3

University.............4

Others(specify).......5

1.5 Have you ever attended an adult literacy class?

Yes 1

No..........2

1.6 Can you read a letter or a newspaper in any language easily, with difficulty or not at all?

Easily.......1

With difficulty.....2

Not at all..........3

1.7 Do you usually listen to a radio at least once a week?

Yes.......1

No.......2

1.8 Where does your household get most of its water for drinking, hand washing and cooking most of the year?

Piped into the house..........1

Public tap....................2

Well with handipump.............3

Well without " 4

Pond..........................5

River.........................6

```
          Rainwater.......................7

          Others(specify)..................8

1.9  How long does it usually  take to the place you get

water?

      Hours..........

          Minutes........

1.10 What  kind of toilet  facility does your  household

have?

      Flush toilet..............1

      Pit latrine...............2

      Bush......................3

      Others....................4
```

Part two

II Womens' group Information

2.1. Do you belong to a womens' group?

      Yes............1

      No............2

2.2 If yes when did you join the group?

      Year.......

      Month......

2.3 For how long have you been a member?

      No. in years.......

      No. in months......

2.4 What prompted you to join the group?

      Group benefits............1

A friend.................2

Persuaded by community....3

Community workers.........4

Others(specify)...........5

2.5 What is your position in the group?

Chairperson..............1

Secretary................2

Treasurer................3

Member...................4

2.6 Does your group have accounts?

Yes...............1

No............... 2

2.7 If yes what means of savings do you use?

Post office...........1

Bank..................2

Investments...........3

Others................4

2.8 As an individual do you have an account?

Yes.............1

No..............2

2.9 If yes did you open the account before or after joining group?

Before...............1

After................2

2.10 What is the groups' source of income?

Self-help.............1

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NGO'S.....................2

Members contribution...3

All of the above.......4

2.11   How does the group utilise the money?

State.......................................

....

....

2.12   How   do   you   benefit   from   the   group   as   an
individual?

State...

....

....

Part three

III Marital status information

3.1 What is your marital status?

Married...............1

Single................2

Widowed...............3

Divorced..............5

3.2   If   married   did you   get   married before   or after
joining group?

Yes...........1

No...........2

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3.3 Does your husband encourage you to engage in group matters?

    Yes...............1

    No...............2

3.4 If no, what is the problem?

    Group takes a lot of time...........1

    Group takes a lot of money.........2

    Group gives alot of freedom.......3

    Group gives alot of power.........4

3.5 Have you had fights, separation, or divorce as a result?

    Fights..........1

    Separation......2

    Divorce.........3

3.6 Has your spouse changed roles since you joined group?

    Yes.............1

    No..............2

3.7 If yes,

    please state how...................

    ....

    ....

    ....

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Part four

Reproduction and mortality

4.1 Have you ever given birth during your lifetime?

    Yes............1

    No.............2

4.2 How many births did you have before joining group?

    No. of births.......

    No births..........

4.3 How many births did you have after joining group?

    No. of births......

    No births..........

4.4 Before joining the group, did you ever give birth to a boy or a girl who was born alive but died later or a child who showed a sign of life but only survived a few hours later or days?

    Yes............1

    No.............2

4.5 How many boys and girls have died before joining the group?

    Boys dead..............

    Girls dead.............

4.6 How many boys and girls have died after joining group?

    Boys dead.............

    Girls dead............

4.7 Please indicate total number of children dead below five years of age?

....

<u>Part five</u>

<u>Contraception information</u>

5.1 Have you ever heard about contraception?

    Yes................1

    No.................2

5.2 When did you first learn about contraception, before or after joining group?

    Before.............1

    After..............2

5.3 Do you contracept?

    Yes..........1

    No..........2

5.4 When did you first contracept before or after joining group?

    Before...........1

    No...............2

<u>Part 6</u>

<u>Womens' status and decision making</u>

6.1 Who is the head of the family?

    Husband.......1

Wife...........2

6.2 Who makes major decision e.g how money is to be used.

Husband...........1

Wife...........2

Both...........3

6.3 Can you make decisions independently?

Yes...........1

No...........2

6.4 Who buys foodstuffs(source of money)?

Husband...........1

Wife...........2

In turns...........3

6.5 Before you go to meetings, hospital,and visiting, do you have to inform your husband?

Yes......1

No.......2

6.6 If you have your own source of income, do you have to inform your husband on how you intend to use your money?

Yes.......1

No.........2

6.7 What is your occupation?

Housewife.......1

Teacher.........2

Casual labourer..3

Civil servant.....4

Company employee...5

Others(specify).....6

6.8 Do you hold any other position in the community?

State...........................

