INTERCENSAL NET MIGRATION IN KENYA, 1989-1999: APPLICATION OF THE AGE-SPECIFIC GROWTH RATE METHOD

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DEDICATION

This work is dedicated to my Mum Emilly Atieno Onyango

DECLARATION

I declare that this research project is my original work and has not been submitted for examination for an award of a degree in this or any other University

Annette Adhiambo Aduda

_____ _____

Signature Date

I certify that this project has been submitted for examination with my approval as the University Supervisor.

Dr. George Odipo

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Signature Date

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

ASGRM	-	Age- Specific Growth Rate Method
CSRM	-	Census Survival Ratio Method
IR	-	In- migration Rate
LTSRM	-	Life Table Survival Ratio Method
NMR	-	Net Migration Rate
NGRM	-	National Growth Rate Method
VSM	-	Vital Statistics Method
OR	-	Out-migration Rate
POB	-	Place of Birth
POE	-	Place of Enumeration
POR	-	Place of Residence
PSRI	-	Population Studies and Research Institute

ABSTRACT

This study applied the age-specific growth rate technique to generate intercensal age-specific net migration rates in all the eight regions of Kenya. Age-specific growth rate (ASGR) technique was developed by Preston and Coale in 1982. A major strength of the technique is that it can be used to estimate migration, mortality, as well as fertility for non-stable populations, as is typical of the developing countries where fertility and mortality rates are rapidly changing. The 2009 Kenya census, recorded the population at 38.6 million. The population is steadily growing and projected to reach over 50 million by 2020 (Oucho, 2015).

This study utilized the 1989 and 1999 Kenya Population and Housing census data sets. Age-specific growth rate technique was first applied by Wakajummah (1986) to the 1969 and 1979 Kenyan census data sets. Twenty five years later, the same technique was applied by Adieri (2012) to the 1999 and 2009 census data sets. The general objective of this study was to generate the intercensal net migration rates and patterns by age-group and sex for the intercensal period, 1989-1999 in the eight (8) regions of Kenya using the age-specific growth rate method. Specific objectives of the study were: to estimate the intercensal net migration rates by age-group and sex for the intercensal period 1989-1999; and to establish the intercensal net migration patterns by age-group and sex for the intercensal period, 1989-1999 in the eight (8) regions of Kenya using the age-specific growth rate method.

Study findings revealed that Nairobi and Coast regions experienced similar age-specific migration patterns at age-groups 10-24 and 35-74 with a slight variation observed at age-groups 5-9 and 25-34 with Nairobi recording in-migration of persons belonging to these age-groups. In-migration of the youthful population evidenced at age-group 10-24 suggests that these are young individuals who go to the city in pursuit of either education or job-seeking. It is also possible that the two regions attract many migrants mainly because of the better welfare services that are available there in terms of learning institutions and employment opportunities. Similar patterns of outmigration from these areas were observed at age-group 35-69.This could be as a result of possible job transfers or retirement in the case of the older population aged 60 and above.

Central region on the other hand recorded a slight loss of population at most age-groups but recorded a substantial gain of population at age-group 65-74 years old. Central, Eastern and Rift Valley regions registered population loss at most age-groups. Nyanza region as was found in this study, as well as Oucho et al (2000), is a net out-migration region with high fertility and equally high mortality and has been recording a slow population growth. Birth place statistics show Nyanza region as losing its population mainly to Nairobi. Nairobi region offers an attractive destination area to migrants as this is where most industries, learning institutions, better living conditions and health care services are. Eastern and Western regions also registered massive population loss to other neighboring regions. Eastern region lost its population mainly to Coast region because of the proximity to the coastal region whereas Western region lost mainly to Rift Valley region.

In conclusion, the study estimated the intercensal net migration rates for the eight (8) regions of Kenya hence found that the technique is still relevant for application in Kenya where births and death rates are rapidly changing for example from a TFR of 7.5 in the 1950s to 4.4 in 2014 (KDHS, 2014). The study recommended that policy planners take migration issues seriously and incorporate these issues into their planning before embarking on developmental undertakings.

Further, students of migration studies and the Government need to undertake more studies that employ indirect techniques of measuring migration in order to solve population related issues. Hence policy planners should consider funding such studies. In addition, the populace needs to be sensitized on the need to register vital events as and when they occur so that we can have a complete and accurate vital statistics system.

CHAPTER ONE
INTRODUCTION

1.0 Background of the Study

Studies on internal migration have for a long time applied stable population models which assume that fertility and mortality schedules are fixed. These models vary from those based on data derived from vital registration systems or continuous population registers, to those which depend on sample surveys or total counts of the population of component areas that is births, deaths and movement of people at two successive censuses (Wakajummah, 1986). Choice and application of any of these models are determined by the availability and nature of data as well as the kind of information required for subsequent migration estimates.

The analysis for this study was based on the intercensal net migration rates (NMR) obtained using the age-specific growth rate method (ASGRM) in Kenya's eight regions, namely; Central, Western, Rift Valley, Coast, Nairobi, Nyanza, Eastern, and North Eastern. The rates were used in this study to explain intercensal net migration in Kenya, 1989-1999. Age-specific growth rate method basic assumptions are that population growth rates change from one age-group to another and that population growth is attributed to changing fertility and mortality rates as well as varying migration rates. The technique is among other indirect methods used for estimating migration rates. The technique is also suitable for application in developing countries where birth and death rates have been changing rapidly (Oucho et al, 2000).

Indirect estimation is used in demography to describe influential techniques that produce estimates of a certain variable on the basis of data that may only be indirectly related to its value. Countries with well developed data reporting systems have their demographic estimation based on data collected by censuses and vital registration systems. Whereas demographic estimation in countries with inadequate data reporting systems often must rely on indirect methods (Rogers, 2002).

Several other methods of estimating intercensal net migration rates include: the vital statistics method (VSM); the national growth rate method (NGRM)); the life-table survival ratios (LTSR), the census survival ratios method (CSRM) and; the estimation by birth residence. These methods have been used to estimate intercensal net

migration both in the developed and developing countries. However, the most common ones have been cross-tabulation of the place of birth with place of enumeration statistics especially in developing countries where very few censuses have been undertaken. Detailed cross-tabulation of districts of origin with districts of destination provides an interesting picture of primary, secondary, tertiary, and other destinations (Oucho, 1988). Different scholars (Ominde, 1968; Rempell, 1977; Beskok, 1981 and Oucho, 1988) have used the direct methods of estimating internal migration in Kenya.

Age-specific growth rate method (ASGRM), applied in this study seeks to establish the internal migration patterns in Kenya's eight regions for the period between 1989 and 1999. This is the third time that the same method has been applied to the Kenyan census data. The method was first applied by Wakajummah (1986) to the 1969 and 1979 census data sets. The second time that the technique was applied was by Adieri (2012) who applied it to the 1999 and 2009 census data sets. This study applied the technique to the 1989 and 1999 census data. The reasons for applying the technique on Kenya's eight regions as opposed to the districts, is because the administrative boundaries for regions remained identical (unlike the districts) for the intercensal period 1989-1999. Kenya had 41 districts up to 1989. With multi-party politics in the offing, 39 districts (excluding Nairobi and Mombasa) were sub-divided into "ethnic districts" (for example Kuria, Suba, Mbeere, Teso, Sabaot) or "clan districts" (for example Rachuonyo), while some former administrative divisions (for example Vihiga and Migori) were elevated to district status (Oucho et al, 2000).

Age-specific growth rate method (ASGRM) is an indirect measurement technique that, unlike other techniques, does not assume a constant mortality schedule. This makes it suitable for application in developing countries where birth and death rates have been changing rapidly (Oucho et al, 2000; 2014). Moreover, the technique does not need the census interval to be in five years or a multiple of five like the census survival ratios method (CSRM).The national growth rate method (NGRM) which is another indirect technique used to measure migration, basic assumption is that fertility and mortality increase steadily and is closed to migration making it suitable for computing migration rates for stable populations.

This study is divided into five chapters: chapter one covers the introduction, statement of the problem, rationale of the study, objectives of the study, research questions and the limitations of the study; chapter 2 explores the literature review; chapter 3 discusses the methodology; chapter 4 is devoted to the study findings while chapter 5 covers the summary and conclusions.

1.1 Statement of the Problem

The Kenyan vital statistics system, which should be ideally used to answer migration questions, is not up to date to provide adequate information on the subject. Further, our understanding on migration has been hampered by lack of estimates based on indirect techniques of migration measurements. The analytical reports provide estimates based on direct techniques of calculating migration. These reports are also based on census data hence do not provide us with the intercensal net migration rates as the census is usually carried out after ten years. Dependence on application of cross tabulations of the place of birth with place of enumeration data, as is common in the analytical reports, provides crude estimates. Crude rates measure the frequency of phenomenon in the total population and thereby not providing specific estimates in or to particular sub-populations (Kpedekpo, 1982).

Nearly all migration estimation techniques devised in developing countries have for many years relied on the stable population model (Oucho et al, 2000), which assumes constant mortality and fertility schedules. Developing countries especially those in the African continent (for example Kenya) are characterized by unstable mortality and fertility schedule. Hence the need to apply age-specific growth rate method to estimate migration rates. The method does not assume a constant fertility and mortality schedule.

1.2 Objectives of the Study

1.2.1General Objective:

To generate the intercensal net migration rates and patterns by age-group and sex for the intercensal period 1989-1999 using the age-specific growth rate method.

1.2.2 Specific Objectives:

a) To estimate the intercensal net migration rates by age-group and sex for the intercensal period 1989-1999 using the age-specific growth rate method.
b) To establish the intercensal net migration patterns by age-group and sex for the intercensal period 1989-1999 using the age-specific growth rates obtained.

1.3 Research Questions

The following were the research questions addressed:

1. What are the intercensal net migration rates by age-group and sex for the regions for the period 1989-1999 using the age-specific growth rate method?
2. Have the patterns of intercensal net migration patterns by age-group and sex remained the same as compared to 1969-1979 and 1979-1989 intercensal periods?

1.4 Rationale of the Study

The linkage between age structure and the analysis of fertility, mortality, and migration processes is central to demographic study (Rogers, 2009). Migration as a component of population change determines the population structure, size, density and distribution of a given area (Adieri, 2012). Further, it is important to establish age-sex migration flows between regions in order to understand population growth in these areas. Kenya, like many other countries in the African continent, faces the pressing demand to apply modern techniques of migration measurement so as to obtain accurate estimates for migration related problems. This study lays emphasis on the application of age-specific growth rate method (an indirect technique) in estimating intercensal net migration as opposed to the direct methods that provide crude estimates.

Indirect methods are preferable in measuring migration rates because direct measurements of migration detect only those who survived and were therefore enumerated in the second census but does not include those who had migrated or died prior to the enumeration. Also, it is a snapshot picture of a specific census and does not explain intercensal net migration. Based on its basic assumptions; population growth rates change from one age-group to another and population growth is attributed to changing fertility and mortality rates as well as varying migration rates, age-specific growth rate method becomes very relevant and applicable in Kenya

where the birth and death rates are rapidly changing. Worthy to note, is that the method is the only indirect method that does not assume constant fertility and mortality rates.

