Indirect Estimation of Inter-Censal Net Migration Rates in Kenya

Abstract

The main objective of the study was to estimate net inter-censal migration rates by use of Age-Specific Growth Rate Technique in all Counties of Kenya. The specific objectives were to establish the levels and patterns of internal migration in Kenya. The study found out that migration in the metropolitan areas; Nairobi and Mombasa reflected the same age-specific migration patterns as in the previous censuses, suggesting that major forces attracting the people into and/or repelling them from these two regions are nearly similar. In-migrants in these two regions were in the age groups 5-34 for both sexes, whereas out-migrants were aged 35 years and above. Migration patterns and levels in re-settlement areas were found to have reduced significantly, whereby some re-settlement areas are noted to being senders of the migrant population in nearly all age groups. The migration at the border areas (that is, along the international boundaries were found to register net gains in population in all ages, except for the counties bordering Uganda in Western Kenya. The net flow of young children aged 5-9 years seeking for education is observed in almost all rural counties accompanied by their mothers. The counties with large rural populations experienced massive out-flow of youth aged 15-34 years, whereas the urban counties exhibited significant out-flow of older population from age 35 years onwards.

Key Words: *migration; inter-censal; Age Specific Growth Rate; patterns; levels; County; Kenya*

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Introduction

Internal migration is important globally and in some countries is far greater than international migration (Deshingkar and Grimm 2004). However, emerging trends indicate that even though internal migration has been a subject of study and debate; data has been deficient and less attention has been paid to detailed measurement issues. In countries with limited and defective data such as in Sub Saharan Africa indirect estimation methods of fertility and mortality rates are relatively well known and utilized (UN Manual Xl, 1983) but estimation of internal migration is relatively sparse. Although the use of indirect estimations of age-specific migration flows (Rogers and Castro, *2001; Rogers et al., 2003; Rogers and Jordan, 2004*) has been developed, their utilization has been limited in developing countries (Raymer and Rogers, 2006). Raymer and Rogers (2006) pointed to the need for further studies involving their utilization. In Kenya despite the wealth of information on migration flows provided by census data, studies on estimating migration flows have had relatively little methodological development.

Deshingkar and Grimm (2004) suggests that internal population movements are increasing and the classic push and pull forces that resulted in people from poor regions migrating to richer rural and urban locations still exist, largely driven by rising population pressure and deteriorating land and water availability at places of origin. They further argue that many new patterns have also emerged due to increased occupational diversification and mobility in response to macro-economic reforms in Sub- Saharan Africa.

Raymer and Rogers (2006) indicate that schedules of age-specific migration rates exhibit remarkably persistent regularities with the most prominent regularity being the high concentration of migration among young adults. That is, rates of migration starts with a peak during the first year of life and then drops to a low point at about age 16 thereafter turning sharply upward to a peak near 20 to 22, and then declines. In some cases, there is a slight hump at the onset of retirement and possibly an upward slope after that hump.

Migrations due to marriage and education are concentrated between the ages of 10 and 30 and are essentially unimodal in age profile (Rogers and Castro, 1981; Rogers and Watkins, 1987; Raymer and Rogers, 2006). However, those caused by change of employment and moving closer to the place of work have profiles that are bimodal, with local peaks during infancy and during the early years of labor-force participation (Raymer and Rogers 2006). Health as a cause appears to be important for the elderly (Raymer and Rogers 2006). The main aim of this paper is to utilize Preston and Coale (1982) non-stable population model of age specific growth rate technique to generate inter-censal net age-specific migration rates for sub regions of Kenya in order to examine age patterns of migration flows in Kenya.

The paper is structured into four sections, with varied sub-sections. The first section (the introduction) is on background information of Kenya, taking into consideration the varied migration typologies, summarized as "the country's setting". The section further undertakes a situational analysis of the previous studies on internal migration in Kenya, and identifies the existing gaps on the measurement techniques used in estimating net migration rates, as applied to Kenya data. The second section synthesizes internal migration data, and accounts for the plausibility of Age Specific Growth Rate Method (ASGRM) technique and its relevance to the Kenyan situation. An illustration of the conceptual steps used in the computation of age specific net migration rates by sex and counties is also provided, as this is aimed at providing the utility of the technique, as compared to the other methods. The third section discusses the results of the computed net migration rates by age, sex and counties for all the eight provinces (regions) of Kenya. The results are discussed, and incise concluding remarks made. The last section is on the references and the appendices.

Country Setting

Kenya is situated in eastern part of the African continent, bordering Ethiopia, Somalia, Sudan, Uganda, Tanzania and the Indian Ocean (Appendix 1). Although the total area is 582,646 sq. kms, with a land area of 571,466 sq kms, only 20 percent of this land is arable. The arable land is situated along the narrow tropical belt in the coastal region; the highlands east and west of the Rift Valley and the Lake Basin lowlands around Lake Victoria. It is the arable land that accommodates a large proportion of the country's population. The north and north eastern and much of the southern areas towards the Tanzania

border consist of arid or semi- arid lands (ASALs), primarily covered with bushes and shrubs, unsuitable for agriculture, but affording an opportunity, predominantly , for pastoralism and wildlife conservation. A critical feature of intra-regional migration patterns among Kenyan communities are the agro-ecological heritages that were shaped by colonial settlement patterns that resulted in imbalanced infrastructural development (Agwanda and Odipo, 2012). Colonial settlement focused largely on the high agricultural potential areas of Central and Rift Valley Provinces that had better access to education, health and roads infrastructure (World Bank, 2008).

Past Studies on Internal Migration in Kenya

The initial studies on migration in Kenya were geared towards the measurement of migration flows (Ominde, 1968; Rempell 1977; Oucho 1988). These studies identified the typologies of migration, of which, the following two types were predominant, namely: rural to rural migration and rural to urban migration (Ominde, 1968; Oucho, 1988; Knowles and Anker 1977). Major migration patterns in Kenya have been stimulated by more or less the same factors, namely: economic disparities between geographical areas; the search for employment and resettlement especially in the former white lands (Oucho, 1981; Oucho and Odipo, 2000). The attraction to urban centres, particularly the capital Nairobi, has been mainly due to its dominance in the national formal, informal and tertiary industrial sectors (Agwanda et al, 2004). Out migration from urban centres is caused by retirement, old age, transfers and desperation (Agwanda et al, 2004).

Some studies (Wakajumah, 1986; Oucho and Odipo; 2000) indicate that in the post independence Kenya internal migration patterns in Kenya can be summarized into six broad areas. These broad areas are migration into: (a) resettlement areas, (b) cash crop growing areas, (c) nomadic areas, (d) border areas, (e) Western and Eastern regions of Kenya, and (f) migration in metropolitan areas.

Migration into resettlement areas (particularly in the former settlement districts) involved movements for permanent settlement (Wàkajummah, 1986) largely attributable to land pressure in adjacent districts (Wàkajummah, 1986; Oucho and Odipo, 2000). These areas include; Laikipia, Trans-Nzoia, Uasin Gishu, West Pokot, Kajiado, Nakuru, Lamu and Tana River districts of Kenya. These districts are the current counties (Appendix 1).

Migration in crop producing areas has been attributable to colonial and post colonial policies. The colonial government and the first government in post independence divided the country according to levels of agricultural potential. Areas of high agricultural potential particularly suitable for high yielding cash crops designated for export (Central and Rift valley regions). Such crops included tea, coffee, and pyrethrum. These areas have been found to register net gains in the population of young people aged between 10-19 years because of their involvement in the plucking of coffee, and picking of tea and pyrethrum (Wakajummah, 1986; Odipo, 1994 and Oucho and Odipo, 2000). A pattern of migration observed from the rural districts of Eastern Kenya (in particular Kitui, Machakos), districts of Nyanza and Western provinces was dominated by the male population, aged 10-39 years, moving to major urban centres or metropolitan areas (Oucho, 1988; Wakajummah, 1986, Oucho and Odipo, 2000) , in such of employment.

Data and methods

This study utilized 1999 and 2009 Kenya Population and Housing censuses data to estimate net intercensal migrations rates for Kenya sub national populations. The sub national populations are based on administrative areas referred to as the counties as per Kenya constitution 2010. However it also refers to the districts and provinces that were used as administrative centres before 2010.

Preston and Coale (1982) devised a technique to estimate mortality, fertility, and migration for unstable populations. The analytical approach taken in this study and the associated computations are explained in detail in (Preston and Coale 1982).

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

$$C_{(a)} = b * \exp(-ra) * P_{(a)} \quad (1)$$

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 equation (1), the growth rate r is assumed to be constant through all ages, which is an unlikely situation for an unstable population. If the equation (1) is modified to assume constant growth rate within specific-age groups, then

$$C_{(a)} = b * P_{(a)} * \exp\left[-\int_0^a r(x)dx\right] \quad (2)$$

Equation (2) assumes that population growth occurs only due to natural increase. However, population growth is accounted for both by natural increase and net migration. To take into account for change due to migration equation 2 can be written as:-

$$C_{(a)} = b * P_{(a)} * \exp\left[-\int_0^a \{r(x) + e(x)\}dx\right] \quad (3)$$

Where, $e(x)$ is the net out-migration rate and e(x) will be positive for net out migration and negative for net in migration

$C_{(a)}$ and *'b'* can be replaced by $\frac{N_{(a)}}{N}$ and $\frac{N_{(o)}}{N}$, respectively where N is the total population N(a) the population at age a.

Equation 3 can therefore be written as

$$N_{(a)} = N_{(0)} * P_{(a)} * \exp\left[-\int_0^a \{(r(x) + e(x)\}\right] \quad (4)$$

Or

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

Taking natural logarithm on both sides of equation (5) we have:

$$\ln\left(\frac{N(a)}{N_{(0)} * P_{(a)}}\right) = \left[-\int_0^a \left\{r(x) + e(x)\right\}dx\right] = -\int_0^a r(x)dx - \int_0^a e(x)dx \quad (6)$$

Therefore, the net outmigration rate becomes

$$\int_0^a e(x)dx = -\ln\left(\frac{N(a)}{N_{(0)} * P_{(a)}}\right) - \int_0^a r(x)dx \quad (7)$$

Equation (7) implies that:

$$\Rightarrow \int_{0}^{a+5} e(x)dx = -\ln\left(\frac{N(a+5)}{N_{(0)} * P_{(a+5)}}\right) - \int_{0}^{a+5} r(x)dx \quad (8)$$

and

$$\Rightarrow \int_{a}^{a+5} e(x)dx - \int_{0}^{a} e(x)dx = -\ln\frac{N_{(a+5)}}{N_{(0)} * P_{(a+5)}} + \ln\frac{N_{(a)}}{N_{(0)} * P_{(a)}} - \int_{a}^{a+5} r(x)dx + \int_{0}^{a} r(x)dx \quad (9)$$

Therefore age specific net migration rate from age 'a' to 'a+5' becomes,

$$\int_{a}^{a+5} e(x)dx = \ln\frac{N_{(a)}}{N_{(a+5)}} * \frac{P_{(a+5)}}{P_{(a)}} - \int_{a}^{a+5} r(x)dx \quad (10)$$

This can be estimated by:

$$5 *_5 e_a = \ln\frac{N_{(a)}}{N_{(a+5)}} * \frac{P_{(a+5)}}{P_{(a)}} - 5 *_5 r_a \quad (11)$$

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

$$\text{i.e. } _5 e_a = \frac{-1}{5}\ln\left[\frac{N_{(a+5)}}{N_{(a)}} * \frac{P_{(a)}}{P_{(a+5)}}\right] - _5 r_a \quad (12)$$

Computational steps

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

$$_5 r_a = \frac{1}{t_1 - t_0} * \ln\left[\frac{_5 N_{a(t_1)}}{_5 N_{a(t_0)}}\right], \quad (13)$$

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:-

$$ {}_5\bar{N}_a = \frac{{}_5N_{a(t_1)} + {}_5N_{a(t_0)}}{2} \tag{14} $$

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

$$ N_{(a)} = \frac{{}_5\bar{N}_a + {}_5\bar{N}_{(a-5)}}{10} \tag{15} $$

Given the above formula, the inter-censal net migration rate can be obtained by :

$$ {}_5e_a = \frac{-1}{5}\ln\left[\frac{N_{(a+5)}}{N_{(a)}} * \frac{P_{(a)}}{P_{(a+5)}}\right] - {}_5r_a \tag{16} $$

Note: e(x) is not the life expectancy at age x but it is rather net out-migration rate.

