MIGRATION AND INEQUALITY IN KENYA

By

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DECLARATION

This thesis is my original work and to the best of my knowledge has not been presented for a degree in any other University.

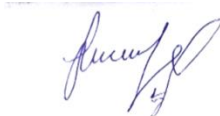Mary Kalerwa Muyonga

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My parents, the late Robert Shibalira Muyonga and late Alice Atyang Muyonga

and

My children Jan and Jon, the sky is the limit!

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ABSTRACT

Since early 2000, understanding the nature of the migration and inequality relationship has received global attention. This arises from the different conclusions from research, on the nature of the association, as a result of conflicting conceptual and methodological dispositions. While most studies focused on the effect of migrant remittances on inequality only a few compare the counter effect of migration on inequality. In Kenya, earlier studies had indicated a possible relationship between the county migration patterns and the patterns of development. This study seeks get a deeper understanding of the relationship between inequality and subnational migration patterns in Kenya.

Data were derived from Kenya Population and Housing census for 1999 and 2009, to reconstruct migration movements within the counties. The migration intensity measures for the 2009 census were used to generate the migration intensities for the analysis. Inequality data was obtained using four variables measured at the County level – access to water, access to electricity, the County Human Development Index and the County Gini, that measures income distribution. The test of the relationship was done using spatial analysis based on ArcGIS version 10.5.

The findings show that migration has a significant relationship to the County Gini and County Human Development Index, although they influence each other differently. County Gini has a non-linear relation to the County migration intensity, but the County development measured by County HDI, exhibited a positive relationship with migration. The relationship between county migration intensity and County Gini was statistically significant, such that a unit change in migration intensity resulted in 567 negative unit change in County Gini. This finding corroborates previous studies that found a negative relationship between migration and income inequality. The finding leads to the conclusion that as migration intensifies, income inequalities reduce.

Several other findings from the study confirm that migration in Kenya is patterned such that regions with similar intensities neighbor each other. Two migration hotpots emerge in the analysis, one of high-high intensities in the western part of the country around the Lake Victoria basin, and low-low intensities, in the eastern part of the country in Mombasa and surrounding regions. The locations associated with low migration intensities are characterized by high poverty levels, which point to deeper systemic factors accounting for the migration patterns observed therein. Furthermore, the study findings show that Kenya has experienced changing patterns of migration between 1999-2009, notably the increased feminization observed across the years although internal migrants are moving shorter distances.

The study recommends the use of spatial analysis to enrich future studies of migration dynamics in Kenya. It also recommends the use of qualitative methods to understand migration and inequality dynamics, to complement this quantitative study. Such a mixed methodology approach will nuance how migration affects intrahousehold inequalities beyond the income dimension. A recommendation for policy makers is to initiate a migration survey, that would enable analysis to be done at micro level – allowing for household and individual migrant characteristics to be tracked over time. This is a rallying call to support the push for a specialist migration survey to support future migration studies in the country.

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CHAPTER ONE

GENERAL INTRODUCTION

1.0   Study Background

Migration as one of three measures of demography is the most dynamic and most difficult to measure, as it shows the least stable trends over time. Understanding the linkages between migration and inequality requires a close understanding of how migration relates to development. In the early 1990s global views shifted to affirming that freedom of human movement has potential economic and social impacts and is therefore important for development. In the post 2000 period, focus shifted to the relationship between migration and development and the role that remittances play. One of the United Nations reports focused on exploring the migration and development nexus across all angles including inequality (Klugman, 2009). The results revealed how migration is constrained by economic and policy barriers that disproportionately affect poor people. As stated in the United Nations Development (UNDP) 2010 report, "concerns about equity in human development translate directly into an explicit focus on inequality" (UNDP 2010, p. 23). Inequalities reflect structural barriers to opportunities in society and amplify those constraints (Melamed & Samman, 2013).

The Sustainable Development Goals (SDGs) have given impetus to the interest on migration and development linkages and their intersection with inequalities. Tackling inequalities among coutries, captured in SDG Goal 10 focuses on understanding and tackling the underlying causes of inequalities including those that result in migration. Inequality has been described as a fundamental issue for human development characterized by the unequal access to power and resources among and between countries (Melamed & Samman, 2013). Since then, inequality has been a subject of interest across disciplines including demographers (see Black et., al, 2005).

Black et., al, (2005) argued that the underlying issues on the migration and inequality nexus is the question of access – understanding how decisions are

made on who migrates, and considering options on where they migrate to, based on the existing opportunities at hand. Thus, migration varies across geographical locations as well as by type of inequalities manifested within these locations. This confirms the importance of the macro context including the political, economic, and social cultural institutions in influencing migration outcomes, since these factors influence redistribution of power, wealth and opportunities in society. Migration affects different generations of migrant households as they are impacted by both national and global social change, prompting Castels (2010) observation that migration must be interrogated as part of the broader social change.

Internal migration in Kenya has been on the rise, over time, with increased impact on the spatial distribution of the population. The 2009 census data shows that one in every five Kenyans was not born in the county in which they live, meaning over 8 million people are in-migrants. Internal migration results in the changes in the age as well as sex structure in the sending and receiving areas, and this in effect impacts the economic development of the respective areas. Urban growth in Kenya was largely fueled by internal migration (UNECA, 2008) although urban areas continue to demonstrate social, economic, and spatial development challenges and growing inequalities.

Studies in Kenya were previously focused on understanding how migration correlates with development in the country (Rempel, 1971; Oucho, 2007). These scholars postulated that there may be a close relation between the development patterns and internal migration flows in the country. Whilst Rempel (1971) indicated that migration in Kenya may be in direct response to the development patterns, there have been almost no attempts to explore the relationship between these two phenomena. For those who have interrogated such relationships, migrant selectivity by age, sex, and education have been key variables of interest. Labor migration has been associated with loss of human capital in rural areas that is associated with income inequalities biased in favor of urban areas. Migration in response to land inequalities which were important in the post-

colonial period (Wakajummah, 1986; Oucho, 1988) is still noted in the recent migration flows with Ovyat (2017) illustrating that regions with high land inequalities have higher out migration propensities. Oucho (2007) also notes that the development patterns in the country seem to closely mirror the migration patterns in the country. Beyond these studies, there have been no others investigating how migration and inequality interphase in Kenya.

1.1 Policy and contextual factors influencing migration in Kenya

Kenya's migration and development context has been influenced by the countries colonial legacy including policies on population movements, resource distribution and development priorities in the country. These past policies can account for the structural factors that influence migration by enhancing or limitation population flows across the country. Access to land and basic social services in Kenya was tied to the residential rules operating during the colonial times, leading to some racial stratification of the country. The European colonialists resided in the most fertile parts of the country and amassed great pieces of land for commercial farming, displacing masses of the native populations Africans whose land had been grabbed were put in reserves and not allowed to leave without permission. Several laws were put in place to ensure the restriction of movements in the country during the colonial period including the Native Passes Regulations 1900 ,Native Passes Ordinance 1903, 1906 Master and Servants Ordinance, and the Vagrancy Ordinances (Home, 2012).

In the post-colonial period, the Kenya government did away with restrictions on population movement as stated in the 1963 Republic of Kenya Independence Constitution which guaranteed the freedom of movement of all Kenyan citizens (Republic of Kenya, 1963). However, the colonial segregation measures continued and existing planning instruments such as the Town Planning Rules resulted in wide developmental gaps between rural and urban areas of Kenya (Ayonga, 2019). Beyond the residential restrictions, the colonial legacy was characterized by skewed distribution of employment opportunities in Kenya.

A notable policy document, Sessional Paper No. 10 of 1965 led to focus of development projects in the 'agricultural regions' of the country while ignoring the 'unproductive regions' most of lay in the northern part of the country. The policy resulted in identification of growth poles in which development would be centered in areas of economic potential with the intent that the benefits of growth in such areas would later reach the rest of the country through a trickle-down effect. The growth poles approach has been heavily criticized for partly contributing to the unequal development in the country, that is reflected in the migration trends in the country (Oucho, 2007; Otiso, 2005; Rempel, 1976; Soja, 1968).

For example, Sessional Paper No. 10 of 1973 on Wage Guidelines placed restraints on wage earnings between Africans and other races resulting in racially induced wage differentials. Minimum wages were set higher in Nairobi ,Mombasa and the other major towns, while lower wages remained in the rest of the country, especially the hinterland. In their review of migration determinants in Kenya, Harris & Todaro (1970) noted that migrants moved out of rural areas because urban areas offered higher wages for similar jobs they would do in rural areas, and that migration was fueled by consideration of the perceived wage differentials. The growth poles approach has been heavily criticized for partly contributing to the unequal development in the country, that is reflected in the migration trends in the country (Soja, 1968; Rempel, 1976; Otiso, 2005; Oucho, 2007).

Following the realization that there were widening inequalities in the country, a new policywas formulated to revert the widening inequalities in the country in the postcolonial period. The District Focus for Rural Development policy was implemented in the 1984-1988 National Development Plan with the objective of spurring growth in the rural areas ostensibly to provide a counterflow of movement from urban to rural areas (Omolo, 2010). While launching the policy, the Head of State, President Moi noted that 'district focus' would result in planning and service delivery based on the needs of respective districts, with

more involvement of the local citizens in planning and priority setting, and finally, the resource allocation for development would be based on the priorities identified at the district level. In the period between 1978-2002 during the Moi legacy, the total number of districts in Kenya almost doubled, from 41 in 1967 to 71 (Hassan, 2013). Creation of new districts played a role in the internal migration patterns, as newer districts created economic opportunities and previously marginalized ethnic groups who domiciled in the smaller administrative units, gained opportunities.

Another cause for slow economic growth that triggered further rural to urban migration in Kenya was the launch of the Structural Adjustment Programs (SAPs) by the Bretton Woods Institutions in the 1980s. Some scholars argue that these SAPs were based on economic models different from the social structure and conditions of the countries implementing them (Rono, 2002 p:5). Other effects of the SAPs include the decline of economic opportunities, rise in crime, poor enrolment into educational institutions and increase in cases of school dropouts, poor health services and outcomes owing to cost sharing directive, and a significant increase in poverty levels (ibid). Ikamari (2004) posits that the SAPs affected access to health services and could partly explain the rise in child mortality in Kenya. As result of the labor related rationalization changes, there was massive retrenchment of workers and early retirement, resulting in an outflow from the urban areas where jobs were located, to rural areas.

The government policies aimed at growing the economy did not result in job creation in the formal sector, and a huge number of Kenyans remained unemployed. The informal sector provided an alternative source of livelihood for many Kenyans and the Government of Kenya developed an economic policy, Sessional Paper No. 1 0f 1896, to tap into this sector (Republic of Kenya, 1986). Subsequent development plans focused on strengthening the informal sector, including the 1994-1996 National Development Plan (ROK, 1994a). To guide the performance of the *Jua Kali* sector the Sessional Paper No. 2 of 1992 was proposed which specified ways to promote the sector. Studies showed that the

Jua Kali sector absorbed many migrants to urban areas like Nairobi, Mombasa, Kisumu and Eldoret (House, 1984; ILO, 1995; Omolo, 2010; Ouma 2010; ROK,1994b). The 1997-2000 Development Plan removed the Wage Guidelines and was more focused on industrialization through private sector investment (ROK, 1997a; ROK, 1997b)). This informal sector economy would attract many migrants to urban settings and curtail the return migration of individuals who had not found formal employment. Many subsequent studies in Kenya would focus on urban migrants and their survival within the urban informal economy.

The political policies and processes sustained the unequal development in the country, as there was marginalization of parts of the country that did not agree with the incumbent leadership (Republic of Kenya, 1964). Political marginalization of regions of the country from which the key opposition leaders originated was rampant during the single party democracy period in Kenya (Owiti, 2014; Oucho, 2010; Kanyinga & Okello, 2010; Murunga, 2007). Investment of infrastructural projects were mostly done in the politically favored regions as evidenced by inequalities in education (Schech & Alwy, 2004; Mulongo, 2013), health (Ilinca et. al., 2019; Nyanjom, 2006), land ownership (Syagga, 2006), and other investments in the country. Several other policy changes, such as the cost-sharing policy in the health sector, resulted in devastating results for the sector (NCPD,2013:244). The clamor for constitutional changes that aimed at solving long standing inequalities in the country would result in the change of the constitution in 2010, with the country adopting devolution of its governance structure, where power, resources and planning happen at the subnational county governments which also become the new administrative units of the country. The Constitution of Kenya promises equity and reduction of inequalities in the country by creating a devolved system of government which aims at bringing service provision closer to the people across the country (Republic of Kenya & National Council for Law Reporting, 2010c).

1.2   Problem Statement

There has been increased scholarly interest on migration and inequality since 2000 including the works of de Haas (2007, 2010, 2014) and in the Human Development Reports for the year 2009 (UNDP, 2009). The main question has been understanding how migration interacts with inequality and the direction of the relationship – scholars querying if one is the prerequisite for the other or not. Migration and inequality are intrinsically interrelated as migration alters the social structures in a society and creates new institutions (King, 2012; Castles, 2010). The outcome of migration therefore requires a holistic understanding, as it may result in improved economic opportunities on one hand, or increased poverty and inequality on the other (de Haas, 2014). Thus, understanding how migration affects society, including an elaboration of the effects migration has on development, including inequality is a useful undertaking.

While several studies have been done globally to review migration and inequality, in Kenya, few studies show that the internal migration flows in the country could be responsive to the development inequities, but there are few focused on the reverse effect of inequalities on migration. The earliest attribution of internal migration flows mirroring the development patterns in Kenya was asserted by Soja (1968) where he concludes that migration occurs owing to unequal development in the country. This was later confirmed by Rempel (1971) and later Oucho (2007) who asserted that internal migration in Kenya may be in direct response to the development patterns. Majority of the scholarly work on migration in the country have focused causal factors for migration in Kenya. Most concluded that drivers of internal migration include, the unequal distribution of resources (Society for International Development (SID), 2004, 2006; Oucho, 1980, 2002, 2007, 2016; Rempel, 1981; Knowles & Anker, 1981; Todaro, 1969; Ominde, 1968) all sustained by strong ties between origin and destination areas, through migrant social networks (Hoddington, 1994; Weisner, 1972).

The studies, mostly relying on national average estimates of migration, confirmed that Kenya has wide regional variations in internal migration flows, with net gainers, mainly in the Coast, Nairobi and Rift Valley regions, and net losers mainly in Eastern, Nyanza and Western regions. This approach used to determine migration levels in such studies, however, masks the underlying subnational variations in level and patterns of flows, as revealed in a study of intercensal patterns of migration, using data for the 1999-2009 census (Adieri, 2012).

A few studies looked at impact of remittances, from migrants, on the income distribution in the sending and receiving communities but reached conflicting conclusions. Knowles & Anker (1981) look at the urban remittances and the impact on the receiving communities in rural areas and find that they do not affect income inequality in the receiving areas, and therefore recommend that more variables should be considered to understand how these two concepts interphase. Some of the variables they suggest include the migrant-centric attributes such as level of education and income; household-based attributes like as urban or rural location and wealth status. A different study finds higher income inequality between non-migrant and migrant households in Kenya (Hoddinot, 1994), with the authors arguing that the previous studies had only looked at changes within migrant households, yet remittances impact more than the migrant households, with effects spreading to community levels.

Beyond the effects of remittances on income inequality, a different study focused on role of inequalities as migrant determining factors. Wakajummah (1986) finds that land inequality explains migration behavior in Kenya, such that propensity to migrate increases when the household head, especially males, has poor access to land. Using the World Bank supported Kenya Household Migration Survey of 2009, Bang et. al., (2016) analyzed migrant remittances in Kenya, and conclude that migration propensity is not only affected by land ownership, but also preexisting conditions of the households.

Bigsten (2016) confirms this observation and argues that the preexisting inequalities in different social contexts in Kenya were largely responsible for some of the migratory patterns in the country. This derived from his analysis of the landholding status in Kenya, an outcome of colonial legacy, which resulted in Central and Nyanza regions grossly affected by land fragmentation and high poverty, respectively, as a result of colonial policies, resulting in higher outmigration observed in these regions. This led Bigstein to conclude that the coupling the observed outmigration levels and the colonial policies on local development, the resultant urban-rural differentials in living standards have largely contributed to poverty and inequality in Kenya (Bigsten, 2016: p.367). Thus, the regions attracting migrants were those that have better development infrastructure.

Oyvat & Mwangi (2017) add that higher development influenced migration in different ways when urban and rural areas are compared. Migrants from rural areas received lower wages than urban residents, thus migration into urban areas led to higher income inequality between migrant and native wages. Meanwhile, outmigration from rural areas, resulted in migrant households receiving remittances, which increased income inequality within the sending communities.

The preceding examples confirm that previous studies investigated the side-effect of migration, that is, remittances, and the impact this had on wealth inequality. Migration as a demographic process is largely ignored and considered through the proxy of remittances. The effect of remittances on income inequality was largely conducted through econometric approach, which has been criticized because migration occurs repeatedly across the life course, hence the point estimates of the migration event do not help in understanding the entire migration system. As postulated by de Haas (2010a; 2007), migration processes change over time, therefore the effects should also change over time.

There remains a lacuna on how migration as a demographic process affects inequalities, beyond the current focus on income inequalities. While Wakajummah considered how migration rates were changing based on land inequalities in Kenya, the study is now outdated as it was based on data from the 1969 and 1979 census. The study by Adieri (2012) confirms that using regional averages of migration rates, has been masking subnational variations in intensity and typologies of migration.

It is against this background that this study investigated how subnational migration interphases with subnational inequalities in Kenya. More specifically, the study investigates how county level inequalities change with county migration patterns. The migration of youth was of great interest, as scholarly work had established that the youth are the most mobile population in Kenya.

This study is timely and contributes to knowledge in three ways that differ from previous ones. First, the study considers migration as a demographic process with changes in intensity as key measure of the changes in population in the counties over time, while previous studies used remittances as the key measure of migration effects. Secondly, the study is based on macro analysis, which considers a net effect of migration in counties and not on individual migrant experiences. Third, the study is based on newer data derived from 2009 census but considers the historical changes in mobility in the country between 1999 and 2009, thus builds on older national studies.

1.3   Research Questions

Previous studies only focused on migration and land inequality (Oyvat &Mwangi, 2017; Bigsten, 2016;Ominde,1968). This study seeks to investigate if internal migration at subnational level is affected by other forms of subnational inequality (such as income, access to social amenities, development level).

The specific research questions are:

1) What are the trends in internal migration? Do these trends differ by age and sex?

2) What are the patterns of migration at the subnational levels?

3) Controlling for the effect of population size in each subnational unit, has the rate of gross and net migration changed?

4) Is there a relationship between the indicators of inequality and internal migration?

1.4   Study Objectives

The specific objectives of the study are as follows:-

a) To establish the migration trends by age and sex patterns in the counties between 1989-2009 and confirm the peak ages for migration.

b) To establish the trends in migration flows within counties between 1999 and 2009 to reconstruct the previous migration history.

c) To determine the domains of inequality in the counties and how these differ between counties.

d) To determine how the county migration patterns change with county inequality patterns in Kenya.

1.5   Hypothesis

This study hypothesized that the factors that cause migration may be related to the ones that cause inequality. In Kenya, a country with unequal development, structural factors including the policy environment and colonial legacy tend to sustain the inequalities between regions. At the meso level, the aggregate effect would be that the spatial inequalities will lead to higher migration propensity in the poorly endowed counties. That coupled with the individual level inequalities, such as level of education, will increase migration propensity to better resourced regions. The end effect is that in the receiving regions, there will be a rise in inequalities between the haves and have nots.

Thus, the study hypothesis is that migration and inequality are interrelated such changes in county migration intensity will result in changes in county inequality levels. Thus, the counties with higher migration intensity, will record high county inequality levels. The null hypothesis is that changes in county inequality will result in changes in county migration intensity and the nature of the relationship is presumed to be positive. The alternative hypothesis is that changes in migration intensity have no effect on the levels of county inequalities.

1.6   Justification

In Kenya despite the rising economic growth, certain parts of the country continue to experience poor access to the country's economic and social resources. The Kenya Constitution (Republic of Kenya,2010) tries to boldly tackle these growing inequalities, by making provisions for equity to level the playing field for all regions of the country that were perceived to be disadvantaged in the past, notably northern region of Kenya. The process of rapid urbanization compounds the problem with residents in some urban settings living below the poverty line, in a phenomenon described as the 'urban poor'. The study is therefore quite timely in expounding the impacts of skewed development policies on the resultant population distribution in the country, as illustrated by the internal migration patterns.

The main question is whether increased migration will be associated with increased inequality as observed in previous studies (de Haas , 2007; Zelinsky, 1971). Zelinsky (1971) in his proposal of the migration transition theory, sets the pace by showing that migration, which was omitted in the demographic transition theory (Notestein, 1945), changes as economic development occurs. The more developed a society the more complex the mobility patterns therein. While Zelinsky's work does not factor in inequality, the gap is filled by de Haas (2010a, 2010b) in the migration transitions framework, where he shows that development affects migration propensity in two ways, first by increasing opportunities that allow people to live the life they aspire, and influences their

movement into or out of such contexts; and secondly, by increasing affordability of migration by local migrants, who can now afford the costs and risks associated with movement. This results in the observation that as economic development occurs, there is higher migration intensity.

This study complements previous studies in Kenya investigating the migration and development nexus. The study used data from the 2009 census data that has been extensively analyzed to generate several reports including the subnational levels of migration, subnational inequality in the country (Republic of Kenya, 2012a) .Such research creates opportunities for researchers to interrogate the interrelations of some of these phenomena with the population dynamics in the country.

An added outcome of the study was to confirm which was the most mobile population of Kenya as well as the age and sex dynamics of migration in the counties. While building on the works of other scholars (Awuor, 2015), the study considered the youth as a demographic group, adopting the definition outlined in the Constitution of Kenya 2010, that is, persons aged 15-35 years of age. The study considered the new definition of youth and provides data on youth migration across counties, with differentiation of youth into two key categories, namely those under 20 years, those between 20 and 34 years. By this definitional difference, the previous studies may not have reflected the true picture of youth migration in Kenya.

Finally, the change in administrative units in Kenya occasioned by the constitutional changes provides new areas of research based on the subnational administrative units called counties. In previous studies of trends in both lifetime and recent migration in Kenya from census data were based on the earlier administrative unit in Kenya, named Provinces, which provided averages of the regional variations in migration. While in-migration and outmigration data was available up to district level, the constitutional changes resulted in the creation of counties, which are made up of some old districts, creation of new districts or

amalgamation of several existing districts into one county. Table A-11 in the Annex provides a list of the counties and their matching districts.

1.7   Scope and Limitation of the Study

The study explored the relationship between subnational migration levels and subnational inequality levels so as to determine the nature of association between these two phenomena. In this study, the unit of analysis is the county, which a geographical administrative unit. There are 47 units, as outlined in Table A.11 in the Annex of this study.

The research interest was determining the relationship between county migration and county inequality patterns. The study was limited to this macro level analysis of county variables and did not focus on household or individual level attributes.

Methodologically, the study was limited by the lack of comprehensive dataset that combines the county level indicators to the migration indicators. It relied on census data which is limited as it captures point estimates of migration and therefore does not capture return migration, death of migrants and temporary movements (Goldstein, 1984). This means that the individual migrant behavior over time is omitted in the analysis, and yet this would have provided useful information on the differential impacts of inequality on migration. While a qualitative approach would have helped to nuance the migration and inequality dynamics at the household or individual household levels, this study was focused on quantitative analysis owing to availability of data to support this approach.

Migration patterns were reconstructed from the 1999 and 2009 census. This study builds on the analysis of several decades of internal migratory flows in Kenya which helps to depict associations between inequalities and migration in Kenya. Challenges were encountered in the 1989 census for one of the major geographical regions, namely Nyanza Province, which was reported to be lost due

to data storage technologies. The data was therefore only used to provide an overview of the age and sex patterns of migration and was expunged for the migration and inequality analysis.

There were limitations of using census data for this study because it captures information on migrants, but not the migration process, meaning repeat migrations and return migrations may not be easily identifiable from the data. The data therefore omits repeat migrations as well as deceased migrants, as it is only live migrants who are captured.

The study used lifetime migration data to generate the migration intensities for counties. Lifetime migration data can overestimate migrants by capturing short term movements and includes challenges such as recall errors, especially if the administrative units have changed over time. To mitigate the challenges anticipated in the study, historical trends were analyzed to infer the subnational migration trends over time, therefore yielding data on regions that have high outmigration in the country. As census data is limited to point estimates of migration, the historical analysis helped to build a picture of what was happening within the 30-year study period. This gave a firm foundation to make generalization of patterns and trends, which provide useful insights to the emerging correlations with inequality.

The study adopted a quantitative approach rather than a qualitative approach. The availability of the census data was useful for the application of quantitative analysis which is robust for determining the association between the two variables of interest.

Finally, while the analysis focused on aggregate migration flows , most attention was given to analyzing age and sex differentials. Despite these limitations, the analysis was rigorous, and the results obtained in the study reflect patterns observed elsewhere.

1.8   Organization of the Thesis

The study is presented eight chapters. In the following chapters, the literature review is provided in Chapter 2 , while Chapter 3 provides the methodological approach. The key findings of the study are presented in four chapters that mirror the study objectives – provided in Chapter 4, 5, 6 and 7. The final chapter, Chapter 8, provides the summary of key findings, the study conclusions and recommendations, to inform future academic and policy discourse.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter presents the review of literature on studies done on the migration and inequality, including theoretical perspectives, case studies and emerging issues. The findings provide a contextual analysis and challenges encountered in previous studies and ends with a summary of emerging gaps in research on this discourse.

2.1 Migration and Inequality Theoretical perspectives

Research on the migration and inequality interphase does not benefit from a distinct theoretical foundation that explains how migration and inequality are interrelated. In fact, migration as a subunit of demography, is always neglected due to a lack of a robust theoretical foundation (de Haas, 2014). Despite this challenge, several migration theories explain some of the observations in the relationship and will be discussed in this section.

Everett Lee in 1966, observed that migration determinants are context specific, such that sending regions are characterized by factors which push people out of them, while receiving regions are characterized by attributes and factors that draw migrants into them(Lee, 1966). These factors, operate within the 'Push and Pull Framework' through the intervention of Personal factors, resulting in a migration decision Lee (1966) argues that migrants make rational decisions to migrate based on consideration of factors both at the origin and destination areas, but the migration movements occur at specific periods of the lifecycle.

Scholars have opined that some of the push factors include aspects of inequality, for example wage differentials between urban and rural areas (Todaro, 1969), with the Neoclassical Economics theory argue that differences between supply and demand of labor even if these are perceptions of higher wages offered in urban areas, by would-be migrants. The theory postulates that urban to rural

labor migration will stop when the there are no differences in wages between the two areas. The Neoclassical theorists though accepting this observation, also point out that, international migration is greatly motivated by the difference sin wage earnings between countries, such that migrants move to countries they expect to earn higher wages. This view has been criticized as migration trends show an increase in rural to urban migration even in situations when economic opportunities are dwindling, implying that in addition to economic considerations, there are other factors influencing migration.

Supporting the Neoclassical theory view that wage differentials motivate migration, the Dual Market Economy suggests how this is achieved. Priore (1979) in postulating the theory argues that development results in two types of key sectors of society, the capital- intensive primary sectors and the labor-intensive sectors such as agriculture. Owing to economic development, wage differentials between these two sectors results in migrants moving to areas where they can offer skilled labor for higher wages. Migration results in the outflow of the educated and skilled members of society leaving the unskilled and uneducated members in the origin areas.