....

....

Part seven

Growth monitoring

7.1 Do you know the Growth monitoring and promotion programme.?

Yes.......1

No.......2

7.2 Is the programme going on in your area?

Yes.......1

No.......2

7.3 Do you take any of your children for weighing?

Yes......1

No......2

7.4 In which year and month did you begin participating?

Year......

Month.....

7.5 For how long now have you been a participant?

Years.......

Months......

7.6 How many children do you take for GMP?

    Number of children.......

7.7 Since you started taking the children for GMP, have you noticed an improvement in their weight and general health?

    Yes.....1

    No......2

7.8 Do you keep records for weighing sessions since you began?

    Yes.....1

    No.....2

7.9 Can you do the reading of the scale and do the recording or do you need help?

    I can read.....1

    I need help....2

7.10 How many times do you take the children for GMP?

    Once a week.....1

    Once a month....2

    Twice a month...3

    Once a year.....4

    Dont know.......5

7.11 (a)   Since you started taking the child for the
            GMP, from the records of each child please
            show the progress of the weight of the
            children being weighed for the last three
            years after every six months.

Table Appendix 1.1   Record of weights from the growth
monitoring charts.

Name nd sex	First weight	Second weight after six months	Third weight after six months	Fourth weight after six months	Fifth weight after six months	Fifth weight after six months
M						
F						
M						
F						
M						
F						
M						
F						
M						
F						

7.11(b) Please fill the following chart.

Table A1.2 Particulars of the monitored child.

Age when first weighed	Age now	Is name alive or dead
Years Months		
Years Months		
Years Months		
Years Months		

Part eight

Impact of group Activities

10.1   Since you joined the group has the group benefited you in terms of education?

Yes.............1

No.............2

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10.2   If yes how? state

        Health education.....1

        Relational   "......2

        Academic   " 3

            Business   ".......4

            Agricultural " 5

10.3   Has the group of been help to you in improving

        source of water?

        Yes..................1

        No...................2

10.4   If yes how? state

        Water tank......... 1

        Water pipes.........2

        Group well..........3

        Others (specify)....4

10.5   Has the group helped in uplifting standards of

        living in the home?

        Yes............1

        No.............2

10.6   If yes how? state

        ....

        ....

        ....

10.7   Is the group a source of income to you?

        Yes...............1

        No................2

10.8 ...... If yes how often do you get money from the
        ...... group?

    Once a week.........1
    Once a month........2
    Once in two months..3
    Once a year.........4
    Others (specify)....5

10.9   Approximately how much money can tout get from
        the group at one go?

    Less than 100........1
    Between 100-500......2
    Between 500-1000.....3
    Between 10000-2000...4
    Over 2000...........5

10.10 Do you discuss family planning matters in the
       group?

    Yes........1
    No.........2

10.11 Do you have guest lecturers on this subject?

    Yes.......1
    No........2

10.12 What is your view towards contraceptive use?

    Acceptable........1
    Unacceptable......2

10.13 Do you think this family planning education has
       been of any benefit to you?

Yes........1

No........2

10.14   Has this knowledge so far helped you on birth

        spacing?

Yes.........1

No..........2

10.15   Have the group activities helped you maintain

        and improve your own health?

Yes.........1

No..........2

10.16   If yes, how? state

        ....

        ....

        ....

10.17   Has the group helped you maintain and improve

        the health of your children?

Yes.............1

No.............2

10.18   If yes, how? state

        ....

        ....

        ....

10.19   Do you discuss the importance of breastfeeding

... in the group?

Yes.............1

No..............2

10.20   At any time in the group have you ever been
         advised against breastfeeding?

Yes........1

No.........2

10.21   Do you learn about the importance of
         immunization in the group?

Yes......1

No.......2

10.22   Do you receive guest lecturers on this subject?

Yes.............1

No..............2

10.23   Has the group helped you play a better role in
         decision making?

Yes..............1

No...............2

10.24   If yes how? state

....

....

....