Inter-censal net out-migration rate in a given age group denoted as ${}_5e_a$ is computed as:

$$ {}_5e_a = \frac{-1}{5}\ln\left[\frac{N_{(a+5)}}{N_{(a)}} * \frac{P_{(a)}}{P_{(a+5)}}\right] - {}_5r_a \tag{17} $$

The above formula (equation 17) expresses the out- migration rate between age 'a' and 'a+5' in terms of: - i) Probability of survival at age 'a' and 'a+5' and ii) Age-Specific Growth Rate between age 'a' and 'a+5'. It should be noted that in our obtained results, net in-migration at any specific age group is denoted by a negative sign (-) whereas, net out-migration rate at a given age group is denoted by a positive sign.

The estimation of the age specific migration rate requires: an appropriate life tables from which the probability of survival can be obtained; and two consecutive population censuses computed by five-year age groups. If implemented from age 0, this

technique also requires inter-censal births. However, in absence of inter-censal births, the estimation should begin at age 5, with $N_{(a)}$ estimated by averaging numbers in the adjacent 5 – years age groups. The study effected its estimation from age 5. The study employed the Life Tables by Sex and District attached in Appendix 10 of Volume V in the Analytical Report on Mortality (CBS 2002) where the P_a values were extracted (Refer to Appendix 2: 2a and 2b).

Data Quality: The migration data used is likely to be affected by age misreporting thus, the study applied the United Nations Age-Sex Accuracy Index (United Nations 1955; Shryock and Siegel 1976) to evaluate the quality of the data and then smoothed it using Pasex Computer Program.

Results

This section presents the age-sex specific migration rates for all the counties in Kenya by province, presented in both figures and tables (tables are attached in the Appendices Section; that is Appendices 2-9). Only the age-sex net migration rates are presented. It is worth noting that the figures give a pictorial depiction of the net migration trends, whereas the table depict the net migration values.

Nairobi County – The Capital City

The generated net migration rate for Nairobi is characterized by net gain of population between 5-34 years for both sexes and net loss of population at all remaining age groups. Female in-migrants dominated in the age groups 5-9, 10-14 and 20-24, whereas males outweighed their female counterparts in the age groups 15-19, 25-29 and 30-34 (figure 1 below). The in-migration level was similar among sexes in Nairobi between ages 15-34 (Figure 1).

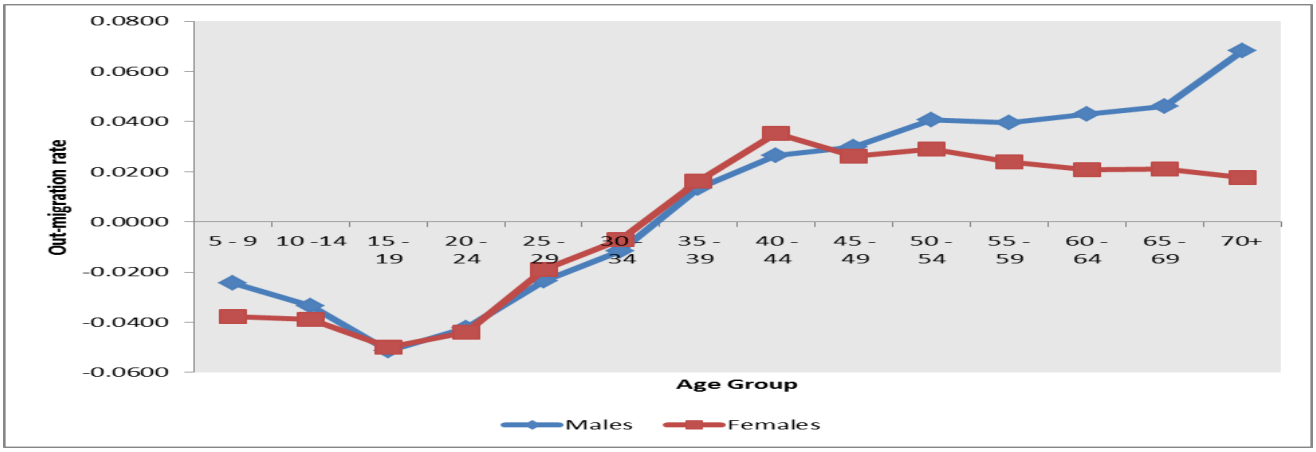

Figure 1: Net Migration Rates for Males and Females, Nairobi

The peak age group of migrating into Nairobi was 15-19 years; meaning that at that age group, more people flow into Nairobi. The peak age groups of outmigration were 40-44 and 70+ years for females and males, respectively. Although both sexes migrated out of Nairobi as from age 35 years, the males' level of out-migration was lower. The migration pattern in Nairobi is driven by circular migration, meaning that most people come to Nairobi for education and employment; thereafter, out migrate to their areas of origin. In addition, there are those who in-migrant to Nairobi to join their family members, either as wives, children or the wider extended family members.

Migration into Nairobi was fuelled on the one hand by migrations from the neighbouring counties in Central Kenya (constituting about half of the city's population), and migrants from Western Kenya (who constitute about 40% of the city's population), while only 10 per cent originated from the north and east of Kenya ((Bocquier et al, 2009).). Reasons for migration into and out of Nairobi have been due to its dominance in the national formal, informal and tertiary industrial sectors acting as pull factors and out migration due to retirement, old age, transfers and desperation (Bocquier et al, 2009).

Central Region

Those regions that border Nairobi the capital city were initially characterized by high youth out migration in search for jobs and business opportunities in the cities on one hand and movements due to population pressure to resettlement areas

particularly in the Rift valley region. Age specific net migration pattern among the male population in Nyeri, Murang'a, Nyandarua and Kirinyaga counties is similar. However, in Kiambu County the age net migration pattern is dissimilar to the rest of the regions. This can plausibly be explained by its proximity to Nairobi city, thus, being a buffer zone to the city and possibly absorbing some of the immigrants who have moved into Nairobi. Equally, as Nairobi expands, its excess population and those moving to the outskirts of Nairobi, find Kiambu as an ideal location. Importantly, most of those from Kiambu County who work in Nairobi commute to work, but travel back home (that is, experience a mobility referred to as "circular migration"). The county was moreover characterized by: a net loss of children aged 5-19 years (males) (Figure 2a), and 5-14 years (females); net gain of young adults within the 20-24 age group for males and 15-24 years among females; net loss of population from age 25 to 59 for males and 25-69 for their female counterparts; and net gain of population from age 65 years for males and 70 years for female counterparts. The massive out-flow of population aged between 25-69 years reflects the similar migration patterns for Nairobi County.

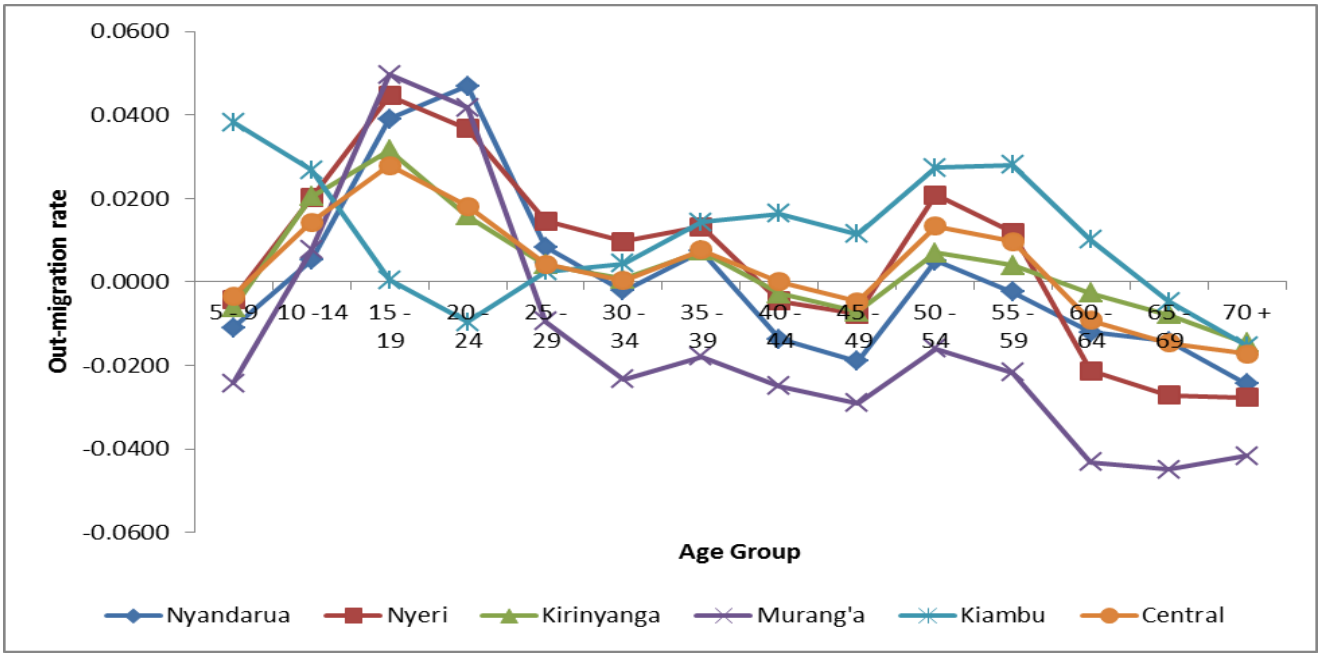

Figure 2a: Net Migration Rates for Males, Central

The female migration patterns (Figure 2b) although similar to male displays some unique features for particular counties.

Murang'a experiences net loss during the youthful ages perhaps displaying migration due to education labour and marriage but after age 30 the county has recorded net gain throughout the older ages. Kirinyaga and Nyeri display out migration up age 40 and thereafter followed by another out migration between age 50 and 64 while Nyandarua appears to have similar features as Murang'a. It is worth noting that, Muranga, Nyandarua, Kirinyaga and Nyeri Counties are predominantly agricultural areas. Hence, because of pressure on land, and the incapacity of the farmland to accommodate the excess labour force, majority of people out-migrant in search of jobs, educational institutions and also move out to accompany their husbands.

The reduction in the inequality between males and females in these counties, due to increase in education enrolments by both sexes, has reduced the imbalance in age-sex migration patterns. The emerging age-sex net migration patterns in the region, is not in conformity with the findings from previous studies that males dominate in net outmigration in Kenya (Ominde, 1968; Rempell, 1977; Oucho, 1988). Contrary to the findings of earlier studies (Wakajumah, 1986; Odipo, 1994), the females in Central Province were the dominant in outmigration than their male counterparts.