The critical association between migration and inequality may be found in a framework that considers the migration decision making within households. This is espoused in the New Economics of Labor Migration theory (Stark & Bloom, 1985), where migration is considered a household survival strategy (Stark & Bloom, 1985). Migrants send remittances from their earnings, to aid in development and other household improvement processes back home, as they consider their migration as part of a social contract with their households. Migrant remittances have wide ranging effects not only on the receiving household but the community at large.

Studies looking at the effect of remittances on income inequality find an inverse U-shaped curve, which shows that in the short term, remittances increase inequality in sending areas, but in the long term they may decrease inequality.

Thus, households with migrants have higher income than those without migrants as confirmed in China (McKenzie & Rapoport, 2007) and Mexico (Docquier & Rapoport, 2003). A few other studies find no effect of remittances on income inequality , pointing out that the relationship is not monotonic (Stark et., al, 1986;1988). Taylor (1999) cautions that several factors including the relative position of the household within the sending community, are important predictors of the effect that remittances would have on income inequality.

Other theories on migration and development could offer insights on how migration and inequality are interrelated. Notestein (1945) seminal work on the demographic transition process, aimed to illustrate how population dynamics change with economic development. The Demographic Transition theory however left out migration as a key population dynamic. His theory was based on the experiences of fertility and mortality as well as economic development of European countries and did not factor the impact of migration. A useful finding from Notestein (1945) theory is that societies tend to experience reduced mortality and fertility levels as they gain higher development. Thus, development has a positive effect on mortality. The demographic transition theory faced criticism for generalizing based on Western experiences and also ignoring the effect of migration(Mabogunje, 1970).

Mabogunje (1970) offers an alternative approach that theorizes rural to urban migration flows in Africa. He observes that migration occurs within a specified migration system comprising of sending and receiving regions, such that changes in one part of the migration system affect changes in the other, resulting in the spatial redistribution of the population. Mabogunje (1970) borrows the concept of migration system from the Systems theory conceptualized by Von Bertalanffy (1956). Mabogunje (1970) illustrates this using a framework that demonstrates how the macro environment plays a key role in migration decision making by individual migrants; but also, that the feedback mechanism between urban and rural areas sustains the flows between them, Mabogunje (1970) concludes that migration, especially rural to urban migration lead to the

redistribution of populations. He concludes that migration movements between rural and urban areas, results in systemic changes between these regions (Mabogunje, 1970:15-16).

Building on Notestein (1945) demographic transition theory and factoring in the missing link on migration, Zelinsky (1971) introduces the patterns of changes to the migration processes as societies develop, as 'Mobility Transitions'. Although the model uses data from Western countries, it demonstrates how the type of migration observed within a given country depends on the stage of development. Countries with lower economic development are characterized by short movements within neighborhoods, but when development is higher, movements increase beyond the neighborhoods with rural to urban migration gaining prominence. While Zelinsky (1971) introduces a linkage between migration and mobility with development, he receives criticism for ignoring the effect of improved infrastructure and communications that leads to higher and quicker mobility (de Haas, 2007; Skeldon, 1990). Earlier migration theories such as these continued to receive criticisms as most relied on experiences of the Western nations, and these cannot be generalized globally prompting Brown and Sanders (1981) to opine that future migration theories should be based on local contexts of different countries.

de Haas (2010a) observes that increased economic development will not stop migration because the two processes are connected and reciprocal. Through the capabilities and aspirations framework, de Haas (2010a) observes that people are able to achieve their aspirations owing to economic development and this results in increased migration, especially in the shorter term. Therefore, migration can be determined by social and economic development (de Haas, 2010a:20). Thus, de Haas (2010a) postulates that development process initially increases migration across space and communities, beginning with internal migration then international migration, but as more people migrate, the development process results in slower migration. These results in a rise in migration at the early stages of development, then a peak, which is the highest

level of mobility, before a decline in migration as development progresses. de Haas (2010a) offers a critical contribution by elaborating that human mobility is not a monotonic phenomenon but comprises of changes or transitions that reflect the level of development. De Haas (2010a) cautions that migration should be studied within the local development contexts it occurs (de Haas, 2007:27).

In later works, de Haas (2010b) conducted an empirical test of the Migration Transitions theory advanced by Zelinsky (1971) and provides a modified framework , the Migration Transitions Framework, that builds on the works of earlier scholars of migration, including Zelinsky's Mobility Transitions model (Zelinsky,1971), and Sen's capabilities-development concept (Sen, 1988). The Migration Transitions Framework seeks to explain the developmental drivers of internal migration processes and provided an empirical test of the Migration Transitions theory. The framework postulates that as societies develop, there is increased migration and mobility owing to the opportunities created that facilitate movement of people including availability of jobs, improved transport and communication systems. The nature of mobility may shift according to the spatial opportunities available, resulting in a series of migration transitions that occur over time, in response to these local development contexts. In testing the framework, de Haas (2010a) compared the effects of relevant development indicators on migrant stocks using data from the Global Migrant Origin database[1]. The analysis confirms that higher levels of migration occur as economic and human development levels rise. de Haas (2010a) contributes to the modification of the Migrations Transitions framework by hypothesizing that human development increases migration through three processes – by allowing free movement, increasing aspirations, and increasing occupational specialization. Thus, the critical contribution of de Haas (2010a) is in confirming that human development and migration have a patterned relationship, such that development coincides with a particular sequence of migration transitions.

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[1] http://www.sussex.ac.uk/Units/SCMR/drc/research/typesofmigration/global_migrant_origin_database.html

In later works, de Haas (2010c) demonstrates how migration may lead to increased inequalities in two conflicting ways. First is the observation that migration is selective, and migrants may initially come from the wealthier households, and over time, there are human capital and related wage inequalities between urban and rural areas. Owing to these observations, de Haas (2010d) suggests a framework that comprises of macro-level development factors as well as micro-level development factors, and how they interact with migration (de Haas, 2010d:254). The macro factors include the cultural, economic, political and social factors that affect migration; the micro factors include relate to the individual migrant agency, and their household, family or community level. The framework outlines five mechanisms through which migration affects development, and the important feedback mechanisms at play.

In later works, de Haas articulates the difficulty of getting a comprehensive theory that captures the dynamism of migration process, noting that it comprises of many parts in 'different multilayered arrangements' (de Haas, 2014:6). He proposes the aspirations-capabilities framework which conceptualizes migration as a function of individual aspirations against the capability to migrate, within a set of existing opportunities in geographic locations. Thus, migration is part of the social transformation process, shaped by the stage of development of a country.

2.2 Methodological approaches in Migration and Inequality Studies

Data for studying migration and inequality interphases ideally brings migration data on one hand, and inequality data, on the other. Sources of migration data are population censuses, surveys and population registries. Data sources for migration research in Africa has included censuses and surveys although these have had various employed different design methodologies (Plaza et., al, 2011).

Census data usually measures two types of migration experiences, the first is the capture of all moves across time and space, that is migration event. The

other, is migration transition, which captures who the migrant is and where they moved to, as captured in the census. The limitations of using migration transition data from the census is that it neither captures repeat or return migration nor deaths that may have occurred between two census periods. Researchers reconstruct migration history from analyzing trends of census data (see Arouri & Nguyen, 2018). Owing to such differential experiences, migration data and experiences across Africa have been hard to measure as the data is not comparable, prompting the World Bank Group to initiate the collection of in-depth data on migration and remittances that follows a standard research protocol (World Bank, 2011).

Survey data has been used in two ways: first, through sample survey of geographical areas where data is collected from key populations in regions with long migration history, while the second using Specialist Surveys focused on collecting migration data while mirroring the format of the Demographic and Health Survey (DHS) as evidenced in Kenya (Knowles & Anker, 1981) and in Egypt (Adams, 1989). In the early 90s, surveys had been conducted in few countries as observed by Oucho and Gould (1993) that few countries in Africa have developed specialized surveys to capture migration data, namely Botswana and Burkina Faso.

In recent times there have been improvement in generation of migration data in Africa with support of global agencies like the World Bank who conducted the Living Standards Survey in Africa. Additionally, Egypt has a specialist survey which collects information on migration (Muyonga et., al, 2020). There are still challenges faced in obtaining survey information on migration and remittances because of the difficulty of be sampling households with migrants, especially international migrants. Other challenges include social factors such as the exclusion of women in some surveys as they are perceived to be sedentary (Adams, 1989).

Comparably, measuring of inequality has been a different challenge, although several methodologies are available. Inequality measures the differences in social status, wealth and opportunities between people in a society. Inequality is a multidimensional concept measuring differential access between groups and within groups. Inequality can arise because of differential access to opportunities or outcomes. Analysis comprises of showing the differences between or within group access to opportunities, or differences in outcomes and includes vertical versus horizontal inequalities, spatial or geographical inequalities, gender inequality and income or wealth inequality.

Studies generally look at inequalities between household-based measures, such as access to amenities, level of education, wealth status, and so on. It is important also to factor the differential access to such amenities within households as this reveals other factors that impact on access. For instance, the gender relations withing households, who goes to school, who gets to migrate, all contribute to the differential access to opportunities and differential outcomes for different household members. The challenge with this, is that the measure of inequality will be based on a point estimate, whereas, living conditions of households change with time. For instance, if considering the income distribution in a community, one would be establishing where most households fall, and what variations exist between them. Inequality measures are generally summarized using an index, that captures the degree of dispersion within the population under study.

Globally, migration and inequality studies have focused on studying income inequality generated from the Lorenz Curve (Morgan, 1962) and measured using the Gini Coefficient index (Gini, 1912). The Lorenz curve arises when the incomes are graphed with cumulatively against the proportion of population earning this. ideally, as incomes rise the cumulative proportion of the population increases. The resultant index, the Gini index, takes a value between 0 and 1, with values closer to zero, implying equality while those closer to 1 implying a rise in inequality.

The use of the Gini index presumes that data on household income is available, but this may not be the case for some contexts. Suggestions to improve measurement of income inequality when data is limited includes the use of asset indicators that measures the inequality in living standards as proposed by McKenzie (2005), and which has been widely used in Latin American migration surveys. Owing to the popularity of the Gini coefficient, more studies on inequality has focused on measuring income inequality at the expense of other dimensions of inequality. To improve scholarship on inequality, other dimensions of inequality beyond income should be analyzed including between and within group inequalities, inequality of opportunities and outcomes, and temporal changes in inequality (Mckay, 2002).

A major finding from empirical studies, is that migration becomes less selective over time. Two different approaches have been used to determine this – one where remittances are viewed as extra sources of income for migrant households, while the other, remittances are viewed as substitutes for income that would have been earned if migration did not happen. The underlying assumption of such approaches is that migrants move out in search of income or employment. To test the relationship between remittances and income inequality, scholars have relied on the use of quadratic (nonlinear) equations and apply this on a regression model and results confirm that the relationship is U shaped' (Lind & Mehlum, 2010).

Stark & Lucas (1988) used data from the 1978-79 Botswana National Migration Survey and found the relationship between migration and remittances is an inverse U-shape, observing that when migrants initially move, only the wealthy members of the society do so, as they afford the costs related to such movements, and as they send remittances back home, this increases income inequality between migrant and non-migrant households. With time however, as more people move within the origin communities, inequality rises then declines, resulting in the inverted U shaped. Data used for this analysis included inequality measured by Gini index, which was decomposed to indicate sources

of income; with migration data obtained from migration history – where two villages were compared, one with higher migration prevalence than the other.

Elsewhere, scholars have used data on the US-Mexican migration to test the effects of migrant remittances on development in sending communities. The US-Mexican migration route has received extensive scholarly attention, as are several data sources available[2] that capture migration trends across the US-Mexico border. Docquier & Rapoport (2003) investigate how migration out of rural Mexico to the USA and remittances from migrants affected inter-household inequality in rural Mexican communities. Compared to previous research which considered migration as a static event, they consider migration as a dynamic process that changes over time. They modelled three migration scenarios based on the relative history of the origin areas. The findings show that migration decreases wealth inequality in general, but this depends on the relative position of a household before migration, such that some report an increase in income inequality, while others a decrease in income inequality.

McKenzie & Rapoport (2007) test how remittances affect inequality in rural Mexico, by comparing past migration stock and current inequality using the MMP[3] data sets to generate migration prevalence ratios for different time periods, capped at 15 years before the survey, although in the modelling they compare the ratios for shorter (5 or 10 years, and longer, 20 years, before the present). They conclude that in the longer term, migration reduces inequality in communities with long migration history, resulting in an inverse U shape pattern.

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[2] They include data from the Mexican Migration Project (MMP) and National Survey of Demographic Dynamics (Encuesta Nacional de la Dinamica Demografica - ENADID) and the National Survey of Household Income and Expenditure (Encuesta Nacional de Ingresos y Gastos de los Hogares - ENIGH) surveys, that capture the information on the origin areas in Mexico and the destination areas in US, as well as remittance flows between the two countries.

[3] MMP contains data since 1982 obtained from surveys each year in Mexico and United States, used for the sociodemographic study of Mexican migration to the United States and therefore captures migration history retrospectively.

Koechlin & Leon (2007) also find this inverse U shape pattern in the relationship of remittances and income inequality when using panel data for 78 countries. Data used in this analysis included inequality measured by Gini coefficient derived from the World Inequality database, and remittances data was collected from World Development Indicators (World Bank, 2005). Comparatively, Shen et., al, (2009) apply a dynamic migration model on effects of migration and remittances on origin communities, with the results showing an inverse U-shaped curve, consisted with earlier studies. The study argues that migrant networks are not the only intervening factors on the migration and inequality relation, but intergenerational wealth impacts positively on development in origin communities.

Geographical or spatial inequalities have also received considerable attention from scholars. Spatial inequalities refer to the differentials arising from locational factors. Spatial inequalities arise from the socio-economic development patterns employed in different countries that end up determining where government resources are spent and the resultant outcomes in distribution and access to common social amenities. A common method for measuring spatial inequality is the spatial decomposition technique proposed by Shorrocks & Wan (2005). which decomposes the aggregate inequality value, into contributions associated with the different spatial dimensions. The spatial decomposition technique has been empirically tested in various studies using non-spatial elements such as age, education, gender, and so on (Agyire-Tettey et., al, 2018; Hayashi et., al, 2014; Obayelu & Awoyemi, 2012; Wan, 2007).

Using a different method that relies on multiple regression analysis Gezici & Keskin (2005) investigate how interregional dipartites affect provincial migration in Turkey. The study compares the internal migration movements within Turkish provinces against the local development level. Migration data is obtained from the State Institute of Statistics (SIS) for the period 1985-1990 where the net migration rate was computed; while the locational variables include population increase between 1990-2000, birth rate, number of schools increased during the

period, doctor to population ratio, per capita GNP and geographic location. Using stepwise multiple regression analysis in SPSS program, the study found that the GNPC had the most significant influence on the net migration rate. This implies that migration in Turkey is largely influenced by the level of development within a given geographical location.

Phan & Coxhead (2010) compared the effect of provincial income inequalities on migration patterns in Vietnam, using census data. The results show that regions with higher industrial investments report the higher inequality reductions from migration. The spatial effects are seen when flows are compared within the provinces, with results showing that income inequality is diminished when the flows are the more industrialized zones, while almost no effect is shown when flows are to non-industrial zones. In conclusion, Phan & Coxhead (2010) confirm that migration and economic growth have a complementary relationship.

The studies featured here show the different approaches used to measure the effect of migration on inequality, both income and non- income inequality. Data becomes an important consideration especially in capturing migration variables. The evidence shows that use of census data is limited owing to measures of point estimates, and most studies resort to using several census datasets to reconstruct past migration history. For studies looking at the urban-rural differentials of opportunities, there is evidence that urban inequality is rising in certain contexts (Von Braun, 1993).

2.2.1 Global Case Studies on Migration and Inequality

Kuznets in his seminal study of the effects of development on inequality posited that as per capita income increases, inequality first worsens and then improves, thus concluding that development has an inverse relationship with income inequality (Kuznets, 1955). This is illustrated as inverted U shape, implying that inequality first rises, peaks and then declines, with development. This observation has profoundly affected studies on migration and inequality.

Scholars of migration have documented how migrant remittances increase income inequality in origin areas, and later, the inequality declines as more members of the sending communities move out. With time and using existing migrant networks, complemented by improved communication and transport, remittances become more pronounced and their effects spill over beyond the migrant households. As more people migrate, the effects of migration on sending areas decline (Vogler & Rotte, 2000; Faini & Venturini,1993; Stark & Taylor, 1991). Thus, remittances also depict an inverted U shape curve with income inequality, just like Kuznets (1955) curve, after a threshold is achieved.

Observing this, Stark & Bloom (1985) suggest that migrant diffusion process is largely responsible for the increase in migration propensity from origin areas owing to migrant networks, who help in scaling down the costs of migration, leading to not only the wealthy members of a community moving, but also those in lower wealth status, resulting in the sustenance of migration through this 'diffusion' process tests of this relationship confirmed in studies that show how first-time migrants, usually the wealth members of the society, send remittances to their households. With time and using existing migrant networks, complemented by improved communication and transport, remittances become more pronounced and their effects spill over beyond the migrant households. Migration continues to rise until a threshold is reached where it starts to decline to domestic economies grow and offer opportunities in the origin areas, resulting in an inverted U-shaped curve (see Vogler &Rotte, 2000; Faini & Venturini, 1993; Taylor,1991).

This view has been criticized in other studies that show that development may lead to further marginalization of the inhabitants of underdeveloped regions, thus increasing poverty and inequalities (SID, 2006; NCPD, 2013). Subsequent studies have yielded conflicting findings on how migration affects income inequality when using remittances as the proxy indicator. Stark et., al,(1986) used data in Mexican villages and finds a decline in Gini coefficient over time, especially in areas with longer migration history Stark & Lucas (1988) apply a

more robust measure of the effect of remittances on income inequality using the extended Gini inequality index. Whilst earlier studies showed that impacts of migration on rural income distributions depend on the type of migration and time period of migration history, the extended Gini index analysis shows that benefits from migrant higher paying jobs in the US will affect receiving households in a different way from remittances from migrants in lower paying jobs.

Several studies have been done on remittances, with results showing they increase income inequality in origin areas however, this depends on the preexisting conditions in the origin, as Lipton (1980) finds out. Remittances result in the increase income inequality in origin areas as observed in Egypt (Adams, 1989), India (Oberai & Singh, 1980), rural India (Lipton, 1980); while in Nicaragua, remittances have an equalizing effect on communities with long migration history (Barham & Boucher, 1998) and in the Philippines (Ackay, 2021).

Examining the US-Mexican border migration, Massey et. al., (1994) established that migrants initially came from wealthier social status, thus can afford the costs of relocation but who must seek employment in the destination area. Remittances from such migrants increases the wealth status of migrant households. As migration sustains itself continuously, the economic benefits shift from the higher to middle class in the village, to the lower and lower-middle class, thus reducing income inequality. In an earlier study in two Mexican sending communities of Guadalupe and Las Animas, Mines & Massey (1985) find that migration initially only attributed to males, eventually attracts community members of diverse backgrounds. Owing to the wealth accumulated from the migration process, the migrants record higher wealth than non-migrants. This is confirmed in later in Mexico (Durand et., al, 1996; Durand & Massey, 1992).

Taylor (1999) offers three key observations about these findings – first, the volume and type of migration change across different countries hence the impact

of remittances will be unequally distributed across countries, hence impacts will be felt in limited areas; second, how households receive remittances and what they use these for, could largely influence if the impact of the remittances will be positive or negative; and third -some of the push factors affecting migration may deter the full access to remittances by households in the origin areas, hence curtail the impact that such remittances would have on income inequality.

The foregoing analysis shows that migration and inequality may be related directly or indirectly. When remittances from migrants are considered, they demonstrate a direct effect on the income distribution within the households in the receiving communities. Such methodological differences largely explain why studies find conflicting effects of remittances on inequality (Barham & Boucher, 1998). Migrant households gain extra income which results in improved household welfare compared to non-migrant households (Mendola, 2012). This effect will eventually spill over to the wider community as more migrants move out (Massey et., al, 1994).

An opposing view is offered by some scholars who posit that migration increases spatial and interpersonal disparities within communities (McKenzie & Rapoport, 2006; Binford, 2003; Zachariah et., al, 2001; Solimano, 2001; Rahman, 2000). In Shanghai China, wages between migrant and native workers were compared with findings revealing that migrant workers earn less than natives. Using data spanning over 10 years, Yao & Wang (2013) describe the new form of inequality created by rising wage gap between migrants and natives in the city that had been perpetuated by the State and dual market economy that favors the natives born in the city.

de Haas (2007) that when early migrants settle, they establish networks, leading to an increase in the proportion of migrants from the origin areas over time. This increase tends to diffuse the selectivity of migration over time, leading to reduced changes in the wealth of migrants or their origin communities.

Reflecting on these findings, Brown et. al., (2008) suggest that differences in methodology employed for the analysis and empirical contexts under which the studies have been conducted results in the different impacts of migration on inequality. They recommend that to determine the true effect of migration on inequality or vice versa, would require a considered effect of the household conditions prior to migration – how wealthy was the household in the community. This implies that such a cause-effect relationship would need the longitudinal assessment of household before migration and comparisons with the post migration period using a wider framework that looks at migration as a life cycle event (Hernandez & McGoldrick ,1999).

2.2.1.1 Case Studies in Africa

The migration process in Africa is a complex phenomenon and has different effects, including increased inequality owing to the loss of human capital from sending areas (Adepoju, 2004). In this section, we document some these studies based on a review of published articles from Africa and their respective conclusions, as some show that remittances have a positive effect on inequality, while others hold an opposing view (Muyonga et., al, 2020).

When domestic and international remittances are compared in Burkina Faso, the findings show that domestic remittances reduced income inequalities between rural households while international remittances increased inequality (Wouterse, 2010). Comparatively, in Nigeria, using the Living Standards Survey data, several studies shows that domestic remittances reduce income inequality in the rural areas to the benefit of migrant households (Chiwuzulum et., al, 2010). Elsewhere, the urban areas of Nigeria recorded higher income inequality owing to remittances (Fonta, 2011). When domestic and foreign remittances are considered in rural Nigeria, there are higher inequalities reported in rural areas for households that benefits from such remittances (Olowa et. al., 2013).

In Ghana, Quartey (2006) compares remittance flows from the Ghana Living Standards Survey and finds that increase in the flow of remittances improves

the household welfare (Quartey, 2006:23). Using the Ghana Living Standards Survey Wave V and focusing on the effect of domestic compared to international remittances, Adams et., al,(2008) conclude that international remittances contribute a higher volume of remittances than domestic remittances, but the latter benefits more rural households, as few Ghanaians are meet the cost of international migration. A study that compared international remittance data for Africa from 1960-2006, finds positive effects on income inequality in most countries except in North Africa, where negative effects are observed (Anyanwu, 2011). In the southern Africa region, a study using the Botswana National Migration survey data finds that remittances increased interhousehold income inequalities in rural areas (Lucas & Stark ,1985).

From North Africa, the literature review highlights several studies in Egypt. In rural Egypt, Adams(1989) finds that worker remittances benefit only the households with higher wealth status, that were more likely to have migrants. In a study that compared income inequalities in Egypt, the results show that international migrants preferred to invest and settle in urban areas, resulting in inequality between urban and rural Egypt (McCormick & Wahba, 2013). Urban Egypt attracted rural migrants who settled in regions with higher assets and income inequality (Arouri & Nguyen, 2018).

For the Horn and Eastern Africa, several studies were conducted in Ethiopia, Somali and Kenya. The studies in Ethiopia yield conflicting results owing to different methodological approaches. A study investigating if migration improves wellbeing in Ethiopia finds that remittances increase consumption per capita, resulting in higher benefits for migrant households. De Brauw et., al,(2013) observed this from comparing the livelihood of migrants compared to their rural household conditions, using the Ethiopian Rural Household Survey. Elsewhere, Beyene (2014) compared scenarios where migrants send remittances to their families back home, and the counterfactual scenario where no migration occurs, and concludes that there are no significant impact of remittances on urban inequality.

In Somaliland, Lindley (2007) using ethnographic techniques finds that families in Hargeisa, who are living in a fragile political setting improve their welfare status using remittances, and benefits from remittances accrue to the wider community. The study adopted three key data sources including informal conversations with key social groups including the money transfer agencies, government, and non-governmental organization; use of semi structured interviews with Hargeisa residents to understand the impact that remittances have had on their households, and use of a small survey of 538 remittance recipients in Hargeisa.

Kenya featured in several studies investigating linkages between migration and inequality, although most looked at the effect of remittances on inequality, not the reverse relationship under investigation in this study. In an early study using a national household survey that compares the effects of income transfers from migrants to their kin in rural areas finds a weak effect on rural livelihoods in Kenya (Knowles & Anker, 1981). The authors conclude that other intervening variables may better explain the effects of migration on income inequality, including the education and wealth status of the migrant, residency, as well as the number of dependents. In a different study using census data, Wakajummah (1986) observed that household heads from regions with low access to land reported higher migration propensity leading to the conclusion that high land inequality leads to higher outmigration. Hoddinott (1994) conducted an empirical study of migrants in Western Kenya in an area traditionally associated with high outmigration, to test if remittances increase income inequality in rural areas. The study relied on a rural sample to factor in household effects on migration rather than urban samples that have a few proportions of non-migrants. The results show that remittance increased interhousehold inequality in the rural areas.

Oyvat & Mwangi (2017) confirm that rural migrants from homes with high land inequality migrate to other villages and smaller towns and cities including Mombasa, Kisumu, Nakuru and Eldoret, but not to Nairobi. Moreover, migrants

from rural areas received lower wages compared to urban natives, resulting in increased inequality between these two groups The widening inequality in the rural areas, arises from remittances sent to migrant households (Oyvat & Mwangi, 2017). Elsewhere, using data from a survey of migrant households in Kenya, a study finds that the determinants of migration influence the effect that remittances would have on income inequality. Although all households receive remittances, the impact is higher on poorer households who move to a different wealth status owing to increased income (Bang et., al, 2016).

Van de Walle (2009) observes that income inequality in Africa, may partly be attributed to elitist formations in the region, who took over from the colonialists and continue to sustain discriminatory policies resulting in sustained inequality within the countries. The conflicting findings however, of positive versus negative effects of remittances on inequality could be attributed to methodological differences. Remittances increase inequality in cases where they are considered as exogenous income affect the income distribution of the migrant household (Gustafsson & Makonnen, 1993). In the counterfactual scenario, remittances may have no effect on inequality if they are considered as expected contribution of a migrant within their households if no migration occurred (Adams et., al, 2008; Adams & Page, 2005).

In a bid to understand why some countries are getting positive effects of remittances on income inequality while others do not, Ebeke & Le Goff (2011) conducted a study sampling 80 developing countries, where they observed the trends in migration and remittances between 1970-2000, and they conclude that macroeconomic positions of migrants before migration is key in influencing the outcome of the impact of remittances. When income inequalities are considered on their own in a separate study, Aiyar & Ebeke (2019) conclude that the access to opportunities is the key determinant.

This review of global case studies can be summarized as follows:

- The choice of study area has mostly been in regions with high migration and data derived from existing surveys such as in the US- Mexico region, where a dedicated survey tracks changes over the years. This was common too in African studies where Specialist migration survey data was used in the analysis such as the Botswana National Migration Survey, or Ethiopian Rural Household Survey.

- In places where survey data is unavailable, scholars have used other innovative ways to collect information on migration and inequality. This includes use of ethnographic studies in in regions experiencing high migration or use of mobile phone data as was experienced in the Kenya Migration Survey 2009.

- Domestic remittances and international remittances have differential effects on migrant households and sending communities. International migration contributes highly to the income distribution in origin areas compared to internal migration, through remittances sent to migrant households.

- Migration influences income inequality and is characterized by an inverted U shape relationship.

- Most studies have been inconclusive on which comes first, does migration intensify inequality, or does inequality intensify migration.