10.25   Are you taught how to manage diarrhoea and
         other childhood diseases?

Yes.............1

DISCUSSED NON-LOCATION

	Frequency	Percent %
Total		100.0

Age in years	Frequency	Percent %
		1.5
	61	
	62	41.0
		16.0
Age 5		1.5
No response		1.5
Total		100.0

Age group	Frequency	Percent %
	187	
		1.0
		0.5
No response	1	
Total	200	100

KARURUMO SUB-LOCATION

Table Appendix 2.1   Respondents' source of water.

Water source	Frequency	Percent %
Piped into compound	93	46.5
Public tap	2	1.0
Well with pump	6	3.0
Well wad pump	6	3.0
Pond	19	9.5
River	69	34.5
Rainwater	3	1.5
Others	1	0.5
No response	1	0.5
Total	200	100.0

Table A2.2 Age in years when children begin using toilet

Age in years	Frequency	Percent %
Age 1	7	3.5
Age 2	84	42.0
Age 3	82	41.0
Age 4	20	10.0
Age 5	5	2.5
No response	2	1.0
Total	200	100.0

Table A2.3 Belonging to a womens' group

Womens' group	Frequency	Percent %
Belonging to	197	98.5
Not belonging to	2	1.0
No response	1	0.5
Total	200	100

Table A2.4 Duration respondent has been in the group

Duration	Frequency	Percent %
Less than 1 year	1	0.5
2 years	81	40.5
3 "	26	13.0
4 "	20	10.0
5 "	18	9.0
6 "	9	4.5
7 "	3	1.5
8 "	3	1.5
9 "	2	1.0
10 "	2	1.0
No response	33	16.5
Total	200	100.0

Table A2.5 Women with an account

Savings account	Frequency	Percent %
Owns account	91	45.5
Doesn't own account	13	6.5
No response	96	48.0
Total	200	100.0

Table A2.6 Account opened before or after joining group

Account	Frequency	Percent %
Before	95	47.5
After	101	50.5
No response	4	2.0
Total	200	100.0

Table A2.7 How respondent benefits from the group

Benefits	Frequency	Percent %
Given cash	138	69.0
" utensil	32	16.0
" livestock	13	6.9
Literacy	12	6.0
Health education	5	2.5
Total	200	100.0

Table A2.8 Those women who are taught through guest lectures on importance of immunization in the group.

Guest lectures	Frequency	Percent%
Yes	73	36.5
No	124	62.0
No response	3	1.5
Total	200	100

Table A2.9 Those women advised on importance of immunization in the group

For immunization	Frequency	Percent
Yes	106	53.0
No	92	46.0
No response	2	1.0
Total	200	100.0

Table A2.10 Those taught on importance of breastfeeding in the group

Importance of breastfeeding	Frequency	Percent
Yes	73	36.5
No	127	63.5
No response	1	0.5
Total	200	100.0

Table A2.11 Those taught against breastfeeding in the group

Against breast feeding	Frequency	Percent
Yes	34	19.0
No	164	80.0
No response	2	1.0
Total	200	100

Table A2.12 Those who discusses family planning matters in the group

Discuses family planning	Frequency	Percent
Yes	69	33.0
No	133	66.5
No response	1	0.5
Total	200	100

Table A2.13 Those who have been taught about family planning through guest lectures in the group.

Guest lectures	Frequency	Percent
Yes	59	29.5
No	140	70.0
No response	1	0.5
Total	200	100

Table A2.14 Those who have benefited from family planning

Family planning benefit	Frequency	Percent
Yes	126	63.0
No	72	36.0
No response	2	1.0
Total	200	100

Table A2.15 Those who are taught about child health in the group

Child health taught	Frequency	Percent
Yes	118	51.5
No	72	46.5
No response	10	0.5
Total	200	100

Table A2.16 Respondents' marital status

Marital status	Frequency	Percent %
Married	187	93.5
Single	12	6.0
Divorced or Separ.	1	0.5
Widowed	0	0.0
Total	200	100.0

Table A2.17 Cases where marriage has broken because of group matters

Marital Problems	Frequency	Percent %
No problems	194	97.0
Fights	1	0.5
Separation	5	97.0
Total	200	200

Table A2.18 Cases where husband has changed his roles because of group matters

Changed Roles	Frequency	Percent %
Yes	10	5.0
No	180	90.0
No response	10	5.0
Total	200	100.0