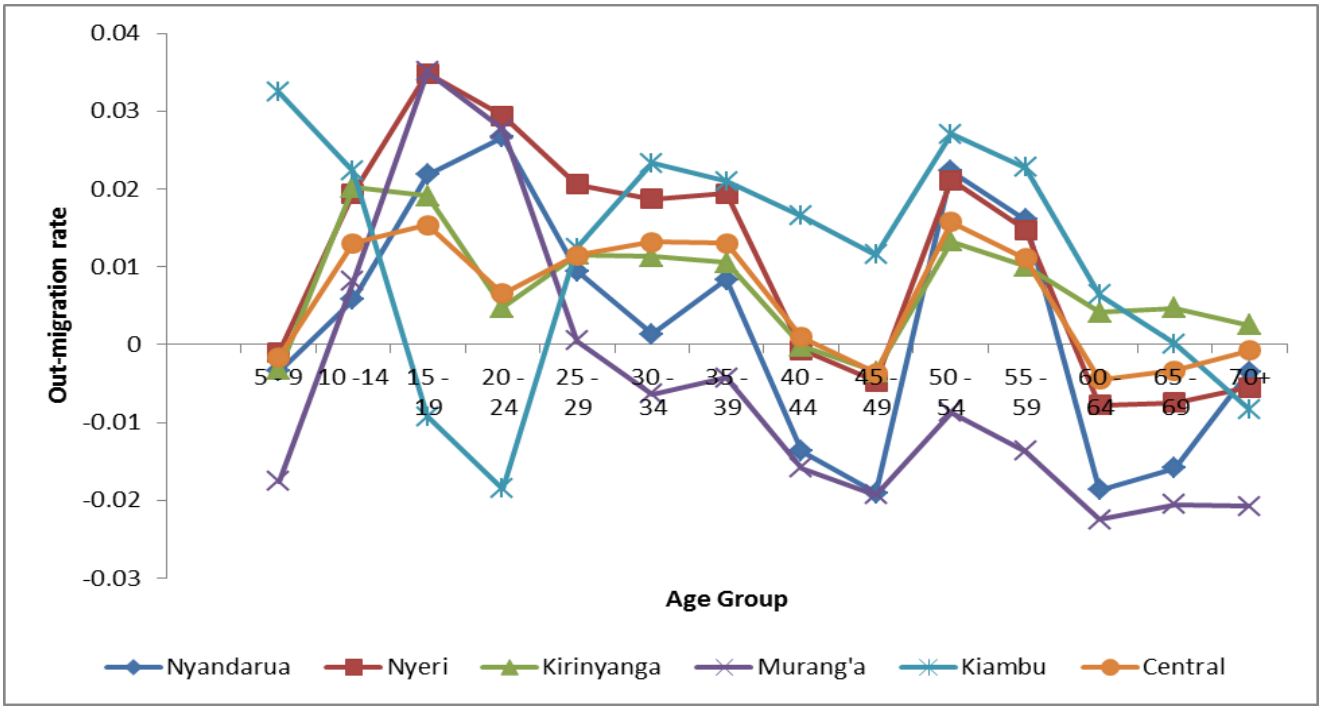

Figure 2b: Net Migration Rates for Females, Central

Coast Region

The Coast Region is predominantly an in-migration area, with the majority of the immigrants originating from Central, Nyanza, Western and Eastern regions (mainly, those from Makueni, Machakos and Kitui Counties). The migration pattern in Mombasa is similar to that of Nairobi, mainly because of its city status; hence people in-migrate in search of jobs, educational opportunities, and to join their family members (either, as a wife and/or brothers and sister). The in-migrants consist of young children aged between 5-9 years who accompany their parents aged between 20-34 years. In Mombasa, the males recorded a higher level of out-migration rate than their female counterparts, just as is the case in Nairobi; whereas, the females registered a high net in-migration than their male counterparts.

Kwale and Tana River Counties exhibited net losses of population for all age groups, indicating that they are out-migration zones. Like Kwale and Tana River, Kilifi exhibited out-migration flows of population, but it also experienced net gain of population for certain age groups. This implies that the migration patterns in these areas have changed significantly because they have changed from being resettlement (receiving) zones to being sending areas, as exhibited during the 1999-2009 inter-censal period.

Taita Taveta County registered a net in-flow of boys aged 5-9 years (Figure 3a) not accompanied by their mothers. Other than in-migrants aged 5-9, 25-34 and 70-74 years, Taita Taveta County experienced an out-flow of its population to other counties. The in-migration pattern in Lamu County was similar to that of Mombasa County, particularly, among the male population aged 5-39 years and 5-24 years among the females (Figure 3b). It would be plausible to attribute the exhibited net in-migration patterns in the county to have been that of the young females (aged 15-24 years) accompanied by their children, in-migrating to join their males counterparts (husbands) aged 20-39 years who were living in Lamu County.

It is also of worth noting that in the recent past to-date, the prominence of Lamu County has been increased because of the construction of a new seaport and the attraction of the county as a tourism destination, having been recognized by United Nations Education, Science and Cultural Oorganization (UNESCO) as a cultural heritage centre Thus, the exhibited

migration pattern is an aspect of "transnational mobility theory", which propounds that migrants get attracted to a place as a result of the prior knowledge they have of the place of destination, due to the existing association between them and the earlier migrants based at the destination.

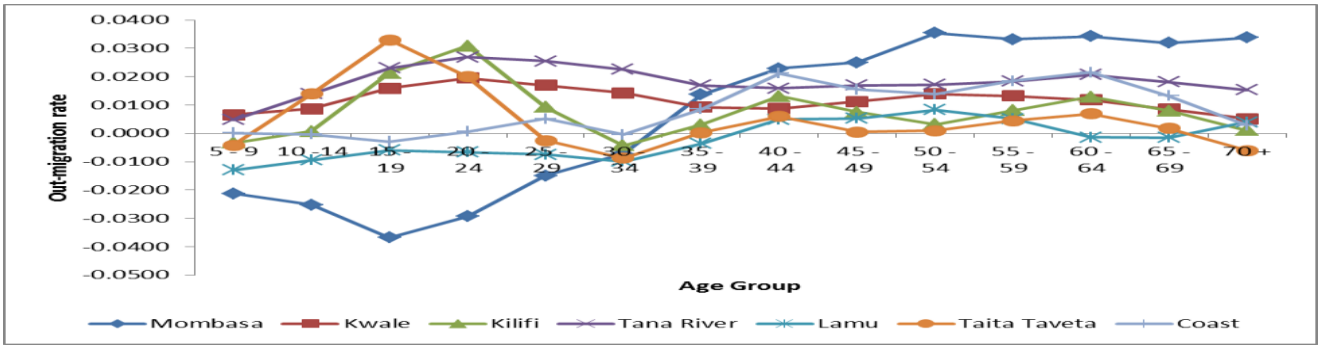

Figure 3a: Net Migration Rates for Males, Coast

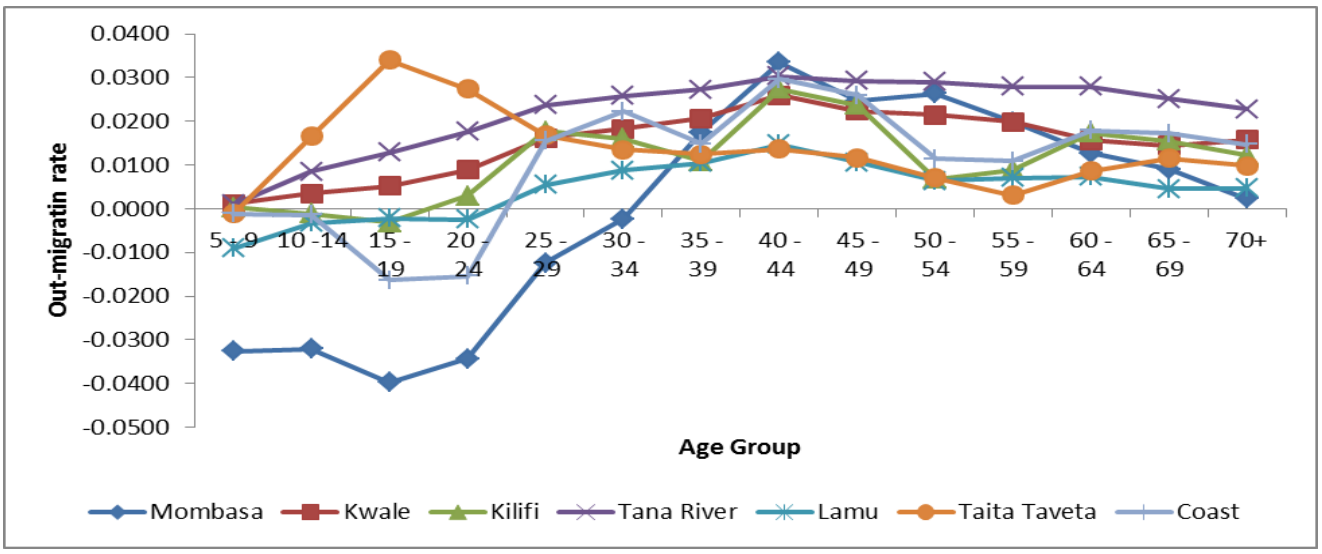

Figure 3b: Net Migration Rates for Females, Coast

Eastern Region

Figures 4a and 4b depict the patterns of net migration rates in Eastern Province. Two distinct features are noticeable: Isiolo and Marsabit in the northern part is characterized by in-migration of youthful while other parts of the region, such as, the central (Embu, Meru, Tharaka Nithi) and southern counties of Machakos, Makueni and Kitui, exhibit a net out migration of both young persons (5-19) and adults (20-49). Nonetheless, it is noted that the male and female migration patterns are

similar. For all the regions, except Isiolo and Marsabit, the peak age of out-migration is 15-24 years, while that for in-migration is 50-74 years (an aspect of return migrants).

The region is the second largest administrative area in the country (after Rift valley region) characterized by pastoral nomadic activities in the north, fertile and immense farming activities in the central and, mixed savannah and semi-arid climatic conditions in the south. These characteristics, coupled with being largely rural habitation, it is plausible to observe that the area experiences a mixed typology of migration consisting of rural-rural, urban-rural, rural-urban and urban-rual migration.

Marsabit County had similar migration patterns to that of the North Eastern Province counties and Turkana. This can plausibly be associated to the nomadic way of life by those who predominantly inhabit the northern parts of Kenya, which is a marginal ecological zone, with harsh climatic conditions. The prevailing climatic condition therefore influences the out-migration (rural-urban migration). On the other hand, there occurs rural-rural migration to other districts or provinces, in search of water and pasture for their livestock. This leads to exacerbated intra- and inter-county mobility of the Marsabit inhabitants into North Eastern Province counties.