2.2.2 Migration and Spatial Inequality

There are several studies on migration and non-economic inequalities including spatial, educational, and multidimensional inequalities and their impact on migration. These studies are premised on the belief that development process more often results in inequalities owing to 'circular and cumulative causation' (Myrdal, 1975). This occurs because people move to regions already experiencing development, and such regions will attract other development activities, resulting in increased spatial inequalities. Studies on spatial inequalities

generally confirm this observation with some pessimists arguing that development results in increased poverty and regional inequalities.

Several studies have confirmed the existing of urban rural inequalities in standards of living for example, studies in Kazakhstan, Kyrgyz Republic, Tajikistan, Turmenistan and Uzbekistan show wide variations in household expenditures arising from family structure and education levels, resulting in the poorest households likely to come from communities with least access to public services (Anderson & Pomfret, 2006).

Elsewhere, migration has been associated with geographical disparities resulting from unequal development outcomes. A study in Ogun State Nigeria, notes that higher rural to urban migration was not because of employment opportunities, but due to skewed educational infrastructures in urban areas, where the young migrants would move to pursue higher education (Okahnkhuele & Opafunso, 2013). While most studies imply that opportunities are better in the urban areas compared to rural areas, researchers such as Von Braun et. al (1993) disagree, showing that urban inequality is rising instead. This has been confirmed in a study showing urban dwellers suffering malnutrition and food insecurity leading to worsening health and development outcomes (Maxwell & Harding, 1998). These studies point researchers to consider the influence of macro factors in investigating development related issues like migration and inequality.

2.3   Emerging Issues from the Literature Review

The literature review shows that the discourse on migration and inequality received considerable attention, although most of the studies feature works by economists, who analyze the effect that remittances sent by migrants, have on the receiving communities. Although migration is a demographic phenomenon, there has been lower attention given to the study of migration on inequality although this has recently gain prominence.

When one considers the case studies from Africa, although few, they reveal the data challenge for measuring migration, and its effect on inequality. Most studies

resorted to using remittances as the proxy measure for migration, and the effect on the receiving communities. The Somaliland study relied on ethnography, but majority of the studies used census data.

The effect of migration on equality thereafter was based on econometric analysis, applying the Gini coefficient. For studies looking at migration and income inequality, findings were conflicting. To boost the data for such analysis, the studies used the World Bank database on migration and remittances which did not cover many countries in Africa, with Northern and Southern African studies largely missing. Innovative approaches are observed from Ethiopia which relied on specialist migration surveys.

Critically reviewing the methodological approach adopted in previous studies, shows the difficulty of getting a direct link between migration as a process and inequality, and the various approaches adopted depend on the availability of data to undertake such an analysis. As a demographer, the interest would be in showing how migration as a demographic process change with inequality, in the same manner that Zelinsky contributed to scholarly discourse with the migration transition theory. The task at hand would therefore be showing evidence of how migration process affects or changes with different forms of inequality. Such analysis requires a dearth of data as shown from the literature review. Using point estimates of migration from the census would not offer a good proxy for migration history. Availability of migration history data has transformed how the US-Mexico migration research was conducted. For example, in areas where migration and mobility data exist for several years such as US-Mexico migration, researchers track changes in migration and inequality across the years by different subgroups of the population. In the absence of such data, then researchers are left with little temporal data to explain such a relationship.

Considering the theoretical underpinnings of migration and inequality, the review shows that macro theories are useful for understanding the relationship. While the Neoclassical scholars focuses on labor migration and effects on income

inequality, the suggestion that migration will have an equalizing effect on incomes does not conform to the realities in Kenya. Previous studies in Kenya show that migrants still move into urban areas even when there are no existing opportunities and in fact, it is not only the younger educated male migrants who move, but also older migrants can move to settle into more urban spaces. The Social Networks theory while important in elucidating the self-sustaining nature of migration could partly help in showing how sending and origin area inequalities affect and are influenced by migration and the counterfactual scenario. The weakness of this theory to the study would be its usefulness in micro level analysis of migration, which falls outside the scope of the study. The migration system theory is useful in helping to understand how the flows between counties have been shaped over the years.

Comparatively, the Dual Labor Market theory holds true for Kenya especially when one compares the agricultural economies common to the periphery and rural hinterland, and the capitalist non-agricultural economy of the urban areas including Nairobi City. The theory is however limited as it focuses on the formal economy and ignores the large informal market systems operational in African settings. Based on the review of all these theories, it the considered view that Zelinsky's (1971) theory of the mobility transitions seems apt in understanding the migration and inequality nexus. The theory posits that development will lead to increased migration over time, although societies go through different mobility transitions that have a U-shaped relationship with development. There are changes in the migration patterns from longer distance flows to movements within shorter distances. The migration transitions theory brings in the role of contextual factors to the understanding of migration processes

An improved framework of the theory by de Haas (2010b) considers agency and structure of how migration-enabling and migration-undermining mechanisms play out to influence migration systems. The decision and impact of migration affect migrants individually and collectively at the origin community level and is affected at the destination community as migrants interact with their new

settings. All these endogenous and contextual factors are further affected by social, economic, and cultural domains in the migration system. Thus, the macro context is an output of all the interactions within the sending and receiving contexts as well as their interplay with the intermediate contexts. This study adopts and modifies de Haas (2010c) framework that shows that migration process is affected by factors that interact with migrants at three levels - intermediate (migrant group); the origin community and the destination community.

Based on these findings and observations, this study proposes to take a different approach given that Kenya does not have any specialist migration survey but has been collecting information on migration every decennial period using the census.

2.4 Conceptual Framework

The study adopted the de Haas (2010a) pluralist framework that summarizes emergent relationships between migration and development, with inequality conceptualized as an outcome of the development process. de Haas (2010a) observes that higher development generally results in higher mobility and migration in society; but migration and development have a non-linear relationship, as societies move through a sequence of migration transitions. He recognizes that migration occurs within a system and the migration system experiences series of transitions over time. Building on the earlier observations, de Haas (2010b) adds that structural factors including the political economy of countries, historical contingencies and local geography can influence migration, as well as individual agency.

In this study, de Haas capabilities framework is modified to investigate how migration in the counties in the longer term interrelates with existing county inequalities. The framework recognizes that the macro development context influences the economic, political and social structures thus determines the

choices and opportunities that individuals can harness within the based on their aspirations. Migration propensity in the local context depends on individual capabilities. The migration-induced processes in turn affect the local citizens aspirations and capabilities to migrate, as those with social networks increase the overall migration propensity. The resultant feedback mechanism leads to self-sustaining migration systems as postulated by Massey(1993).

Several studies on internal migration in Kenya have identified pathways of relationships between migration and development (Oyvat & Mwangi, 2017; Wakajummah, 1986) and consequences of migration including wage differentials between migrant men and women (Agesa & Kim, 2001). Specifically, regarding migration and inequality, empirical studies focused on the effects of inequality in origin areas of migration and not the reverse relationship of migration on inequality. Land inequalities are associated with higher propensity for migration (Bang, et., al, 2016). Elsewhere, studies show that income inequality occurs in destination areas, because migrant workers have lower incomes than the native workers.

Kenya is governed by various laws and policies that influence migration flows within the region including free movement within the country as stipulated in the. In addition, Kenya's migration system has been greatly influenced by the colonial heritage, which discriminated against the locals limiting their movements to labor migration of mostly males to work in the colonial farms and in building the Mombasa to Uganda railway. Thus, there are already inherent inequalities within the country. The framework by de Haas (2010a) suggest that migration has a relationship with inequality, and the study explored how that relationship turns out using Kenyan data.
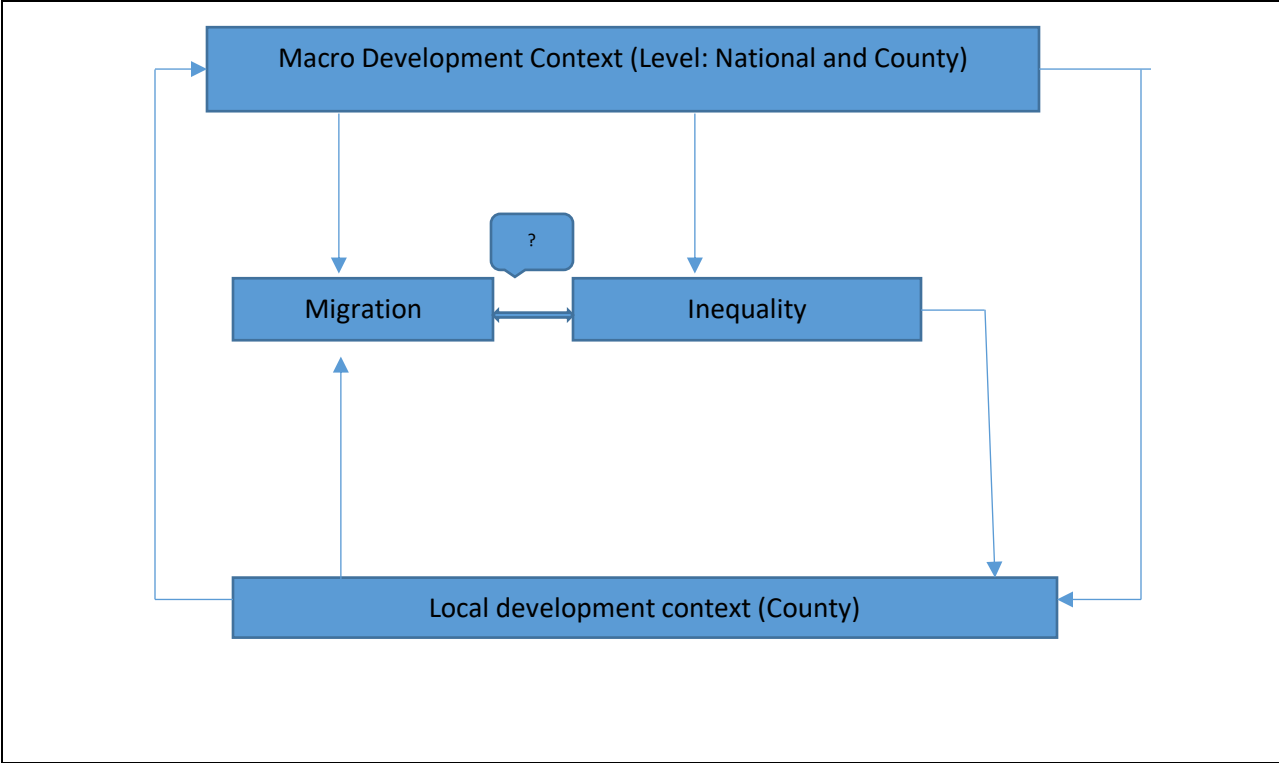
Figure 2-1: Modified Conceptual Framework

2.5   Operational Framework

Two questions are often asked in the debate between inequality and migration-Does migration affect (often income) inequality?   Does inequality affect migration? The focus of this study is the latter. Is level of inequality in sub national region related to observed migration patterns?

The framework considers subnational associations of migration and inequality in Kenya including the development level. The framework suggests that county level factors influence both the migration and inequality levels in Kenya. The key variables in the framework are migration and inequality. The study considers migration as a demographic process measured using an aggregate indicator, the county migration intensity, which captures the temporal effects of migration over time. A positive value of migration intensity means that migration is contributing to population change in the receiving areas, while a negative value, means

migration is resulting in population loss, owing to higher outmigration compared to in migration to a county.
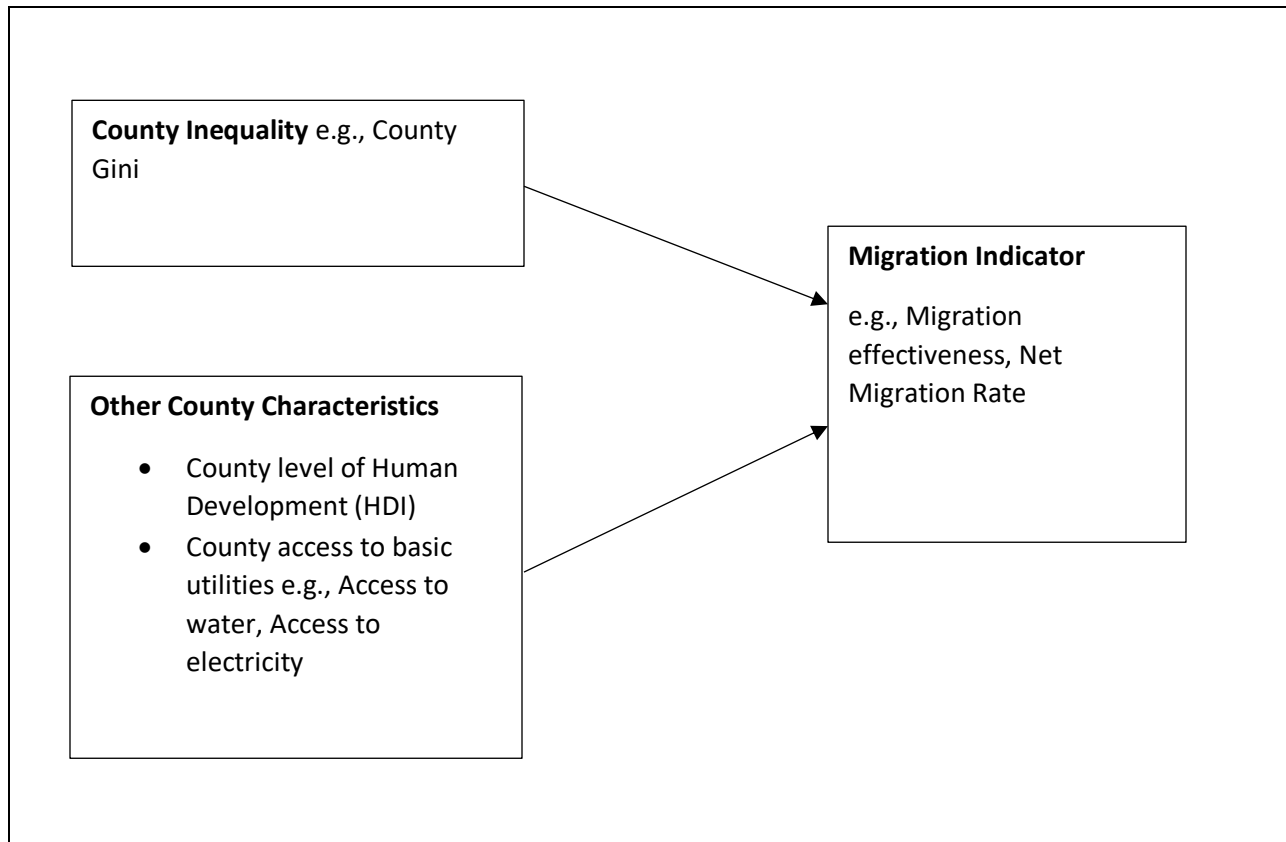
Figure 2-2: Operational framework for County migration and County Inequality

The independent variables are the ones measuring inequality and are four including: the income distribution in counties, measured by the County Gini, the County Human Development Indicators measured by the County HDI, and two measures of access to social amenities, namely proportion of the population with access to improved water sources, and those with access to electricity. The test of the relationship is done by comparing the association between migration intensity and each of the independent inequality variables, and a multivariate regression and spatial analysis of the county migration intensity against the four independent variables. Once the migration indicators are observed, the study

compares changes in migration intensity and county inequalities using spatial analysis.

2.6   Definition of terms and concepts

The definition of terms used in this study is derived from the UNFPA (1993) instructional book on population research methodology.

- Migration is the change of residence from one administrative region to another within a specified period of time. In this study, the focus is on internal migration, meaning within national borders.

- A migrant is a person who has changed the place of residence from one administrative unit to another.

- Area of origin (departure) in migration refers to the administrative region where the individual lived before migrating.

- Area of destination (arrival) is the place where migration terminates. For migrants, this would be the area of residence at the end of the migration interval.

- A Lifetime migrant is a person whose place of enumeration during the census night, is different from their place of birth. Lifetime migration captures the number of persons in a population who are lifetime migrants.

- A county is an administrative unit in Kenya that was created following the shift to a devolved system of government under the new constitution of Kenya. A total of 47 counties were carved out of the existing regions, see the ways in which matching of districts to counties was done in Table A11 in the Appendix.

- Region refers to the previous administrative units in Kenya, Provinces, which were eight in number, namely Nairobi, Central, Eastern, Northeastern, Nyanza, Western and Rift Valley.

CHAPTER 3

METHODOLOGY

3.0   Introduction

This section presents the methodology used in the study. As an exploratory study, historical data was used to give insights of migration trends and patterns, and then correlated with the patterns of inequality. The study used the county of residence as the analytical unit.

3.1   Data Sources

Most studies reviewing the association between migration and inequality conduct a temporal analysis, comparing changes over two or more separate time periods. Most rely on household or census data to obtain information about the migrant stock and allows for the comparison of the pre- and post-migration scenarios. However, in Kenya, a comprehensive dataset on internal migration is lacking. Hence, linking migration to inequality becomes more challenging owing to lack of a comprehensive data set that captures relevant information on migrant and their households.

Bell et. al., (2002), describe migration data sources and observe that censuses provide information on transitions which compare temporal movements, while migration events are captured from population registers that are usually associated with the developed nations. Censuses captures movers while population registers capture moves, hence providing a complete record of migration over time. This study estimated migration intensities as defined by Rees et., al, (2000) who have extensively used migration intensity as an indicator of the effect of migration over time argue that it captures both migration rates and migration probabilities.

3.1.1 County Migration data

Migration data was derived from the census questionnaire on place of birth and place of usual residence. Both the 1999 and 2009 dataset contain information

on emigrants in the household in the last fifteen years prior to the census, using a separate short questionnaire (Republic of Kenya, 2012:14). The data was analyzed to give a temporal dimension of migration in the country and to reveal the emerging patterns.

There was however some difference in the analysis of the residence due the changes in national boundaries between the 1989 and 1999 census, resulting in the increase of districts from 41 to 69 (Republic of Kenya, 2004). For the 2009 census, the main administrative units had moved from 69 districts to 47 counties following changes to the new constitution of Kenya (Republic of Kenya & National Council for Law Reporting, 2010). This introduced problems in the trend analysis of migration from the previous censuses (Republic of Kenya, 2004:2). The 1989 census captured migration information on district of birth and district of enumeration, with Kenya having a different administrative regime including eight provinces and 41 districts like the 1979 Census (Republic of Kenya, 1996).

To make the data comparable, a matching process to administrative units from the older census to the newer census data to reconstruct the migration patterns across the years. A challenge was encountered though with the 1989 data for Nyanza Province, which was reported to be lost due to data storage technologies. Using the extracted data from the 3 consecutive censuses, a series of origin/destination migration flow matrices were constructed that show how migrants moved into and out of the 47 counties, resulting in a complex analytical process resulting in 47 contingency flows. The destination and origin of all migration flows in the subnational units are a byproduct of this study.

3.1.2 County Inequality data
Several measures of county inequalities were obtained in the study. They include the access to water, access to electricity; measure of the county level of development, the County Human Development (County HDI) and measure of the

county income inequality, the County Gini. The county access to water and electricity data was obtained from the Socio-Economic Atlas of Kenya (Wiesmann et. al., 2013).

County income inequality data, or County Gini values, were obtained from the Kenya Inequality Study(KNBS & SID, 2013). The County Gini data on was generated from the combination of the household data in the 2009 Kenya Population and Housing Census data with the 2005/6 Kenya Integrated Household Budget Survey data (Kenya Central Bureau of Statistics, 2007) using a technique articulated in the Kenya Inequality Study (ibid:p34[4]).

Income inequality measured by Gini Coefficient, has values ranging from 0 to 1, with values closer to zero implying perfect equality, that is, everyone has the same income; while values closer to 1 implies that income is grossly unequal, and one person may have all the income and others do not. The results of the County Gini compilations show that the national average was estimated at 0.445, indicating very high-income inequality. The data shows that rural parts of the country have higher inequality than urban areas. The resultant County Gini Coefficients are adopted in this study to explain county income inequality patterns.

3.1.3 County Development data

County Human Development Index (County HDI)[5] was derived from the Kenya National Human Development Report 2009, ((Republic of Kenya, 2010b: p9). The HDI measures several dimensions of human development including income earnings, health, education and standard of living. The County HDI is designed

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[4] The basic principle of small area estimation is to use the sample survey data , which collects detailed information on household expenditures from a sample of the population in 2005/6, and the census data from the 2009 census, so as to match the households in the sampling frame to the census households so as to statistically impute household consumption variables into the 2009 census from the data available for the 2005/6 survey.
[5]The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone (UNDP)

for assessing changes in the longer term. The Kenya County HDI is a composite index of the following indicators a) education and literacy rates; b) Healthy living and access to social amenities including access to an improved water supply; life expectancy and survival probabilities; c) position and conditions of women, d) proxy for GDP, and e) estimates of income earnings by gender (Republic of Kenya, 2010: p9).

3.2   Analytical Approach

Data analysis was focused on meeting the key objectives of the study and is presented for each objective.

3.2.1 Determining the age and sex differentials in migration trends

This analysis helps to meet the first objective of the study, that determines the most mobile population and age and sex differentials of migration. To get the age differences in migration, lifetime migration data was recoded into three age groups namely, 0-19, 20-34 and 35+. The rationale for this classification was to determine which subgroup of the population was most mobile and therefore meet the objective of this study. The first category (Under 20s) captures children and students who may be in educational institutions following the government policy of Free Primary[6] and Free Secondary Education[7] in Kenya, although there may be out of school youth within this group as documented elsewhere (Ngau,1992; Achoka, 2007). The next category, 20-34 years, captures youth in their productive ages and would comprise of students who have already completed secondary education and would be in tertiary level institutions, and those considered legally adults in the country. The last category of 35+ years comprises of adults who are probably advanced in their careers including those who may be already retiring from formal employment.

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[6] Initiated by the Government of Kenya, this policy of Free Primary Education set up in 2003 aims to reverse the poor trends in educational achievement and attainments and makes primary education free and compulsory for all children.
[7] The Free Secondary Education policy in Kenya begun in 2008 and makes secondary education in public schools free but not compulsory.

Once the data on migrants was generated, the measure of outmigration was calculated using the formula below.

To calculate the total number of outmigrants for a County X, we take:

Total Migrants in County X (Age $_i$) – Migrants Born in County X (Age$_i$) = Total Outmigrants County X (Age$_i$)

For the gender analysis, the study examined the population sex ratios of migrants by the respective age categories. The normal population sex ratio is affected by three key societal factors including birth sex ratio, morbidity and mortality differentials between sexes, and migration related differentials (Coale, 1991). The sex ratios of migrants tend to have extreme values than ratios of births or deaths, and they are influenced by occupational opportunities and cultural factors (Gugler & Gudrun, 1985). Generally, migration data is disproportionally male while the natural sex ratio at birth has more females. While rural-urban sex selectivity results in unbalanced sex ratios among first generation of migrants, the patterns shift towards parity among the younger generation. Observing the sex ratios across different countries especially in Africa, leads to the conclusion that women are 'more urban than men' (Gugler & Gudrun, 1985: 263).

To derive the sex ratios of migrants, the total number of male migrants per county was divided by total number of female migrants, and the results multiplied by 100. The male-to-female sex ratios that are over 100 indicate that males are dominating migration, while those below 100 indicate that women are dominating migration.

3.2.2 Determining subnational migration patterns
Determination of the county migration flows and intensities formed the second study objective. Previous studies used migration rates based on regional

aggregate measures, to explain the population flows across regions and districts. However, since the changes in the Constitution of Kenya in 2010 which changed the structure of the lowest administrative units from districts to counties, there was need to first obtain county level estimates of migration from the census data. Using the census data for 1999 and 2009, all districts and regions were matched to their present-day counties.

To generate the county migration flows, data from the question of place of birth was cross tabulated with data on place of residence for each county for each respective census year resulting in contingency tables of county migration flows. Migrants are those whose place of birth differed from place of residence. Any persons who were not born in a county but were enumerated in that county at the time of the census, were in migrants. Out-migrants were defined as persons who were enumerated outside their county of birth. Therefore, for a given county, the lifetime out migrants will be persons born in the county but enumerated in a different county.

To measure migration intensity, the study applied three indices to the lifetime migration data, namely: the Migration Effectiveness Ratio (MER), Revised Weighted Net Migration rate (RNI), and Revised Weighted Gross Migration rate(GMI), discussed in turn. Bright & Thomas (1941) defined the migration effectiveness ratio is defined as the ratio of net migration to the sum of total inflows and outflows from other areas. The outcome is expressed as follows:

The MERi is calculated as:

$$\text{MER}i = 100 * \{(D_i - O_i) / (D_i + O_i)\}$$

where i is the geographical area in question, D_i is the in-migration to the area and O_i is the out-migration from the area.

High positive (or negative) values indicate that more people have moved into a county. Conversely, values closer to zero denote those inter-areal flows are more closely balanced leading to comparatively little redistribution of the population.

The migration effectiveness ratio has been used in other studies to analyse subnational migration in USA (Plane, 1984) and in Australia and Britain (Stillwell et., al, 2001). In this study, the migration effectiveness ratio will give insights on the net effect over time, of the population movements. The measure is useful to the study as it gives an indication of the net effect of migration over time in each respective county, factoring only the migrant population.

The second measure is the revised net migration rate (RNMi) as described in (Shi et., al, 2020; Liu et., al, 2011) as providing a more accountable effect of the impact of migration on spatial distribution of populations. Thus, counties with positive RNM_i values are net in-migration zones, attracting in-migrants, while counties with a negative RNM_i value, are losing their population to migration. There is also the possibility that migration has no effect on the population distribution in each county, and this was indicated by a nil value for RNM_i.

When the in-migrants are more than the outmigrants, the net migration rate gives a positive result, whereas a negative migration rate implies that outmigrants surpass the in-migrants.

Revised Net Migration rate is computed as

$$RNM_i = ((I_i\text{-}0_i/P_i) * (I_i/P_i)) * 47$$

Where Ii is the number of in migrants in County$i$, Oi is the number of out migrants in County i, and Pi is the resident population in County$_i$.

The third measure, the Revised Gross Migration Rate (RGMi), captures the proportion of migrants in a given population. The RGMi gives us the effectiveness of migration in a given county by showing what proportion of the total population is made of migrants. The RGMi is calculated as:

$$RGM_i = ((I_i + O_i)/P_i) * (\sum I_n + \sum O_n)) * 47$$

Where Ii is the number of in migrants in County$_i$, O$_i$ is the number of out migrants in County i, and Pi is the resident population in County$_i$ and n is the total number of counties.

3.2.3 Determining patterns of county inequalities

The County Human Development Index (County HDI) was extracted from the Kenya National Human Development Report 2009, (Republic of Kenya, 2010b: p9). The County Gini values were obtained from data in the Kenya Inequality Report (Wiesmann, et. al, 2013). They were derived using household expenditure data and access to important basic services (Ibid: p4). The Gini Coefficient of inequality is a measure that condenses all income distribution of a country into a single measure (Gini, 1912) and the values range between 0 and 1, with 0 indicating complete equality while 1 indicates complete inequality. Thus, higher value of the coefficient implies higher income inequality. There have however been several variants of the Gini Coefficient derived by scholars over the years (Sung, 2010; Yitzhaki, 1998; Blomquist, 1981).

Gini was derived using the following formula:

$$Gini = 1 - \sum_{i=1}^{N}(x_i - x_{i-1})(y_i + y_{i-1})$$

where x and y are points on the X and Y axis of the Lorenz curve.

3.2.4 County migration and County inequality relationship

The key analysis in this study is to understand the nature of the relationship between migration and inequality. To achieve this, the following approach was adopted.