This study is important to organizations and individuals interested in migration and development because it seeks to equip them with information on the patterns of internal migration in Kenya between 1989 and 1999. By and large, the study seeks to provide policy makers with the necessary information that they need to be able to make development plans from an informed perspective.

This study applied the age-specific growth rate method (ASGRM) to estimate age-specific intercensal net migration rates for the eight regions of Kenya based on the 1989 and 1999 census data sets.

1.5 Scope and Limitations of the Study

Using the age-specific growth rate method (ASGRM), the study examined internal migration in the eight (8) regions of Kenya during the intercensal period between 1989 and 1999. The 1989 and 1999 data sets were utilized in this study. Unlike other techniques, age-specific growth rate method does not assume a constant mortality schedule. This very assumption is what makes it applicable to the Kenyan scenario where we have births and deaths rapidly changing.

Among the limitations inherent in application of the age-specific growth rate method are: the method does not show the origin or destination districts; the technique is also affected by age misreporting; and finally, the technique does not show how many times individuals may have moved from one place to the other, nor does it indicate the direction of population movement (Wakajummah, 1986). In order to address some of the limitations, the age-sex accuracy index was calculated using the UN joint score. AGESMTH spreadsheet in the PASEX computer programme was then used to smooth age data where applicable. Birth place matrix was also used to explain the direction of movement.

1.6 Operational definitions

An out-migrant and Out-migration: An out-migrant is a person who moves from one administrative area to another in the same country with the aim of changing the dwelling place. Out-migration therefore refers to movement that entails change of dwelling place or residence from migration defining area by crossing the region outside the area within the same nation.

In-migrants and In-migration: Any person who comes to live in an area by crossing an administrative boundary inside the same country is referred to as an in-migrant. Hence in-migration refers to movement by a person that involves change of dwelling place or home or house by crossing the boundary outside the area in which he had originally been living in within the same nation.

Internal migration: This refers to change of dwelling place by a person within a nation and this is usually defined in terms of residential movements across boundaries that are often taken as the boundary or minor divisions of the region or district of a country (Kpedekpo, 1982). Movements that do result in crossing boundaries are termed as mobility. It involves movement of people (out-migrants and in-migrants) within boundaries of their country of birth (United Nations, 1970; Wakajummah, 1986 and Odipo, 1994).

Locality: A distinct population cluster in which the inhabitants live in neighboring sets of living quarters and that has a name or a locality recognized status.

Migration interval and Intercensal period: Migration interval refers to the study of migration occurrence by classifying or compiling data with reference to specific periods of time. Intercensal period refers to a fixed period of time such as 5 or 10 years, it is the time interval between the first census and subsequent census.

Migration Streams: This is a term that is used to refer to the total number of moves made during a given migration period and usually have a common area of origin and of destination (United Nations, 1970; Wakajummah, 1986; Odipo, 1994).

Migration: The International Union for Scientific Study of Population (1982) describes migration as the movement of population in space often involving a change in the usual residence; internal migration is such a movement within national boundaries. Hence migration requires a change of residence, a certain distance from previous to current residence and a time period of reference (Arriaga et al, 1993). Weeks (2005) refers to migration as any permanent change in residence that involves the detachment from the organization of activities at one place and the movement of the total round of activities to another.

Net migration: The balance between in-migration and out-migration is called net migration. Net migration is equal to in-migration minus out-migration or in-migrants minus out-migrants. If the figure representing in-migration is higher than out-migration, then the net gain to the area can be classified as net in-migration and is represented by a positive sign (United Nations, 1970; Wakajummah, 1986; Odipo 1994)

Place of birth: According to the UN (2008), this refers to the common division in which the person was born, also known as the country of birth (for those who were born outside the country).

Place of previous residence: This is the place of dwelling prior to relocating to the current one.

The place of usual residence: Defined for census purposes as the place at which the person lives at the time of the census, and has been there for some time or intends to stay there for some time (UN, 2008).

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter explores the literature review on methods of estimating net migration rates using both direct and indirect techniques and their application by the various scholars. The discussion further covers the strengths and weaknesses of the techniques reviewed and categorically explains why the age-specific growth rate method (ASGRM) was the preferred technique used in this study.

The direct and indirect methods of estimating internal migration discussed in this chapter are as follows: The place of birth statistics (POB), place of last previous residence, duration of residence, the vital statistics method (VSM), the national growth rate method (NGRM), the survival ratios and finally the age-specific growth rate method (ASGRM).

2.1 Direct Measures of Internal Migration

The following direct measures of estimating internal migration are discussed in detail:

- Place of birth
- Place of last previous residence
- Duration of residence

a) Place of Birth Statistics

The place of birth (POB) statistics as one of the direct methods of estimating migration was applied by Eldridge and Kim Yun (1968) in the United States (US) census data. According to Eldridge and Kim Yun (1968), the birth residence statistics gives more accurate estimates than the net migration streams technique. However, application of the method in most African countries is faced with many challenges such as lack of adequate data and errors associated with place-of-birth. Some people because of political reasons do not state the real place where they were born for fear of victimization. Prolonged stay in particular areas make some to claim that they were born in that area. Yet others choose to associate themselves with certain areas because of the prestige linked to the name of the place.

Ominde (1968) in his pioneering work on Kenya's internal migration used direct techniques for measuring migration to identify migration streams. Later studies that adopted Ominde's (1968) approach were Rempell (1977), Beskok (1981) and Oucho (1988). These cross-tabulations facilitated the application of the age- specific growth rate method (ASGRM) developed by Preston and Coale (1982) and was applied by Wakajummah (1986) using the 1969 and 1979 Kenya's census data sets. The same technique, age- specific growth rate method (ASGRM) is applied in this study. Direct techniques for measuring migration involve cross-classification of place of enumeration (POE) with place of birth (POB) or place of residence (POR) statistics.

There are certain advantages in applying place of birth method : the data can represent in-migrants, and out-migrants; specific streams (net losses or net gains) of a given area; these statistics also reveal the immigrants from other countries; it gives a clear volume and direction of internal lifetime migrants as opposed to other methods; and finally, it is possible to present migration balances/streams cartographically with the place-of- birth statistics provided the quantity of areal parts is not big for feasibility purposes.

b) Place of Last Previous Residence

According to Adieri (2012), "Place of last previous residence rather than birth-place, gives the recent migratory flows. Data obtained allows identification of persons as migrants whenever their place of last residence and place of present residence differ". Also, "…a major advantage of place-of-last-residence approach over the place-of birth approach is that the former reflected direct movement between places, while the latter ignores intervening moves between departure from the first residence and arrival at the last residence" states Adieri (2012). However, Place-of-last-previous-residence data suffer from the absence of a definite time reference. Persons who migrated fifty years ago or earlier and persons who moved only a few days ago will be grouped together as recent migrants. Place of residence at a fixed prior date understate the number of return migrants since it does not count migrants who moved out of an area during the interval and returned to it before the end of the interval.

c) Duration of Residence.

According to Adieri (2012), "Migrants by the duration-of-residence definition include all who had ever migrated: a) those born outside the area of enumeration, and b) those born in the area of enumeration, who had at some time lived outside it (return migrants). Their number must therefore be more than, though very rarely it may be equal to, the number of lifetime migrants by the birth-place definition". The duration of residence approach includes return migrants, fill a gap inherent in the ordinary birth-place approach. The approach also provides a distribution of lifetime in-migrants by time of last arrival, or a classification by migration cohorts. Third, it can be expressed in time periods. However, data obtained from this approach alone cannot distinguish migrants from non-migrants, place of birth (POB) statistics are required to reveal the type of migrants (lifetime or recent migrants) as well as the direction of migration flows. The method is also influenced with the quality, accuracy, and adequacy of data that is misreporting of the duration by the respondents who do not know the duration of all household members or reported as unknown (United Nations 1970).

2.1.1 Applicability of Direct Measures of Migration

The growth of urban centers as a result of migration, has progressed at a faster rate in least developed countries (LDCs) than in most developed countries (MDCs) and in many cities overtaken the rate of job growth in the modern sector and infrastructure development hence creating squatter settlement, highly concentrated poverty, serious problems of congestion and widespread deficiencies in vital services (McGee and Griffiths, 1988).

Kenya is among those categorized as least developed in the world where migration into cities has also grown at a fast rate. According to the 1999 Kenya Population and Housing Census, the demographic, social, economic and political variables have significantly impacted on the urbanization process, resulting in diverse urbanization levels, trends and patterns at both the provincial and district levels Changes in population distribution resulting from migration in LDCs are consistent with the idea that migration occurs in response to geographical differences in the distribution of economic resources and opportunities (White and Lindstrom, 2005). With this in

mind, there is need for estimating migration trends and patterns in most regions of the world and Kenya specifically.

Keefe (1984) contends that patterns and likely trends of spatial distribution of the Kenyan population are more difficult to discern largely because of inadequacies of existing data. Efforts have been made to improve data on migration. As a recommendation of the United Nations, steps towards the improvement in the quality of migration data featured the inclusion of a time specific question in the 1980 round of censuses that required that migrants be asked where they were living one year before the census. In the 1979 Kenya census, questions relevant to calculation of annual migration rates were included.

Several methodological attempts on the Kenyan census data have been made; Ominde (1968) used the 1962 census data in his seminal work on internal migration in Kenya. In his study, Ominde used direct techniques of estimation by cross classifying place of birth with place of residence or place of enumeration statistics to identify migration streams. There were also estimations done on sex ratios. Later studies (Rempell, 1977; Beskok, 1981; and Oucho 1988) made direct measurements of migration with respect to the 1969 and 1979 census data. Detailed cross classification of districts of origin with district of destination provides an interesting picture of primary, secondary, tertiary and other destinations (Oucho, 1988; 1990).

Ominde (1968) study findings revealed that by 1962, Rift Valley region accounted for 44% of all internal migrants in Kenya; principal sources of migrants in Rift Valley region was Central region (48.2%). In addition, Rift Valley region ranked as an area of net in-migration alongside the capital city, Nairobi and Coast regions. Whereas Central, Nyanza, Eastern and Western regions experienced net loss of the population.

Knowles and Anker's (1977) study on the factors that contribute to the process of internal migration in Kenya found that internal migration in Kenya proceeds by stages and that land pressure appears to encourage out-migration. The study identified two kinds of rural-rural migration besides rural-urban migration: (i) rural-rural migration to obtain employment in the cash crop estate sector; and (ii) rural- rural migration for settlement purposes into areas which were formerly reserved for White settlement

during the colonial period. However, the preponderance of males among rural-urban migrants and the temporary nature of this type of migration are cited as some of the characteristics of internal migration.

Rempell's (1977) study on internal migration in Kenya revealed extensive out-migration of children from Nairobi, the dominance of young rural-urban migration over the other types of migration and the dominance of young adults among rural to urban migrants. Migration patterns in the Coast region and Northern parts of the country showed that people born in the two regions rarely migrate to other districts outside the two regions (Rempell, 1977). Further, the study revealed that although the number of rural-urban migrants appeared large from the point of view of the receiving centers, the proportion of the rural population moving to towns was very small. Confirming Knowles and Anker's (1977) finding, Rempell (1977) study revealed that although a large number of people did move across district boundaries, the majority moved to other rural areas.