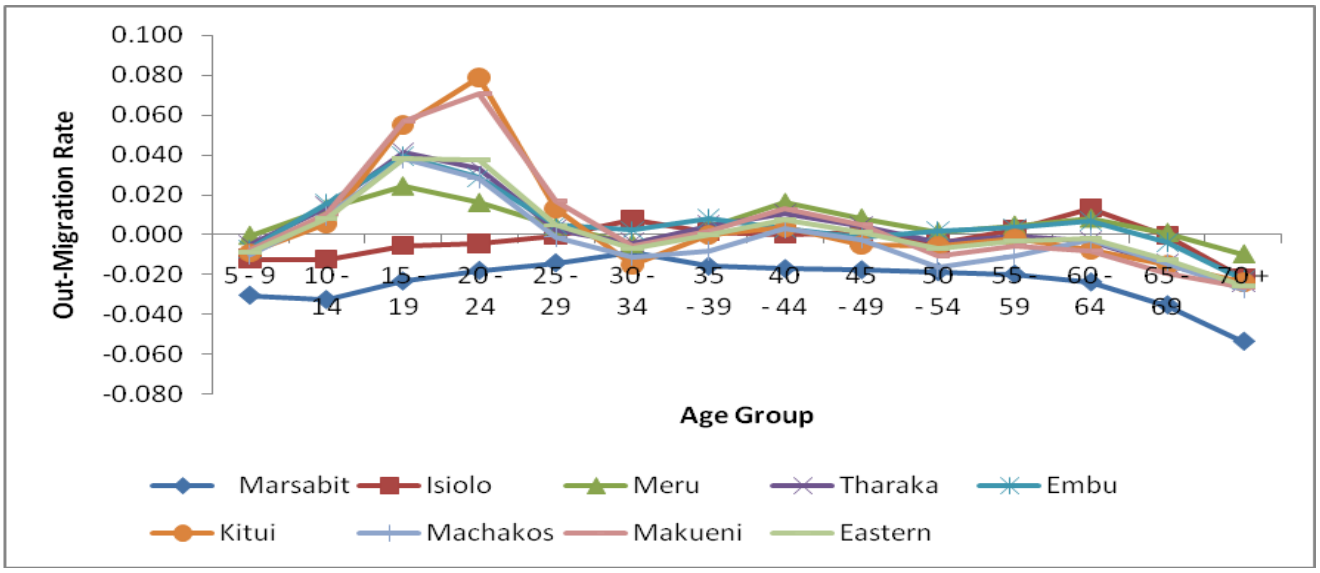

Figure 4a: Net Migration Rates for Males, Eastern

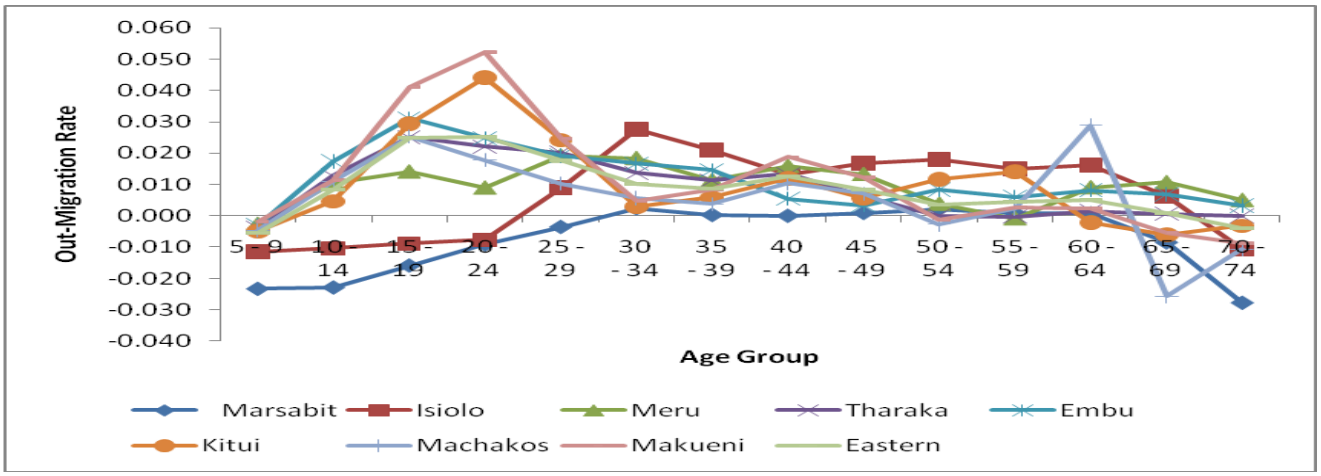

Figure 4b: Net Migration Rates for Females, Eastern

North Eastern Region

North Eastern Province had a net gain of population across all the ages (Figures 6a and 6b. In all its counties, except in Wajir, that exhibited a net loss of females aged 55-64 years and male 30-34 years. This pattern is not consistent with the previous migration patterns in the region, which is known for decades as being an out-migration zone, It is associated with harsh climatic conditions, that have rendered the region a marginal ecological zone and is close to Somalia, where militia groups have continually posed massive threats to the normal livelihoods of the communities living in the region.. Nonetheless, the analysis indicates that of all the counties in North Eastern Province, Mandera exhibited the highest level of in-migration (Figures 5a and 5b).

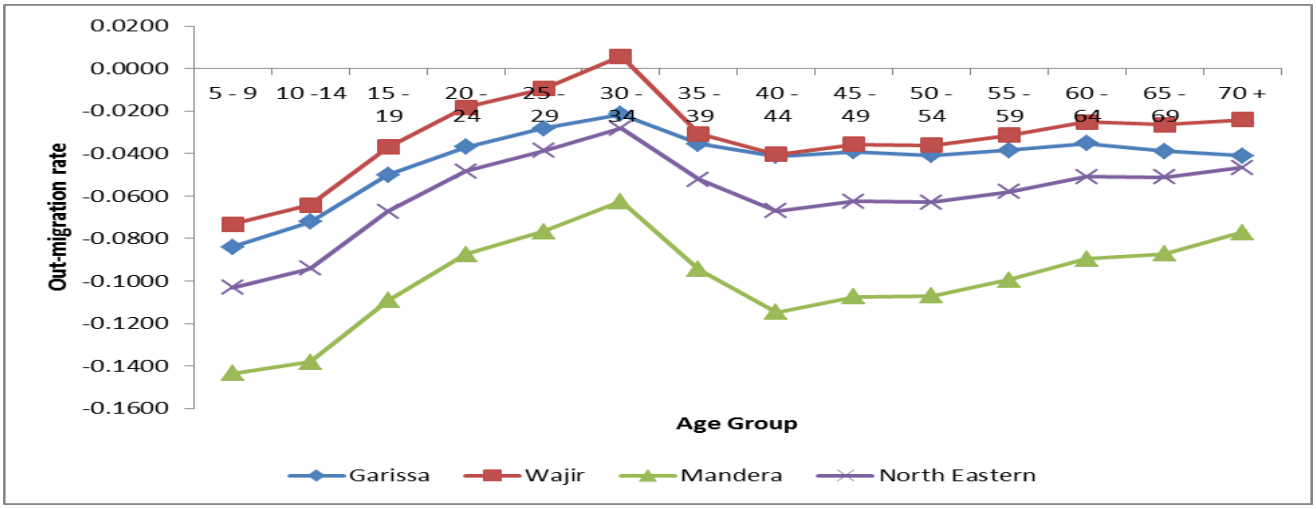

Figure 5a: Net Migration Rates for Males, North Eastern

Other than Wajir, which recorded an insignificant out-migration in the ages 30-34 years among the males, and 50-64 years among the females, all the other counties had an/experienced in-migration for all the ages. Mandera had the highest in-migration followed by Garissa. This can be attributed to the civil strife in Somalia that has been on-going fort /for over a decade causing the Somali nationals to escape into Kenya for safety reasons. For instance, the Daadab refugee camp in Garissa County is the largest refugee camp in the world, hosting, mainly refugees from Somalia.

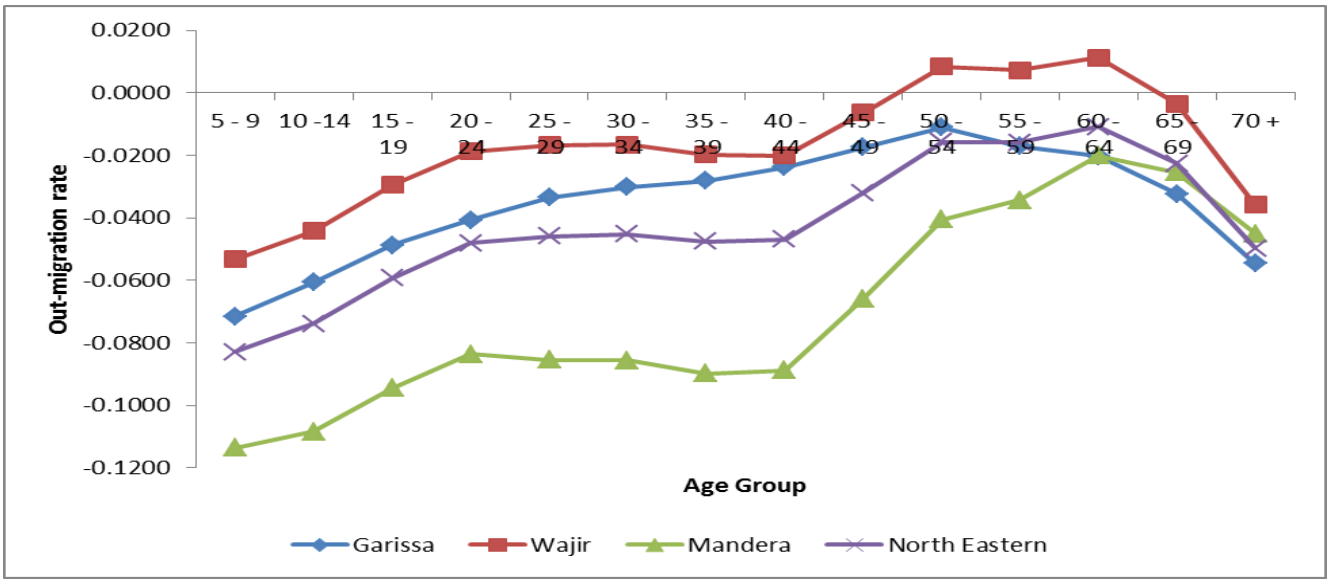

Figure 5b: Net Migration Rates for Females, North Eastern

Nyanza Region

Previous studies (Oucho, 1988; Wakajummah, 1986, Oucho and Odipo, 2000), just as this study show that counties in regions surrounding Lake Victoria have experienced net losses in male population aged 10-39 years. The majority move from rural districts in such/search of employment in major metropolitan areas or large plantations in the Rift Valley of central parts of Kenya (Oucho, 1988; Wakajummah, 1986, Oucho and Odipo, 2000). Figure 6a depicts that age patterns of male migration rates by counties in Nyanza Province. The peak ages of migration are 15-24 and 40-49 years among the male population, except in Migori County, whose peak age was 60-64 years. The migration pattern for females is almost tri-modal at ages 15-19, 25-34 and 45-50 years, respectively (Figure 6b). The female migration patterns observed during the 1969-1979, 1979-1989 and 1989-1999 intercensal periods showed that males were the dominant out-migrants**.** The study shows that the female population was equally out-migratory as their males. The migration process could be attributed to both associational family mobility, as well as autonomous moves.