Table A2.19 Cases that have ever given birth

Ever given birth	Frequency	Percent %
Yes	200	100
No	0	000.0
Total	200	100.0

Table A2.20 Births before joining group

No. of births	Frequency	Percent %
0	2	1.0
1	32	17.0
2	41	20.5
3	29	14.5
4	21	10.5
5	20	10.0
6	12	6.0
7	11	5.5
8	12	6.0
9	5	2.5
10	1	0.5
11	1	0.5
14	1	0.5
No response	10	5.0
Total	200	100.0

Table A2.21   Births after joining group

Births	Frequency	Percent %
0	3	1.5
1	76	38.0
2	129	14.5
3	7	3.5
4	7	3.5
5	4	2.0
6	1	0.5
7	1	0.5
8	2	1.0
10	1	0.5
No response	69	34.5
Total	200	100.0

Table A2.22 Boys dead before joining group

No.of boys dead	Frequency	Percent %
0	171	85.5
1	24	12.0
2	1	0.5
4	1	0.5
No response	3	1.5
Total	200	100.0

Table A2.23 Boys dead after joining group

No. of boys dead	Frequency	Percent %
0	194	97.0
1	3	1.5
No response	3	1.5
Total	200	100.0

Table A2.24 Girls dead after joining group

No. of girls dead	Frequency	Percent %
0	177	88.5
1	19	9.5
3	1	0.5
No response	3	1.5
Total	200	100.0

Table A2.25 Girls dead after joining group

No. of girls dead	Frequency	Percent %
0	194	97.0
1	3	1.5
No response	3	1.5
Total	200	100.0

Table A2.26 Women with contraception knowledge

Knowledge	Frequency	Percent %
Have	182	91.0
Do not have	18	9.0
Total	200	100.0

Table A2.27 Whether knowledge about contraception was before or after joining
          group

Knowledge	Frequency	Percent %
Before joining	140	70.0
After	34	17.0
No response	26	13.0
Total	200	100.0

Table A2.28 Women's view on contraception

View	Frequency	Percent
Acceptable	167	83.5
Not acceptable	30	36.0
No response	3	1.0
Total	200	100.0

Table A2.29 Women who have benefited from family planning and birth spacing from the group.

F.P/Birth spacing	Frequency	Percent
Benefited	121	60.5
Not benefited	76	38.0
No response	3	1.5
Total	200	100.0

Table A2.30 Women who are currently using a contraception method

Use of contraception	Frequency	Percent %
Yes	105	52.5
No	94	47.0
No response	1	0.5
Total	200	100.0

Table A2.31 Did respondent contracept before or after joining group

Contraception	Frequency	Percent %
Before	66	33.0
After	39	19.5
No response	95	47.5
Total	200	100.0

Table A2.32 Household head

H/Hold head	Frequency	Percent %
Husband	188	94.0
Wife	5	2.5
Both	6	3.0
No response	1	0.5
Total	200	100.0

Table A2.33 Women who can make decisions without husband's interference

Decision making	Frequency	Percent
Can make decisions	145	72.5
No making decisions	54	27.0
No response	1	0.5
Total	200	100.0

Table A2.34 Women who feel the group has enabled them make more decisions than before they joined

Decision making	Frequency	Percent
Benefited	89	44.5
Not benefited	107	53.5
No response	4	2.0
Total	200	100.0

Table A2.35 Number of children taken for growth monitoring per woman

No. of children	Frequency	Percent
1	119	59.5
2	72	36.0
3	9	4.5
Total	200	100.0

Table A2.36 Participant's response on the effect of the programme

Response	Frequency	Percent
Positive	169	84.5
Negative	31	15.5
Total	200	100.0

Table A2.37 Education

Education benefits	Frequency	Percent
Benefited	120	60.0
Not benefited	80	40.0
Total	200	100

Table A2.38 Water source

Water benefit	Frequency	Percent
Have benefited	32	16.0
Not benefited	164	82.0
No response	4	2.0
Total	200	100.0

Table A2.39 Type of water source

Type of water source	Frequency	Percent %
Piped into compound	7	3.5
Established public well	6	3.0
Given a water tank	25	.12.5
Given money to install	2	1.0
No response	160	80.0
Total	200	100.0

Table A2.40 Receiving cash (how often)

Receiving cash	Frequency	Percent
Once a week	49	24.5
Once a month	77	38.5
Once in two months	35	17.5
Once a year	22	11.0
Others	4	2.0
No response	13	6.5
Total	200	100.0

Table A2.41 Amount received by each woman

Amount received	Frequency	Percent
Less than 100	13	6.5
Between 100-500	157	78.5
Between 500-1000	14	7.0
Between 1000-2000	2	1.0
No response	14	7.0
Total	200	100.0

APPENDIX III

KIGUMO SUB-LOCATION

Table Appendix 3.1   Respondents' source of water.