Huntington (1974) using the 1962 and 1969 census data sets singled out ethnic linkage as a major determinant of rural to urban migration. Beskok (1981) analyzed lifetime migration data provided in the 1979 census which portrayed considerable regional variations in internal migration. Similar studies on internal migration in Kenya have been carried out by Nyaoke (1974), Mbithi and Migot-Adholla (1977), Matingu (1974), Oucho and Mukras (1983) and Okatcha (1982). Nyaoke's (1974) found that: both economic factors and non-economic factors had bearings on two types of internal migration, namely, rural-urban and urban-rural; the rate of rural-urban migration was dependent on the rate of economic development of the sending areas. Mbithi and Migot-Adholla's (1977) study findings showed that selective rural-urban population drift contributed much to the continued rural underdevelopment as it is both a brain and energy drain.

Matingu's (1974) study showed most migrants were either landless or nearly so. And that the migrants were generally under fifty years of age and had very little or no formal education. Such migrants tended to migrate with their families to the areas of destination because the majority of them were married and migrated mainly into areas where their kinsmen had settled. Oucho's (1981) study of the nature and pattern of

rural-rural migration and the implications of such movement for rural development at the Kericho tea estates complex as a case study, revealed that rural-rural migration was motivated by the presence of relatives and friends at the area of destination, and that rural-rural was also highly selective of migrants by ethnicity.

The intercensal period between 1969 and 1979 saw Garissa district - the provincial head-quarters of North Eastern region - receive most migrants from other districts of North Eastern region (Oucho et al, 2000). These areas registered an increase in the population aged 10-19 years. Of importance to note is that when a district either losses or gains in its population, this affects nearly all age-groups during the intercensal period under study. The calculated migration rates used in conjunction with birth place statistics reflect southward movement of the population from northern part of Kenya to well watered districts further south, suggesting that some of the nomadic population are beginning to settle down.

Other studies that have used direct measures to analyze migration in Kenya include Analytical Reports on Migration and Urbanization in Kenya. The reports have been compiled by Central Bureau of Statistics (CBS) in different volumes. Central Bureau of Statistics (2004) analytical report showed the levels, trends, and patterns of internal migration both recent and lifetime migrants as well as the demographic and socio-economic characteristics of lifetime migrants. The Central Bureau of Statistics is nowadays referred to as Kenya National Bureau of Statistics (KNBS).

2.2 Indirect Methods of Estimating Intercensal Net Migration

Indirect methods were initially developed to facilitate measurement of demographic processes in countries lacking accurate conventional data (K. Hill in Encyclopaedia of the Social and Behavioral Sciences, 2001).The methods were not intended as a long-term replacement for direct estimation of demographic rates for census and vital registration data, the methods were derived as a stopgap way of estimating rates from limited and defective data, with the hope that, in time, improvements in census data collection and improving completeness of vital registration systems would render the methods obsolete. Unfortunately, progress in this regard in developing countries, and especially in sub-Saharan Africa, has been slow. Consequently, these indirect

methods still play an important role in demographic estimation where the quality of data is poor, or is inadequate.

With much greater quantities of data now available, even from developing countries, work still continues on validating, refining, and improving the suite of indirect methods using simulation techniques as well as comparison with gold standard data. A recent example is the work of Masquelier (2013) in his investigations of the nature of biases in the estimates of adult mortality produced by the siblinghood methods

The following discussion covers the indirect methods of estimating migration rates.

a) The Vital Statistics Method (VSM)

The vital statistics method (VSM) has been widely used in developed countries (Eldridge, 1965; Hamilton, 1966; Siegel et al, 1952; Leroy, 1967). The method is best applicable where there are reliable statistics of births and deaths to the residents of each component area of a country. The method provides estimates on the balance of all movements made between one census and the subsequent one. However, vital statistics of most countries (especially the developing countries) are not likely to be available in much detail for the group approach. Incomplete coverage and misreporting of age in both the census and the death statistics affect the accuracy of the migration estimates obtained through this method. Estimation of net migration by this method is further affected by political boundaries thereby making regional comparability of such estimates exceedingly difficult (United Nations, 1970 as c.f. Oucho et al, 2000).

b) National Growth Rate Method

Zachariah (1964) used the national growth rate method (NGRM) to study migration in the Indian subcontinent. The same method was applied by the Directorate of National Sample Survey with much success to study migration in India (India, 1962).The basic assumption in the method is that migration rates can be computed for stable populations. Odipo (1994) applied national growth rate method (NGRM) to the Kenyan census data sets (1969, 1979 and 1989) and concluded that the method can be used for both stable and unstable populations of developed and undeveloped regions of the world.

Odipo's (1994) study findings revealed that migration patterns in Kisumu and Nakuru areas, being influenced by municipality effects, resembled those of Nairobi and Mombasa. Population increase in the four (4) urban districts mentioned was in the age-groups10-29 and 10-39 for females and males respectively.

A major strength in the national growth rate method (NGRM) is that it does not require vital statistics, thus a country with no detailed or comprehensive vital statistics can apply this technique to estimate net intercensal migration. However, it cannot show the direction of population movement, that is, it cannot show which of the districts may be gaining or losing population to which other districts (Shryock and Siegel, 1976).

c) Survival Ratios

Other methods that have been used are the survival ratios. These involve the use of survivorship probabilities. Survival ratios assume that the population is closed and therefore not subject to external migration. The survival ratio method gives estimates on mortality together with relative coverage and reports errors in the two censuses. However, the method's very assumptions are not realistic and as such are considered a disadvantage to the technique. Like the vital statistics method, the survival ratio method provides good estimates of internal migration only when it is applied to a population for which external migration is insignificant.

Census survival ratios (CSR) and Life-table survival ratios (LTSR) are the two types of survival ratios. The census survival ratio (CSR) is the ratio of the population aged x+n at a given census to the population aged x at the census n years later. Census survival ratio (CSR) becomes very useful where the required life tables are not available. The method assumes that the true survival ratios are similar for the geographic division as for the entire country. Also, that the pattern of discrimination errors in the census age data is also similar. Problems associated with the use of this method are: that the national population is not affected by external movements; that the use of specific mortality rates similar for each area as for the nation and that the ratio of the degree of "completeness' of enumeration in any age-sex group bears to the true population to that of the nation is the same for the same cohort in both censuses.

The census survival ratio is used where the life table is not readily available. Survival ratios have been found to be useful in estimating net migration in statistically underdeveloped countries (Siegel et al, 1952; Hamilton, 1967). Oucho and Omogi (1991) used census survival ratio (CSR) and made estimates of intercensal migration for Kenya's eight regions for the period between 1969 and 1979.

Life table survival ratios (LTSR) are applied to estimate net migration for an area when a life table describing the average mortality conditions of the intercensal period is available for the particular area making it possible for survival ratios to be computed. The method is applicable when the period between one census and the subsequent one is ten years and the population is ordered by five year age-groups. Major weakness associated with the application of this method is that age misreporting present themselves in the migration estimates.

Other scholars who have applied survival ratios are Miller (1994) and Otieno (1999). Miller (1994) analyzed historical data at the University of Minnesota. He used birth place specific variant of the census survival ratio method and this can also be extended to estimate gross directional migration. Otieno (1999) also estimated intercensal net urban migration using life table survival ratios on the 1979 and 1989 Kenya data sets.

d) Age- specific growth rate method (ASGRM)

Developed by Preston & Coale in 1982, age-specific growth rate method is an indirect method for estimating age-specific migration rates for non-stable populations.The basic assumptions of the method are; population growth rates change from one age-group to another and population growth is attributed to changing fertility and mortality rates as well as varying migration rates. In Kenya, the method was applied by Wakajummah (1986) and Adieri (2012) on 1969-1979 and 1999-2009 Kenyan data sets respectively.

This study presents the third attempt to apply the technique to estimate migration rates for non-stable populations. A major strength of the technique is that it can be used to estimate mortality, fertility and migration for non-stable populations. Hence the method is very suitable for application in the developing countries where fertility and

mortality rates are constantly changing. Also, in this technique the census interval does not need to be in five years or a multiple of five as is required of the survival ratios.

Rogers et al (1978) observed that from fertility analysis, migration studies can borrow from well-developed techniques for graduating age-specific schedules. Wakajummah (1986) and Adieri (2012) applied the technique to Kenya's 1969 and 1979 and 1999 and 2009 census data sets respectively. Both Wakajummah and Adieri (2013) used the intercensal net migration rates and found that the results portrayed regional variations in age-specific intercensal net migration rates. However, like the national growth rate method (NGRM), the technique does not indicate the direction of population movement. Further, the technique is also affected by age-misreporting, and does not show how many times an individual has moved from one place to the other during the intercensal period.

Wakajummah (1986) observed that all regions recorded net gains in population at older age-group 70-74 years. Odipo (1994) and Wakajummah (1986) both observed that in Western and Eastern Kenya, districts contributing migrants to urban centers experienced net gains in male population after age 40, suggesting some return migration of unsuccessful job seekers. For most districts in Eastern and Western Kenya, return migration due to retirement was from age groups 50 and above. In Kenya, there have only been few studies conducted on internal migration. Adieri (2012) using age-specific growth rate method, found out that migration in the metropolitan areas Nairobi and Mombasa reflected the same age-specific migration patterns, suggesting that major forces attracting people into and/or repelling them from these two regions are nearly similar. In-migration into these regions that was experienced was in the age group 5-34 for both sexes, whereas out-migration was observed at age-group 35 and above.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

Kenya's vital statistics records fall short of giving accurate estimates of migration inherent in the inadequacy of data. As such, it becomes increasingly important to apply indirect methods of estimating internal migration. This section discusses the analytical framework, data, data source, appraisal and methods of analysis applied in this study.

3.1 Analytical Framework

Age-specific growth rate method is an indirect technique of estimating internal migration. It is based on the assumption that population growth rates change from one age-group to another. Moreover, population growth is attributed to changing fertility and mortality schedules as well as varying migration rates. It is thus theorized that migration being an adjustment to changing environmental, socio economic and even demographic factors is molded by different processes that have emerged over time, creating different age-specific migration patterns within the country.

In the stable population, the age distribution at age 'a' is given by:-

$$C_{(a)} = b * \exp(-r\,a) * P_{(a)}, \qquad (3.1)$$

where, b is the birth rate, r is the growth rate and $P_{(a)}$ is the probability of survival up to age 'a' from birth.

In the above stable population equation, the growth rate r is assumed to be constant through all ages, which is an unlikely situation in unstable population. If the equation is modified to assume constant growth rate just within specific-age groups, but for all ages, the equation is modified to:

$$C_{(a)} = b * P_{(a)} * \exp\left[-\int_0^a r(x)dx\right],$$

The foregoing formula assumes population growth occurs only due to natural increase. However, population growth is accounted for both by natural increase and net migration. To take care of migration, the formula may be re-written as follows:-

$$C_{(a)} = b * P_{(a)} * \exp\left[-\int_0^a \{r(x) + e(x)\}dx\right], \qquad (3.1a)$$

where, b is the birth rate, r is the growth rate and $P_{(a)}$ is the probability of survival up to age 'a' from birth and $e(x)$ is the net out-migration rate.