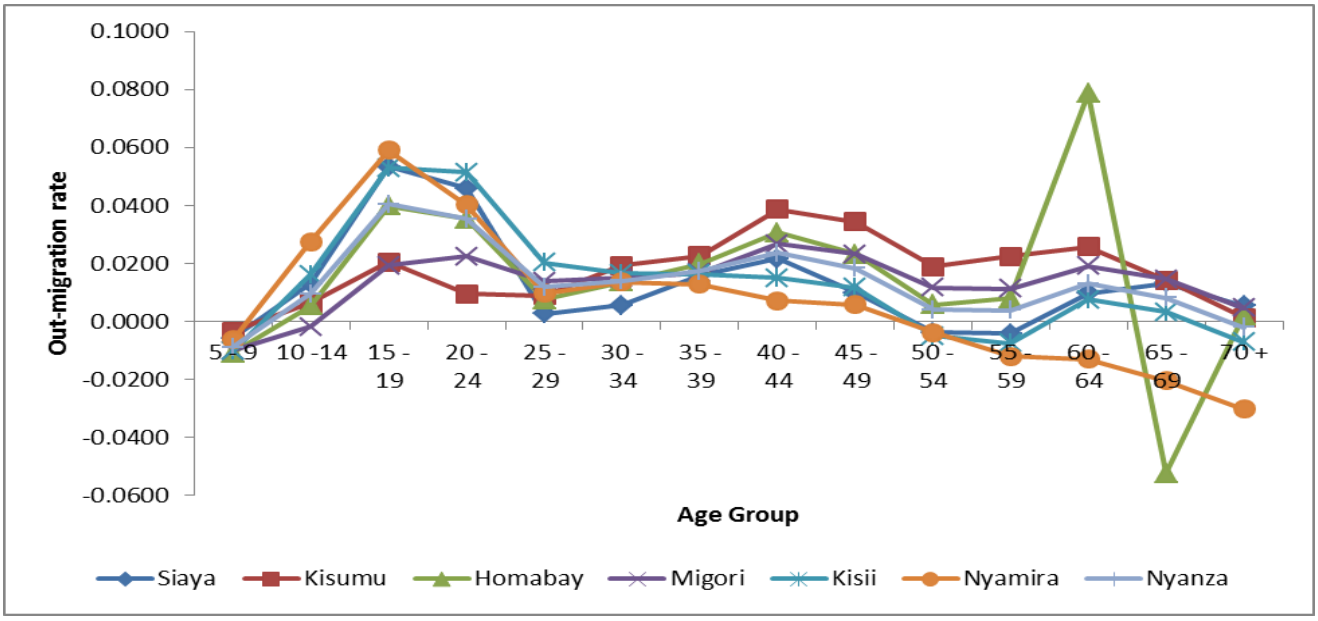

Figure 6a: Net Migration Rates for Males, Nyanza

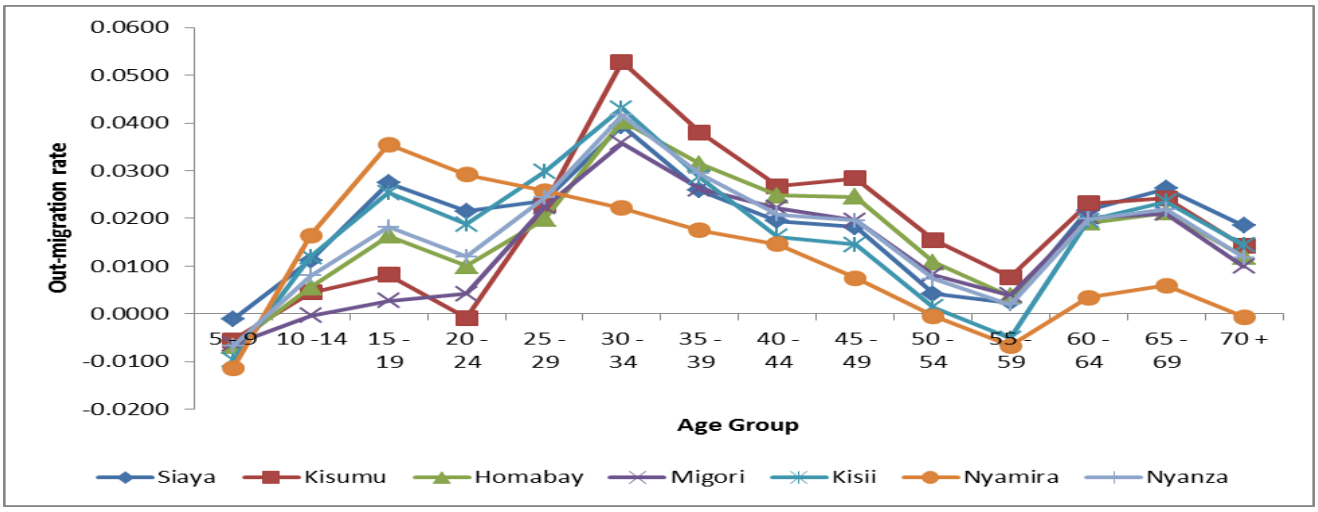

Figure 6b: Net Migration Rates for Females, Nyanza

The out-migration from this region can plausibly be attributable to limited socio-economic (employment, higher educational institutions, housing) opportunities for its population to earn a descent standard of living. For instance, in the more densely populated parts in Kisii and Nyamira Counties, out-migration is highly driven by the search for land for both farming and settlement.

Rift Valley Region

Generally, this region has been a net receiver of migrants from different parts of the country, mainly in the agricultural plantations that are spread across the region. For instance, the province is home to Trans Nzoia County which is the "food basket" of Kenya, due to its extensive farming and production of maize, the staple food in the country. It is also home to Kericho county that houses the Kericho Tea Complex; a fertile and attractive zone to in-migrants who come for tea-picking; and the flower farms in Naivasha, which is renowned the world over for its flower production. Much of the farming in these areas is labour-intensive, hence attracting many non-skilled and semi-skilled labourers from across the country. Apart from the farmlands, there are many urban centres dotted across the Province that attract in-migrants who come to look for job opportunities and/or undertake commerce and business ventures. These include Nakuru, Kericho, Eldoret, Naivasha, Gilgil, Kitale and Narok, amongst others. Nakuru is one of the fastest growing urban centres in Kenya.

The region receives more of the young female population aged 5-24 years than their male counterparts. However, it lost more females than males of the ages 25 years+. All the counties in the region received young children of age 5-9 years who were seeking primary education, except in Kericho. Among those aged 5-9 years old, both Laikipia and Narok exhibited net gains of boys (Appendix 8a), but a net loss of girls (Appendix 8b). Kajiado, Bomet and Turkana recorded massive in-migration flows of population; who accounted for 20 per cent of all the counties in Rift Valley province

Narok and Samburu Counties experienced similar migration patterns, whereby they gained more males and lost more females than their other counterparts. Turkana County portrayed a net in-flow of migrants for all the ages, except for the females aged 45 to 54 years. This migration pattern resembles that of the resettlement areas, particularly in the irrigation scheme and large scale farming areas of Bura (Tana River County), Mwea (Embu County) and Trans Nzoia County. It can plausibly be explained by the fact that Turkana County, being on the border with Kenya, Sudan, Uganda and Ethiopia, where there have been ongoing conflicts in South Sudan, the Lord's Resistance Army in Northern Uganda and the Oromo Liberation Front in Ethiopia. For decades, Kakuma Refugees Camp is located in Lodwar in Turkana. Table 7, in the appendix, shows that Turkana County recorded a massive in-flow of young persons of ages 5-14 years, more than any other age group.

Baringo, Trans- Nzoia and West Pokot Counties had male out-migrants falling mainly within the 15-29 year age group. Kajiado, Uasin Gishu, Narok, Turkana and Samburu Counties gained the male population (15-29 years); although with varying levels. On the other hand, Bomet and Kericho Counties had a different mobility pattern, whereby there was a net in-migration of both males and female at all ages, apart from the ages 50+. This can be plausibly attributed to labour intensive tea picking that takes place in both Kericho Tea Estates, whereas in Bomet County, it can be attributed to in-migration of people from the counties of Kisii and Nyamira for the purposes of farming and working in the tea estates.

Analysis of age-sex migration pattern in Rift Valley Region shows that majority of the female population experienced some form of out-migration, except in Turkana, Baringo and Kajiado, which is attributable to their cultural way of life, whereby it is the women to take care of the homesteads, children and to some extent the livestock; thereby limiting their migration outside their counties. All the counties experienced a net gain of those aged 70 years, except in Laikipia, Kajiado and Kericho; attributable to the fact that these counties act as either 'livestock or arable farming zones" , providing menial employment opportunities and/or resettlement areas. It can be plausibly concluded that upon acquiring their proceeds they move out to establish either businesses or homes in different parts of the country. Nakuru and Uasin Gishu Counties also exhibited a similar migration pattern, whereby there was a net gain of the economically active population and the aged, depicting an aspect of both rural-urban and urban-rural migration. This was particularly, for those who in-migrated as labour force (the young persons), and those who either retired or eventually bought land to settle in the region (province).

Western Region

The migration patterns in Western Province were similar to those of Nyanza Province, with the only difference being, in the magnitude. Busia, Kakamega and Vihiga Counties in Western Province had a net gain of children (aged 5-9 years), other than in Bungoma County, which had an out-migration of males in the same age group. Of all the Western Province counties, Vihiga had the highest rate of out-migration among those aged 15-24 years (Figure 7a), for both males and females. Conspicuously, there were more women out-migrants than the male ones. For instance, unlike in the other counties, Busia

had a net gain of females aged 10-14 years (Figure 7b). It exhibits a migration pattern almost similar to that of Kakamega, where all females out-migrated to other counties. However, this was not the case among the young people. Equally, there was minimal in-migration of males aged 50-59 and 70 years+. In general, both the counties had a net gain of the males aged 50-59 years.