- **Bivariate Correlation analysis**

To determine if there is any correlation between migration and inequality, the study used SPSS program Version 22, to conduct a bivariate correlation analysis between migration intensity, and each of the respective independent variables: access to water, access to electricity, County Gini and County HDI. The bivariate correlation analysis checks the direction of the relationship and statistical significance of the relationship between two variables, measured using the Pearson correlation index *r* (Pearson, 1909, whose values range from -1 to 1, such that values closer to -1 imply that there is no correlation between the variables, while those close to 1 show there is correlation between the variables. Values of the Pearson r with asterisk signs imply that the relationship is statistically significant.

- **Spatial analysis**

The study conducted a spatial analysis to determine if the migration and inequality variables are geographically associated, and if so, whether the results are random or not. Migration is a spatial process resulting in population redistribution. Spatial analysis was conducted using ARGIS 10.5 software.

Spatial analysis is based on Tobler's Law (Tobler, 1970) of the connectedness of everything. Anselin (1990) describes spatial analysis as the measure of the relationship between neighboring spatial units, thus showing if they are interdependent or not. Correlation analysis that will be done to the variables will only test if the variables of migration have any association with those of inequality. However, the spatial analysis builds on this by testing if the pattern of migration flows and intensities, are divergent or connected. This will have significant implications on the observed relationship between migration and inequality in Kenya. As this study is based on counties, spatial analysis will determine if the observations made within these spatial units are random or connected.

The Global Moran's I developed by Anselin (1995) clarifies not only the existence of a spatial autocorrelation (positive or negative) between variables, but also the degree of spatial autocorrelation. The spatial analysis generated the Global Moran I, which check if there is any spatial connectedness of the variables, meaning that values that are similar are clustered together or not. The null hypothesis tested by the Global Moran's I is whether the variables are random, such that is the spatial autocorrelation value is zero. If the null hypothesis is rejected, the variable is said to be spatially autocorrelated (Ord & Getis, 1995).

A criticism of Moran's I is that the measure is limited only to the strongest associated locations (Wartenberg, 1985). The Global Moran's I is a contiguity index measure that uses a spatial weights matrix, *W* (Getis, 2010). In this case, *W* is derived by assigning value 1 for all contiguous neighbors and 0 for all others. Each row sum in the matrix is made to equal one, the individual *Wij* values are proportionally represented. Each neighbor in a spatial unit is given equal weight and the sum of all *Wij* is equal to n. The disadvantage of this approach is that it deals with correlation with neighbors and ignore any correlation with interaction with others far away.

The Global Moran I is normally distributed and thus, the z-score can be the test of association. The use of the Global Moran's I however is guided by the sample size of the variables under investigation. It is recommended that at least 30 features of the units of analysis be considered to have a reliable outcome. The mathematical formula for Moran's I is presented in the figure below.

The Moran's I statistic for spatial autocorrelation is given as:

$$I = \frac{n}{S_0} \frac{\sum\limits_{i=1}^{n} \sum\limits_{j=1}^{n} w_{i,j} z_i z_j}{\sum\limits_{i=1}^{n} z_i^2} \tag{1}$$

where z_i is the deviation of an attribute for feature i from its mean $(x_i - X)$, $w_{i,j}$ is the spatial weight between feature i and j, n is equal to the total number of features, and S_0 is the aggregate of all the spatial weights:

$$S_0 = \sum_{i=1}^{n} \sum_{j=1}^{n} w_{i,j} \tag{2}$$

The z_I-score for the statistic is computed as:

$$z_I = \frac{I - E[I]}{\sqrt{V[I]}} \tag{3}$$

where:

$$E[I] = -1/(n-1) \tag{4}$$
$$V[I] = E[I^2] - E[I]^2 \tag{5}$$

To conduct the spatial analysis, each indicator was run through the ARGIS software. All the indicators that had their z-scores outside the null hypothesis interface (-1.96 to +1.96) were considered for the next stage analysis.

In the next stage, incremental spatial analysis using Moran's I, was conducted to determine the best distance parameters. The output of the Moran's Index gives five key values that help in determining the spatial association between the variables under investigation. The Moran's I values ranges from -1 to 1, implying a spectrum of association where there is perfect clustering of dissimilar values indicated by -1; or perfect clustering of similar values, indicated by 1. If there is no spatial autocorrelation between the variables, the Moran's Index returns a value of zero. The values of Moran's I can be positive or negative, those with

positive implies that high values are clustering together, while a negative Moran's I implies that low values are clustering together.

A second output of the Moran's Index output report is the Expected Index, which is an automatically generated value that would occur is the variables have spatial autocorrelation. To interpret the outputs of the Moran's Index, one needs to compare the Moran's Index against the Expected Index, using the p values and z-scores that accompany the output report. The p values measure the probability that the pattern observed is random, such that lower p values imply that clustering is not random. The Moran's Index report also gives a spatially generated map with clusters of the z scores.

- **Identification of Local Spatial Clustering (LISA)**

While the spatially generated maps using Global Moran's I show clustering, studies show that regional clusters may mask sub local variations (Weeks et., al, 2001). Thus, an additional test was conducted for the local indicators of spatial association (LISA), to unmask county level spatial variations. LISA help to show the contribution of each local specific unit to the Global Moran's I, by decomposing the constituent parts (Anselin,1995). This is achieved by first identifying patterns of local clustering within a given locality, and then identifying outliers and pockets of spatial non-stationarity or local instability (Hepple,1998; Tiefelsdorf & Boots, 1995 ,1997).

Anselin (1995:95) provides the following formula for LISA (Ii):

$$Li = f(yi,jji)$$

where Li is the LISA statistic, variable yi, observed at location I, and f is a function and yij are the observed values in the neighboring location Ji of i.

The results of the process are local significance maps Moran I$_i$ statistic (p<0.005), which is the recommended threshold (Anselin, 1995).

An alternative test of the statistical significance of the Local Moran Statistic, LISA, is the use of the Getis-Ord Statistic, Gi*(9d), developed by Getis & Ord (1992). The Getis-Ord statistic helps in identification of regions exhibiting clustering of variables. A cluster is a group of local units with significant positive autocorrelation. For a given area with several subunits, such that I = 1, 2,3...n; and the geolocation data is available for each subunit, the Getis-Ord test of local spatial autocorrelation is derived using the formula below:

$$G_i(d) = \frac{\sum_{j=1}^{n} w_{ij}(d)x_j}{\sum_{j=1}^{n} x_j} , \quad j \text{ not equal to } i ,$$

The output of the Getis-Ord statistic indicates the types of clustering manifested by the data, such that a positive value denotes clustering of high values, while a negative values, denotes a clustering of low values.

- **Spatial Regression Analysis**

To determine the relationship between migration and inequality variables, we modelled the spatial relationships using regression analysis, first the Ordinary Least Square regression (OLS) and thereafter, using the Geographically Weighted Regression (GWR) tools in ARCGIS. A common problem encountered with regression analysis is multicollinearity, where one or more variables in the regression equation affects another, in addition to correlating with the dependent variable. The GWR analysis can help detect incidences of multicollinearity. As a result of this, a typical regression analysis with such variables results in some significant variables becoming statistically insignificant (Shrestha, 2020; Young, 2018).

OLS Regression Analysis

The first step was testing for efficacy of the model used for regression, and the Ordinary Least Squares (OLS) regression analysis was the appropriate method for conducting this test. OLS regression helps to assess six key aspects in the relationship between variables. The first is a test of the model performance, where the Multiple R squared and Adjusted R squared values give this feedback, with ranges of 0.0 till 1.0. The Adjusted R value gives a more accurate measure and confirms what proportion of the phenomenon is explained by the variables in the equation. OLS also assesses the explanatory of each individual variable in the equation.

The OLS outputs include the coefficient of regression, Probability index, Robust Probability Index and the Variation Inflation Factor. The coefficient gives us the strength and type of relationship that the explanatory variable has with the dependent variable, in this case, how they relate with the Migration Intensity. A negative sign on the coefficient implies the two variables has a negative relationship, such that an increase in value in one may correspond with a decrease in value of the other. The coefficient shows that change expected in the dependent variable for every unit change in the explanatory OLS generates a t-statistic, which confirms if the explanatory variable is helping in explaining the phenomena. The t-statistic is interpreted as follows: when the coefficient is 0 or approaching 0, then the variable is not useful. Higher coefficient values mean the variables will be useful in the model. Each t-static is accompanied by a statistical significance measure, p. A small p value on the test of association indicates that the variable may have good explanatory power. variable, if all other variables are held constant. VIF measures the redundancy of the explanatory variables, thus, variables with higher value than 7.5 should be removed from the model. This takes care of multicollinearity, as it removes variables that have similar explanatory powers from the model.

OLS also checks on the model significance using and uses two key statistics, *Joint F* and *Joint Wald* statistics. The *Joint F* Statistic is interpreted with the *Koenker* (BP) Statistic, hence when the *BP* is statistically significant, then *Joint Wald* Statistic,χ^2, is the preferred measure of the significance of individual coefficients in the model. A *p* value smaller than 0.05 implies the model is statistically significant. To check for stationarity in the model, OLS tests for stationarity in the model. Ideally, if the model is consistent with the geographical space, then the spatial processes represented by the explanatory variables will be consistent everywhere in the study area, thus the processes are stationary. Likewise, if the model is consistent with the data, then changes in the explanatory variable do not cause any change in the relationship between the predicted and explanatory variables, implying there is no heteroscedasticity in the model. If a model passes this test, by having a statistically significant nonstationarity, then it can be used for the Geographically Weighted Regression Analysis (GWR).

A fifth test of the OLS is measuring the model bias using the *Jarque-Bera* statistic, that indicates whether the residuals are normally distributed. The p-value for this test if smaller than 0.05 (95 per cent confidence level), shows that the model is biased. This may arise due to spatial autocorrelation between the variables, or a case of model misspecification, where some stronger explanatory variables are missing, and could also imply that there is heteroscedasticity in the variables. Finally, the sixth test of OLS is an assessment of residual spatial autocorrelation, using Moran's I. Statistically significant clustering of high or low residuals indicates that a key variable is missing in the model, so the OLS results cannot be trusted in this case.

Geographically Weighted Regression Analysis (GWR)

To factor the effect of spatial relationships in the data, a second regression was conducted using the Geographical Weighted Regression (GWR), in a model that

allows the variables to vary by their spatial units. The underlying principle in GWR is that the observed spatial relationship between variables is influenced by the contextual and geographical factors where they are located (Fotheringham, ,et., al, 2003). The following variables were included in the GWR analysis.

$$Y = PW_1Y_1 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4$$

Where, Y is the Dependent variable and measures migration intensity, PWY is the autocorrelation factor, while the independent variables denoted as B_1, B_2,..B_n . The dependent variable Y is the migration intensity, while the independent are County Gini, County HDI, access to water, and access to electricity.

The output of the Geographical Weighted Regression Analysis comprises of five features. The Output feature class; the Optional coefficient raster surfaces; the message window report giving overall model results; a supplementary table showing model variables and diagnostic results and a Prediction Output feature. The output feature class includes fields for observed and predicted y values, condition number (cond), Local R^2, explanatory variable coefficients, and standard errors. Condition Number is the diagnostic that evaluates local multicollinearity. In the presence of strong local multicollinearity, results become unstable. Results associated with condition numbers larger than 30 may be unreliable. The Local R Squared (R^2) values range between 0.0 and 1.0 and indicate how well the local regression model fits observed y values. Very low values indicate that the local model is performing poorly.

The output of the GWR analysis on ARCGIS produces a map of the Local R^2 values, to show where predictions were good and where they were not. The predicted values are computed by GWR, and the Residuals are outputs, indicating the differences between the fitted y values computed by GWR subtracted from the observed y values. The standardized residuals have a mean of 0 and a standard deviation of 1. The coefficient standard error measures the reliability of each coefficient estimate. The findings are more reliable when the

standard errors are small in relation to the actual coefficient values, as larger standard errors may imply a problem with multicollinearity.

Testing the association of migration and inequality

The following steps were undertaken for the spatial analysis:

Step 1: Harmonization of datasets

This entailed preparation of various available datasets into formats compatible in ArcGIS interface. The data set containing counties, migration indicators and background variables including county Gini, county HDI, proportion of population in county with access to water, and access to electricity, respectively, were all modified into csv format, to enable their harmonization with ARCGIS. The next step was to generate shape files to the county data using the 2009 geocoordinate dataset and later cojoined with the CSV files for readability by ArcMap. If data are not assigned to a location, then spatial analysis is not possible (Weeks, 2001).

Step 2: Analyzing patterns of association (Moran's I)

Global Moran's I was used to assess the likelihood of cluster occurrence on the following variables: migration efficiency, access to power, access to water, county HDI and county Gini. For each of these parameters, incremental spatial autocorrelation graphs and reports were generated to appreciate the dynamics of distance bands and enabled determination of the fixed distance band.

Step 3: Cluster Analysis

Cluster analysis was tested on the variables, with those testing positive, taken to a second level analysis of clustering and outlier analysis using Anselin's Local Moran's I. The result was a generation of maps showing the spatial occurrence of high and low value clusters within the counties.

Step 4: Hotspot analysis

All the parameters were mapped using the continuity edges corners(polygons), such that the peaks of clusters were used to map out further areas for autocorrelation. While the program uses the fixed distance parameter as an option, this may have led to spurious results as some counties are larger than others, for example Nairobi compared to Marsabit or Turkana counties, respectively. Tests for the significance of the identified hotspots was done using the Ged-Ord statistics G^* (Getis & Ord, 1992, 1996) which tests for spatial dependence.

The analysis was guided by the several assumptions. First, the assumption that regions with high outmigration (net outmigration areas) would also have similar levels of income and non-income inequalities. The regions of out and in migration were identified through a trend analysis and results presented in the previous chapter. A second assumption was that we can use the meso level data, in this case, county level indicators, to determine the relationship between migration and inequality.

AGE-SEX DISTRIBUTION OF MIGRATION TRENDS

4.0   Introduction

The first research objective seeks to establish the most mobile population in Kenya by analyzing the age and sex specific migration trends using data from previous censuses. Information about the most mobile population and the age and sex specific migration patterns and trends is useful as it reflects the characteristics of the country's past migration system which is important in understanding migration history. Furthermore, while the Bureau of Statistics publishes data on migrants, there is little analysis of the age and sex differentials of subnational migration flows, yet a previous study showed that peak age of migration for some counties is 20-24 years, while in some it is 25-29 year. The chapter contributes to clarifying the age and gender dimensions of migration within counties in Kenya, which provides useful background information for the analysis of the migration and inequality nexus.

4.1   Age at Migration

Age at migration is a factor of several background variables, but it reveals a lot about the population structure, with studies showing that migrants are mostly young people. Using data for 1989 through to 2009, the results show that migration in Kenya peaks at the ages 20 to 34 years. The county level dynamics of migration by age are provided in Table A.1 on lifetime migrants by age and county(see Annex).

Table 4.1 shows that number of total out migrants increased slightly in the 1999 period but declined to 8 million in 2009. Comparatively, total in migrants rose to 10.8 million in 2009. A possible explanation for the decline in 2009 could be the effects of the 2007/8 post-election violence in Kenya that resulted in population displacement in the Rift Valley region especially Nakuru and Naivasha (Adeagbo & Iyi, 2011; Oucho, 2007b).

Table 4.1: Lifetime in migrants and outmigrants by age group of migrants

Age	Out Migrants			In Migrants		
	1989	**1999**	**2009**	**1989**	**1999**	**2009**
0-19 years	2,208,782	3,091,021	2,481,086	1,190,549	3,257,162	4,395,218
20-34 Years	2,414,455	4,190,707	3,341,073	1,296,594	3,731,617	4,301,013
35+ Years	1,732,639	3,023,200	2,473,306	863,903	2,783,954	3,353,496
Total	**6,355,876**	**10,304,928**	**8,295,465**	**3,353,035**	**9,774,732**	**12,051,736**

The data shows that persons aged 20-34 years take the bulk of the migrant populations when both in migration and outmigration is considered. The youth, persons under 35 years of age form the majority (70 %) of the total migrant population in Kenya.

The data shows patterns of child migration (0-19 years), youth migration (20-34years) and adult migration (35+ years) in Kenya across the years, 1989-2009. When migration inflows are observed across countries, there is evidence of higher child migration in 1989 in several counties including Nyandarua, Embu, Kitui and Kakamega counties. There is little evidence of rampant child migration from the 1999 data, but 2009 data shows evidence of high influx of child migrants in Muranga, Mandera, Turkana, Bomet and Busia counties. The trend analysis shows that highest child migration was observed in Nyandarua, Kitui and Kakamega counties in 1989, Siaya and Vihiga counties in 1999, and Busia, Bomet and Turkana counties in 2009.
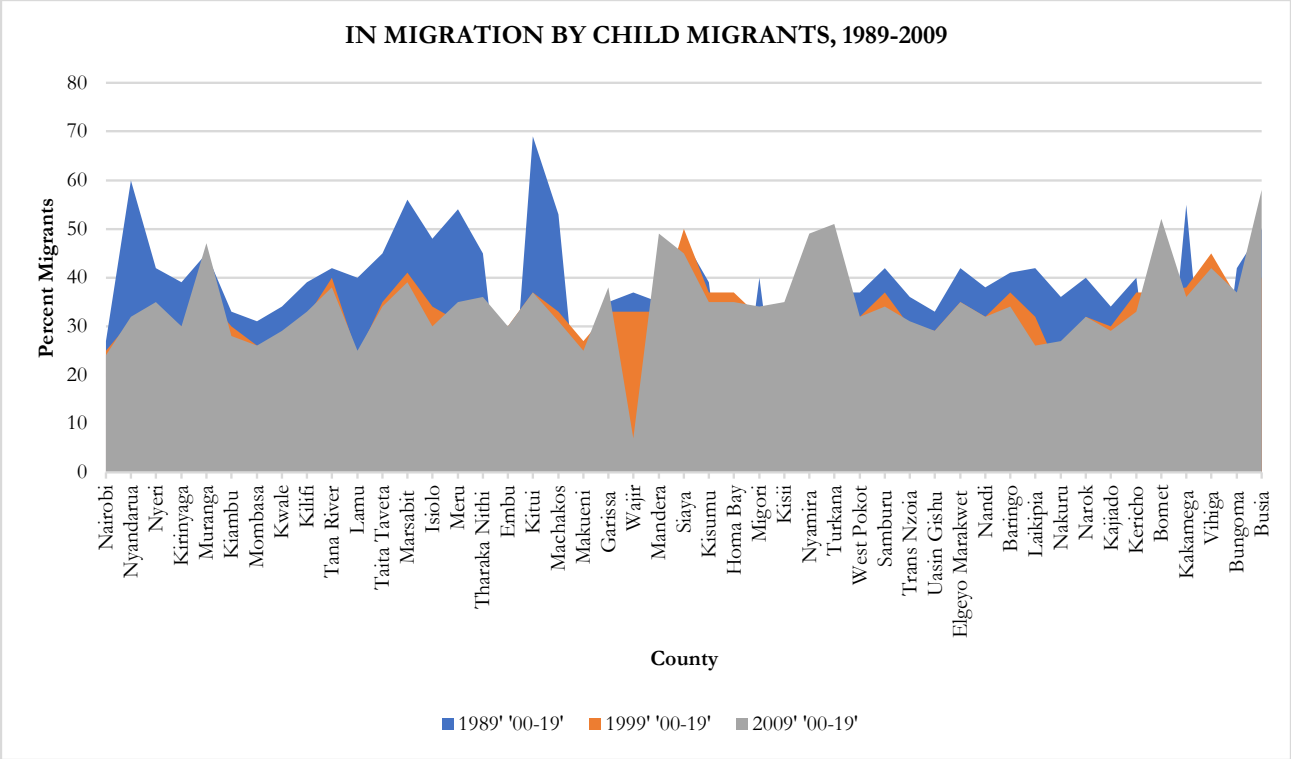
Figure 4-1: In migration for Persons 0-19 years, 1989-2009

Migrant youth in the age category 20 -34 years dominated migration streams across all counties. These youth migrants had a higher preference for urbanized counties like Nairobi, Kiambu, Kisumu, Uasin Gishu and Kajiado counties. Data for 2009 shows a notable rise in the proportion of migrants aged 20-34 years in Siaya, Samburu, Kajiado and Kericho counties, but a decline in Nyandarua, Muranga, Lamu, Nyamira and Busia counties. It is important to note that Wajir County reported the highest level (88%) of lifetime migration in 2009, which seems abnormal, and may be a result of the data challenges experienced in the county following the census. The findings corroborate studies that showed that migrants in Kenya are young with migration peaking at 21 for males and age 22 for females (Adieri, 2012).
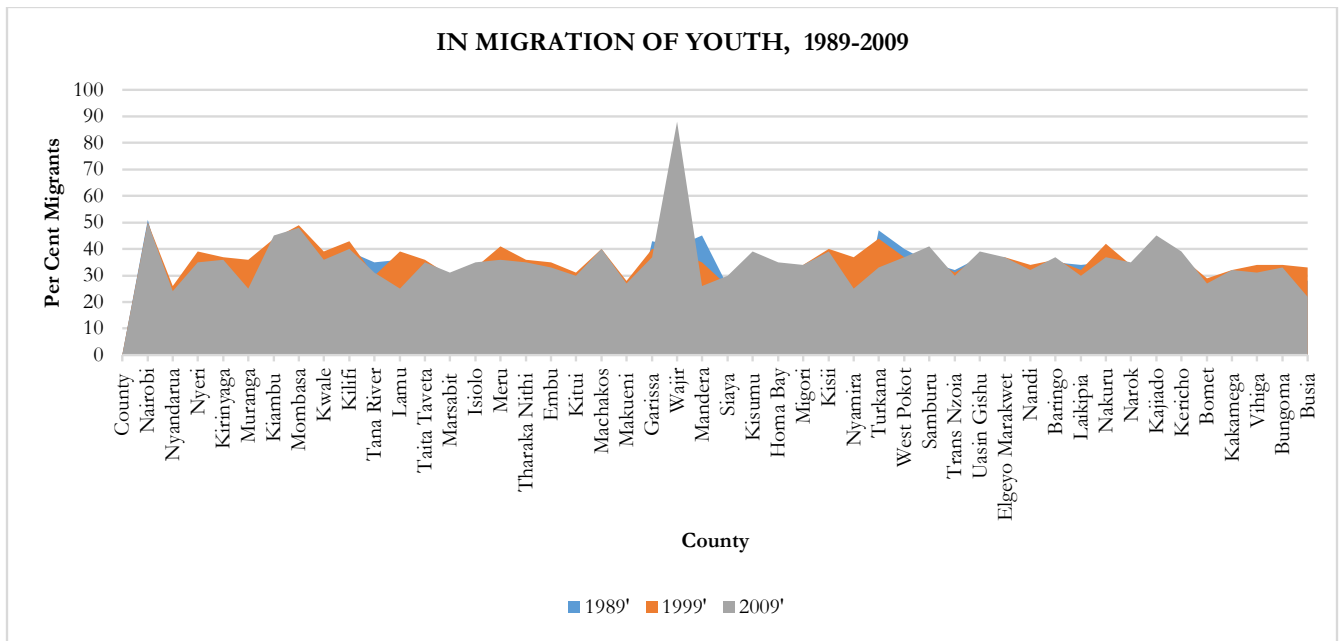
Figure 4-2 In migration trends, 20-34 yrs., 1989-2009

Inflows to counties by adult migrants, above 35 years of age, is shown in Figure 4.3. Majority of adult migrants are moving into 'settlement areas' including Nyandarua, Trans Nzoia, Lamu counties. Higher mobility is noted in the data for 2009 census. In several counties, more than 40 per cent of the total migrant population were adult migrants including Nyandarua, Kwale, Lamu, Makueni and Laikipia counties.
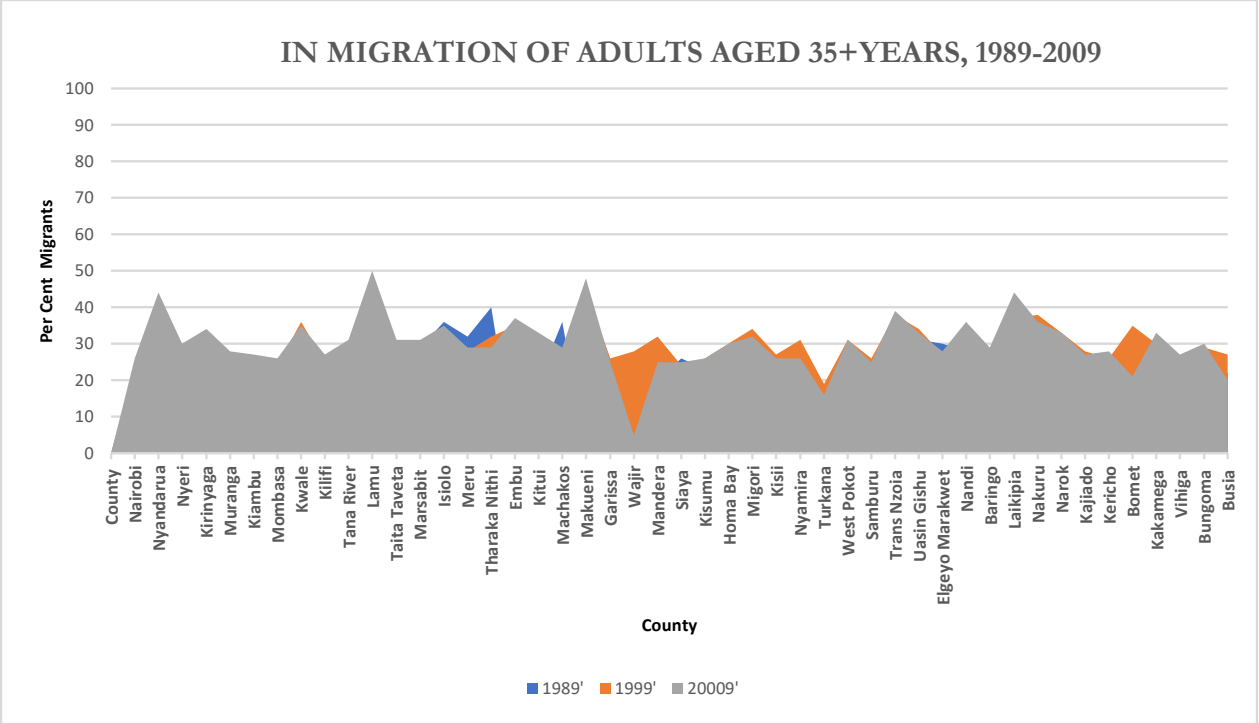
Figure 4-3: In Migration by 35+ years, 1989-2009

For most counties, the proportion of older migrants dropped between 1999 and 2009, including Nairobi, Nyeri, Kiambu, Muranga, Mandera, Nyamira and Busia Counties. Data for Wajir County shows incredibly low numbers of migrants in all age categories, and this is attributed partly to the data error experienced during the 2009 population and housing census, making the observations here to be inconsistent with the past trends.

4.2   Sex Distribution of Migrants

Migration is selective by age and sex as indicated in previous studies. A summary table capturing the sex ratios of in migrants by county is provided in Table A.2 (for 1989 census), Table A.3 (1999 census) and Table A.4(2009 census), all located in the Annex. Sex ratios for outmigrants are captured in the following tables in the Annex, including Table A.5 (1989 census), Table A.6 (1999 census) and Table A.7 (2009 census).