$C_{(a)}$ and 'b' can be replaced by $\frac{N_{(a)}}{N}$ and $\frac{N_{(o)}}{N}$, respectively. The formula therefore becomes:-

$$N_{(a)} = N_{(0)} * P_{(a)} * \exp\left[-\int_0^a \{(r(x)+e(x)\}\right]$$

$$\frac{N(a)}{N_{(0)} * P_{(a)}} = \exp\left[-\int_0^a \{r(x)+e(x)\}dx\right]$$

$$\ln\left(\frac{N(a)}{N_{(0)} * P_{(a)}}\right) = \left[-\int_0^a \{r(x)+e(x)\}dx\right] = -\int_0^a r(x)dx - \int_0^a e(x)dx$$

Therefore,

$$\int_0^a e(x)dx = -\ln\left(\frac{N(a)}{N_{(0)} * P_{(a)}}\right) - \int_0^a r(x)dx$$

$$\Rightarrow \int_0^{a+5} e(x)dx = -\ln\left(\frac{N(a+5)}{N_{(0)} * P_{(a+5)}}\right) - \int_0^{a+5} r(x)dx$$

$$\Rightarrow \int_a^{a+5} e(x)dx - \int_0^a e(x)dx = -\ln\frac{N_{(a+5)}}{N_{(0)} * P_{(a+5)}} + \ln\frac{N_{(a)}}{N_{(0)} * P_{(a)}} - \int_a^{a+5} r(x)dx + \int_0^a r(x)dx$$

Therefore,

$$\int_a^{a+5} e(x)dx = \ln\frac{N_{(a)}}{N_{(a+5)}} * \frac{P_{(a+5)}}{P_{(a)}} - \int_a^{a+5} r(x)dx$$

$$5*_5 e_a = \ln\frac{N_{(a)}}{N_{(a+5)}} * \frac{P_{(a+5)}}{P_{(a)}} - 5*_5 r_a \qquad (3.1b)$$

$$_5 e_a = \frac{-1}{5}\ln\left[\frac{N_{(a)}}{N_{(a+5)}} * \frac{P_{(a)}}{P_{(a+5)}}\right]^{-1} - _5 r_a$$

$$\text{i.e.}\ {}_5e_a = \frac{-1}{5}\ln\left[\frac{N_{(a+5)}}{N_{(a)}} * \frac{P_{(a)}}{P_{(a+5)}}\right] - {}_5r_a \qquad (3.1c)$$

The equation (3.1c) expresses the out-migration rate between age 'a' and 'a+5' in terms of: probability of survival at age 'a' and 'a+5'and age-specific growth rate between age 'a' and 'a+5'.

Age-specific growth rate method can be used to provide estimates on migration, mortality and fertility for non-stable populations which are characteristic of the Kenyan population. However, like most indirect techniques of estimating internal migration, the method does not indicate the direction of population movement.

3.2 Data and Research Methods

This sub-section discusses the data source used in this study, the methods of analysis and the estimation of intercensal net-migration rates as applied in this study.

3.2.1 Data Source

Information on internal migration is available from two main sources: first, data derived from direct or indirect questions about mobility related to birth place, last place of dwelling at a fixed past date and the duration of such abode. The second type consists of estimates of net migration derived from total counts of population by sex and age at two consecutive censuses. The study used the census data sets of 1989 and 1999 for Kenya, in response to the above asked questions to estimate the intercensal net migration rates in Kenya.

3.2.2 Methods of Analysis

The study applied the age-specific growth rate method for estimating intercensal net migration rates at the regional level.

3.2.3 Estimation of Intercensal net migration rates

The section presents a practical application of the age-specific growth rate method in estimating intercensal net migration rates (NMR).

Requirements:

1) The appropriate life tables from which the probability of survival can be obtained. However, In this study, the $P_{(a)}$ values were picked from the 1999 Kenya census analytical report.
2) Two consecutive population censuses computed by five-year age groups.

These two sets of data enable us to calculate the age-specific growth rates required by this technique. If implemented from age 0, this technique also requires intercensal births. If the intercensal births cannot be obtained, then the estimation should begin at age 5, with $N_{(a)}$ estimated by averaging numbers in the adjacent 5– year age groups.

The computational steps:

1. To obtain the age specific growth rate, the following formula was used:

$$ {}_5r_a = \frac{1}{t_1 - t_0} * \ln\left[\frac{{}_5N_{a(t_1)}}{{}_5N_{a(t_0)}}\right], \qquad (3.1d) $$

where, ${}_5N_{a(t_0)}$ and ${}_5N_{a(t_1)}$ are the number of persons between ages "a'' and "a+5" at times t_0 and t_1, respectively, when the two censuses were taken. In this case, $\frac{1}{t_1 - t_0}$ is the reciprocal of 10.

2. To estimate the number of persons at exact age "a" denoted by ($N_{(a)}$), we first average the number of persons in the two censuses age-wise:-

$$ {}_5\bar{N}_a = \frac{{}_5N_{a(t_1)} + {}_5N_{a(t_0)}}{2} \qquad (3.1e) $$

The obtained result was further averaged in the adjacent 5 -year age group as shown below:-

$$ N_{(a)} = \frac{{}_5\bar{N}_a + {}_5\bar{N}_{(a-5)}}{10} \qquad (3.1f) $$

Given the above formula, the intercensal net migration rate can be obtained by the formula shown in 3.1c.

$$ {}_5e_a = \frac{-1}{5}\ln\left[\frac{N_{(a+5)}}{N_{(a)}} * \frac{P_{(a)}}{P_{(a+5)}}\right] - {}_5r_a \qquad (3.1c) $$

where e_a= net migration rate

N_a = number of persons at exact age "a" using the arithmetic mean

N_{a+5} = number of persons between ages "a'' and "a+5"

5Na= Arithmetic mean

p_a= Probability of survival at exact age a

p_{a+5}=Probability of survival between ages "a'' and "a+5"

$_5r_a$= Age specific growth rate

Ln= natural logarithm

To compute intercensal net migration rate by age-specific growth rate method, this study used the arithmetic mean for 1989 and 1999 census data sets for two consecutive time interval as well as the probability of survival values that is the $P_{(a)}$ values were picked from the 1999 Kenya census analytical report.

In the result obtained, net in-migration at any specific age-group was denoted by a negative sign (-).This is because in the formula for net out-migration rate, the result was denoted by a positive sign (+). Of significance is that, because age-specific growth rate method does not reveal the direction of population movement, birth place statistics were used to explain this. Hence as had been stated in the literature review, place of birth (POB) reveals in-migrants, and out-migrants.

3.3 Supporting Models

This study employed the P(a) values from life tables for different regions based on child mortality estimates of 1999; migration streams to depict the direction of migrants presented in-migration birth statistics matrix and data quality appraisal model that is the UN joint score.

3.3.1 Data Quality Appraisal Model

Age-specific growth rate method is affected by age-misreporting. In order to address this limitation, this study utilized the United Nations (UN) Age-Sex Accuracy Index to check the accuracy of age-sex reporting in the data. In this index, the mean of the differences from age-to-age in reported sex ratios, without regard to sign, is taken as a measure of the accuracy of the observed sex ratios, on the assumption that these age

to age changes should approximate to zero. Further, the index combines the sum of: a) the mean deviation of the age ratios for males from 100.0; b) mean deviation of the age ratios for females from 100.0; and c) three times the mean of the age-to-age differences in reported sex ratios (UN 1952; Shryock and Siegel 1976).

In the U.N procedure, an age ratio is defined as the ratio of the population in a given age group ($_5P_a$) to one-half the sum of the populations in the preceding ($_5P_{a-5}$) and following ($_5P_{a+5}$), groups, see the age ratio formula below.

$$\text{Age Ratio} = \frac{{}_5P_a}{\frac{1}{2}({}_5P_{a-5} + {}_5P_{a+5})} * 100$$

The sex ratio is defined as the ratio of males to females per 100, in each age group.

$$\text{Sex Ratio} = \frac{Males}{Females} * 100$$

Computational steps:

- Get the sex ratios for all age groups from age group 10-14. ……65-69.
- Obtain the successive differences to compute the mean of the age-to-age differences in reported sex ratios.
- Analyze age ratios, males and females differently.
- Obtain the deviations of age ratio for males and females separately from 100.
- Compute the mean deviations of the age ratios separately, again for males and females.
- Obtain the index by adding the following; 3 times mean difference in sex ratios, mean deviations of male and female age ratios. Table 1 illustrates how the results obtained are interpreted.

Table 1: Interpretation of the UN Age-Sex Index

Index	**Description**
Below 20	Accurate
20-40	Inaccurate
Above 40	Highly inaccurate

Source: Shryock and Siegel 1976.

If the index is above 20 as indicated in table 1, then there is need to adjust the data. AGESMTH spreadsheet (found in Population Analysis Spreadsheets for Excel-PASEX computer programme) was used to reduce the age-sex misreporting. Table 2 shows the results obtained after applying the UN age-sex accuracy index.

Table 2: UN Age-Sex Accuracy Index by Region, 1989-1999

Region	1989	1999
Nairobi	153.14	87.17
Rift Valley	23.95	22.89
Western	25.39	46.49
Eastern	38.82	29.22
North Eastern	138.64	119.87
Nyanza	23.67	30.99
Central	27.63	27.04
Coast	25.40	33.09

Source: Computed by author using 1989 and 1999 KPHC data sets

3.4 Limitations of the Study Technique

Despite producing good results, the technique has several limitations. It is affected by age–misreporting which has been resolved by graduating age data and the adjusted data used depending on the index obtained. Secondly, the method cannot reveal the direction of migration flows hence the use of the birth place statistics matrix to explain the direction of migrants.

CHAPTER FOUR
INTERCENSAL NET MIGRATION IN KENYA

4.0 Introduction

This chapter analyzes net migrations rates obtained using the ASGR method. The analysis was undertaken for the eight (8) regions for the period 1989-1999. To obtain the net migration rate for the eight (8) regions, formula (3.1c) given in chapter three was applied:-

Thus,

$$ {}_5e_a = \frac{-1}{5}\ln\left[\frac{N_{(a+5)}}{N_{(a)}} * \frac{P_{(a)}}{P_{(a+5)}}\right] - {}_5r_a \qquad (3.1c) $$

The following tables illustrate the intercensal age-specific net migration rates by sex for the eight (8) regions obtained after applying the formulae 3.1c above. The figures that have a negative sign represent in-migration and those that have a positive sign show out-migration. Table 6 represents the birth place matrix which was used to explain place of birth vis-à-vis place of enumeration.