Water source	Frequency	Percent %
Piped into compound	141	70.5
Public tap	1	0.5
Well with pump	4	2.0
Well wad pump	2	1.0
Pond	5	2.5
River	47	23.5
Rainwater	0	0
Others	0	0
No response	0	0
Total	200	100.0

Table A3.2 Type of toilet

Toilet type	Frequency	Percent %
Flush	0	0
Pit	200	100
Bush	0	0
Total	200	100.0

Table A3.3 Age in years when children begin using toilet

Age in years	Frequency	Percent %
Age 1	2	1.0
Age 2	68	34.0
Age 3	117	58.5
Age 4	11	5.5
Age 5	1	0.5
No response	1	0.5
Total	200	100.0

Table A3.4   Belonging to a womens' group

Womens' group	Frequency	Percent %
Belonging to	197	98.5
Not belonging to	3	1.5
No response	0	0
Total	200	100.0

Table A3.5   Duration   respondent has been in the group

Duration	Frequency	Percent %
Less than 1 year	1	0.5
2 years	81	40.5
3 "	26	13.0
4 "	20	10.0
5 "	18	9.0
6 "	9	4.5
7 "	3	1.5
8 "	3	1.5
9 "	2	1.0
11 "	2	1.0
12 "	2	1.0
13 "	1	0.5
14 "	2	1.0
No response	26	13.0
Total	200	100.0

Table A3.6   Women with an account

Savings account	Frequency	Percent %
Owns account	115	57.5
Doesn't own account	1	0.5
No response	84	42.0
Total	200	100.0

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Table A3.7   Account opened before or after joining group

Account	Frequency	Percent %
Before	117	58.5
After	83	41.5
Total	200	100.0

Table A3.8   How respondent benefits from the group

Benefits	Frequency	Percent %
Given cash	134	67.0
" utensil	48	24.0
" livestock	8	4.0
Literacy	4	2.0
Health education	6	3.0
Total	200	100.0

Table A3.9   Those women who are taught through guest lectures on importance of immunization in the group.

Guest lectures	Frequency	Percent%
Yes	68	36.5
No	128	62.0
No response	4	2.0
Total	200	100

Table A3.10 Those women advised on importance of immunization in the group

For immunization	Frequency	Percent
Yes	106	53.0
No	92	46.0
No response	2	1.0
Total	200	100.0

Table A3.11 Those taught on importance of breastfeeding in the group

Importance of breastfeeding	Frequency	Percent
Yes	73	36.5
No	127	63.5
No response	1	0.5
Total	200	100.0

Table A3.12 Those taught against breastfeeding in the group

Against breast feeding	Frequency	Percent
Yes	34	19.0
No	164	80.0
No response	2	1.0
Total	200	100

Table A3.13 Those who discusses family planning matters in the group

Discuses family planning	Frequency	Percent
Yes	69	33.0
No	133	66.5
No response	1	0.5
Total	200	100

Table A3.14 Those who have been taught about family planning through guest lectures in the group.

Guest lectures	Frequency	Percent
Yes	59	29.5
No	140	70.0
No response	1	0.5
Total	200	100

Table A3.15 Those who have benefited from family planning

Family planning benefit	Frequency	Percent
Yes	126	63.0
No	72	36.0
No response	2	1.0
Total	200	100

Table A3.16 Those who are taught about child health in the group

Child health taught	Frequency	Percent
Yes	118	51.5
No	72	46.5
No response	10	0.5
Total	200	100

Table A3.17   Respondents' marital status

Marital status	Frequency	Percent %
Married	181	90.5
Single	13	6.5
Divorced or Separ.	1	1.0
Widowed	5	2.5
Total	200	100.0

Table A3.18 Cases where marriage has broken because of group matters

Marital Problems	Frequency	Percent %
No problems	183	91.5
Fights	12	6.0
Separation	5	2.5
Total	200	100

Table A3.19 Cases where husband has changed his roles because of group matters

Changed Roles	Frequency	Percent %
Yes	7	3.5
No	184	92.0
No response	9	4.5
Total	200	100.0