The proportion of migrants by sex and census year is presented in Figure 4.4, with data showing domination of female migrants in 1999 and 2009, while the earlier period (1989) shows male domination of migration. The county level analysis is provided in Table A.8 in the Annex.
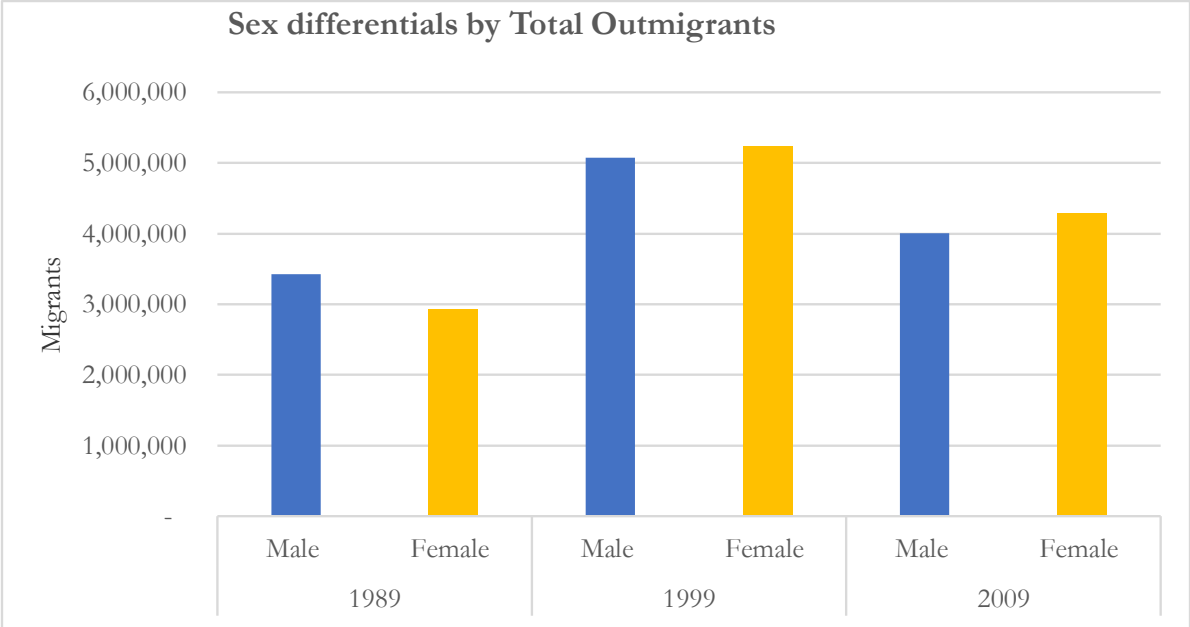
Figure 4-4: Sex differentials by Total Outmigrants

For the in-migrants, the data for 1989 to 2009 is presented in the Annex of this report (see Table A.2, Table A.3 and Table A.4). Data for Nairobi County reveals low sex ratios for the in-migrants in the younger ages, 0-19 and 20-34 implying feminization of migration, while migrants over 35 years were mostly males. The outmigration patterns for Nairobi City County data for 1989 and 1999 showed higher outmigration of females in the 20-34 and 35+ ages, with male dominance of migration in the younger ages, However, in 2009, the data shows increasing gender parity for outmigration of persons under 20 years of age.

There is higher in migration of females into Central region, especially for the younger ages, except for Nyandarua County which had feminization of in migrants across all ages. Conversely, the outmigration data shows higher female migration for all ages in 1989. The 2009 census data shows feminization of in migration amongst younger migrants, but male domination in the inflows of migrants above 35 years of age. Outmigration in Kiambu County was feminized in 1999. When 2009 data is compared with the earlier years, there is increased feminization of outmigration in most counties, although Nyandarua shows higher male outmigration in the 35+ age group, while Muranga has higher male outmigration in the 20-34 age group. The findings show the rise in female migration in Central region.

Comparatively, in the Coast region, 1989 data shows higher female migration is noted amongst younger migrants aged below 20 years of age in Mombasa, Kwale, Kilifi and Taita Taveta counties, while older ages are dominated by male migration, with almost doubling of male migrants in Mombasa County. For Tana River and Lamu counties, there was male domination of migration across all the age groups. The 1999 data, there is male domination of migration especially in the older ages from 20 and above, while feminization of migration for persons under 20 years noted in Mombasa, Kwale, Kilifi, Lamu and Taita Taveta Counties. In 2009, Mombasa County reported higher female migration for the youth below 20 years of age, while higher domination of male migration for the older ages. Both Kilifi and Kwale counties reported higher migration of young females below 35 years, while older migration was dominated by males. Lamu County depicted a unique pattern where the younger ages were dominated by male migration while female migration dominated the older ages above 35 years. Taita Taveta and Tana River counties both depicted male in migration across all the age groups.

When outmigration patterns are observed, the Coastal region exhibits dominance of male outmigration among the 35+ age group but female domination of outmigration for the 0-19 and 20-34 ages as observed in

Mombasa, Lamu and Taita Taveta counties. Kwale County had the highest incidence of female outmigration for the 0-19 ages in 1989 and 1999, but dominance of male migration in the 20+ ages. Later data for 2009 shows female domination of migration across all ages in Lamu County, while increased feminization is observed in all other counties for migrants in the 0-19 ages.

For the Eastern region, there has been consistency in the patterns of migration of the sexes, with feminization observed in Embu and Meru counties, as well as among older migrants in Kitui County, while male domination was observed in Marsabit, Isiolo and Machakos counties, across all age groups. 1999 data shows a dominance of male migration amongst the older ages especially in Marsabit, Isiolo, Machakos and Meru. Feminization of migration was observed for the age group 20-34 years in Isiolo, Tharaka Nithi, Embu, Kitui, Machakos and Makueni counties. Comparatively, 2009 data shows male domination consistent for Marsabit County across all the age groups. Female domination is reported amongst all age groups in Tharaka Nithi and Embu counties but among younger migrants in Isiolo, Meru, Kitui and Makueni counties. The Eastern region reflects a mixed pattern of outmigration. There is female domination of outmigration for the younger ages and male domination of migration after 20 years. Marsabit County exhibits male domination of migration across the years and in all age groups. There is near gender parity in Isiolo County for persons below 35 years, while older migrants over 35 years are mostly males. In Kitui County, there is male domination of outmigration in the 20-34 and 35+ ages, while the remaining counties of Meru, Tharaka Nithi, Embu, Machakos and Makueni counties, show higher female migration among 0-19 and 20-34, while older migration is dominated by males.

The Northeastern region comprising Wajir, Mandera and Garissa, shows male domination of migration across all the age groups across the years. However, owing to data challenges faced in the 1999 census, the results need to be treated with caution. The preliminary data indicates male domination of in migration flow in the three counties of Garissa, Wajir and Mandera across all age groups

of migrants. The same pattern is noted for outmigration flows with male dominance in the three counties, although the 2009 census data show higher female outmigration for 20-34 and 35+ ages in Mandera County.

Nyanza region data for 1989 was flawed and therefore was omitted from this analysis. However, 1999 and 2009 census data show feminization of in migration streams across all age groups in Siaya, Kisumu, Homa Bay, Migori, Kisii and Nyamira. Comparatively, outmigration data shows female domination across all age groups in most of the counties namely Siaya, Kisumu, Homa Bay, Migori and Nyamira counties. The exception is Kisii County where there is male domination of outmigration for the persons aged above 20 years.

In the 1989 data for Rift valley region shows a pattern of feminization of migration for young migrants under 20 years of age in all the counties except Samburu, Elgeyo Marakwet and Kajiado counties but male migration dominated across the age groups. Comparatively, the 1999 data shows higher in migration of females among the 35+ age group, while in other counties, there was male domination in that age group as observed in Turkana, West Pokot, Samburu, Uasin Gishu, Elgeyo Marakwet, Nandi, Baringo, Nakuru, Narok, Kajiado and Kericho counties. Trans Nzoia and Bomet counties both exhibited feminization of migration across all the age groups. The 2009 census data for Rift Valley shows higher female in-migration for all most counties among the 0-19 ages, except for Narok and Bomet counties where gender parity has been achieved for this age group.

For Turkana and Samburu counties, there was higher male in migration for the youth aged 20-34 years and 35+ years, respectively. All other counties reported higher female in migration for youth aged 20-34 years including West Pokot, Trans Nzoia, Uasin Gishu, Elgeyo Marakwet, Nandi, Baringo, Laikipia, Nakuru, Kajiado, Kericho and Bomet. Only Narok County reported gender parity for in migration of youth aged 20-34 years. For migration of older persons over 35 years of age, most of the counties reported higher male migration except for Trans

Nzoia, Nandi and Laikipia counties. The outmigration trends for the regions show male domination across all age groups in several three counties of Turkana, Samburu, and Kajiado. Feminization of migration is increasingly noted in all ages across the years for migrants in Uasin Gishu, Elgeyo Marakwet, West Pokot, Trans Nzoia, Nandi, Baringo, Laikipia and Kericho counties. There is almost gender parity achieved amongst older migrants in Nakuru and Kericho counties, and among the 0-19 ages in Kajiado County.

Data for Western region generally shows higher female in migration in all the counties in the region across all age groups in the country for the period 1989-2009. However, Vihiga County data for 1999 recorded the lowest sex ratios for the region. Outmigration data shows female domination of all age groups in the counties of Kakamega, Vihiga, Bungoma and Busia counties, although higher male outmigration is noted in Kakamega and Busia counties among the older migrants above 35 years of age. An outlier for the region is Vihiga County which exhibited male domination of outmigration for migrants aged 20 years and above.

4.3   Discussion

The main objective of this section was to determine the most mobile demographic group in Kenya and understand the effect of migration activity by this group on the population redistribution. This was achieved by analyzing the age and sex specific differentials using the census data. For the age of migrant, findings show that most migrants in Kenya are persons below the age of 35, with the most mobile age group being 20-34. Together with migrants under 20 years of age, they comprise 70 per cent of the total migrant population nationally.

A trend analysis of the patterns of migration by age shows changes in the dynamics of youth migration in the country. Higher proportion of youth migrants was noted in urbanized counties like Nairobi and Mombasa, where youth form almost half of the total share of migrants. A higher proportion of migrants below 20 years of age is common in several counties including Busia, Kitui and Siaya.

These findings corroborate previous studies that confirmed that peak ages of migration in Kenya are 20-29 years (see Awuor, 2015; Milton, 2012). This implies that the motivations for migration are different in the counties and may reflect inequalities of opportunities in the counties.

When the gender analysis is done, the findings show male domination of migration in several counties, but a rise in female migration in most counties, especially from the 2009 census data, although previous studies had indicated that migration was male dominated (Ominde, 1965; 1968). In most counties, the male domination of outmigration is common amongst the older migrants aged above 35 years of age, with shifts to feminization noted among the young migrants. Several studies could shed some light on this. Agesa and Agesa (1999) note that while men and women both migrate to urban areas, such as Nairobi, there are wide wage-differentials that disincentivize women from migrating, as men tend to earn higher income than women. This perspective shows the importance of destination factors in migration decision making.

Could the shift be due to marriage or other factors? A look at data from the 2009 census indicates that in all the regions except Northeastern region, most lifetime migrants were married (Republic of Kenya, 2012: p25). There are regional variations in nuptiality with Western, Nyanza and Eastern regions respectively having the highest proportion of married migrants while Central and Coast provinces had lower rates. While higher feminization of migration was observed in Central and Nyanza regions, it seems the motivations for this are not clear, as they have different nuptiality trends. The other useful comparator is the proportion of education by the female migrants although this information was not analyzed, with studies showing that majority of migrants had primary level education in all regions except Nairobi and Northeastern regions (Republic of Kenya, 2012: p39). It would be useful to determine if educational attainment is an effect or driver of female migration in Kenya as implied in previous studies (De Jong 2000; De Jong & Fawcett, 1981) although previous results have been inconclusive and inconsistent (Williams 2009). The findings however corroborate

previous research that confirms this rise in female migration in Africa. For example, Adepoju (2005) notes that women are migrating independently to seek their own opportunities, not necessarily to reunite with their spouses. Others point to this transition as a response to the globalization process, where women contribute to the labor force although limited to the lower ranking sectors (Tittensor & Mansouri, 2017).

The intercounty migration flows reveal higher in-migration of the youth into urban areas while outmigration of persons aged 35 years and above in rural areas, a fact confirmed in earlier studies (Milton, 2012; Otieno,1999; Ominde, 1965). The study reveals that persons aged 20-34 years are the most mobile population in Kenya and they move into urban areas and out of rural areas accompanied by their children. In the larger urban areas in Kenya, they comprise up to half the total population of migrants. This may be attributed to the educational institutions available in urban areas in Kenya. For example, the analysis of migrants by economic activity from the 2009 census data shows that most migrants move after secondary school, mostly looking for vocational or higher education.

While this is true, the intercounty variation may also reflect the structural factors behind inequality in the country, such as distribution of educational facilities in the country. Migration is closely tied to education as studies have shown that migrants come from wealthier and better educated backgrounds. Thus, the distribution of educational facilities in the country plays a big role in exacerbating inequalities. Several studies have confirmed the existence of educational inequalities in Kenya (Alywn & Schech , 2004; Oucho, 2002; Oyugi, 2000; Abagi, 1997; Ogot & Ochieng,1995). The historical origins of these inequalities are captured in the works of Wainaina (2006) who shows the close correlation between access to education and general improvement in household welfare, and he cites how educational levels in Northern Kenya are lower than the rest of the country, owing to poor infrastructural development in the region.

A review of the in-migration and outmigration trends from the data shows a progressive shift from male domination of migration to a significant increase in female participation in migration, especially in the younger ages, a phenomenon described as feminization of migration.

Geographical variations emerge in the internal migration patterns, with the northern part of the Kenya comprising of Turkana, Marsabit, Mandera counties, as well as the Northeastern region counties of Wajir, Garissa and Mandera counties characterized by male domination of migration across all ages. This is in contrast to the patterns in Central, Coast, Nyanza and Western regions which are characterized by feminization of migration. There are few outliers within the regions, for example, while most counties in Central region reported higher female in-migration, male domination was reported in Kirinyaga (1989), Kiambu (1999) and Muranga (2009). In Eastern region, there was dichotomy of patterns with Marsabit County experiencing male domination of migration across the years, whereas Kitui County exhibited feminization of migration even amongst migrants in the older ages. For the Coast region, Tana River and Lamu counties had male domination of migration across the ages in 1999 and Taita Taveta and Tana River counties in 2009.

There is an emergence of gender parity in migration rates, showing a social shift from domination of male migration in Kenya, common in the urban areas including Nairobi and Mombasa Counties. The 2009 census data shows that gender parity is achieved amongst the younger ages as noted in Nairobi, Nakuru, Kericho, Bomet, Nandi and Kajiado counties in Rift Valley region, and in Isiolo County in the Eastern region. The motivation for this could include the shift to urban areas in search of educational opportunities, which are unevenly distributed in the country. Other reasons could include the observation by Oucho & Odipo (2000: p250) that "...mostly young adults moved out of rural areas into towns in response to better welfare services, health centers, educational facilities, job opportunities and other amenities concentrated in such centers." Migration is an adaptive process and therefore molds differently

over time resulting in different age and sex patterns (Ibid: p233). The observations show that urbanized counties have higher mobility hence the near gender parity of migration in these spaces.

4.4   Conclusion

The findings reveal that the youth are the most active migrants in Kenya and there is increasing participation of female youth in migration leading to gender parity in urbanized counties. The independent migration of females has been associated with a change in social structures especially in urban areas, and a break in social norms. An opportunity exists in the 2019 Kenya Population and Housing Census which had questions on reason for migrating, to clarify these patterns.

The age and sex patterns of migration in the country show similar traits for urbanized areas, where sex parity is almost universal, and the younger population is moving into these areas. With the devolution process in place, there is anticipated higher mobility into the county headquarters which serve as the centers for service delivery. The phenomenon of higher child migration along the border communities needs further investigation to determine the motivational factors. This could be a case of independent movement by young children against the norm of associational moves with their parents.

There is generally low mobility in counties in the Northeastern region, which remains largely dominated by male migration. Possible factors could be cultural, but additional research may yield further insights.

Several recommendations can be made from this analysis. Qualitative studies should be conducted in urban areas that attract the youth, and the border areas that reported higher incidence of child migration. The findings point to a generational dimension on the effect of migration on inequality, as most migrants are young persons between 20-34 years. The determinants of migration for this demographic group can help in the understanding of the migration and

inequality dynamics in Kenya. The motivations for migration remain unknown from the census data and therefore a qualitative study could help to investigate the factors affecting youth migration in Kenya.

CHAPTER 5

COUNTY MIGRATION PATTERNS IN KENYA

5.0   Introduction

This section presents findings on intercounty migration patterns using the 1999 and 2009 population and housing census data on migration, including migration effectiveness outcomes for various counties. The subnational patterns of migration help to identify which counties attract and which ones lose population through migration. This chapter summarizes the findings from the migration flows across the years, which provides a snapshot of the migration history of the different counties.

5.1   Net In migration Counties 1999-2009

The top ten net in migration counties in 1999 and 2009 in Kenya are listed in the Table 5.1. The net in-migration counties are those counties who gained migrants over the period, while the net outmigration counties are the counties that lost migrants over the period. As indicated in Chapter 5, there has been a notable change in the number of migrants in 2009 compared to 1999, which may be attributed to displacement of people following the 2007 postelection violence in Kenya (Adeagbo & Iyi, 2011). The data shows the changes in the top ten counties which reported higher volumes of migrants in 1999 and 2009, respectively. Nairobi remains the most attractive county for migrants, with over 2 million lifetime migrants reported in 2009.

Counties reporting highest volumes of migrants in Kenya comparatively for the two census periods are Nairobi, Nakuru, Mombasa, Kiambu and Uasin Gishu counties. Kajiado and Trans Nzoia counties together with Kisumu and Kakamega counties all recorded high volumes of in-migrants across the period. Additionally, while Kisumu County recorded lower number of lifetime migrants between the two periods, Kericho which was among the top ten counties with in-migrants in the 1999 census, did not feature as such in 2009 census, but Kajiado County recorded higher numbers in the 2009 census rising to be one of the most popular destinations for migrants.

Table 5.1: Top Ten Counties with highest in migration, 1999-2009

	County	Migrants (2009)	County	Migrants (1999)
1.	Nairobi	2,031,859	Nairobi	1,337,440
2.	Nakuru	584,500	Nakuru	398,377
3.	Mombasa	516,761	Mombasa	339,307
4.	Kiambu	473,142	Kiambu	319,426
5.	Busia	366,746	Uasin Gishu	228,992
6.	Uasin Gishu	339,849	Kisumu	195,078
7.	Kajiado	253,042	Trans Nzoia	183,352
8.	Trans Nzoia	244,771	Nyandarua	148,132
9.	Kisumu	244,417	Kakamega	145,408
10.	Kakamega	208,102	Kericho	141,188

5.2   County migration patterns

Table 5.2 presents the top 5 counties where migrants arrive from in each of the respective 47 counties in Kenya based on the 2009 census data. The findings show wide regional and intercounty migration movements, with a diminishing prevalence of long-distance movements that characterized internal migration in the past. These findings need to be interpreted against the backdrop of the geographical distribution of the counties to demonstrate where long-distance versus short-distance migration occurs. To discuss the findings from the table the section will use the region of residence approach.

The analysis of migration patterns between counties reveals that there is increased inter regional migration in Kenya. Data on lifetime migration across the counties for 1999 and 2009 reveals new patterns of migration previously unreported. The discussion of the migration patterns is clustered into the former administrative regions which illuminates the direction of flows against the

geographical location. Table A.11 in the Annex, outlines how the present-day counties are aligned to the former geographical regions.

In the Central region which comprises of five counties under the new constitution, migration has led to population distribution in three of these counties namely, Kiambu, Nyandarua and Muranga counties. In Coast region, the counties with high migration dynamics include Mombasa, Kilifi and Kwale counties. In Eastern region, the leading counties in internal migration volumes are Machakos, Makueni and Meru counties.

In Northeastern region, Wajir and Garissa counties are leading in the volume of migrants. Comparatively, in Nyanza region, Kisumu, Nyamira, Homa Bay and Migori Counties have larger number of migrants, while in Rift Valley region, Nakuru, Uasin Gishu, Kajiado and Trans Nzoia counties reported higher volume of migration. In Western region traditionally associated with high outmigration in previous reports (Oucho, 2016), the counties contributing to high volumes of migration are Busia, Kakamega and Bungoma counties.

Table 5.2: Top 5 Counties of In Migrants by Region of Residence, 2009

County	Top 5 Counties from which migrants came
Nairobi	Muranga, Machakos, Kiambu, Kakamega, Siaya
CENTRAL REGION	
Nyandarua	Nyeri, Kiambu, Muranga, Nakuru, Laikipia
Nyeri	Muranga, Laikipia, Nairobi, Nyandarua, Kiambu
Kirinyaga	Nyandarua, Nyeri, Muranga, Embu, Kiambu
Muranga	Kiambu, Nairobi, Nyeri, Machakos, Nakuru
Kiambu	Muranga, Nairobi, Nyeri, Machakos, Nyandarua
COAST REGION	
Mombasa	Kilifi, Kwale, Kitui, Taita Taveta, Siaya
Kwale	Kilifi, Mombasa, Machakos, Taita Taveta, Makueni
Kilifi	Mombasa, Kwale, Tana River, Taita Taveta, Kitui
Tana River	Kilifi, Garissa, Kitui, Lamu, Mombasa
Lamu	Kilifi, Tana River, Muranga, Kiambu, Kirinyaga
Taita Taveta	Mombasa, Makueni, Kwale, Machakos, Nairobi
EASTERN REGION	
Marsabit	Wajir, Busia, Samburu, Mandera, Meru
Isiolo	Meru, Samburu, Marsabit, Garissa, Wajir
Meru	Tharaka Nithi, Isiolo, Kitui, Nyeri, Kiambu
Tharaka Nithi	Meru, Embu, Kitui, Kiambu, Nairobi
Embu	Machakos, Kirinyaga, Kitui, Tharaka Nithi, Muranga
Kitui	Machakos, Makueni, Nairobi, Mombasa, Tharaka Nithi
Machakos	Makueni, Kitui, Nairobi, Kiambu, Muranga
Makueni	Machakos, Kitui, Nairobi, Mombasa, Taita Taveta
NORTHEASTERN REGION	
Garissa	Wajir, Kitui, Busia, Mandera, Nairobi
Wajir	Garissa, Mandera, Kitui, West Pokot, Samburu
Mandera	Wajir, Samburu, Isiolo, Garissa, Busia
NYANZA REGION	
Siaya	Kisumu, Nairobi, Kakamega, Homa Bay, Busia
Kisumu	Siaya, Homa Bay, Kakamega, Vihiga, Nairobi
Homa Bay	Kisumu, Migori, Siaya, Nairobi, Kisii
Migori	Homa Bay, Kisumu, Siaya, Kisii, Vihiga
Kisii	Nyamira, Migori, Homa Bay, Nairobi, Nakuru
Nyamira	Kisii, Kericho, Homa Bay, Nairobi, Nakuru
RIFT VALLEY REGION	

County	Top 5 Counties from which migrants came
Turkana	Trans Nzoia, Uasin Gishu, Nairobi, Bungoma, West Pokot
West Pokot	Trans Nzoia, Bungoma, Turkana, Baringo, Elgeyo Marakwet
Samburu	Marsabit, Laikipia, Nyeri, Nyandarua, Nakuru
Trans Nzoia	Bungoma, Kakamega, West Pokot, Elgeyo Marakwet, Kakamega
Uasin Gishu	Nandi, Elgeyo Marakwet, Kakamega, Vihiga, Bungoma
Elgeyo Marakwet	Baringo, Uasin Gishu, Trans Nzoia, Bungoma, Nandi
Nandi	Vihiga, Uasin Gishu, Kakamega, Kericho, Trans Nzoia
Baringo	Nakuru, Elgeyo Marakwet, Uasin Gishu, Kericho, Laikipia
Laikipia	Nyeri, Nyandarua, Nakuru, Samburu, Kiambu
Nakuru	Kiambu, Kericho, Nyandarua, Baringo, Kisii
Narok	Kericho, Kisii, Nakuru, Kiambu, Nyandarua
Kajiado	Nairobi, Kiambu, Machakos, Makueni, Kisii
Kericho	Bomet, Nakuru, Kisumu, Homa Bay, Kisii
Bomet	Kericho, Narok, Kisii, Nakuru, Nyamira
WESTERN REGION	
Kakamega	Vihiga, Bungoma, Busia, Siaya, Nairobi
Vihiga	Kakamega, Nairobi, Siaya, Kisumu, Nandi
Bungoma	Kakamega, Trans Nzoia, Busia, Vihiga, Nairobi
Busia	Bungoma, Kakamega, Mandera, Vihiga, Siaya

Nairobi region comprises of Nairobi County. Data from the 2009 census shows that the largest in-migrants to Nairobi County were from the following five counties, namely, Muranga, Kiambu, Kitui, Machakos and Makueni, all which are contiguous to Nairobi, although some long-distance migrants from Kakamega and Siaya counties. This may prove that the migration patterns are shifting with fewer migrants opting for longer distance cross country movements characteristics of earlier migration patterns. The long-distance migration was common in the colonial period as migrants moved to seek employment in the colonial farms and urban areas of Kenya (Citations).

Central region comprises of five counties namely, Nyandarua, Nyeri, Kirinyaga, Muranga and Kiambu counties, two which border Nairobi County. In this region, migrants are most likely to move within the region to the neighboring county. Kirinyaga reported the lowest level of outmigration in the Central Province region. In migrants from Nairobi County streamed into Nyeri, Muranga and Kiambu counties, while other migrants came from the neighboring counties namely Laikipia, Nyandarua, Nakuru and Machakos counties.

Coast region comprises six counties including Mombasa, Kwale, Kilifi, Tana River, Lamu and Taita Taveta. The largest volume of migrants in this region are found in Mombasa and Kilifi counties. Mombasa County hosts the second largest city in Kenya called Mombasa which has traditionally been associated with long distance migrants who came to the town to work on the Kenya-Uganda railway and Kenya Ports Authority. This is evidenced by the large number of in-migrants from Siaya County in Mombasa County. Long-distance migration is common in the region with in-migrants coming from as far as Nairobi and Machakos counties. Others come from the neighboring counties in the Eastern region including Kitui and Makueni counties, and Garissa County in the northern region of Kenya.

The Eastern region comprises 8 counties namely, Marsabit, Isiolo, Meru, Tharaka Nithi, Embu, Kitui, Machakos and Makueni counties. There is high mobility in the region with highest number of migrants coming from Machakos, Makueni and Meru counties, although migrants move within the 8 counties of the region. There is evidence of long-distance migration with high numbers of migrants from Busia, Marsabit and Mandera counties along the international borders, as well as migrants from Kiambu, Nairobi and Machakos and Nakuru counties.

The Northeastern region of Kenya comprises of three counties including Wajir, Mandera and Garissa, has historically been marginalized following colonial land policies (National Gender and Equality Commission (NGEC), 2018). Mandera

County is in the northeastern part of the country along the Somalia and Ethiopian borders. There is high interregional movement within the three counties. While data from Wajir County indicated abnormally high outmigration in 2009 census data, these results need to be interpreted with caution, as these was disputed census figures from the region. There is evidence of long-distance migration to Northeastern region with in-migrants from Busia, West Pokot, Kitui and Nairobi counties and from the neighboring Samburu County.

The Rift Valley region comprises fourteen counties and was the largest geographical region in Kenya previously divided into North Rift and South Rift regions. The region produced the highest volumes of migrants in previous census reports, and the findings show high mobility within the counties in the region. Migration flows include localized moves between respective rural and urban areas in the region. Evidence of long-distance migration is confirmed with high inflow of migrants from Busia, Nairobi and Machakos counties. Bungoma County emerges as a central migration hub to migrants to the northern parts of the Rift Valley region while Kericho County is a hub for the South rift region and Nakuru County for the central rift region. Previous studies have shown that Laikipia, Kajiado and Machakos districts receive huge numbers of migrants. Most migration to Laikipia and Kajiado are due to 'planned spontaneous settlement of 'nonnatives' especially the Kikuyu people. The large male surplus of migrants in Laikipia is associated with labor migration for work in the large ranches in the area (Kagunda, 2016; Dietz, 1986).