Table 3: Intercensal Net Migration Rates (Combined) % by Region and Age-group, 1989-1999

Age Group	Nairobi	Central	Nyanza	Western	North Eastern	Eastern	Rift Valley	Coast
5-9	-3.8193	0.2625	0.0622	0.7651	-7.7121	0.0801	-0.1740	0.4742
10-14	-4.8033	0.1406	-0.8082	0.2067	-8.1352	-0.0185	-0.3646	-0.7394
15-19	-6.2389	1.5222	2.0303	1.6937	-7.0709	2.7600	-0.2000	-1.9265
20-24	-5.2968	1.9563	4.9138	3.5527	-5.9953	4.7383	-0.7348	-2.0270
25-29	-2.8714	1.4674	3.2552	3.1703	-5.3391	2.6270	0.7102	0.5965
30-34	-1.3388	0.1161	2.3483	2.5535	-4.5992	1.6295	0.8662	3.1100
35-39	1.1405	-0.1215	2.0936	1.5706	-5.0405	1.4889	1.1632	2.3004
40-44	2.8995	2.1264	1.3156	0.8510	-5.1756	1.2680	1.0100	1.4354
45-49	2.4365	1.6118	1.2594	0.9471	-4.5107	1.3897	5.3305	1.9073
50-54	2.8353	-0.2323	2.4288	1.4248	-3.5195	1.1497	0.9353	2.5448
55-59	2.5659	-0.1492	2.4051	0.9379	-3.0757	0.6491	0.9645	2.1071
60-64	2.5142	0.6633	1.5778	0.5904	-2.4926	1.8411	1.0890	1.6220
65-69	2.2725	-9.9217	1.3736	2.2847	-1.9817	0.5510	0.5945	1.8556
70-74	2.2367	-30.5467	1.1490	-2.2752	-0.9423	-1.7405	-11.6235	2.6074

Source: Computed by author using 1989 and 1999 KPHC data sets

Table 4: Female Intercensal Net Migration Rates (%) by Region and Age-group, 1989-1999

Age Group	Nairobi	Central	Coast	Nyanza	Western	North Eastern	Eastern	Rift Valley
5-9	-4.39362	0.2541	0.4131	-0.0240	0.1251	-7.2236	-0.0186	-0.6640
10-14	-4.94357	0.2412	-0.7477	-1.0083	-0.3648	-7.9133	-0.2368	-0.3741
15-19	-5.91181	2.0687	-2.0078	1.5270	1.9360	-7.3443	2.3483	-1.0420
20-24	-5.10366	2.4213	-1.8631	5.5041	5.3776	-6.5003	5.1642	-0.9465
25-29	-2.50975	1.0606	0.9836	5.2994	4.8589	-5.9151	4.1512	0.7653
30-34	-0.98167	-0.3178	3.2522	3.9694	3.6633	-5.2466	2.7905	0.0693
35-39	1.290939	-0.0563	2.1653	3.1087	2.9472	-5.0334	2.1617	1.6354
40-44	3.189045	2.0416	1.1896	2.3728	2.1216	-4.5740	2.1771	0.4300
45-49	2.087904	1.3823	1.6161	2.3694	2.3745	-3.6120	2.5708	9.8650
50-54	1.996641	-0.2781	2.0877	3.5689	3.1785	-2.1735	1.9844	0.0976
55-59	1.370815	-0.0201	1.4952	3.6319	2.1177	-1.8241	1.1747	0.6360
60-64	0.918434	0.7286	1.4110	2.9370	0.9363	-1.3962	2.9517	0.9460
65-69	0.66607	-11.7791	2.0725	2.7974	2.8351	-1.1313	3.4384	0.6570
70-74	0.21848	-8.0707	3.0885	2.4899	-1.2083	-0.8051	-3.6224	-9.3560

Source: Computed by author using 1989 and 1999 KPHC data sets

Table 5: Male Intercensal Net Migration Rates (%) by Region and Age-group, 1989-1999

Age-Group	Nairobi	Central	Coast	Nyanza	Western	North Eastern	Eastern	Rift Valley
5-9	-3.245	0.2708	0.5352	0.1484	1.4051	-8.2006	0.1788	0.316
10-14	-4.663	0.0399	-0.7311	-0.6081	0.7781	-8.357	0.1999	-0.355
15-19	-6.566	0.9756	-1.8452	2.5335	1.4513	-6.7974	3.1716	0.642
20-24	-5.49	1.4912	-2.1908	4.3234	1.7278	-5.4903	4.3123	-0.523
25-29	-3.233	1.8741	0.2093	1.2109	1.4816	-4.7631	1.1028	0.655
30-34	-1.696	0.55	2.9677	0.7272	1.4436	-3.9517	0.4685	1.663
35-39	0.99	-0.1867	2.4355	1.0784	0.1939	-5.0475	0.816	0.691
40-44	2.61	2.2112	1.6811	0.2584	-0.4197	-5.7771	0.3589	1.59
45-49	2.785	1.8412	2.1984	0.1494	-0.4804	-5.4094	0.2086	0.796
50-54	3.674	-0.1865	3.0019	1.2886	-0.329	-4.8654	0.315	1.773
55-59	3.761	-0.2782	2.7189	1.1782	-0.2419	-4.3273	0.1234	2.565
60-64	4.11	0.598	1.833	0.2186	0.2445	-3.5889	0.7305	1.232
65-69	3.879	-8.0643	1.6387	-0.0502	1.7342	-2.8321	-2.3365	1.846
70-74	4.255	-53.0226	2.1262	-0.192	-3.342	-1.0795	0.1414	-13.891

Source: Computed by author using 1989 and 1999 KPHC data sets

Table 6: Birth Place Matrix

	Region of Origin									
Region of Enumeration	Kenya	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western	Outside Kenya
Kenya	28159922	817799	4046206	2167571	5037858	872297	4733260	6105282	3889998	489651
Nairobi	2083509	638700	351490	39988	326051	21257	258752	103623	249060	94588
Central	3683003	47473	3279982	9373	101980	1966	37323	117974	47089	39693
Coast	2442056	17267	42101	2065964	114495	20571	65854	21252	49631	44921
Eastern	4591175	1678	50827	12146	4405330	10956	10693	21312	8492	55821
North-eastern	1141399	699	1251	1358	4239	807660	1100	1072	767	10431
Nyanza	4344770	38364	9596	16777	6496	1580	4069233	36759	80812	85153
Rift-Valley	6532820	43509	299235	14049	74287	7278	238805	5762302	1127853	132509
Western	2511623	15975	11724	7916	4980	1029	51500	59238	2326294	32967

Source: The 1999 KPHC data set

4.1 Intercensal Net Migration Rates for Nairobi Region, 1989-1999

The pattern of migration reflects rural–urban and return urban–rural migration typologies. Rural-urban migration could be attributed to the availability of many schools and colleges/jobs in the city. Further, from Figure 1, young people aged 5-34 years possibly came to Nairobi region to pursue education or jobs.

From the birth place statistics in table 6, it is evident that Nairobi experienced quite a substantial net gain of population from other regions. The intercensal period 1989-1999 saw Nairobi gain 17% of population from Central region, 16% from Eastern region and 12% from both Western and Nyanza regions. Inflow of population observed at ages 5-19 years could have been due to the fact that the city has a wide range of learning institutions for example primary; secondary and; colleges /universities learning institutions that provide vast training opportunities for the youth (see Table 3 column 2; and Tables 4&5 2nd columns). Whereas inflow of population at age-group 20-34 years is consistent with job-seeking behavior (see Table 3 column 2; and Tables 4 &5 2nd columns).

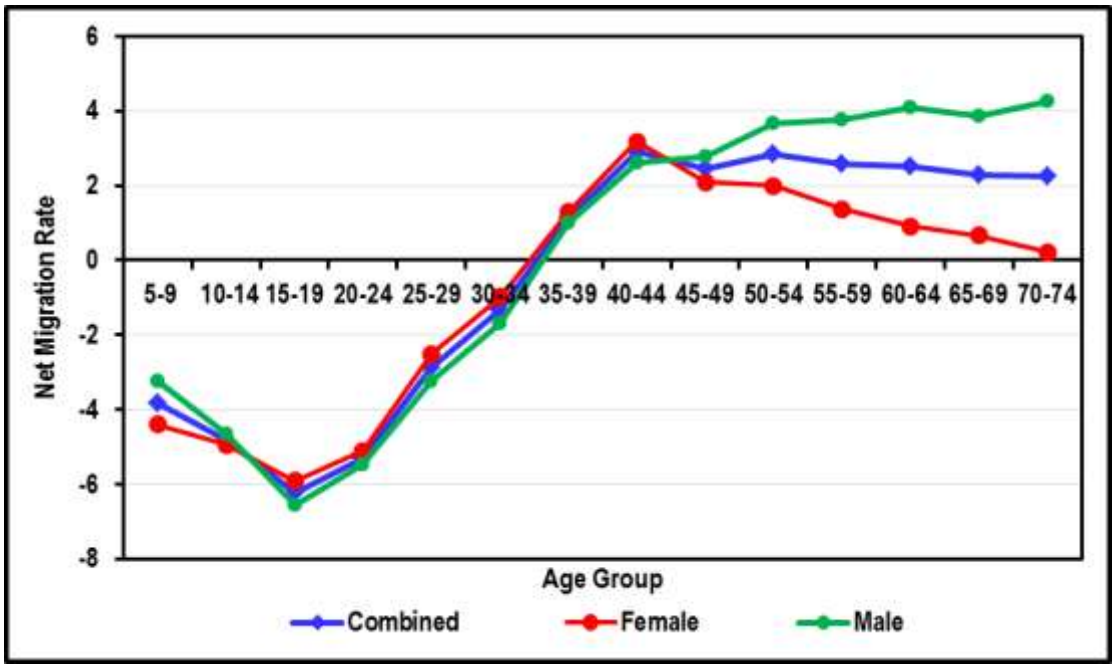

Figure 1: Intercensal Net Migration Rates for Nairobi Region by Sex and Age-group, 1989-1999

Source: Computed by author using 1989 and 1999 KPHC data sets

Outflow of population observed at age-group 35-74 may be characterized by the following groups of people: unsuccessful job seekers; school leavers; people who have been given job transfers and; population attained retirement age hence moving out to settle in their respective regions of birth.

4.2 Intercensal Net Migration Rates for Central Region, 1989-1999

As shown in Figure 2 (and columns 3 of Tables 3 & 4), the region experienced loss of population from age-group 5-29 years old before a slight gain was observed at age-group 30-34 years and a loss again at age-groups 35-44 years old for the male population and 35-54 for the female population. The region later experienced a slight gain of male population from age-groups 45-54 and at age-group 60-64. The region recorded a substantial gain of population at older age-group 65-74 years. Peak in-migration of both male population and female is at age-group 70-74 column 3 of Table 4 shows that over fifty per cent (50%) of the male population leave the area. This is quite alarming. Possible suggestions are that they left the area maybe because of the instability of the family unit or maybe they left to settle somewhere else with their families.

Birth place statistics also show Central region as losing most of its of population to other regions namely- Nairobi and Rift Valley-With Rift Valley region absorbing most of its population (see Table 6). Out-flow of young population aged 5-19 to other regions reflects search of learning institutions for example primary and secondary schools and training opportunities elsewhere. Further loss of population observed at age-groups 20-29 years is consistent with job-seeking behavior or those seeking permanent settlement elsewhere (See column 3 of Tables 3 & 4).