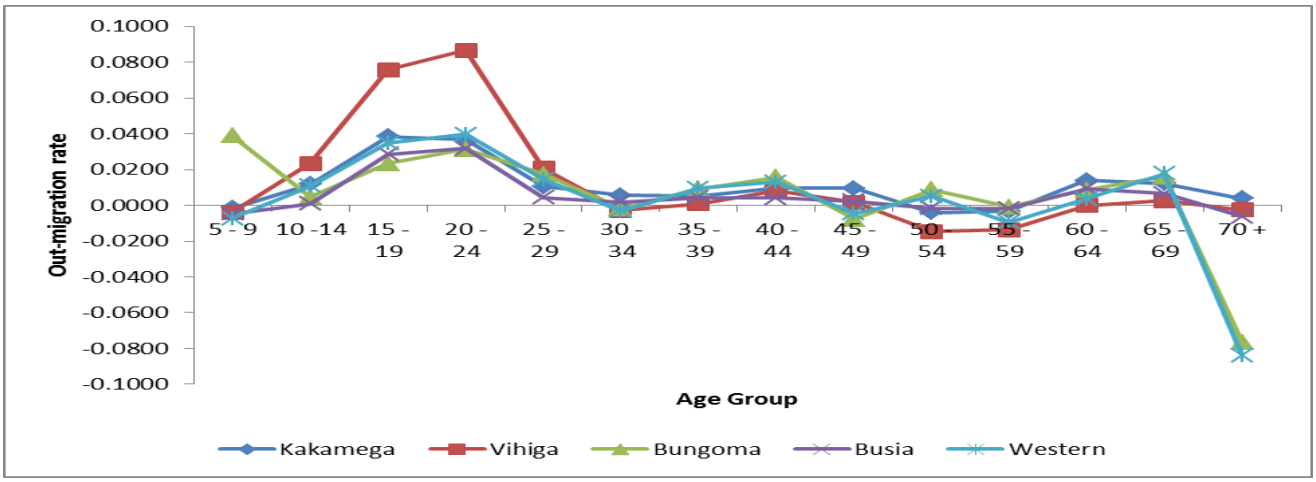

Figure 7a: Net Migration Rates for Males, Western

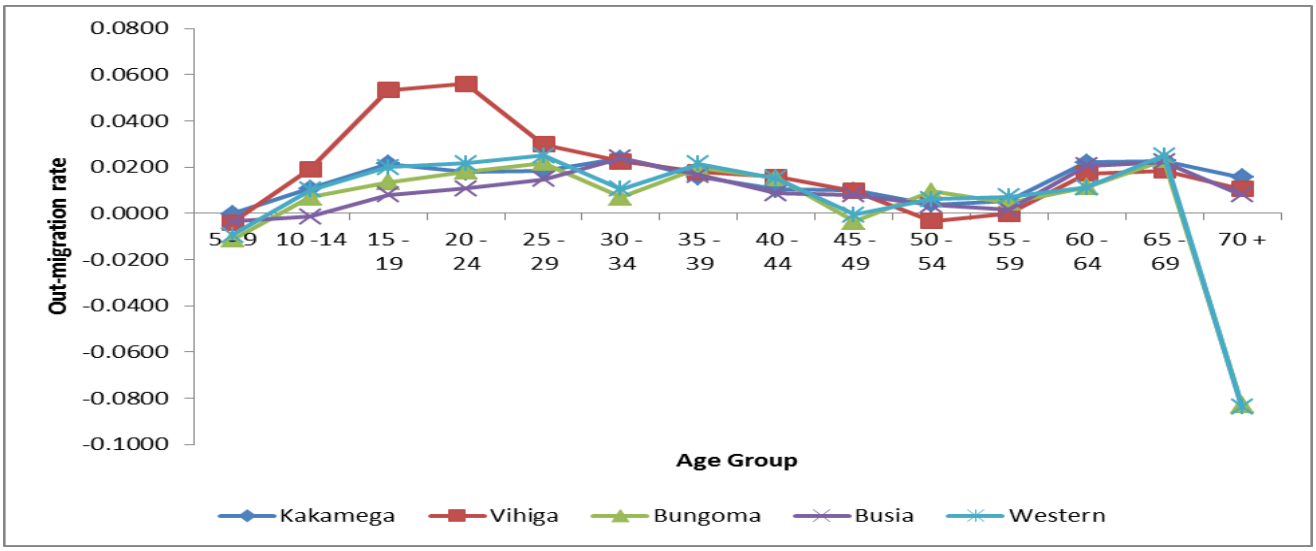

Figure 7b: Net Migration Rates for Females, Western

The in-migration of children, particularly at ages 5-9 is a depiction of those who come back to their counties of origin to secure admission in Class One because of the minimal and competitive chances in Class One in urban areas, as compared to such chances in the rural areas (counties of origin). The migration pattern of these children is similar to that of the females (their mothers) who come along with them as they come home (in-migrate to their counties of origin); which can be plausibly be inferred to as an aspect return migration.

DISCUSSION AND CONCLUSIONS

The use of age specific growth rate method in computing accurate net migration rates, using data generated during censuses in Kenya, confirms that the method that has been frequently used by developed countries, could equally be applied to data from a developing country (Kenya). The application of this technique in this article further produces results that conform to the pattern that was established by Wakajummah (1986.). Worth noting, is that the results of this study conform to the net migration rate patterns that were generated by Odipo (1995), and applied to the National Growth Rate method on data generated during the Kenya censuses.

The results also confirm that the two metropolitan districts of Nairobi and Mombasa reflect the same age-specific migration patterns. This suggests that major forces attracting the people into and/or repelling them from these two cities are similar. The pattern is marked by out-migration of children aged 0-9 years and women in the 20-39 age brackets suggesting that children are sent back home with their mothers. Contrary to this, most rural counties exhibited peak out-flow of population in the ages 15-29 years, who are mainly received in urban centres. The out-migration pattern observed in metropolitan areas is likely to be directed towards other urban centres including unsuccessful job seekers promoting inter-urban re-distribution of the population. The growth of the Nairobi metropolitan area is also changing migration patterns in neigbhouring counties such as Kiambu and Kajiado as housing problems pose challenges to migrant workers. The middle class who find urban housing prices too high prefer to move to neighbouring regions, mostly Kajiado. Further moves to Kajiado have been driven by the expanded Arusha to Nairobi highway, in the wake of developments of the East African Community.

Unlike in the last two decades, the current re-settlement areas in Kenya experienced out-migration. However, they are marked by population net gains in all age groups or nearly all age groups, indicating that population flows into such areas imply movements for permanent settlement. This pattern of migration is largely attributable to land pressure and conflicts in the adjacent counties. Of significance to note are the former districts of Uasin Gishu, Laikipia, Nakuru, Trans-Nzoia, West Pokot and Tana River (resettlement districts) that have recorded net loss of population in the 20-60+ age groups.

According to Ominde (1968) and Wakajummah (1986) the major flows included: - the Rift Valley Stream; the Coast Province Stream; the Nairobi Stream; the Other Stream and finally the Mombasa Stream. The Rift Valley, the Coast, the Nairobi and the Mombasa streams reported to have net gainers of the population whereas; the other streams experienced net loss of the population. The study confirms that it is only the Nairobi and the Mombasa streams that have retained their patterns of migration. Counties located along the international boundaries portray either net loss or net gains in population for almost all age groups, suggesting that there exists both emigration and immigration flows amongst these Counties. The limitation of the Age-Specific Growth Rate Technique is that it does not show the origin and destination of the migrants; although, it provides plausible inter-censal migration rates for Kenya by establishing the patterns and levels of migration and distinguishing in-migration from out-migration zones.

RECOMMENDATIONS

To reduce massive movement of the youth from the rural areas, the study recommends good employment policies to be formulated to be in line with training courses in higher learning institutions (preparing the youth for suitable in the market). The national migration survey need to be carried out annually or after three years to generate more convincing findings that planners and policy makers can utilize for effective planning. This survey will be based on the household (micro) survey data which would be better focused on analyzing migration data with independent variables identified. This will further reveal the motivational forces behind migration flows in Kenya. The provision of more social services at both origin and destination need to be emphasized such as schools; health services and domestic water to balance migration flow. The shift of planning

to Counties is supported by Kenyans. However, if less emphasis is given to decentralize industries that are proximity to their raw materials; to reduce the time and cost of transport, improve quality and security of goods then youth will reap nothing from the new constitution other than retaining the status quo (i.e. continued massive rural- urban migration, continued poverty, underemployment, unemployment, poor health and then poor quality of life). Vital statistics registers need to be put in operational and effective so that more demographic studies in migration using modern developed techniques such as vital statistics method may be applied in Kenyan data.

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APPENDICES

APPENDIX 1: ADMINISTRATIVE BOUNDARIES OF COUNTIES IN KENYA

APPENDIX 2: NET MIGRATION RATES, 2009

Appendix 2a: Male Net Migration Rates by Age and County Error! Not a valid link.

Appendix 2b: Female Net Migration Rates by Age and County

AGE-GROUP	POP 1999	POP 2009	AVPOP	N(a)	P(x)	r(x)	e(x)
0 – 4	114,279	177,674	145976.50		0.9100	0.0441	
5 – 9	117,196	174,361	145778.50	29175.5	0.9844	0.0397	-0.0378
10 -14	119,644	172,226	145934.61	29171.31	0.9938	0.0364	-0.0389
15 – 19	119,735	175,978	147856.50	29379.11	0.9887	0.0385	-0.0498
20 – 24	124,958	194,370	159663.82	30752.03	0.9779	0.0442	-0.0439
25 – 29	111,023	178,269	144646.00	30430.98	0.9692	0.0474	-0.0190
30 – 34	87,852	148,662	118257.24	26290.32	0.9648	0.0526	-0.0072
35 – 39	66,223	115,157	90690.00	20894.72	0.9624	0.0553	0.0164
40 – 44	39,560	70,477	55018.43	14570.84	0.9604	0.0577	0.0352
45 – 49	25,687	46,724	36205.50	9122.393	0.9568	0.0598	0.0261
50 – 54	16,126	29,270	22698.14	5890.364	0.9495	0.0596	0.0292
55 – 59	10,295	18,726	14510.50	3720.864	0.9350	0.0598	0.0240
60 – 64	6,583	11,911	9247.26	2375.776	0.9080	0.0593	0.0208
65 – 69	4,268	7,429	5848.50	1509.576	0.8611	0.0554	0.0210
70 – 74	2,741	4,288	3514.50	936.3	0.7828	0.0447	0.0177
75 +	2,002	2,488	2245.00	575.95	0.6579	0.0217	

APPENDIX 3: NET MIGRATION RATES IN CENTRAL PROVINCE, 2009

Appendix 3a: Male Net Migration Rates by Age, County and Province

Age Group	Nyandarua	Nyeri	Kirinyanga	Murang'a	Kiambu	Central
5 - 9	-0.0109	-0.0041	-0.0062	-0.0243	0.0382	-0.0033
10 -14	0.0052	0.0202	0.0204	0.0077	0.0268	0.0143
15 - 19	0.0390	0.0447	0.0316	0.0496	0.0005	0.0279
20 - 24	0.0469	0.0367	0.0158	0.0418	-0.0096	0.0181
25 - 29	0.0084	0.0145	0.0042	-0.0095	0.0025	0.0042
30 - 34	-0.0021	0.0097	0.0007	-0.0232	0.0044	0.0003
35 - 39	0.0073	0.0132	0.0074	-0.0179	0.0144	0.0077
40 - 44	-0.0137	-0.0046	-0.0028	-0.0249	0.0163	0.0001
45 - 49	-0.0189	-0.0076	-0.0072	-0.0291	0.0115	-0.0046
50 - 54	0.0051	0.0208	0.0070	-0.0159	0.0273	0.0133
55 - 59	-0.0024	0.0119	0.0040	-0.0217	0.0280	0.0097
60 - 64	-0.0120	-0.0212	-0.0026	-0.0431	0.0101	-0.0092
65 - 69	-0.0142	-0.0271	-0.0078	-0.0449	-0.0046	-0.0147
70 +	-0.0244	-0.0277	-0.0146	-0.0416	-0.0152	-0.0172

Appendix 3b: Female Net Migration Rates by Age, County and Province

Age Group	Nyandarua	Nyeri	Kirinyanga	Murang'a	Kiambu	Central
5 - 9	-0.0034	-0.0010	-0.0033	-0.0176	0.0324	-0.0016
10 -14	0.0057	0.0194	0.0202	0.0081	0.0223	0.0130
15 - 19	0.0219	0.0348	0.0191	0.0351	-0.0093	0.0154
20 - 24	0.0266	0.0294	0.0048	0.0277	-0.0185	0.0066
25 - 29	0.0094	0.0206	0.0116	0.0005	0.0124	0.0115
30 - 34	0.0013	0.0187	0.0113	-0.0063	0.0233	0.0132
35 - 39	0.0083	0.0194	0.0105	-0.0043	0.0210	0.0130
40 - 44	-0.0137	-0.0007	-0.0002	-0.0159	0.0165	0.0010
45 - 49	-0.0191	-0.0048	-0.0035	-0.0193	0.0116	-0.0037
50 - 54	0.0223	0.0211	0.0132	-0.0087	0.0271	0.0157
55 - 59	0.0161	0.0147	0.0100	-0.0137	0.0228	0.0111
60 - 64	-0.0186	-0.0078	0.0041	-0.0225	0.0064	-0.0045
65 - 69	-0.0159	-0.0074	0.0047	-0.0206	0.0001	-0.0033
70+	-0.0035	-0.0055	0.0025	-0.0207	-0.0083	-0.0007