Nyanza region comprises six counties namely Siaya, Kisumu, Homa Bay, Migori, Kisii and Nyamira counties. There is inter county migration in the region within the six counties although long-distance migration has been noted with migrants coming from Nairobi, Nakuru and the Western region counties of Kakamega and Busia. Highest mobility was noted in Kisumu, Nyamira, Homa Bay and Siaya counties.

Western region comprises four counties namely Kakamega, Vihiga, Bungoma and Busia County, which is located at the Kenya-Uganda border. Higher mobility is observed in Busia, Kakamega and Bungoma counties. There is substantial intercounty migration within the core counties of Kakamega, Bungoma, Vihiga and Busia, although migrants also come from the neighboring geographic regions including Siaya, Kisumu and Nandi counties. Evidence of long-distance migration to Western region is confirmed from the high number of migrants from Nairobi and Mandera counties, respectively.

5.3   Measuring impact of migration in Counties

Two measures were adopted in the study, the Revised Weighted Net Migration Index (RNMi), and the Revised Gross Migration Rate (GMR). Recall that the Revised Net Migration Rate measures the difference between in- migration and outmigration, weighted by the total migrant population. The Gross Migration Rate indicates the proportion of migrants within a given county. Table A.9 and Table A.10 in the Annex provides results for Revised Net Migration Rate and Revised Gross Migration Rate for all the counties. This section presents the outputs of the ARCGIS mapping of values of migration intensity.

5.3.1 County Revised Weighted Net Migration Index

Using data on revised weighed net migration rates (RNMi), the data as used to generate maps in ARCGIS of clusters and hot points in the country as presented in the figures below. The results here show the mapping of the migration intensity for all migrants for the year 2009, which was the year of interest for our analysis. The findings show two hotspots of internal migration in the country based on the revised migration rates as captured in a recent publication (Muyonga, et. al., 2021a). Figure 5.1 shows a high-high migration hotspot (90% CI) in the region where Nandi, Kisumu and Vihiga counties intersect in Western region and a low-low migration hotspot (99% CI) at the Coastal region, at Kilifi, Kwale and Mombasa counties.
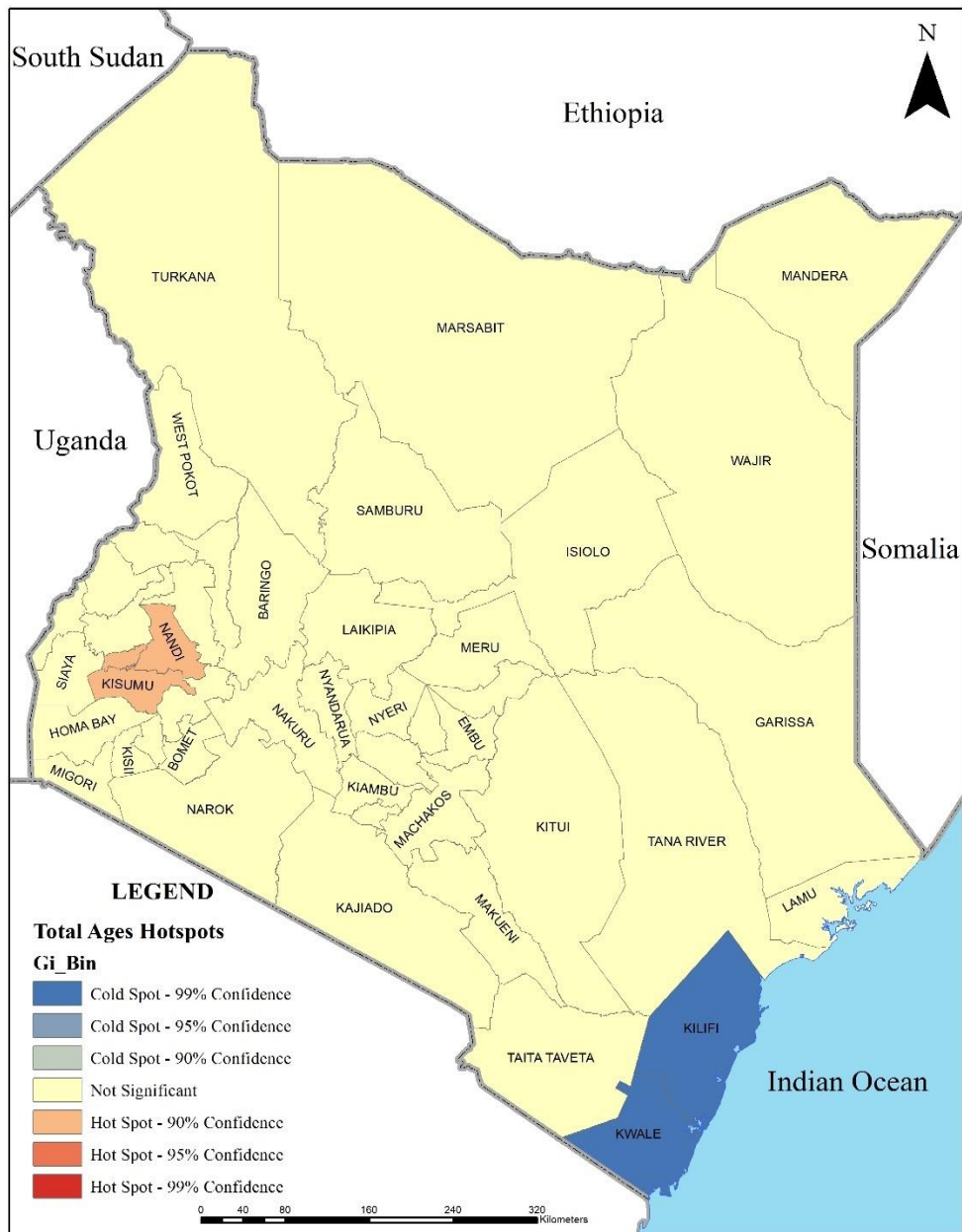
Figure 5-1:Migrant Hotspots

Source: Muyonga et. al, (2021a)

Figure 5.2 shows the results of clustering of migrants, indicating a high-high cluster in Nandi and Kisumu counties, and a low-low cluster in Kwale and Kilifi counties at the Coast.
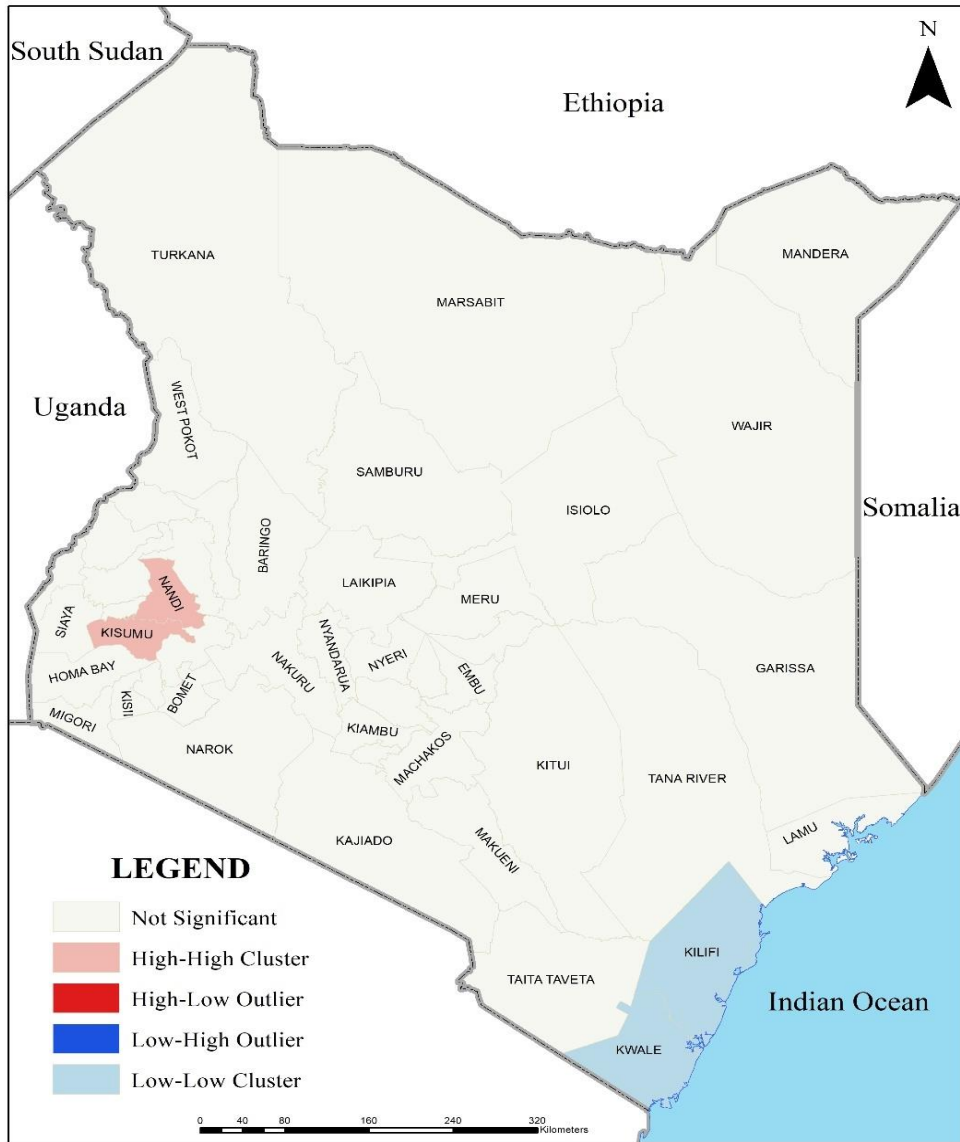
Figure-5-2: Clusters of Total migrants by Counties

5.3.2 Revised Gross Migration Rate

The revised gross migration rates (RGMi) give an indication of which counties have a higher volume of migrants compared to the total population. Positive values of RGM indicate areas gaining migrants, while negative values show areas losing migrant. Table 5.3 shows that counties with larger urban areas experience the highest migrant inflows than those are less urbanized. These counties include Nairobi, Nakuru, Kiambu, Mombasa and Kisumu in 1999 census data, and Nairobi, Mombasa, Nakuru, Kiambu and Uasin Gishu in the 2009 census data.

Table 5.3 Revised Gross migration rates 1999 and 2009

County	RGMi per 100 (2009)	County	RGMi per 100 (1999)
Nairobi	1298	Nairobi	496
Mombasa	448	Nakuru	147
Nakuru	202	Kiambu	125
Kiambu	153	Mombasa	125
Uasin Gishu	121	Kisumu	103
Kajiado	90	Siaya	91
Machakos	87	Kakamega	83
Kilifi	85	Muranga	80
Meru	80	Nyeri	75
Busia	77	Uasin Gishu	72
Nyandarua	70	Vihiga	72
Trans Nzoia	68	Machakos	59
Laikipia	59	Homa Bay	57
Kisumu	58	Trans Nzoia	55
Kwale	56	Nyandarua	55
Lamu	53	Laikipia	50
Makueni	50	Kericho	38
Tharaka Nithi	48	Nandi	32
Embu	47	Bungoma	31
Bomet	40	Busia	26
Vihiga	38	Migori	24
Nyamira	38	Kajiado	23
Muranga	34	Kisii	22
Taita Taveta	25	Kitui	20

County	RGMi per 100 (2009)	County	RGMi per 100 (1999)
Kakamega	24	Makueni	20
Narok	23	Nyamira	18
Isiolo	20	Bomet	17
Tana River	20	Taita Taveta	17
Homa Bay	19	Narok	16
Nandi	19	Embu	12
Migori	17	Kilifi	11
Nyeri	16	Elgeyo Marakwet	10
Bungoma	16	Kirinyaga	10
Marsabit	15	Baringo	10
Siaya	14	Kwale	9
Kitui	14	Isiolo	7
Kericho	12	Lamu	7
Kirinyaga	5	Meru	5
Kisii	3	Tharaka Nithi	4
Elgeyo Marakwet	2	Samburu	4
Baringo	2	Tana River	4
Wajir	2	Turkana	4
Garissa	1	Marsabit	3
Samburu	1	Garissa	3
West Pokot	0	West Pokot	2
Turkana	0	Wajir	1
Mandera	0	Mandera	1

5.4   Discussion

The county migration patterns exhibit wide differentials in terms of volume, direction of flows and the overall impact of migration on population redistribution. When using volumes of migrants only, the findings show that counties with urban areas attract more migrants than those that are less urbanized. According to the 2009 census data, the most popular destination for internal migrants in Kenya is to the counties with bigger cities including Nairobi, Nakuru, Mombasa, Kiambu, Busia, Uasin Gishu, Kajiado, Trans Nzoia, Kisumu and Kakamega counties, respectively. When you compare this with the data on county population sizes, there is some close correlation as counties with largest share of Kenya's population include Nairobi, Mombasa, Kakamega, Kiambu and

Nakuru (over 4 per cent) followed by Bungoma, Meru, Kisii, Kilifi and Machakos counties (about 3 per cent).

The high population density for Nairobi and Mombasa are due to their urban status and availability of opportunities, while counties like Nyamira, Kisii, Vihiga, Busia and Kiambu have good climate with rainfall and good soils allowing agricultural investments (National Council for Population and Development (NCPD), 2013 p.188). The findings corroborate Ominde (1965) description of population movements in Kenya where he notes that Nairobi is the most popular stream with long distance movement from Nyanza complemented by movements from the nearby Central region of Kenya and movements from Machakos and Kitui to the south of Nairobi.

The migration pattens seem to respond to the urbanization patterns in Kenya, the latter closely reflecting the agroclimatic regions and the country's colonial history including the development of the railway line affected the regional distribution of the population. Indeed, all the major metropolitan areas including Mombasa, Nairobi, Nakuru and Kisumu lie along the old railway line. Comparing the lifetime migration data and recent migration data from the 2009 census confirms that Nairobi region attracts the highest number of recent out migrants followed by Eastern, Rift Valley, Central, Nyanza and Western, while Coast and Northeastern regions showed extremely low recent outmigration (Republic of Kenya, 2010). These findings corroborate earlier studies on inter regional migration trends in Kenya (Central Bureau of Statistics, 1196: 2004). The urban and peri urban areas bordering urbanized counties continue to receive inflows of migrants who prefer to reside in them as cheaper alternatives to the high cost of living in the urban areas. This is leading to faster urbanization of these areas as observed in Kajiado, Narok and Laikipia counties.

Long-distance migration is still prevalent, as shown in data for Nairobi and Coast regions, where migrants from Western and Nyanza regions are still predominant. Migration to Nairobi and Mombasa counties, respectively, reflects the important

of urbanization to migration, as these two counties respectively host the two largest cities in Kenya. The migration flows between Western and Nyanza regions to the two counties are sustained by migrants and their networks, including the possibility of chain migration by family members of the initial migrants. Previous analysis by scholars (Ominde,1965; Wakajummah,1986; Oucho ,1988) showed that long-distance movements were tied to Kenya's colonial past, where natives typically moved from rural areas to go work in the large-scale colonial farms mostly in Kericho in the Rift valley region and in parts of Central Kenya where coffee was grown for export. For example, in the colonial period, migrants moved from Siaya to Mombasa County to work at the Kenya Ports Authority and in the construction of the Kenya-Uganda railway, because Mombasa was a port that had expanding industries and employment opportunities (Ominde,1965). In his review of population movements, Ominde (1965) notes that Nyanza migrants contributed up to 25% of the total migrant population in Mombasa.

The two main cities account for the large number of migrants to Nairobi and Mombasa counties, respectively. Comparing the lifetime migration data and recent migration data from the 2009 census confirms that Nairobi region attracts the highest number of recent out migrants followed by Eastern, Rift Valley, Central, Nyanza and Western, while Coast and North Eastern regions showed extremely low recent outmigration (Republic of Kenya, 2004:1196; Ominde, 1965).A significant observation from the analysis of county migration flows across the years confirms a major shift in the 2009 data, with shorter migration distances and decline in importance of long-distance migration, and the feminization of migration as indicated in earlier chapters. Migrants are moving shorter distances within their geographic regions.

Elsewhere previously associated with high out migration like Siaya, migration has a less significant effect on the total population from outmigrants as noted in the 2009 census. The findings suggest that migrants are more likely to move to the nearest contiguous county rather than making long-distance movements to counties located further, thus shifting the dynamics of migration fields. For

example, majority of migrants to Kericho were mainly from Nyanza region in the earlier years (see Oucho, 1981) attracted by work in the thriving tea sector, but comparatively, data from the 2009 census shows that Kisumu County is a more significant regional hub for migrants from Nyanza region compared to previous periods.

Migration contributes to population change by increasing or reducing and redistributing population. The county analysis shows significant changes in the migration streams in Kenya. The migration effectiveness ratio shows a change in patterns of in and out migration zones across the years. There is reported net loss of the most mobile population aged 20-34 years in most counties in Kenya. Only as few counties gained this population Nyamira, Kajiado, Muranga, Mombasa, Uasin Gishu, Narok, Lamu and Nairobi counties. In several counties, more than 40 per cent of the population had migrated out, and these counties include Kisii, Kitui, Makueni, Mandera, Tharaka Nithi, Vihiga, Elgeyo Marakwet and Wajir. The revised weighted migration index gives a clearer picture of the effect of migration on population redistribution in the long term. The RMNi values show that migration has increased population in Nairobi, Mombasa, Nakuru, Uasin Gishu, Laikipia, Trans Nzoia, Kajiado and Nyandarua counties, Conversely, it has led to depopulation of Siaya, Kakamega, Nyeri, Muranga, Machakos, Vihiga, Homa Bay, Kisumu, Bungoma and Busia counties. The revised gross migration rates confirm that urbanized counties are the ones gaining inflows of migrants across the time.

There are changes in the migration flows with shifts in the net outmigration and in migration zones in Kenya. There has been consistent in migration into Nairobi, Nakuru, Mombasa, Kiambu and Uasin Gishu counties, all which have higher levels of urbanization. Counties associated with settlement including Kajiado and Trans Nzoia also report increased inflow of migrants, as well as Kisumu and Kakamega counties, with are regional hubs for Nyanza and Western regions, respectively. Changes observed between 1999 and 2009 census data include the shift from net in migration zones to outmigration zones as observed in Mombasa,

Uasin Gishu, Trans Nzoia, Nakuru and Tana River counties. There are some counties that record nil effect of migration including Isiolo County in 1999 and additional counties in 2009 including Samburu, Mandera, Nyamira, West Pokot, Kisii, Baringo, Garissa, Laikipia, Homa Bay, Bomet, Narok, Kericho, Siaya, Migori, Kisumu, Kajiado and Nandi County. Higher mobility in counties bordering international borders is also evident from the data. There are larger volumes of migrants in Busia County located at the border with Uganda, Kajiado County that borders Tanzania, and in the northern part of Kenya, higher mobility was noted in Mandera County that borders Somalia and Ethiopia.

5.5 Conclusion

The intercounty migration flows are apparent and highlight the counties that contribute to the overall migration system. In previous studies, analysis would be done up to the regional level, thus obfuscating the internal dynamics within each region. This analysis has shown that interregional flows are most common, with fewer migrants moving to farther regions in the long-distance migration observed in the past. The patterns of migration are also changing in terms of distance. Migrants are moving shorter distances within their geographic region, with few still moving long distances to the major urban centers especially to Nairobi and Mombasa counties.

Internal migration flows within counties are positively contributing to population redistribution. Using the revised net migration rates and revised gross migration rates, the findings show that net inflows of migrant populations is mainly to the urbanized counties. Several counties remain net outmigration zones while others remain net in migration zones, but a significant change is in the number of counties that report a nil effect of migration as observed in the 2009 census analysis of migration effectiveness.

The changing patterns may be due to a change in the drivers of internal migration in these counties. Factors impacting on rural to urban migration and

urban to urban migration are largely different. Rural to urban migration is undertaken by poorer members of society with little education who move to provide unskilled labor in agricultural regions (Oucho,1981). Migrant knowledge, skills, and social networks play a crucial role in determining how far they move, hence poor migrants moved shorted distance as this was cheaper and less risky (Bigstein, 1996). Urban to rural migration is influenced on the other hand by wage differentials between such regions (Harris & Todaro,1970; Todaro, 1969).

Data from the 2009 census gives some socioeconomic characteristics of lifetime migrants that may help in explaining the changing dynamics of internal migration. Majority of lifetime migrants in Kenya had only attained primary level education, expect in Nairobi where the majority had secondary level education and Northeastern region where majority had no education (Republic of Kenya, 2012: p39). Migrants to Nairobi are therefore still moving because of the existing opportunities while those in the other regions are moving shorter distances more likely due to lack of resources to move farther distances. The economic opportunities in other parts of the country may not require highly skilled labor like those in Nairobi.

The data shows that majority of the lifetime migrants were married and were mostly males with secondary level education. This implies the inherent inequalities in socio economic opportunities that disproportionately affect women and residents from rural parts of the country. For counties that are settlement areas, migration may have reached its optimal level with population in those counties growing from natural increase. The shorter movements within geographical regions will most likely remain as more counties urbanize soon.

The findings from the analysis have several important implications. First, there is need for data disaggregation to understand migration patterns. The findings also show that migrants are increasingly moving to urbanized areas where opportunities are vast. With the changing political structure in Kenya where county governments take charge of growth and development of their economies,

there will be as sharp rise in urbanization levels across the country. This will have implications on service delivery in the county governments, hence placing migration data analysis and use at the core of county planning.

CHAPTER 6

COUNTY INEQUALITY PATTERNS IN KENYA

In this section, the findings on county inequality patterns are presented based on data from the 2009 Kenya Population and Housing Census as published in the Kenya Inequality Report (KNBS & SID, 2013). The indices used for measuring inequality in the counties are the Gini Coefficient for measuring income inequality and several indicators measuring the county development including the proportion of persons accessing water, sanitation, and electricity in the county. An additional indicator, the Human Development Indicator (HDI) obtained from the 2009 Kenya National Human Development Report (Republic of Kenya, 2010b: p9) was used in the analysis of the migration and inequality nexus in Kenya.

6.1   Income inequality by county, County Gini

Table 6.1 presents the Gini Coefficient values for the 47 counties of Kenya. Based on the Gini values, counties are divided into five categories namely: low inequality (0 and 0.29); medium inequality (0.3 to 0.39), high inequality (0.4 and 0.49), and extremely high inequality (0.5 and above).

Table 6.1: County Inequality patterns Kenya, 2009

County	Gini Coefficient	Inequality Level
Turkana	0.283	Low
Narok	0.315	Medium
West Pokot	0.318	Medium
Wajir	0.321	Medium
Mandera	0.332	Medium
Samburu	0.332	Medium
Kiambu	0.335	Medium
Bomet	0.338	Medium
Nairobi	0.341	Medium
Elgeyo Marakwet	0.342	Medium
Nandi	0.343	Medium
Meru	0.348	Medium

County	Gini Coefficient	Inequality Level
Kirinyaga	0.354	Medium
Baringo	0.356	Medium
Trans-Nzoia	0.360	Medium
Muranga	0.361	Medium
Marsabit	0.365	Medium
Mombasa	0.365	Medium
Nyeri	0.365	Medium
Laikipia	0.369	Medium
Uasin Gishu	0.370	Medium
Taita Taveta	0.372	Medium
Makueni	0.376	Medium
Nakuru	0.376	Medium
Kericho	0.378	Medium
Embu	0.379	Medium
Kitui	0.388	Medium
Kakamega	0.394	Medium
Nyamira	0.394	Medium
Nyandarua	0.394	Medium
Tharaka Nithi	0.398	Medium
Vihiga	0.399	Medium
Kajiado	0.403	High
Machakos	0.403	High
Siaya	0.405	High
Homa Bay	0.416	High
Kisii	0.420	High
Bungoma	0.430	High
Kisumu	0.430	High
Isiolo	0.431	High
Garissa	0.436	High
Busia	0.459	High
Migori	0.464	High
Lamu	0.471	High
Kilifi	0.565	Extremely High
Kwale	0.597	Extremely High
Tana River	0.617	Extremely High

Source: (KNBS & SID, 2013)

The data shows wide intercounty differentials in income inequality. Turkana County had the lowest income inequality whereas Coastal region reported highest income inequality in the country, with 4 out of the 6 coastal counties recording inequality levels above the national average of 0.445 (KNBS & SID, 2013). Western and Nyanza regions reported high levels of income inequality as noted in Busia, Bungoma and Kakamega counties respectively in Western region and in all the counties in Nyanza region. Other counties with high inequality include Nyandarua County (Central region), Tharaka Nithi, Machakos and Isiolo counties in Eastern region, and Kajiado County in Rift Valley region. The data shows that income inequality is not like poverty, as Turkana County which is among the poorest in Kenya reported the lowest inequality levels.

6.2   County inequality by developmental factors

The study looks at other types of deprivation that counties exhibit including the proportion of the population with access to electricity, water, and sanitation.

6.2.1 Access to electricity

This is a proxy indicator for the level of development of the county. The data shows that nationally, only 22.9 percent of Kenyan households have access to electricity, with most households using lamps and lanterns for lighting their homes. Electricity coverage shows the level of investments by the national government, and although there are spatial differentials in access across the country, knowledge of proportion of households with electricity provides a useful assessment of status of development of the county. This implies that a huge majority of Kenyans lived in households with no electricity as a source of light or energy. Figure 6.1 shows the data on access to electricity by county, with the darker color indicating higher proportion of the population have no access to electricity, while the lighter color implies counties with higher proportion of population with access to electricity.
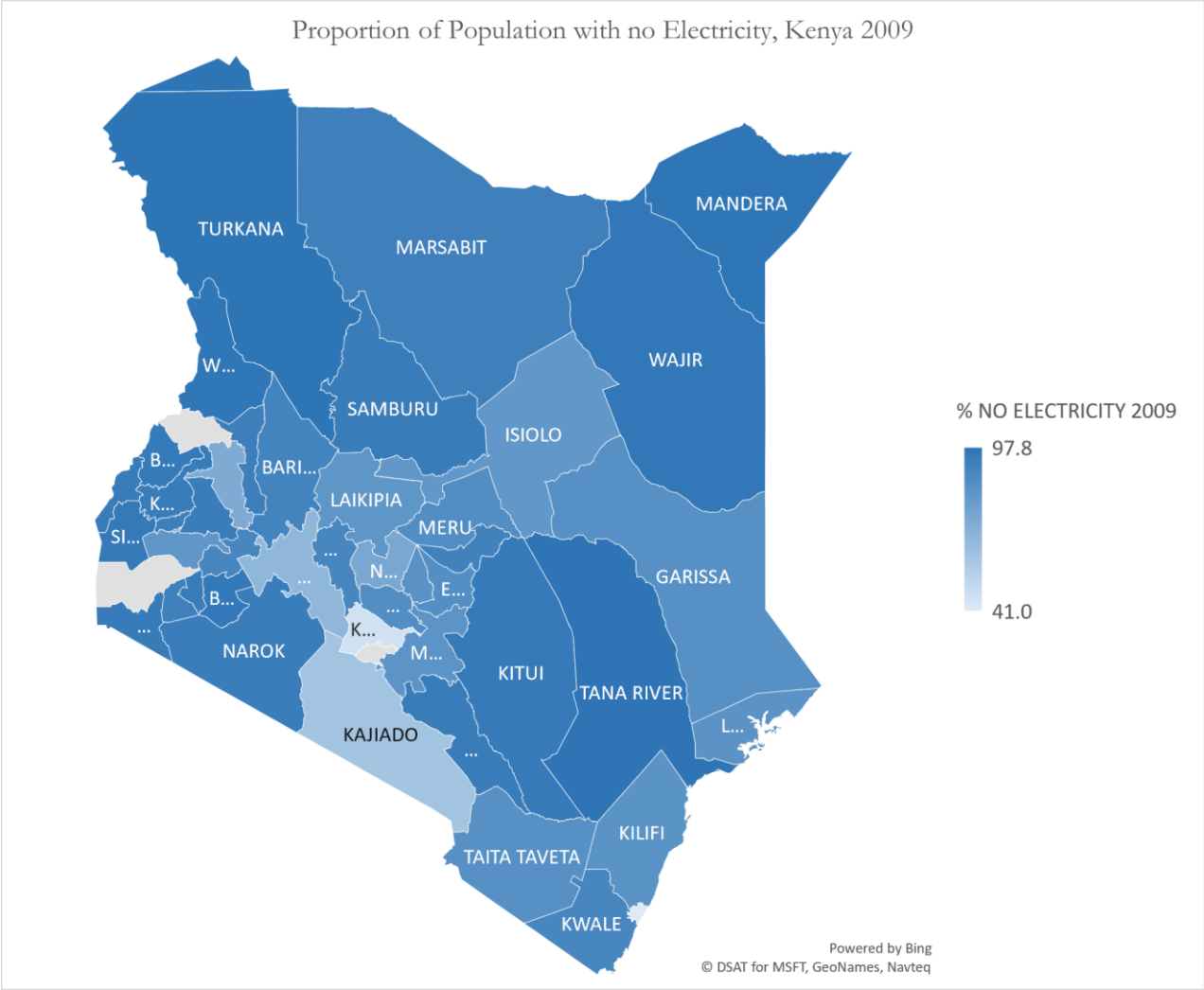
Figure 6-1: Proportion of Population without electricity, 2009

The most deprived populations in access to electricity were found in Turkana, Tana River, Mandera, West Pokot, Homa Bay, Wajir, Bomet, Siaya, Bungoma and Kitui, where only 5 per cent of the population have access to electricity. The northern part of the country and parts of Nyanza and Eastern regions had poor access to electricity. Counties with better access to electricity include Nairobi, Mombasa and Kiambu counties where more than at least half of the county population has access to electricity. The common thing about latter is that they are all highly urbanized counties.