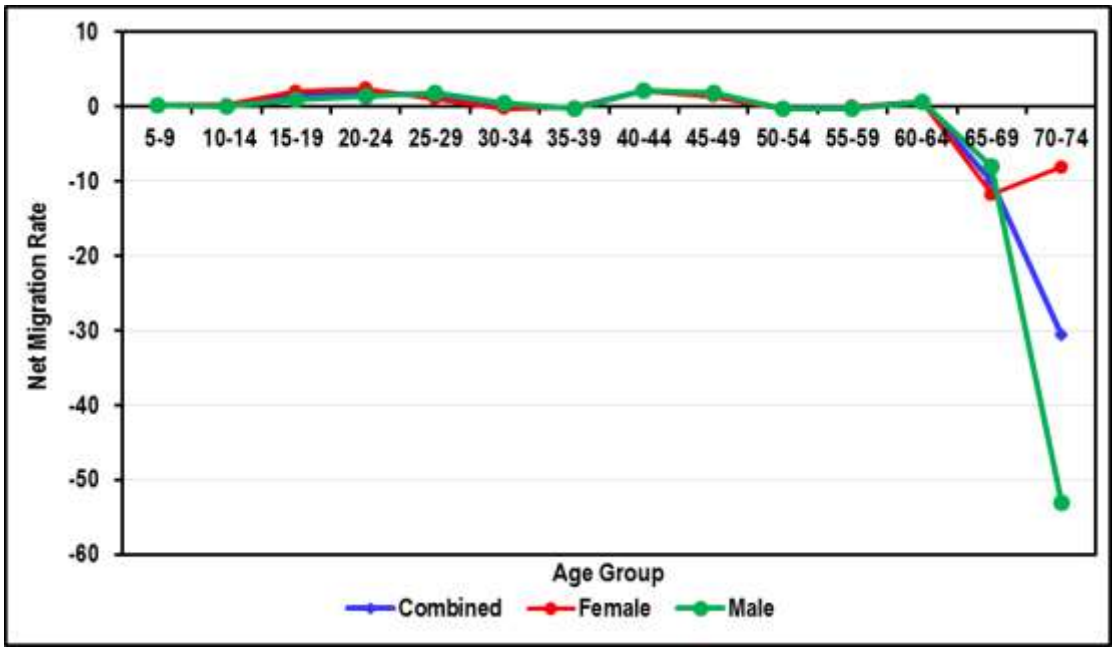

Figure 2: Intercensal Net Migration Rates for Central Region by Sex and Age-group, 1989-1999

Source: Computed by author using 1989 and 1999 KPHC data sets

Inflow of population aged 30-39 years old for both sexes and those at age-groups 45-54 and 60-64 years old for the male population, is characteristic of population that has come back due to job transfers or unsuccessful job seekers or possibly those who have come back to settle down in the region. Loss of female population aged 35-54 could be as a result of family instability and thus break-ups of families causing the female population at these age-groups to move out of the region.

4.3 Intercensal Net Migration Rates for Coast Region, 1989-1999

Birth place statistics (see table 6) show that, alongside Nairobi Region, this region gained population from other regions, mainly from Eastern. The recorded gain of children aged 10-19 years old comprised those who moved into the region with their parents aged 20-24 years old (See column 4 of tables 4 and 5). Adult population aged 25-69 years old moving out of the region include; those who move to other regions in search of jobs or investors from other regions who have accumulated capital and wish to invest in other parts of the country and; those persons who get job transfers to other regions of the country. From the pattern of migration depicted in Figure 3, females

aged 25-35 years old moved out of the region possibly because they got married elsewhere.

Inflow of population aged 10-25 years old reflects the following: those youth who seek for training facilities and opportunities in urban centers; and those given job transfers. Peak in-migration in Coast region was at age-group 20-24 years old. Inflow of population aged 70-74 could be those retired and moved to their region of birth and/or tourists.

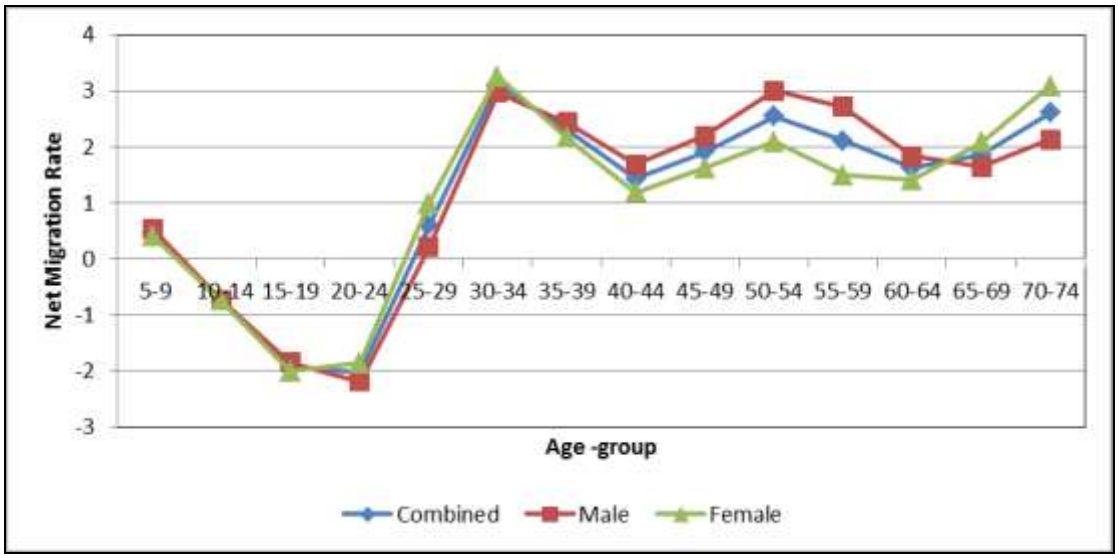

Figure 3: Intercensal Net Migration Rates for Coast Region by Sex and Age-group, 1989-1999
Source: Computed by author using 1989 and 1999 KPHC data sets

4.4 Intercensal Net Migration Rates for Eastern Region, 1989-1999

Intercensal net migration rates (column 8 of Tables 4 & 5) suggest that the region experienced a net loss of male population at all age-groups except at age-group 65-69 years old where we observe a slight gain. In-migration of population was observed at age-groups 5-14 and 70-74 for the female population. From the birth place statistics in Tables 6, the region lost population to other regions with Coast region being the major beneficiary. Characteristics of movers tend to vary with the distance spanned. The nearest region to Eastern region is Coast region. This explains why migrants from Eastern region preferred Coast region as a destination area as opposed to other regions in the country.

Out-migration of population aged 5-9 years old comprised those children who had been taken back to the region to go and school back home. This also ensures that family ties are strengthened. Further, outmigration of male population observed at age-groups 5-64 years in Figure 4 is consistent with those moving out in search of jobs or pursuing education.

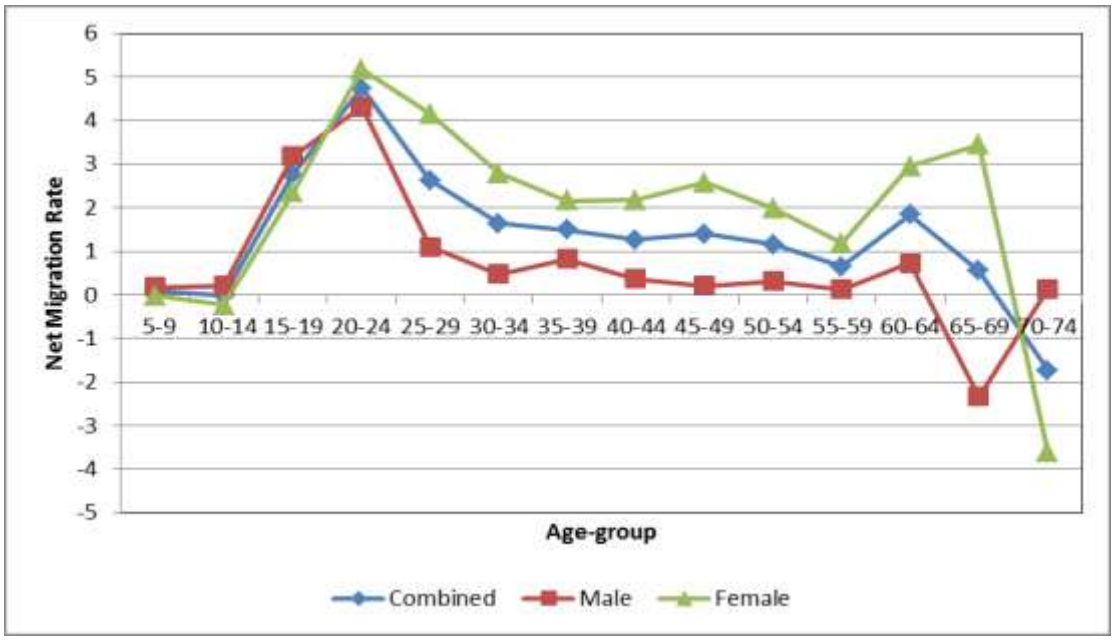

Figure 4: Intercensal Net Migration Rates for Eastern Region by Sex and Age-group, 1989-1999
Source: Computed by author using 1989 and 1999 KPHC data sets

Figure 4, suggests that return migration observed at the older age-group 70-74 comprise of persons of retirement age.

4.5 Intercensal Net Migration Rates for North Eastern Region, 1989-1999

As portrayed in Figure 5, the region was characterized by a net gain in population of both males and females at all age-groups (also see column 7 of Tables 4 & 5). Birth place statistics (table 6) show that the region gained in population at all age-groups, recording a substantial increase at age-group 10-14 years old. The observed inflow of population was occasioned by successful entry by illegal migrants into the country (mainly the Somali). This could be attributed to the proximity of North-Eastern region to Somalia where militia groups have predominantly been active in the last two decades thereby bringing rise of civil unrest hence making many flee as refugees and

seek asylum in other countries, with others going into other countries without proper documents.

Population aged 5-14 years old comprised of children who had come into the region to seek education and possibly had entered the region together with their parents aged 19-39 years old (possibly in the case of refugees). Also, those aged 20-24 years moved into the region for employment/training opportunities. The rest of the people coming into the area included those who; have either come back as a result of job transfers or those people who want to invest in the areas or simply return-migration to settle in the area. Women aged 15-30 came into the area as a result of getting married in the area. Overall, it is possible that the region shows a doubling of its share in 1999 because of a possible under-enumeration which was experienced in 1989 as well as the refugee influx.