Table A3.20 Cases that have ever given birth

Ever given birth	Frequency	Percent %
Yes	195	97.5
No	5	2.5
Total	200	100.0

Table A3.21   Births before joining group

No. of births	Frequency	Percent %
1	31	15.5
2	22	11.0
3	28	14.0
4	27	13.5
5	17	8.5
6	13	6.5
7	15	5.7
8	14	7.0
9	13	6.5
10	5	2.5
11	2	1.0
No response	11	5.5
Total	200	100.0

Table A3.22   Births after joining group

Births	Frequency	Percent %
0	1	0.5
1	45	22.5
2	13	6.5
3	7	3.5
4	1	0.5
6	1	0.5
12	1	0.5
No response	131	65.5
Total	200	100.0

Table A3.23   Boys dead before joining group

No.of boys dead	Frequency	Percent %
0	162	81.0
1	21	10.0
2	7	3.5
No response	5	2.5
Total	200	100.0

Table A3.24 Boys dead after joining group

No. of boys dead	Frequency	Percent %
0	194	97.0
1	1	0.5
No response	5	2.5
Total	200	100.0

Table A3.25 Girls dead before joining group

No. of girls dead	Frequency	Percent %
0	170	85.0
1	15	7.5
2	9	4.5
9	1	0.5
No response	5	2.5
Total	200	100.0

Table A3.26 Girls dead after joining group

No. of girls dead	Frequency	Percent %
0	194	97.0
1	1	1.5
No response	5	2.5
Total	200	100.0

Table A3.27 Women with contraception knowledge

Knowledge	Frequency	Percent %
Have	184	92.0
Do not have	16	8.0
Total	200	100.0

Table A3.28 Whether knowledge about contraception was before or after joining
group

Knowledge	Frequency	Percent %
Before joining	147	73.5
After	21	10.5
No response	26	16.0
Total	200	100.0

Table A3.29 Women's view on contraception

View	Frequency	Percent
Acceptable	174	87.0
Not acceptable	25	12.5
No response	1	0.5
Total	200	100.0

Table A3.30 Women who have benefited from family planning and birth spacing
from the group.

F.P/Birth spacing	Frequency	Percent
Benefited	114	57.0
Not benefited	84	42.0
No response	2	1.0
Total	200	100.0

Table A3.31 Women who are currently using a contraception method

Use of contraception	Frequency	Percent %
Yes	110	55.0
No	90	45.0
Total	200	100.0

Table A3.32 Did respondent contracept before or after joining group

Contraception	Frequency	Percent %
Before	80	40.0
After	32	16.0
No response	88	44.0
Total	200	100.0

Table A3.33 Household head

H/Hold head	Frequency	Percent %
Husband	179	89.0
Wife	11	5.5
Both	10	5.0
Total	200	100.0

Table A3.34 Women who can make decisions without husband's interference

Decision making	Frequency	Percent
Can make decisions	145	72.5
No making decisions	49	24.5
No response	6	3.0
Total	200	100.0

Table A3.35 Women who feel the group has enabled them make more decisions than before they joined

Decision making	Frequency	Percent
Benefited	83	41.5
Not benefited	110	55.0
No response	7	0.5
Total	200	100.0

Table A3.36 Number of children taken for growth monitoring per woman

No. of children	Frequency	Percent
1	84	42.0
2	112	56.0
3	4	2.0
Total	200	100.0

Table A3.37 Participant's response on the effect of the programme

Response	Frequency	Percent
Positive	169	84.5
Negative	31	15.5
Total	200	100.0

Table A3.38 Education

Education benefits	Frequency	Percent
Benefited	121	60.5
Not benefited	79	39.5
Total	200	100

Table A3.39 Water source

Water benefit	Frequency	Percent
Have benefited	6	3.0
Not benefited	193	96.5
No response	1	0.5
Total	200	100.0

Table A3.40 Type of water source

Type of water source	Frequency	Percent %
Given a water tank	6	3.0
No response	194	97.0
Total	200	100.0

Table A3.41 Receiving cash (how often)

Receiving cash	Frequency	Percent
Once a week	22	11.0
Once a month	68	34.0
Once in two months	55	27.5
Once a year	27	13.5
Others	18	9.0
No response	10	5.0
Total	200	100.0

Table A3.42 Amount received by each woman

Amount received	Frequency	Percent
Less than 100	2	1.0
Between 100-500	160	80.0
Between 500-1000	26	13.0
Between 1000-2000	1	0.5
No response	11	5.5
Total	200	100.