A further spatial analysis of the access to electricity reveals existence of spatial clusters in the country. Results in Figure 6.2 show evidence of clustering of access to electricity in the country. There is evidence of clustering in the central parts of the country neighboring Nairobi County, with high-high access to electricity hotspots with the Gi* Statistic statistically significant ($p<0.01$). Thus, there is higher inequality in the distribution of electricity in the country, with areas bordering the Capital city benefitting more than the rest of the country.
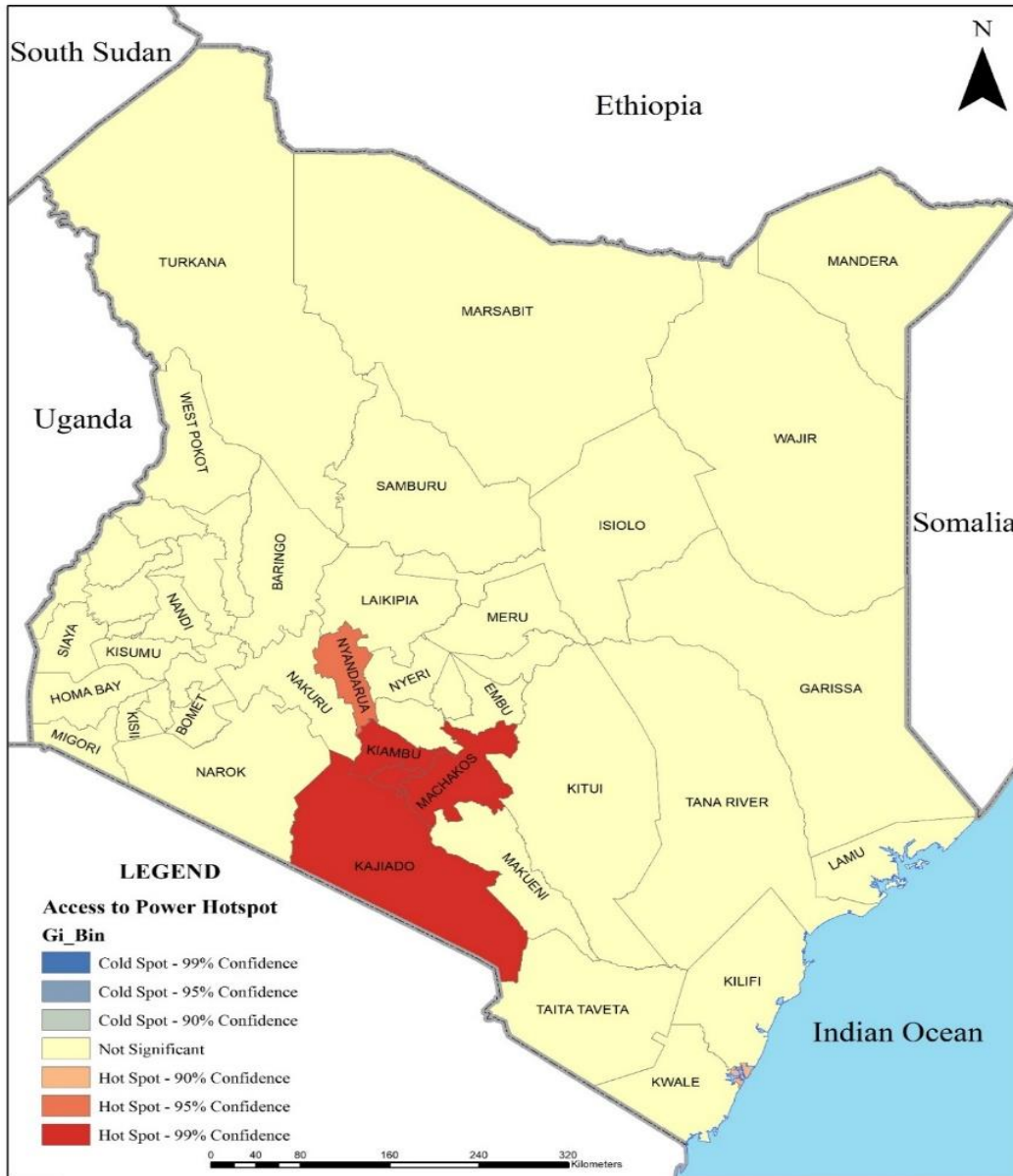
Figure 6-2: Access to Electricity Hotpot analysis

6.2.2 Access to Water

Access water is an important development indicator, and Figure 6.3 presents the levels of access in the country, highlighting regions with poor access to water. The darker the color the more inaccessible the water.
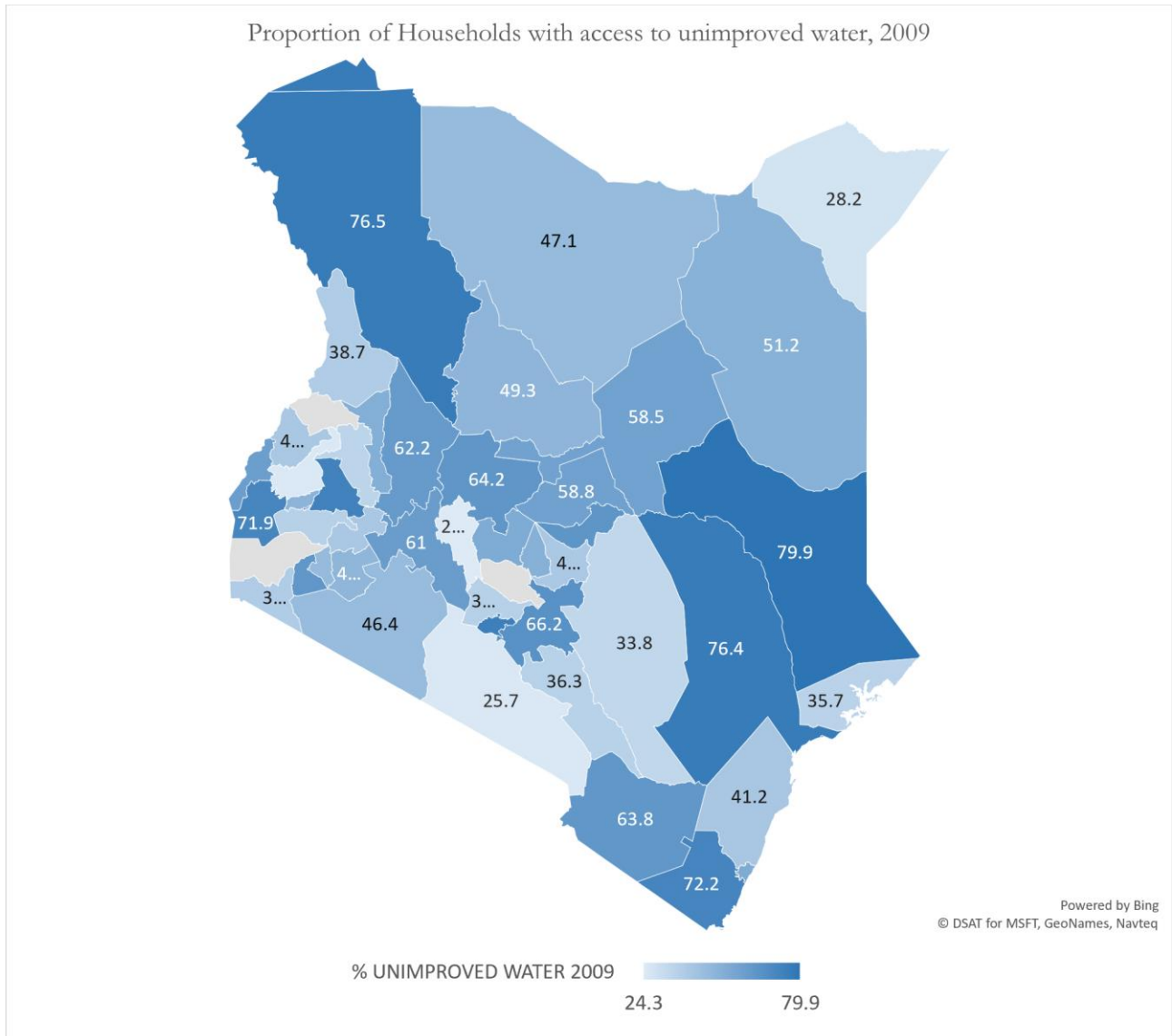
Figure 6-3: Households with access to unimproved water, 2009

The data shows that access to water is still a major challenge in the northern region of Kenya including Turkana and Garissa counties, as well as the coastal counties like Tana River, Kwale, and Taita Taveta. Surprisingly, Nairobi City County which hosts the capital city of Kenya also reported a high number of residents with access to unimproved water sources (75%) as well as Machakos, Nandi, Siaya and Tharaka Nithi counties. Urbanized counties such as Nairobi, Kisumu, Mombasa and the close neighbors are likely to have greater access to improved water sources, implying that geographical inequities exist in the access to basic social amenities in the country.

6.3   County Human Development Index (HDI)

County Human Development Index data is presented in Figure 6.4 and reveals a dichotomy between the northern and southern parts of the country. The data shows that northern parts of the country as well as Nyanza and Coast regions had low HDI values.
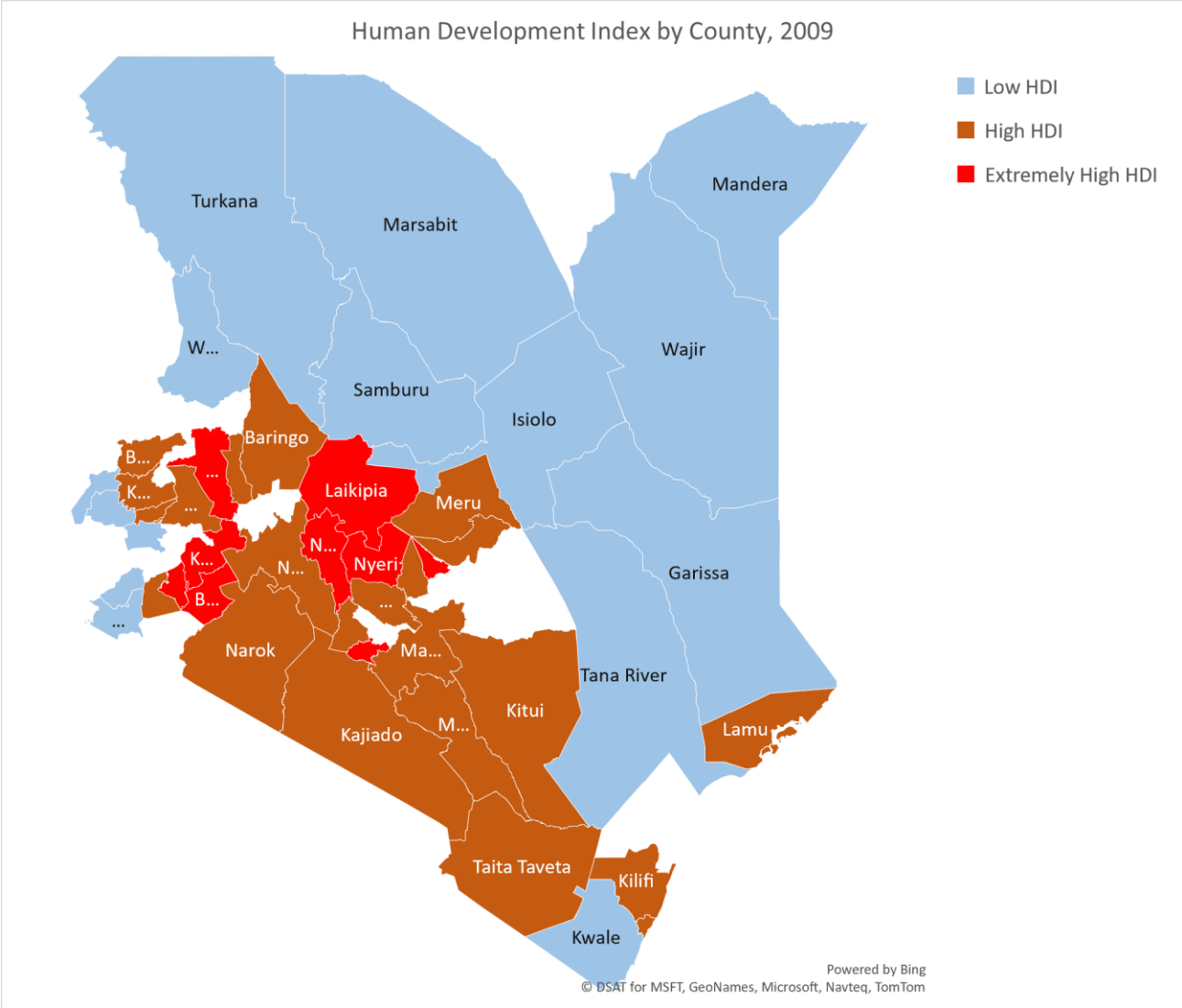
Figure 6-4: Human Development Index by County, 2009

6.4 Discussion

This chapter focuses on the inequality patterns in the counties using several indicators including Gini Coefficient, to measure income inequality, the human development index which is a composite index for several factors, as well as access to electricity, water, and sanitation. The objective of the section was to show the importance of considering non-income inequality indicators. The findings show spatial differentials in access to amenities in Kenya with the

northern frontier region reporting lower access to amenities. The Gini Coefficients show high income inequalities in the country, with wide intercounty variations, from the lowest inequality noted in Turkana County, which also has high poverty levels, and highest inequalities reported in the Coastal region.

Access to electricity shows county variations with highest levels observed in Nairobi, Central region, and several counties with urban areas. Lowest levels were notably visible in the northern frontier regions including parts of Rift Valley and Northeastern regions, and the Coastal region. Comparing access to electricity to access to water, there is consistency in the counties without access to improved water. The worst affected are counties in the northern frontier of the county, as well as the Coastal region.

The composite Human Development Index shows a country divided into two distinct parts, with the northern regions experiencing lower development indicators compared to the central and southern parts of the country. Highest County HDI values are observed in counties in the former Central region including Nyandarua, Nyeri, Embu, in addition to Nairobi which hosts the Capital City of Kenya. Other high development indicators are observed in the Western part of the country, especially in Bomet, Nyamira, Kericho and Uasin Gishu counties, respectively.

6.5   Conclusion

The analysis of county inequality patterns using several indicators confirms that These findings confirm that Kenya is a highly unequal country with wide intercounty differential access to social and economic amenities. The findings confirm what previous scholars observed in several past studies (Oucho, 2007; Gupta, 1979; Rempel ,1971 , 1974). The use of spatial mapping techniques helps to visualize an emerging north-south dichotomy of inequality in the country. Efforts to contain inequality in the country will require concerted efforts from the county and national governments to reduce the gaps for the regions lagging.

Devolution offers hope in mitigating these past inequalities owing to the flow of funds to the county governments where decision making on development priorities rest on the county leadership and citizenry.

There still exists wide regional and intercounty inequalities in development outcomes as the map of the County Human Development Indicators, reveals. Better outcomes are observed in few pockets of counties in the Western part of the country, and some in the Central region and in Nairobi County. The rest of the country, especially the counties located in the northern frontier region are mostly reporting low development indicators. The gap between the extremely high County HDI values between the northern and southern part of the country reflects a colonial legacy. The devolved government system is anticipated to greatly improve development outcomes in the country, especially in the regions that were left behind.

CHAPTER 7

MIGRATION AND INEQUALITY RELATIONSHIP

7.0   Introduction

This chapter presents the analysis of the county migration intensity and county inequality variables – access to water, access to electricity, county Gini (income inequality) and County Human Development Index (County HDI). Two types of analysis were conducted to determine this relationship – first bivariate correlation analysis using SPPS , and then multivariate regression and spatial analysis using ARCGIS software. 7.1

7.1   Bivariate Correlation Analysis

The bivariate correlation analysis is a statistical test to see how much change in the dependent variable is explained by the explanatory variables. A positive r value shows a positive relationship between the two variables, such that a rise in one, leads to the rise in the other. Conversely, a negative r value, indicates a negative relationship between the two variables, such that a rise in one lead to a fall in the other. The other possible outcome of the bivariate correlation analysis is that there is a no correlation, where the r value is 0, implying that there is no relationship between the variables at all.

In Table 7.1, presents the results of running the bivariate correlation using SPSS to show the relation between each of the four explanatory variables with the county migration intensity.

Table 7.1: Correlation Analysis

Correlations

		Migration Effectiveness 2009	Proportion of Households with Electricity	Proportion of Households without Improved Water	County Gini Coefficient	County HDI
Migration Effectiveness 2009	Pearson Correlation	1	.426**	-.336*	.025	.321*
	Sig. (2-tailed)		.003	.021	.867	.028
	N	47	47	47	47	47
Proportion of Households with Electricity	Pearson Correlation	.426**	1	-.674**	-.110	.470**
	Sig. (2-tailed)	.003		.000	.462	.001
	N	47	47	47	47	47
Proportion of Households without Improved Water	Pearson Correlation	-.336*	-.674**	1	-.122	-.372**
	Sig. (2-tailed)	.021	.000		.414	.010
	N	47	47	47	47	47
County Gini Coefficient	Pearson Correlation	.025	-.110	-.122	1	-.139
	Sig. (2-tailed)	.867	.462	.414		.353
	N	47	47	47	47	47
County HDI	Pearson Correlation	.321*	.470**	-.372**	-.139	1
	Sig. (2-tailed)	.028	.001	.010	.353	
	N	47	47	47	47	47

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Muyonga et. al., (2021b)

The findings confirm that migration has a significant positive relationship with access to electricity but a negative relationship with access to water. Migration intensity has a positive association with County HDI. There is no clear relationship between migration and County Gini from the bivariate correlation analysis.

Various scatterplots were generated to visualize the relationships between the explanatory variables and the dependent variable. Figure 7.1 shows that as migration intensity increases, the proportion of population with access to electricity also increases.
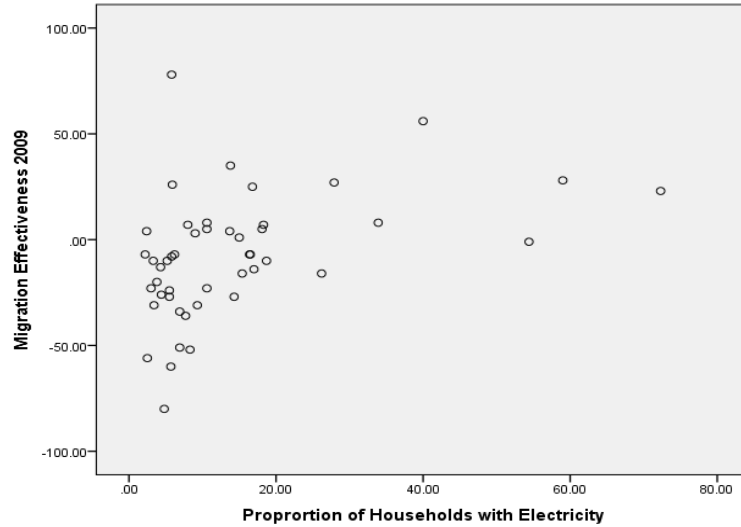
Figure 7-1: Scatterplot of Migration effectiveness by Proportion of Households with Electricity

Source: Muyonga, et. al., (2021b)

Figure 7.2 shows that as migration intensity increases, the proportions with access to unimproved water declines, thus a strong but negative relationship exists between these two variables. This implies that migration may have a more positive relationship with availability of water. Previous studies have demonstrated that migration is an adaptation strategy of households, and there may be indirect effect on water availability and other environmental issues as drivers of migration. However, in terms of availability of water as a household good, there is an expected association for migrants to move to regions which would give them better access to this good, although this would be considered a secondary reason for migration (Jobbins et., al, 2018).
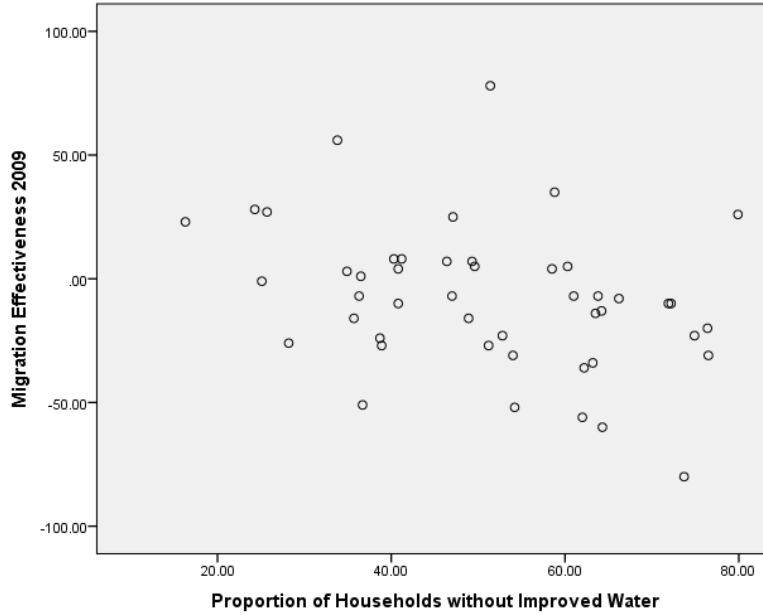
Figure 7-2: Scatterplot Migration effectiveness by Proportion of households without improved water

There is a positive relationship between the level of county development and migration, as demonstrated in Figure 7.3.
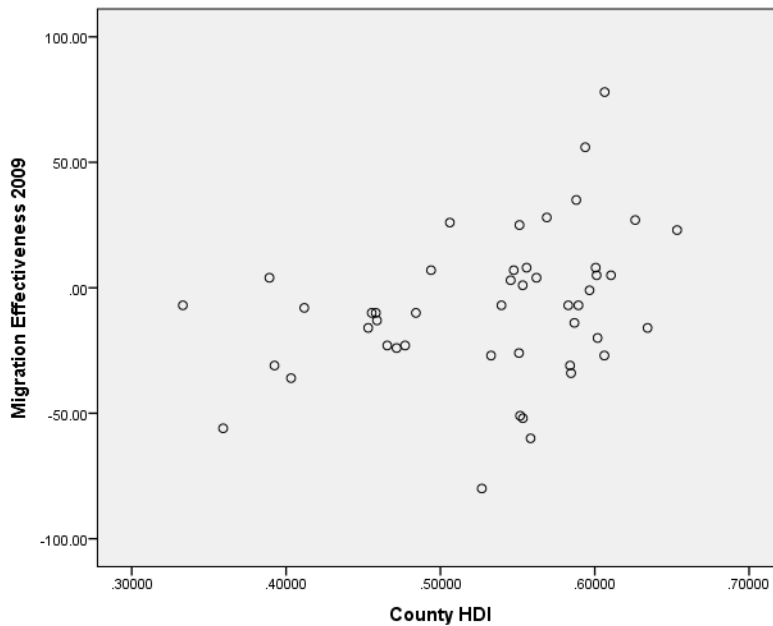
Figure 7-3: Scatterplot Migration effectiveness by County HDI

The observed positive relationship between migration and level of development has been well documented (de Haas, 2007, 2010, 2014; Zelinsky, 1971). In Kenya, various studies identified a possible association between the migration patterns and the level of the development (Oucho, 2007; Otiso, 2005; Soja, Rempel,1976; Soja, 1968).
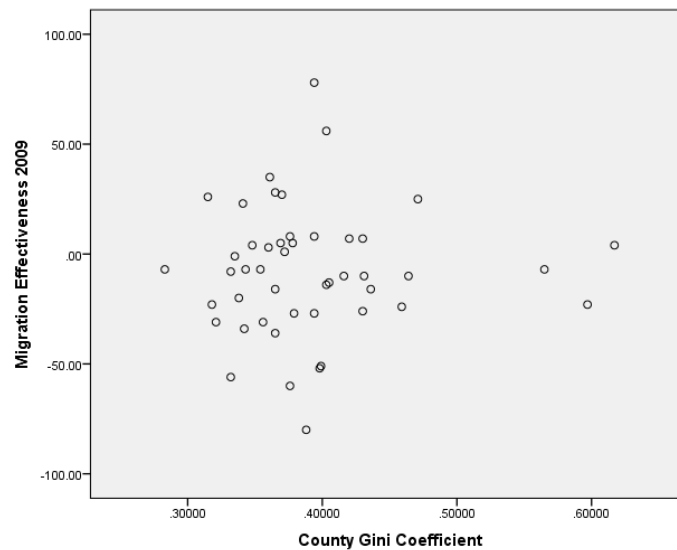
Figure 7-4: Scatterplot Migration effectiveness by County Gini

The analysis, however, does not show any clear relationship between migration and county Gini as shown in Figure 7.4. This may partly be explained by the complexity of the migration and income inequality relationship as expounded in previous studies. For example, some scholars note that the relationship between remittances and income inequality has an inverse U shape (Docquier & Rapoport, 2003; Stark et., al, 1988), implying that in the short term, migrant remittances increase income inequality but in the long term, they reduce income inequalities. However, the complexity of the relationship between migration and inequality has been discussed by de Haas (2010, 2008) who suggests that structural factors play a key role on when migration occurs. Van de Walle (2009) cautions that expected effects of income inequality could be explained by the

colonial legacy of African countries, including who determines who migrates and where they move to.

7.2   Spatial Analysis

The results of the bivariate analysis helped in clarifying the inequality variables and their association with migration; however, they do not confirm if these observed patterns are spatially defined. Using ARCGIS, further analysis was conducted to determine if there is any spatial association between the variables, and whether, any observed spatial association was random, or not in the study area. Two tests were done, first a spatial autocorrelation analysis, and later, a spatial regression analysis using both the Ordinary Least Squares (OLS) regression and Geographically Weighted Regression (GWR).