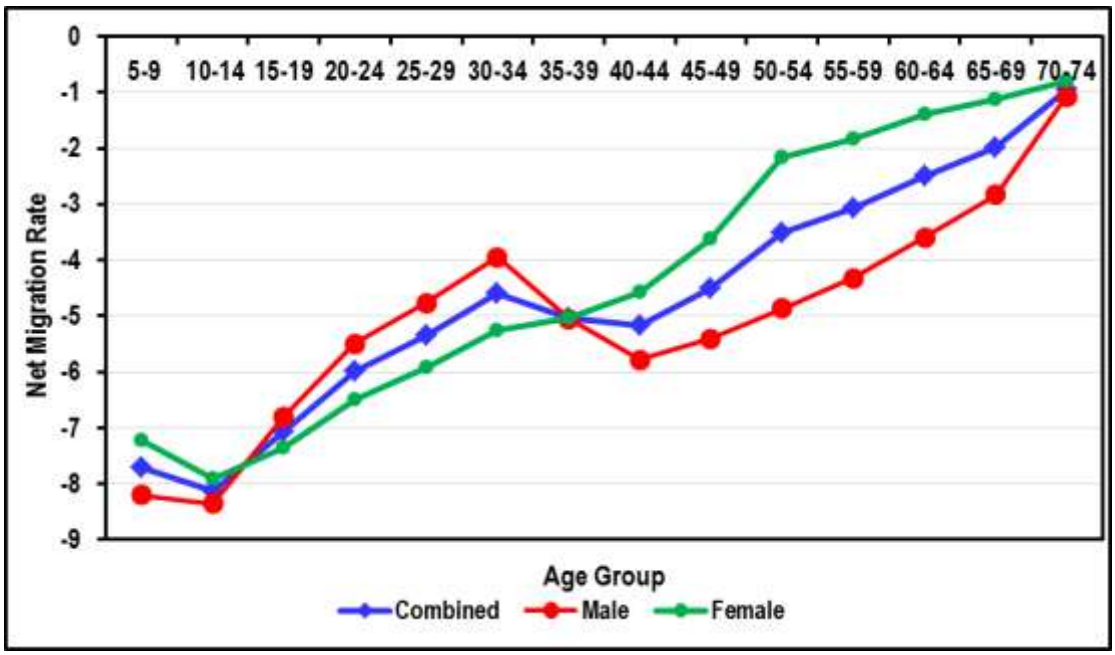

Figure 5: Intercensal Net Migration Rates for North Eastern Region by Sex and Age-group, 1989-1999

Source: Computed by author using 1989 and 1999 KPHC data sets

4.6 Intercensal Net Migration Rates for Western Region, 1989-1999

Intercensal net migration rates obtained for the intercensal period, 1989-1999, saw the region witness outflow of population at most age-groups. Birth place statistics in table 6 show the region as losing population mostly to Rift Valley and Nyanza regions

because of the nearness of the region to the other two regions - namely, Rift Valley and Nyanza regions.

Figure 6 shows Western region registering net loss of persons at age-groups 5-9 years before gaining at age-groups 10-14 years and later recording net loss again at age-groups 15-34 years. There is net gain of males at age-groups 40-59 and 60-74 whereas females record net gain at 10-14 and 70-74 (See also Tables 3 and 4 column 6 for the intercensal net migration rates).

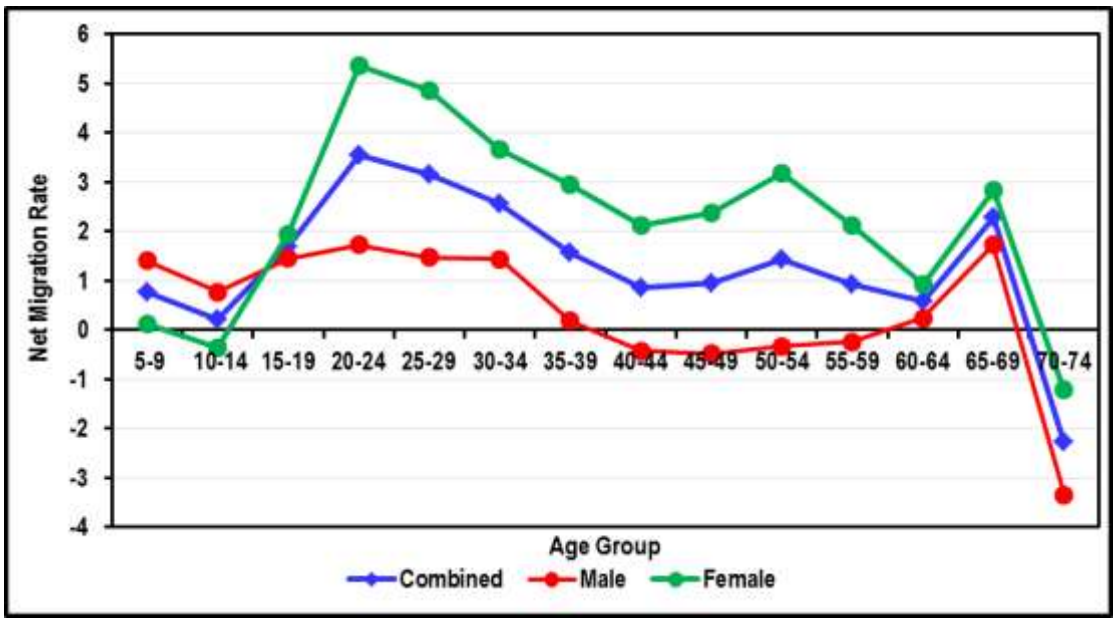

Figure 6: Intercensal Net Migration Rates for Western Region by Sex and Age-group, 1989-1999

Source: Computed by author using 1989 and 1999 KPHC data sets

From the pattern of migration of Western region, it is possible that persons aged 5-9 years left the region with their parents aged 20-34 years old. Adult population aged 20-34 years moved out of the area in search of jobs. Later the same children who had left the area at age-group 5-9 came back into the area aged 10-14 years maybe because the parents found it affordable to have their children school back at home and also to strengthen family ties by having them help their old parents back at home. Male population aged 35-49 years old came back into the area maybe because they were unsuccessful in their job hunting in the places where they had come from or because they would want to invest in the area by becoming entrepreneurs in business ventures.

The intercensal net migration rates for the female population observed at age-groups 20-24 years old could suggest that these were women who had gotten married maybe in nearby regions-most likely Rift Valley or Nyanza regions; or seek job/training opportunities elsewhere (see Table 4 and 5 column 5). Further outmigration of female population of older age- group 55-65 years old is symbolic of family instability in the area and therefore separation. Return migration observed in the area is by those of retirement age 60-74 years old.

4.7 Intercensal Net Migration Rates for Nyanza Region, 1989-1999

Figure 7 suggests that the region was characterized by outmigration of individuals at all age-groups except 10-14 and 60-74 years where it recorded net gain of population. Further, Birth place statistics in table 6 show that the region experienced loss of population mostly to Nairobi, Rift Valley and Western regions.

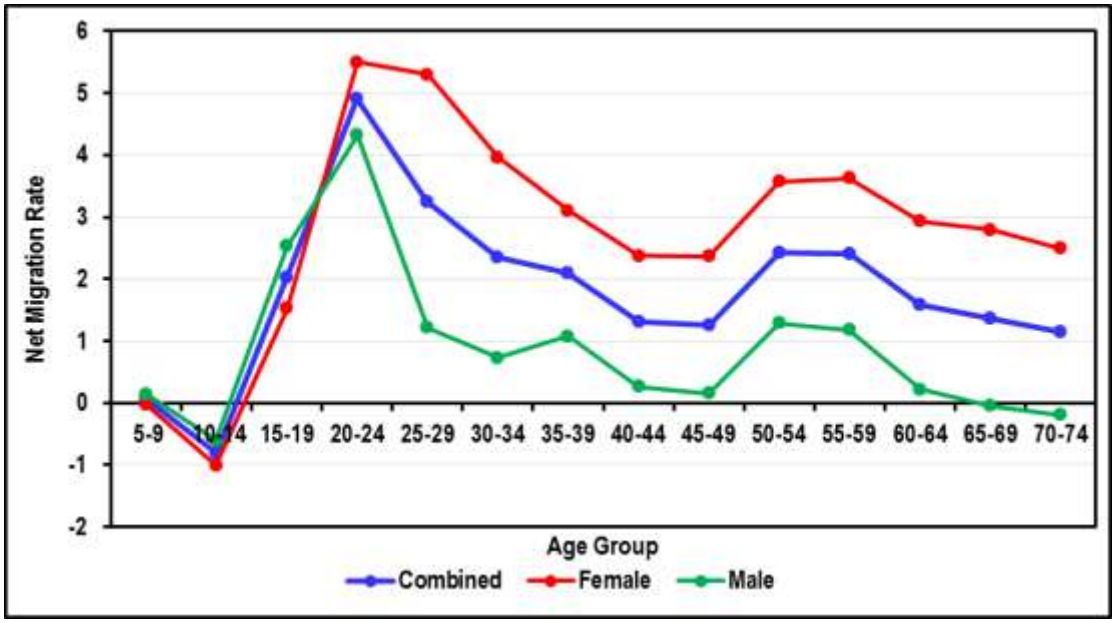

Figure 7: Intercensal Net Migration Rates for Nyanza Region by Sex and Age-group, 1989-1999

Source: Computed by author using 1989 and 1999 KPHC data sets

As portrayed in Figure 7, more males than females migrated at age- groups 10-24 years. These could comprise: those seeking post primary education elsewhere or; standard eight leavers who prefer to seek for employment in urban centers and rural areas where crop plantations are grown or; those who have completed their secondary education and move out to search for training opportunities and / or jobs in urban

centers. Males leaving the area at age-groups 20 onwards do so in search of employment opportunities or those who have acquired land elsewhere and wish to settle there. Females leaving the area at age-group 20-59 could be because of the following reasons: Seeking employment/training opportunities; marriage; family instability or widowhood. Return migration was observed at the older age-group 70-74 (also see tables 4 & 5 column 6).

4.8 Intercensal Net Migration Rates for Rift-Valley Region, 1989-1999

Birth place statistics reflect this region as having gained substantially in population from other regions, notably Central, Nyanza and Western regions. The region experienced net loss of children aged 5-9 years and later registered net gain of population at age-group 10-24 years old.

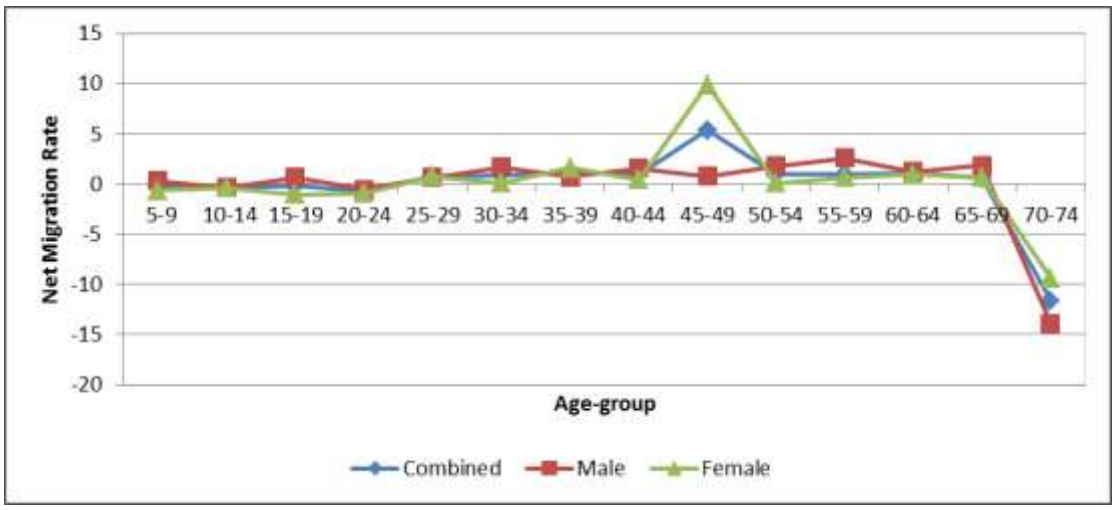

Figure 8: Intercensal Net Migration Rates for Rift Valley Region by Sex and Age-group, 1989-1999

Source: Computed by author using 1989 and 1999 KPHC data sets

Net loss of children aged 5-9 years could be those accompanying their parents (of 25-39 years) to other places. Persons aged 25-39 leave the area in search of jobs or employment opportunities. The region received more females than males at the younger age-groups 10-24 years old. Both males and females came into the area perhaps primarily because of schooling or being closer to their kin by helping their grandparents at home with the daily chores. Young females aged 20-24 could also have come into the area because of marriage.