APPENDIX 4: AGE-SEX MIGRATION RATES IN COAST PROVINCE, 2009

Appendix 4a: Male Net Migration Rates by Age, County and Province

Age Group	Mombasa	Kwale	Kilifi	Tana River	Lamu	Taita Taveta	Coast
5 - 9	-0.0212	0.0066	-0.0033	0.0048	-0.0130	-0.0043	0.0001
10 -14	-0.0253	0.0087	0.0007	0.0139	-0.0095	0.0139	-0.0003
15 - 19	-0.0367	0.0160	0.0213	0.0230	-0.0060	0.0329	-0.0029
20 - 24	-0.0293	0.0195	0.0308	0.0269	-0.0066	0.0199	0.0006
25 - 29	-0.0150	0.0170	0.0093	0.0255	-0.0074	-0.0026	0.0051
30 - 34	-0.0073	0.0142	-0.0043	0.0225	-0.0099	-0.0087	-0.0005
35 - 39	0.0136	0.0093	0.0030	0.0170	-0.0036	0.0003	0.0086
40 - 44	0.0229	0.0087	0.0131	0.0159	0.0049	0.0059	0.0211
45 - 49	0.0251	0.0112	0.0075	0.0169	0.0053	0.0005	0.0155
50 - 54	0.0355	0.0139	0.0032	0.0172	0.0083	0.0010	0.0138
55 - 59	0.0332	0.0133	0.0080	0.0183	0.0051	0.0044	0.0185
60 - 64	0.0342	0.0118	0.0129	0.0207	-0.0014	0.0069	0.0215
65 - 69	0.0320	0.0086	0.0080	0.0181	-0.0015	0.0018	0.0133
70 +	0.0337	0.0052	0.0010	0.0153	0.0040	-0.0061	0.0029

Appendix 4b: Female Net Migration Rates by Age, County and Province

Age Group	Mombasa	Kwale	Kilifi	Tana River	Lamu	Taita Taveta	Coast
5 - 9	-0.0325	0.0010	0.0003	0.0010	-0.0090	-0.0012	-0.0011
10 -14	-0.0320	0.0035	-0.0011	0.0085	-0.0032	0.0166	-0.0014
15 - 19	-0.0398	0.0051	-0.0032	0.0129	-0.0022	0.0340	-0.0163
20 - 24	-0.0343	0.0089	0.0030	0.0177	-0.0024	0.0274	-0.0154
25 - 29	-0.0124	0.0161	0.0178	0.0237	0.0054	0.0168	0.0155
30 - 34	-0.0023	0.0182	0.0160	0.0258	0.0088	0.0136	0.0222
35 - 39	0.0176	0.0207	0.0109	0.0273	0.0105	0.0124	0.0148
40 - 44	0.0335	0.0260	0.0274	0.0303	0.0147	0.0137	0.0296
45 - 49	0.0246	0.0224	0.0237	0.0292	0.0106	0.0117	0.0260
50 - 54	0.0264	0.0215	0.0068	0.0290	0.0064	0.0070	0.0114
55 - 59	0.0199	0.0199	0.0089	0.0280	0.0071	0.0030	0.0109
60 - 64	0.0128	0.0157	0.0174	0.0279	0.0073	0.0086	0.0179
65 - 69	0.0091	0.0145	0.0156	0.0252	0.0045	0.0116	0.0173
70 +	0.0023	0.0158	0.0121	0.0228	0.0047	0.0098	0.0148

APPENDIX 5: AGE_SEX MIGRATION RATES IN EASTERN PROVINCE, 2009

Appendix 5a: Male Net Migration Rates by Age, County and Province

Age Group	Marsabit	Isiolo	Meru	Tharaka	Embu	Kitui	Machakos	Makueni	Eastern
5 - 9	-0.0306	-0.0122	-0.0005	-0.0049	-0.0070	-0.0090	-0.0101	-0.0073	-0.0088
10 -14	-0.0328	-0.0124	0.0131	0.0140	0.0158	0.0057	0.0094	0.0104	0.0080
15 - 19	-0.0234	-0.0055	0.0242	0.0412	0.0395	0.0549	0.0379	0.0568	0.0383
20 - 24	-0.0182	-0.0045	0.0159	0.0333	0.0286	0.0789	0.0282	0.0706	0.0374
25 - 29	-0.0144	-0.0003	0.0041	0.0027	0.0051	0.0133	-0.0013	0.0168	0.0048
30 - 34	-0.0090	0.0077	-0.0046	-0.0040	0.0023	-0.0147	-0.0110	-0.0060	-0.0068
35 - 39	-0.0160	0.0013	0.0034	0.0046	0.0083	0.0001	-0.0082	0.0017	0.0001
40 - 44	-0.0172	0.0002	0.0159	0.0107	0.0033	0.0039	0.0028	0.0127	0.0076
45 - 49	-0.0178	0.0012	0.0082	0.0042	-0.0010	-0.0051	-0.0022	0.0047	0.0012
50 - 54	-0.0189	-0.0044	0.0011	-0.0037	0.0020	-0.0057	-0.0164	-0.0107	-0.0067
55 - 59	-0.0200	0.0026	0.0046	-0.0005	0.0036	-0.0018	-0.0104	-0.0057	-0.0031
60 - 64	-0.0240	0.0133	0.0081	-0.0031	0.0072	-0.0072	-0.0027	-0.0082	-0.0018
65 - 69	-0.0354	-0.0005	0.0009	-0.0149	-0.0036	-0.0150	-0.0145	-0.0198	-0.0126
70 +	-0.0536	-0.0218	-0.0099	-0.0243	-0.0225	-0.0238	-0.0273	-0.0264	-0.0257

Appendix 5b: Female Net Migration Rates by Age, County and Province

Age Group	Marsabit	Isiolo	Meru	Tharaka	Embu	Kitui	Machakos	Makueni	Eastern
5 - 9	-0.0233	-0.0116	-0.0026	-0.0038	-0.0030	-0.0048	-0.0047	-0.0020	-0.0053
10 -14	-0.0229	-0.0105	0.0105	0.0128	0.0174	0.0046	0.0109	0.0112	0.0083
15 - 19	-0.0159	-0.0089	0.0142	0.0251	0.0311	0.0294	0.0253	0.0410	0.0247
20 - 24	-0.0092	-0.0077	0.0090	0.0221	0.0248	0.0442	0.0177	0.0522	0.0252
25 - 29	-0.0036	0.0089	0.0193	0.0201	0.0192	0.0242	0.0102	0.0245	0.0178
30 - 34	0.0023	0.0276	0.0185	0.0136	0.0166	0.0029	0.0056	0.0046	0.0102
35 - 39	0.0002	0.0209	0.0114	0.0113	0.0146	0.0058	0.0037	0.0082	0.0088
40 - 44	-0.0001	0.0130	0.0160	0.0134	0.0055	0.0120	0.0104	0.0187	0.0126
45 - 49	0.0008	0.0166	0.0134	0.0062	0.0033	0.0057	0.0070	0.0123	0.0084
50 - 54	0.0021	0.0178	0.0039	0.0000	0.0084	0.0117	-0.0028	-0.0013	0.0035
55 - 59	0.0008	0.0149	-0.0008	-0.0003	0.0061	0.0141	0.0023	0.0027	0.0046
60 - 64	0.0007	0.0161	0.0091	0.0015	0.0081	-0.0021	0.0287	0.0023	0.0050
65 - 69	-0.0086	0.0063	0.0108	0.0007	0.0068	-0.0061	-0.0257	-0.0055	0.0008
70 +	-0.0278	-0.0108	0.0050	-0.0001	0.0032	-0.0032	-0.0108	-0.0088	-0.0037

APPENDIX 6: AGE-SEX MIGRATION RATES IN NORTH EASTERN PROVINCE, 2009

Appendix 6a: Male Migration Rates by Age, County and Province

Age group	Garissa	Wajir	Mandera	North Eastern
5 - 9	-0.0841	-0.0732	-0.1435	-0.1031
10 -14	-0.0722	-0.0642	-0.1380	-0.0941
15 - 19	-0.0501	-0.0370	-0.1092	-0.0672
20 - 24	-0.0370	-0.0184	-0.0875	-0.0484
25 - 29	-0.0282	-0.0095	-0.0767	-0.0386
30 - 34	-0.0216	0.0058	-0.0626	-0.0281
35 - 39	-0.0354	-0.0308	-0.0945	-0.0523
40 - 44	-0.0412	-0.0404	-0.1147	-0.0671
45 - 49	-0.0391	-0.0356	-0.1074	-0.0624
50 - 54	-0.0407	-0.0361	-0.1070	-0.0630
55 - 59	-0.0385	-0.0314	-0.0995	-0.0579
60 - 64	-0.0352	-0.0251	-0.0897	-0.0510
65 - 69	-0.0389	-0.0264	-0.0873	-0.0512
70 +	-0.0411	-0.0241	-0.0770	-0.0467

Appendix 6b: Female Migration Rates by Age, County and Province

Age group	Garissa	Wajir	Mandera	North Eastern
5 - 9	-0.0714	-0.0532	-0.1136	-0.0829
10 -14	-0.0606	-0.0442	-0.1083	-0.0739
15 - 19	-0.0487	-0.0295	-0.0945	-0.0592
20 - 24	-0.0406	-0.0187	-0.0835	-0.0481
25 - 29	-0.0334	-0.0168	-0.0855	-0.0459
30 - 34	-0.0301	-0.0165	-0.0856	-0.0453
35 - 39	-0.0281	-0.0197	-0.0897	-0.0476
40 - 44	-0.0238	-0.0201	-0.0888	-0.0470
45 - 49	-0.0175	-0.0063	-0.0658	-0.0320
50 - 54	-0.0110	0.0084	-0.0405	-0.0157
55 - 59	-0.0171	0.0072	-0.0343	-0.0160
60 - 64	-0.0203	0.0112	-0.0202	-0.0108
65 - 69	-0.0323	-0.0035	-0.0254	-0.0225
70 +	-0.0545	-0.0358	-0.0451	-0.0497

APPENDIX 7: AGE-SEX MIGRATION RATES IN NYANZA PROVINCE, 2009

Appendix 7a: Male Net Migration Rates by Age, County and Province

Age Group	Siaya	Kisumu	Homabay	Migori	Kisii	Nyamira	Nyanza
5 - 9	-0.0058	-0.0033	-0.0108	-0.0100	-0.0102	-0.0062	-0.0088
10 -14	0.0131	0.0064	0.0054	-0.0019	0.0161	0.0276	0.0095
15 - 19	0.0533	0.0205	0.0399	0.0194	0.0531	0.0590	0.0404
20 - 24	0.0459	0.0096	0.0354	0.0224	0.0514	0.0402	0.0354
25 - 29	0.0026	0.0090	0.0076	0.0139	0.0203	0.0097	0.0119
30 - 34	0.0055	0.0194	0.0137	0.0149	0.0165	0.0137	0.0140
35 - 39	0.0159	0.0226	0.0199	0.0168	0.0164	0.0129	0.0174
40 - 44	0.0217	0.0387	0.0306	0.0267	0.0149	0.0072	0.0237
45 - 49	0.0099	0.0344	0.0233	0.0233	0.0116	0.0057	0.0183
50 - 54	-0.0038	0.0189	0.0059	0.0117	-0.0049	-0.0038	0.0040
55 - 59	-0.0041	0.0225	0.0080	0.0114	-0.0075	-0.0120	0.0038
60 - 64	0.0098	0.0258	0.0787	0.0192	0.0076	-0.0129	0.0130
65 - 69	0.0132	0.0142	-0.0522	0.0147	0.0033	-0.0205	0.0082
70 +	0.0055	0.0014	0.0021	0.0047	-0.0071	-0.0301	-0.0021