Population aged 25-45 years leaving the region could be those in search of better employment opportunities elsewhere. In addition, population aged 45-55 leaving the area could be as a result of family instability and hence divorce or alternatively those seeking settlement elsewhere. Inflow of population aged 70-74 years old was by persons who: had either come back to their places of origin or; had bought land and wished to settle down in the area.

4.9 Discussion of Major Findings Compared to Previous Studies

This section discusses the results obtained using the age-specific growth rate method and compares them with other studies that have utilized age-specific migration techniques. Age-specific growth rate method is an indirect technique of estimating internal migration. Indirect methods of estimating migration are applied in the absence of good and reliable data. These techniques come in especially handy in the third world countries where the vital statistics are usually inadequate. Age-specific growth rate method (ASGRM) technique is based on the assumption that population growth rates change from one age-group to another. In addition, the technique also recognizes that population growth is attributed to changing fertility and mortality schedules as well as varying migration rates. This section also compares with other techniques such as national growth rate method and the census survival ratio.

Firstly, this study confirmed results obtained using the age-specific growth rate technique by Wakajummah (1986) and Adieri (2012) that Nairobi and Coastal regions gained population aged 10-24 years. Also, age-specific migration patterns obtained from the census survival ratio applied by Oucho et al (2000) and the national growth rate method applied by Odipo (1994) showed that Coast and Nairobi regions are net in-migration areas reflecting almost similar age-specific migration patterns with both regions exhibiting net gain of population aged 10-24 years. Birth place statistics, as demonstrated in the table 6 support this finding.

Using cross- classification of place of birth with place of residence or place of enumeration statistics to identify migration streams, Ominde's (1968) pioneering work on internal migration in Kenya established that the two regions, Nairobi and Coast remained the major destination areas for migrants from other regions. Findings from Oucho et al (2000) revealed that the net in- migration areas are Nairobi, Coast

and Rift Valley regions. However in this study Rift Valley region experienced out migration of population at most age-groups.

This study confirmed both Wakajummah's (1986) and Oucho et al (2000) that it was mostly young adults (aged 19-34 years old) who migrated into towns in search of better welfare services. The study further confirms Wakajummah's (1986) finding that in Nairobi region, in-migration rate peaked at age-groups 15-19 years. This study supports Wakajummah's finding that contrary to the findings by Oucho et al (2000) that in migration peaked at age-group 20-24 year old, it actually peaked at age-group 15-19 years old.

Secondly, this study further revealed that North Eastern region recorded substantial gain of population at most age-groups (see Tables 4 & 5 7th columns). This could be explained by under-enumeration of population in 1989 as well as refugee influx. North Eastern region registered net gain of population at all age-groups. Oucho (1984; 1988) his study, found that North Eastern region experienced large-scale net in-migration which influenced a major influx during the land settlement period. The net gain of children in the ages 5-19 years with their mothers aged 19-39 years old was attributable to the return migrants, following the end of the 'Ogaden War' in Wajir and Garissa districts (Adieri 2012). This was an area where the criss-crossing of population occurred between it, Somalia and Ethiopia (Oucho 1988).

Further, this study also confirmed that indeed as had been observed by Wakajummah (1986) and Oucho et al (2000), Nyanza region experienced significant net loss of population in the country. This study also showed that there was a significant loss of population from Eastern, Nyanza and Western regions. From the birth place statistics, population lost from these regions is seen to be gained in Nairobi, Coast and Rift Valley regions (see Table 6).

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of the study. The section covers a summary of the following: Chapter one covered the background, statement of the problem, objectives and limitations of the study. Chapter two explored the literature review. Chapter three discussed the methodology that was applied in the study and chapter four covered the findings.

Age-specific growth rate method is an indirect technique of estimating internal migration. The method does not assume a constant mortality schedule and thus becomes suitable for use in most developing countries. In Kenya for instance, both the birth and death rates have not been constant. Kenya's intercensal growth rate in 1979-1989 was 3.4 and for 1989-1999 declined to 2.9. It should be noted, however, that even among different regions, the intercensal growth rate does not remain constant. The same goes for the individual age-groups that also (through computation) reveal each age-group exhibiting a unique growth rate different from the rest.

The technique was first applied to Kenya's empirical data by Wakajummah (1986) using 1969 and 1979 census data. Twenty five (25) years later then technique was applied by Adieri (2012) using 1999 and 2009 census data sets. The derivation of the formula used in this study was explicitly shown in chapter three where the supporting models are reviewed.

The method has several limitations, among them: the method does not show the origin or destination districts; the technique is also affected by age misreporting; and finally, the technique does not show how many times individuals may have moved from one place to the other, nor does it indicate the direction of population movement (Wakajummah, 1986).In order to address the last limitation, this study applied the place of birth statistics to explain the direction of population movement (See table 6). The major objective of the study was to generate the intercensal net migration rates and patterns by age-group and sex for the intercensal period 1989-1999 using the age-

specific growth rate method. The study also had two specific objectives, namely: to estimate the intercensal net migration rates for internal migration in Kenya for the intercensal period between 1989 and 1999 using the age-specific growth rate method; and to establish internal migration in Kenya for the intercensal period between 1989 and 1999 using the age-specific growth rate method.

The following research questions were addressed:

- What is the intercensal net migration rate by age-group and sex for the regions for period 1989-1999 using the age-specific growth rate method?
- Have the patterns of intercensal net migration patterns by age-group and sex remained the same as compared to 1969-1979, 1979-1989 intercensal periods?

5.1 Summary of major Findings

Nairobi and Coast regions experienced net gain of population at age-group 10-24 years old for both females and males. These are young individuals who go to the city in pursuit of education or job-seeking. The two regions attract many migrants mainly because of the better welfare services that are available there in terms of learning institutions and employment opportunities.

Central region on the other hand recorded a slight loss of population at most age-groups but recorded a substantial gain of population at older age-group 65-74 years old. This may be because of retirement and consequent return migration to areas of origin. The region is one of the eight regions in Kenya that has for a long time been predominantly agricultural in its economic activities. Over the years the region has experienced high population growth thereby leading to increased demand for land. Many have been forced to go buy land elsewhere in other regions of the country and most of them have settled in the Rift Valley region. Other reasons for outmigration from the area could comprise those persons seeking education or employment opportunities elsewhere or family instability leading to divorce.

Nyanza region as was found in this study as well as Oucho et al (2000) is a net out-migration region with high fertility and equally high mortality and has been recording a slow population growth. Birth place statistics in table 6 show Nyanza region as losing its population mainly to Nairobi. Nairobi offers an attractive destination area to

migrants as this is where most industries, learning institutions, better living conditions and health care services are.

Eastern and Western regions also registered considerable population loss to other neighboring regions. Eastern region lost its population mainly to Coast region because of the proximity to the coastal region whereas Western region lost mainly to Rift Valley.

5.2 Conclusion

In conclusion, this study has revealed that the age-specific growth rate method is applicable to the Kenyan situation. By and large, this study has shown the importance of studying age-specific migration patterns. Age- specific migration patterns give a more insightful picture of who exactly migrates and at what ages certain populations are likely to migrate in or out of a region. This information is very useful in future planning and development of a region.

The study has also shown that it is adult population aged 20-34 years who are more likely move to other regions. This is true because young people move in pursuit of employment opportunities as well as prefer regions that have a wide variety of learning institutions. Return migration, as is observed at the older age-groups, is also of importance in establishing the retirement age of most of the migrants.

This study found that most regions recorded a net gain of children population aged 5-14 years old. In addition, this study has also confirmed that the pattern of female migration is no different from their male counterparts, especially with regards to in-migration and out-migration.

The study has also shown that there have not been any major changes in the patterns of Kenya's internal migration and in fact the patterns in most of the regions have remained the same with Nyanza and Western regions experiencing out-migration in most of the age-groups. Further, this study observed that Nairobi, North Eastern and Coast regions are the preferred in- migration areas for migrants. Ominde (1968a) and Oucho et al (2000) also found that Nairobi and Coast regions were in-migration areas. Increase in population observed in North- Eastern region in all the age-groups could

be as a result of under-enumeration in 1989 and possibly influx of refugees in the area. Further, the study findings confirm those by Wakajummah (1986) that it is mainly young adults (20-34) who migrate to Nairobi, Coast and North Eastern regions.

Finally, this study recommends that policy planners take migration issues seriously and incorporate these issues into their planning before embarking on developmental undertakings. This study further recommends that the Government funds future migration research.

5.3 Policy Recommendations

It is true that in Kenya the majority of migrants are male but their female counterparts also seem to be contributing to a large share of migrants in the country, thus there is need to unravel the mystery behind rising number of female migrants and for policy to address the resultant implications.

As confirmed in this study as well as Oucho et al (2000) finding, there is need to establish reasons as to why Nyanza region consistently records net out-migration area for both sexes and all ages. Other areas that were found to register significant net losses of population are Western and Eastern regions. These form major out-migration areas and need to be studied further to establish why. Policy planners also need to put into consideration planning strategies that ensure there is equitable distribution of resources and thus areas that attract migrants such as Nairobi and Coast regions will cease from being key in migration areas for young people seeking employment. If equitable distribution of resources is ensured, then there will be very few people moving from areas of origin.

5.4 Recommendations for Further Research

Research organizations, students and the government need to undertake more studies that employ indirect techniques of measuring migration in order to solve population related issues. It is important that policy planners consider funding of such studies. In addition, because reasons as to why people migrate are not captured in the census data, there is need to carry out research to try to establish why for instance people prefer to move into other destinations and not others.

The vital statistics system should be updated from time to time as this can also allow for measuring of internal migration in Kenya. The public should be sensitized on the need to register events as and when they occur. Moreover, the factors accounting for negligible differences in Coast, Nairobi, and Central regions need to be ascertained (Oucho et al, 2000).It is also important that the Government ensure equitable distribution of resources to curb the large-scale exits from regions such as Nyanza, Eastern and Western regions.

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