Appendix 7b: Female Net Migration Rates by Age, County and Province

Age Group	Siaya	Kisumu	Homabay	Migori	Kisii	Nyamira	Nyanza
5 - 9	-0.0011	-0.0055	-0.0067	-0.0064	-0.0097	-0.0115	-0.0068
10 -14	0.0112	0.0045	0.0055	-0.0004	0.0120	0.0164	0.0079
15 - 19	0.0274	0.0082	0.0163	0.0028	0.0253	0.0355	0.0181
20 - 24	0.0215	-0.0008	0.0100	0.0042	0.0187	0.0292	0.0119
25 - 29	0.0237	0.0227	0.0198	0.0223	0.0298	0.0258	0.0243
30 - 34	0.0393	0.0528	0.0403	0.0358	0.0430	0.0222	0.0416
35 - 39	0.0259	0.0380	0.0314	0.0262	0.0286	0.0175	0.0294
40 - 44	0.0194	0.0267	0.0248	0.0221	0.0161	0.0146	0.0209
45 - 49	0.0181	0.0284	0.0245	0.0195	0.0145	0.0075	0.0196
50 - 54	0.0042	0.0155	0.0108	0.0082	0.0014	-0.0004	0.0073
55 - 59	0.0024	0.0076	0.0037	0.0039	-0.0051	-0.0067	0.0020
60 - 64	0.0217	0.0232	0.0191	0.0202	0.0195	0.0034	0.0198
65 - 69	0.0263	0.0242	0.0212	0.0210	0.0235	0.0060	0.0219
70 +	0.0185	0.0142	0.0119	0.0099	0.0144	-0.0006	0.0118

APPENDIX 8: AGE-SEX MIGRATION RATES IN RIFT VALLEY PROVINCE, 2009

Appendix 8a: Male Migration Rates by Age, County and Province

Age Group	Turkana	West Pokot	Samburu	TransNzoia	Baringo	Uasin Gishu	E. Marakwet
5 - 9	-0.1054	-0.0282	-0.0096	-0.0105	-0.0208	-0.0032	-0.0066
10 -14	-0.0982	-0.0231	-0.0124	-0.0010	-0.0107	-0.0060	0.0008
15 - 19	-0.0546	-0.0016	-0.0074	0.0135	0.0215	-0.0192	0.0212
20 - 24	-0.0132	0.0163	-0.0042	0.0111	0.0362	-0.0242	0.0297
25 - 29	-0.0118	0.0038	-0.0031	-0.0011	0.0153	-0.0038	0.0181
30 - 34	-0.0134	-0.0080	-0.0022	-0.0048	0.0061	0.0071	0.0063
35 - 39	-0.0294	-0.0054	-0.0071	0.0009	0.0044	0.0091	0.0034
40 - 44	-0.0384	0.0031	-0.0043	0.0120	0.0100	0.0143	0.0149
45 - 49	-0.0324	0.0049	-0.0023	0.0101	0.0104	0.0134	0.0139
50 - 54	-0.0254	0.0094	0.0023	0.0030	0.0049	0.0163	0.0077
55 - 59	-0.0267	0.0139	-0.0010	0.0070	0.0056	0.0154	0.0098
60 - 64	-0.0306	0.0028	-0.0037	0.0157	0.0010	0.0066	0.0046
65 - 69	-0.0379	-0.0073	-0.0125	0.0095	-0.0057	-0.0078	-0.0026
70 +	-0.0398	-0.0101	-0.0268	-0.0007	-0.0081	-0.0227	-0.0069

Age Group	Nandi	Laikipia	Nakuru	Narok	Kajiado	Kericho	Bomet	Rift valley
5 - 9	-0.0033	-0.0036	-0.0007	-0.0031	-0.0173	0.0533	-0.0533	-0.0135
10 -14	0.0066	0.0094	-0.0009	-0.0022	-0.0214	0.0573	-0.0445	-0.0086
15 - 19	0.0194	0.0288	-0.0048	-0.0026	-0.0294	0.0592	-0.0318	0.0014
20 - 24	0.0196	0.0259	-0.0038	-0.0056	-0.0286	0.0558	-0.0425	0.0029
25 - 29	0.0139	0.0049	0.0060	-0.0086	-0.0235	0.0589	-0.0624	0.0004
30 - 34	0.0045	0.0028	0.0060	-0.0112	-0.0237	0.0617	-0.0715	-0.0014
35 - 39	0.0041	0.0110	0.0103	-0.0082	-0.0148	0.0699	-0.0651	0.0015
40 - 44	0.0154	0.0017	0.0133	-0.0042	-0.0149	0.0835	-0.0515	0.0086
45 - 49	0.0135	0.0002	0.0083	-0.0043	-0.0181	0.0823	-0.0611	0.0080
50 - 54	0.0084	0.0186	0.0132	0.0048	-0.0088	0.0776	-0.0683	0.0089
55 - 59	0.0105	0.0114	0.0055	0.0050	-0.0082	0.0807	-0.0581	0.0088
60 - 64	0.0077	-0.0111	-0.0078	-0.0064	-0.0092	0.0794	-0.0514	0.0017
65 - 69	-0.0108	-0.0135	-0.0252	-0.0150	-0.0122	0.0657	-0.0587	-0.0080
70 +	-0.0268	-0.0093	-0.0364	-0.0215	-0.0127	0.0509	-0.0668	-0.0160

Appendix 8b: Female Net Migration Rates by Age, County and Province

Age Group	Turkana	West Pokot	Samburu	TransNzoia	Baringo	Uasin Gishu	Elgeyo Marakwet
5 - 9	-0.0836	-0.0220	-0.0068	-0.0074	-0.0151	-0.0073	-0.0061
10 -14	-0.0771	-0.0221	-0.0068	-0.0021	-0.0056	-0.0082	0.0015
15 - 19	-0.0428	-0.0200	-0.0054	0.0001	0.0125	-0.0240	0.0136
20 - 24	-0.0108	-0.0040	-0.0011	-0.0009	0.0206	-0.0270	0.0203
25 - 29	-0.0166	0.0108	0.0043	0.0074	0.0202	0.0065	0.0263
30 - 34	-0.0217	0.0100	0.0086	0.0153	0.0213	0.0216	0.0237
35 - 39	-0.0130	0.0055	0.0123	0.0102	0.0157	0.0119	0.0115
40 - 44	-0.0008	0.0169	0.0166	0.0080	0.0123	0.0123	0.0130
45 - 49	0.0019	0.0190	0.0147	0.0094	0.0131	0.0095	0.0162
50 - 54	0.0004	0.0147	0.0172	0.0057	0.0128	0.0113	0.0139
55 - 59	-0.0014	0.0103	0.0135	0.0043	0.0072	0.0100	0.0045
60 - 64	-0.0043	0.0025	0.0112	0.0169	0.0111	0.0031	0.0025
65 - 69	-0.0136	0.0023	0.0068	0.0164	0.0122	-0.0045	0.0091
70 +	-0.0193	0.0082	-0.0020	0.0086	0.0073	-0.0144	0.0140

Age Group	Nandi	Laikipia	Nakuru	Narok	Kajiado	Kericho	Bomet	Rift valley
5 - 9	-0.0034	0.0002	-0.0023	0.0004	-0.0234	0.0518	-0.0558	-0.0107
10 -14	0.0065	0.0099	0.0019	-0.0020	-0.0308	0.0557	-0.0483	-0.0063
15 - 19	0.0135	0.0152	-0.0101	-0.0162	-0.0414	0.0522	-0.0449	-0.0069
20 - 24	0.0097	0.0112	-0.0165	-0.0187	-0.0313	0.0487	-0.0525	-0.0078
25 - 29	0.0164	0.0125	0.0081	0.0020	-0.0129	0.0671	-0.0423	0.0079
30 - 34	0.0197	0.0151	0.0190	0.0140	-0.0159	0.0847	-0.0337	0.0161
35 - 39	0.0119	0.0145	0.0141	0.0082	-0.0113	0.0821	-0.0442	0.0105
40 - 44	0.0097	0.0022	0.0115	0.0017	-0.0042	0.0773	-0.0428	0.0100
45 - 49	0.0087	-0.0012	0.0078	0.0051	-0.0108	0.0743	-0.0401	0.0101
50 - 54	0.0098	0.0153	0.0174	0.0210	-0.0053	0.0720	-0.0426	0.0121
55 - 59	0.0085	0.0107	0.0126	0.0135	-0.0053	0.0695	-0.0437	0.0074
60 - 64	0.0066	-0.0077	-0.0042	-0.0022	-0.0009	0.0735	-0.0382	0.0040
65 - 69	0.0000	-0.0052	-0.0102	-0.0028	0.0019	0.0665	-0.0418	0.0032
70 +	-0.0062	0.0071	-0.0145	-0.0016	0.0013	0.0524	-0.0514	0.0019

APPENDIX 9: AGE-SEX MIGRATION RATES IN WESTERN PROVINCE, 2009

Appendix 9a: Male Net Migration Rates by Age, County and Province

Age Group	Kakamega	Vihiga	Bungoma	Busia	Western
5 - 9	-0.0015	-0.0037	0.0390	-0.0046	-0.0072
10 -14	0.0119	0.0233	0.0047	0.0009	0.0107
15 - 19	0.0385	0.0757	0.0234	0.0286	0.0348
20 - 24	0.0367	0.0866	0.0314	0.0317	0.0397
25 - 29	0.0104	0.0207	0.0174	0.0043	0.0144
30 - 34	0.0057	-0.0028	-0.0017	0.0019	-0.0029
35 - 39	0.0054	0.0009	0.0092	0.0043	0.0095
40 - 44	0.0097	0.0080	0.0158	0.0042	0.0130
45 - 49	0.0096	0.0017	-0.0079	0.0025	-0.0046
50 - 54	-0.0040	-0.0148	0.0088	-0.0016	0.0050
55 - 59	-0.0032	-0.0138	-0.0009	-0.0020	-0.0094
60 - 64	0.0140	-0.0001	0.0084	0.0092	0.0037
65 - 69	0.0123	0.0026	0.0160	0.0065	0.0176
70 +	0.0039	-0.0025	-0.0765	-0.0062	-0.0838

Appendix 9b: Female Net Migration Rates by Age, County and Province

Age Group	Kakamega	Vihiga	Bungoma	Busia	Western
5 - 9	-0.0002	-0.0040	-0.0114	-0.0034	-0.0094
10 -14	0.0108	0.0192	0.0069	-0.0014	0.0100
15 - 19	0.0214	0.0533	0.0134	0.0081	0.0200
20 - 24	0.0178	0.0561	0.0181	0.0108	0.0216
25 - 29	0.0183	0.0298	0.0218	0.0148	0.0249
30 - 34	0.0237	0.0224	0.0069	0.0239	0.0106
35 - 39	0.0157	0.0178	0.0198	0.0166	0.0215
40 - 44	0.0103	0.0157	0.0152	0.0087	0.0150
45 - 49	0.0098	0.0097	-0.0035	0.0080	-0.0007
50 - 54	0.0039	-0.0034	0.0095	0.0036	0.0062
55 - 59	0.0053	-0.0003	0.0047	0.0014	0.0072
60 - 64	0.0220	0.0173	0.0113	0.0205	0.0111
65 - 69	0.0227	0.0185	0.0230	0.0222	0.0250
70 +	0.0156	0.0105	-0.0831	0.0081	-0.0838