7.2.1 Ordinary Least Squares (OLS) Regression analysis

The OLS analysis employed the four explanatory variables and the dependent variable. OLS analysis was conducted to diagnose if the model we specified was valid. In the diagnostics, we first checked for the performance of the model as specified, using the values of Multiple R-squared and Adjusted R-squared as shown in Table 7.2. The value of R-squared shows the percentage change in migration intensity arising from the variables in the model, where the values range from 0 to 1, with values closer to 1 indicating the predictive prowess of the variable. Since the variables in the model such as access to electricity may be correlated to County HDI, there may be some collinearity in the model. The Adjusted R-squared value is therefore the better index to consider when the model fit is concerned.

Table 7.2 shows that the specified model explains 21 percent of the changes in migration intensity, but falls to 14 per cent, when the Adjusted R values is used. This implies that the current explanatory variables only explain 14 percent of the variations in migration, implying other more influential variables have

been excluded in the analysis, which would be useful predictors of the relationship between migration and inequality in Kenya.

Table 7.2: Ordinary Least Square Regression Diagnostics

Input Features:	Counties (Kenya)	Dependent Variable	Total Ages 2009
Number of Observations	47	Akaike's Information Criterion (AICc) [d]	640.358112
Multiple R-Squared (d)	0.21085	Adjusted R-Squared (d)	0.135697
Joint F-Statistic (e)	2.80552	Prob(>F), (4.42) degrees of freedom	0.037579*
Joint Wald Statistic (e)	10.261295	Prob(>chi-squared), (4) degrees of freedom	0.036249*
Koenker (BP) Statistic (f)	15.045831	Prob(>chi-squared), (4) degrees of freedom	0.004607*
Jarque-Bera Statistic (g)	285.335833	Prob(>chi-squared), (2) degrees of freedom	0.000000*

Source: Muyonga, et. al., (2021b)

The Joint Wald statistic is significant ($p < 0.05$) implying that the model adopted was statistically significant, thus the explanatory variables are effective in the model. The model was also tested for stationarity and the Koenker (BP)Statistic returned a *p* value of 0.005, meaning that the model will give consistent results even when changes occur in the explanatory variables. However, a notable result of the regression analysis revealed by the Jarque-Bera Statistic is 285 ($p < 0.000$) signifying existence of a non-linear relationship between the dependent and independent variables.

Figure 7.5 shows a scatterplot of the relationship between the dependent and explanatory variables. The histograms shows that the study variables are not normally distributed. While County HDI, is positively skewed, the County Gini is negatively skewed. The scatterplots also confirm that the relationship between migration and the explanatory variables is not linear. This leads to the conclusion that the relationship between the variables may be non-linear. Previous literature on migration and inequality concludes that the relations is curvilinear (Lipton, 1980; Kuznets, 1955).
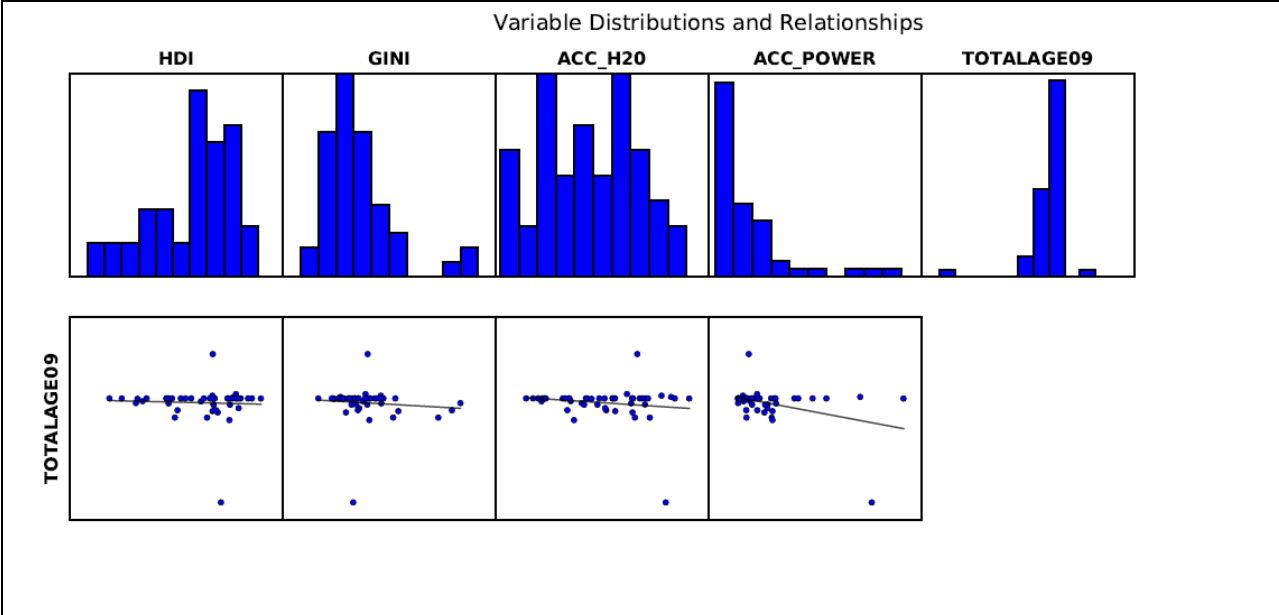
Figure 7-5: Scatterplot of Variable distributions and relationships from OLS regression

Source: Muyonga, et. al., (2021b)

In Table 7.3, are the results of the ordinary least square regression (OLS) analysis. The results capture the significance of the explanatory variables in column 1, as designated by the value of the coefficient (a) in Colum 2. The County HDI and access to water both report a positive correlation with migration intensity while, access to electricity and County Gini have a negative correlation indicated by the negative sign next to the figures.

The robust probability(b) in column 8 of the table is Used to determine the statistical significance of the association. The findings show that County Gini has the most robust explanatory power in the changes to the migration intensity in this model. The results however show that County Gini and access to power both have a statistically significant negative relationship with migration intensity. There is significant negative relationship between migration and County Gini, such that a change in unit of the former results in a 567-unit

decline in migration intensity, compared to a comparative 9-unit decline in access to electricity.

Table 7.3: Summary of OLS Results – Model Variables

Summary of OLS Results - Model Variables								
Variable	Coefficient (a)	StdError	t-Statistic	Probability (b)	Robust_SE	Robust_t	Robust_Pr (b)	VIF(c)
Intercept	-59.24	296.47	-0.12	0.84259	176.895	-0.334887	0.739378	------
HDI	386.16	438.58	0.88	0.383611	334.688	1.153782	0.255113	1.322587
GINI	-567.28	467.49	-1.21	0.231736	204.306	-2.776606	**0.008172***	1.128292
ACC-Water	2.92	2.58	1.13	0.264958	2.009	1.453015	0.153651	1.93954
ACC-Power	-8.74	2.82	-3.09	**.003505***	6.305	-1.385547	0.1732	2.082582

Source: Muyonga, et. al., (2021b)

The findings show that the most important variable in explaining the variation in migration intensity is income inequality, measured by the County Gini. This is a significant contribution of this study to the discourse on migration and inequality in Kenya. The study findings corroborate similar findings elsewhere that found that as migration intensifies, income inequality reduces (De Brauw, 2013; McKenzie & Rapoport, 2007; Mines & Massey, 1985; Lipton, 1980).

7.2.2 Geographically Weighted Regression (GWR) analysis

A second test of the association between the four explanatory variables and migration intensity was conducted using the geographically weighted regression (GWR), specifically checking if the observed association between the study are spatial. The GWR regression was done using ArcGIS version 10.5 modelling using a fixed-distance method. The attributes used in the GWR analysis, and the summary output is presented in Table 7.4.

Table 7.4: Summary of Gross Weighted Regression Output

OID	Variable Name	Variable	Definition
0	Bandwidth	990245.6	
1	Residual Squares	1508556	
2	Effective Number	6.208844	
3	Sigma	192.3081	
4	AICc	636.9436	
5	R^2	0.293231	
6	R^2 Adjusted	0.20298	
7	Dependent Field	0	TotalAges09
8	Explanatory Field	1	HDI
9	Explanatory Field	2	GINI
10	Explanatory Field	3	ACC_H20
11	Explanatory Field	4	ACC_POWER

Source: Muyonga, Otieno and Odipo (2021b)

The OLS regression analysis had indicated that the inequality variables in the model explain only 14 per cent of the changes in migration intensity. The results from the GWR show a more improved outcome, with the model explaining up to 20 per cent of the variations between migration and inequality in Kenya. The low percentage implies that other critical variables are important in understanding the relationship between migration and inequality in Kenya.

An output of the GWR analysis is a cold-to-hot rendered map of standardized residuals, and this is presented in Figure 7.6. The findings reveal evidence of clustering of migration intensities in the country, designated by the different colors, with the deep red implying a clustering of high intensities, while the deep blue shows a clustering of low migration intensities, implying that that migration has a spatial relationship with inequalities in Kenya.

The data for Mombasa and Kilifi counties shows low migration intensities, as do several counties in the former Eastern region showing low intensities in Embu, Machakos, Makueni and Meru counties. High migration intensities are found in Nairobi and the neighboring counties of Kiambu and Kajiado, as well as in Nakuru, one of the urbanized counties in the country. High intensities for counties neighboring Nairobi, is due to the spillover effect of high migration in Nairobi, while in Nakuru County, this may largely be a factor of urbanization, as

the county hosts the fourth largest city in the country. There is evidence of high migration intensities clustering in the Western/Nyanza part of the country, as observed in Vihiga County and Migori County at the Kenya-Tanzania border.

The results of the GWR analysis confirm that there is a spatial relationship between migration and inequality, such that regions with similar patterns of migration are clustered.

As the OLS regression analysis showed that income inequality has the highest explanatory power in the model specified, this has implications on the root causes of these inequalities, as they are tied to the spatial factors within the counties.
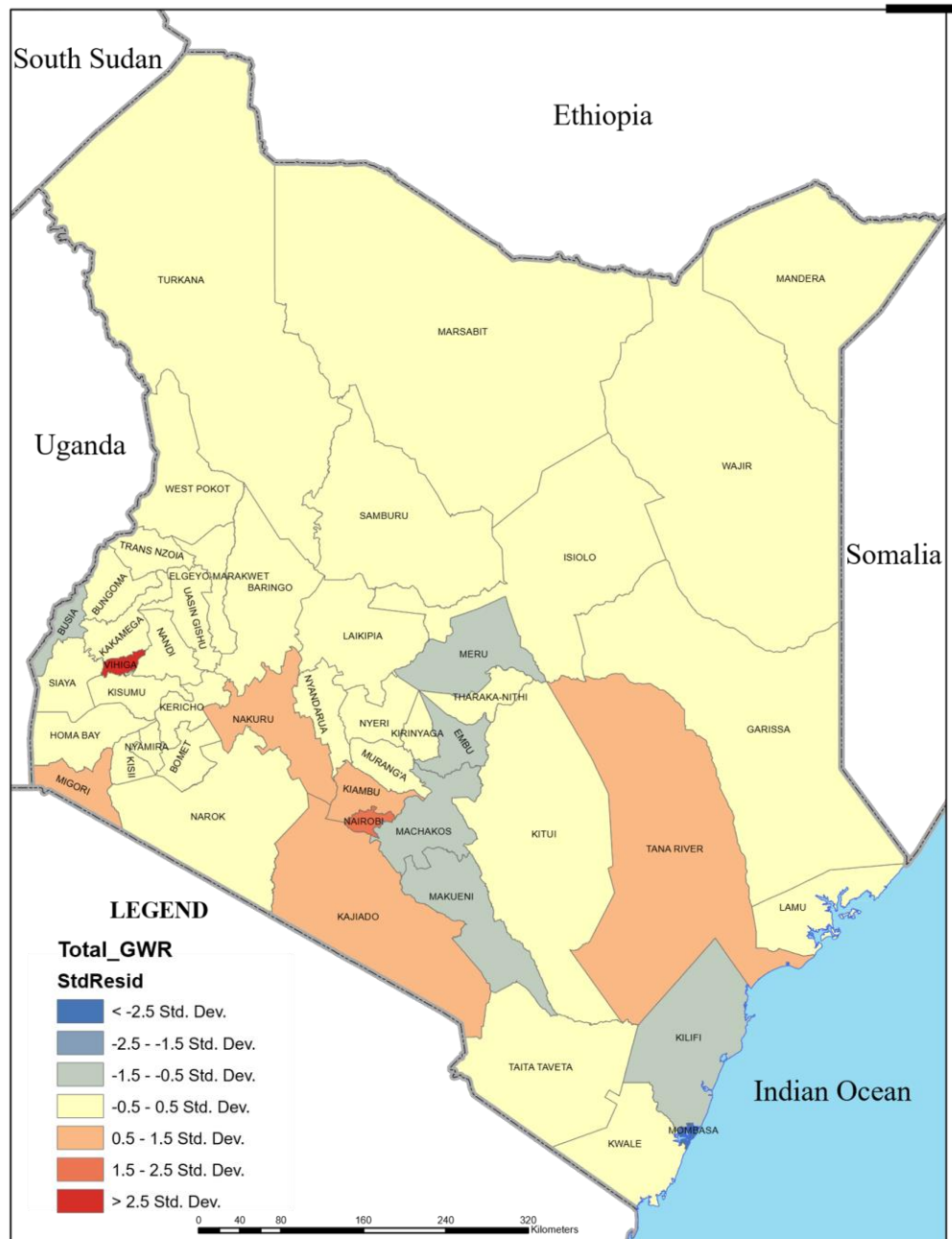
Figure 7-6: Geographically Weighted Regression analysis

Source: Muyonga, et. al., (2021b)

The variables were subjected to a spatial analysis to determine if there is any spatial association between county migration intensity and the independent variables – access to water, access to electricity, county level of development (County HDI) and County Gini(income inequality). The analysis was done using the Gross Weighted Regression analysis using the ARCGIS package. The underlying principle in GWR is that the observed spatial relationship between variables is influenced by the contextual and geographical factors where they are located (Fotheringham et., al, 2003).

The GWR results confirmed that inequality variables account for 20 per cent of the changes in migration intensity in Kenya. When spatial analysis is applied to the residues of the GWR analysis, the results confirm hot and cold clustering of migration intensities across the country. Moran's was used to test for spatial patterns in the distribution of migration intensities in the counties. Moran's, I gives information on the nearest neighbor, shows evidence of spatial autocorrelation by calculating the Moran's I as well as incidence of high/low clustering in the data. Values for Moran's I range from -1 to 1, with -1 meaning that there is perfect clustering of dissimilar values, 0 means there is no autocorrelation while 1 means there is perfect clustering of similar values. Figure 7.7 presents the results of the Moran's test of the migration intensities.

The value of the Moran's index as observed in the figure is 0.105452, which is closer to1, thus implying a clustering of similar values is expected. The Moran's Index is statistically significant, with a p (0.002) confirming that the results are random. Following this test, the results indicate that migration intensities in Nairobi and some parts of the Western region exhibit a clustering of high values, and for some regions in the Eastern parts of the country including Mombasa and Kilifi counties, are a clustering of low migration intensities. The results imply that determinant factors for migration in these areas vary significantly.
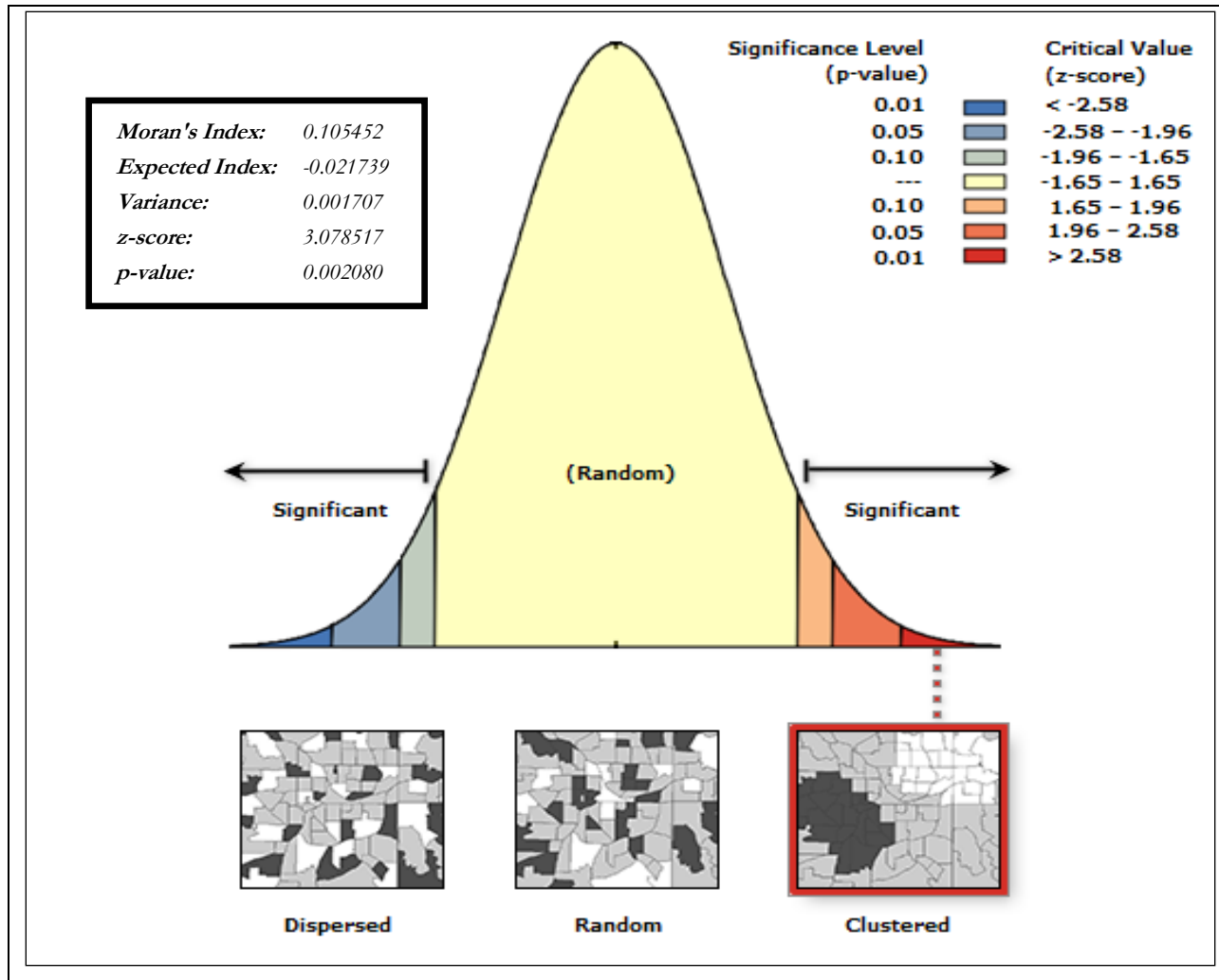
Figure 7-7: Spatial Autocorrelation using Global Moran's I

Source: Muyonga, et. al., (2021b)

Local Moran's Hot spot and clustering analysis

The Global Moran's *I* result have confirmed that the relationship between migration and inequality in Kenya is spatially clustered. To determine how the clustering is distributed locally, the local indicator of spatial autocorrelation (LISA) test was conducted to identify the regions with spatial clustering. LISA tests results helped to identify where the relationship between migration and inequality is clustered and where there are hotspots nationally. This includes testing if there are clusters and hotspots.

- **Cluster analysis**

The results of the cluster analysis of migration intensities confirms the existence of spatial clusters of migration intensities in the country. Figure 7.8 confirm clustering, with a high-high cluster in Kisumu and Nandi counties, and a low-low cluster in Kilifi and Kwale counties, respectively.

Figure 7-8: Cluster analysis of County Migration Intensities

- ## Hotspot analysis

The findings in Figure 7.9 confirm the existence of two key migration hotspots in the country. there is a hotspot in the Western part of the country as noted in Kisumu and Vihiga counties, and a cold spot in the Coastal region in the country as observed in Mombasa, Kilifi and Kwale counties.
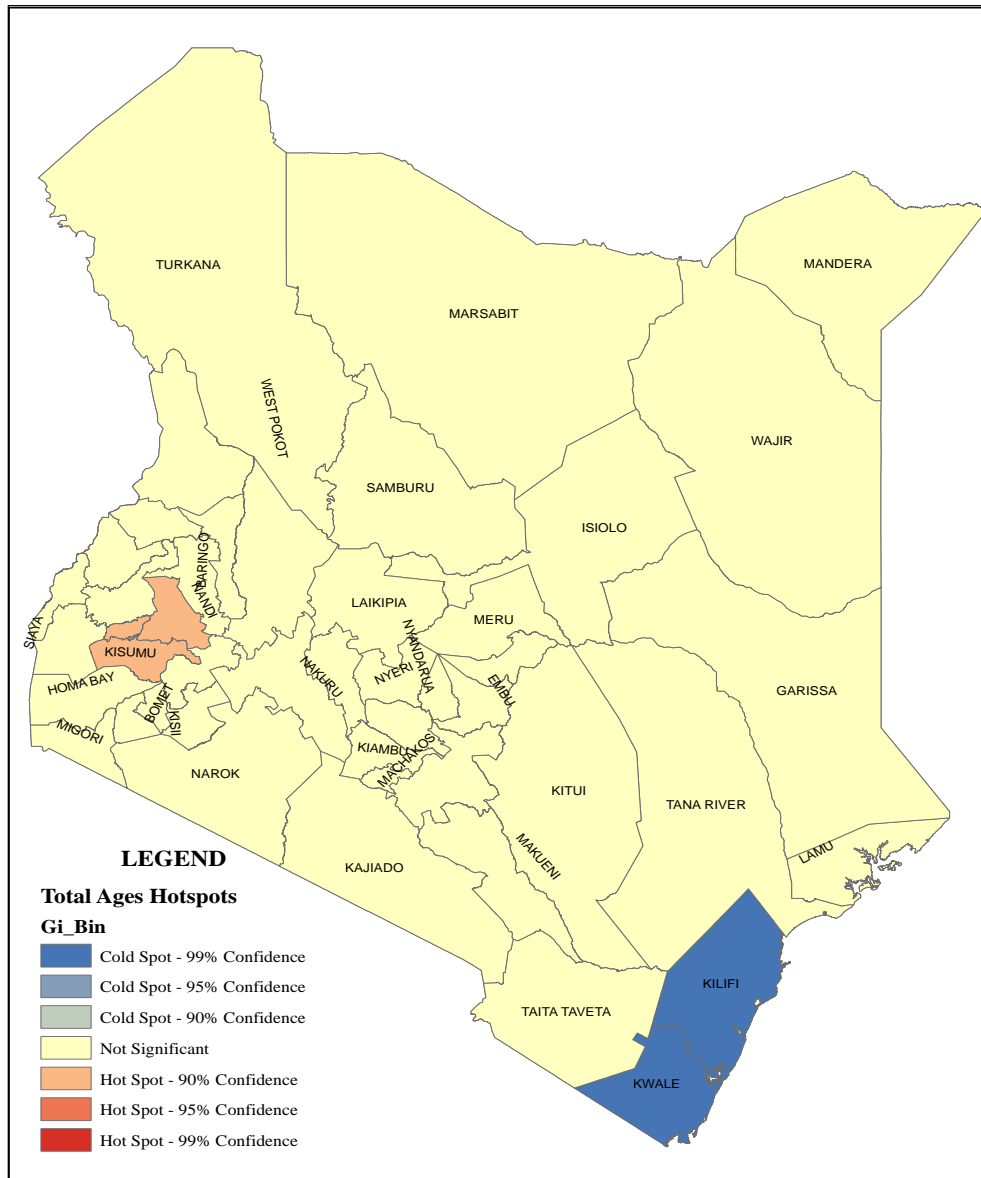
Figure 7-9: Hotspot analysis of County Migration Intensities

Source: Muyonga, et. al., (2021b)

7.3 Discussion

This chapter provided findings from the tests of the associations between migration and inequality in Kenya. The correlation test showed that some of the inequality variables are positively correlated to migration. Access to electricity was positively associated with migration intensity, while access to water was negatively associated with migration. Comparatively, the findings showed that County HDI has a positive relationship with migration intensity, but the bivariate analysis did not find any clear relationship between migration and County Gini.

The bivariate analysis show that migration has a positive association with the County Human Development Indicator (HDI), but a negative relationship with access to water and electricity. This observation was expected, as areas with better development indicators such as improved electricity or water access, should ideally attract migrants. Thus, the findings show that positive relationship between development indicators and migration. The County HDI is a composite indicator of development and thus, has a positive relationship with migration. These findings corroborate the earlier observation that higher migration intensity is recorded in the well-resourced areas, thus counties with high proportions of population without access to water or electricity are likely to have higher migration intensities in the long term. This may imply that poor resources are triggers for outmigration.

Findings from the OLS and GWR regression analysis were done to confirm if the association observed between the variables were valid across the data space and geographic space. One outstanding observation from the OLS regression analysis was the importance of the county Gini in explaining the variations in migration intensity in the country. OLS results confirm that county Gini was the key variable explaining the differences in migration intensity when all variables were considered. The results are statistically significant (p<0.05). Thus, the county Gini has the highest explanatory power in explaining the changes in migration intensities, with a unit change in migration intensity associated with a 567-negative change in county Gini. The outcomes of the OLS regression also showed

evidence of spatial clustering of the findings, meaning that the results observed were not normally distributed.

Further tests were done using GWR to check for the explanatory power of the identified variables and evidence of spatial independence of the findings. The results of the GWR analysis indicate that the model explains up to 20 per cent of the variations in migration intensity from the inequality variables identified. A map of the residuals confirms that the results are spatially clustered, thus they indicate that migration has a spatial relationship with inequality. Further tests using Moran's I confirm this spatial association between migration and inequality with evidence of clustering of positive and negative migration intensities in the country, as well as evidence of hotspots in two regions of the country. A high-high hotspot is observed in the Western part of the country, while a low-low cluster of migration is observed in the Coastal region of the country.

The findings imply that counties with better development indicators including access to water, have higher mobility within them. The counties with high income inequality and with majority of residents having access to power, report lower migration intensity. This may be a result of migrants seeking better development opportunities that are offered in counties with high HDI. The findings explain how regional inequalities in Kenya affect migration as observed by in earlier studies (KNBS & SID, 2013; Oucho, 2007; Rempel, 1976).

7.4   Conclusion

The test of the relationship between migration and inequality in Kenya using income and non-income measures of inequality confirms that Kenya's migration patterns are spatially distributed and respond to the level of development in the country. Bivariate analysis shows a close association between the level of development in the county and the migration intensities. This leads to the conclusion that development plays a key factor in influencing migration, such

that better development outcomes are associated with higher migration, with migrants moving to better endowed regions.

While the other variables measuring inequality are applied in the same model, the income inequality measure, in this case, County Gini, had the highest and statistically significant explanatory power for the changes in migration. Migration intensity was negatively associated with County Gini. This implies that counties with higher income inequality tend to have lower migration. This study confirms this association that was previously unknown.

The findings also confirm the spatial association of migration and inequality, as the values change across regions, resulting in clustering of similar values. The high-high clustering observed in the Western part of the country may be a result of several factors that could explain high outmigration from the region. Similarly, the low-low hotpots identified at the Coastal region, may be explained by other factors beyond inequality measures. For example, locational factors including the environmental factors, investments in public infrastructure as well as public policy, may give insights into these patterns of internal migration in the country. For example, the Nyanza region had lagged development owing to discriminative government policies in the Kenyatta administration (Yieke, 2010; Ajulu, 2002), resulting in extremely low social and economic outputs of the region compared to the rest of the country. With this background, there are reports of high outmigration from the region, leading to various studies investigating the loss of human capital from the region (Oucho, et. al., 2014).

Thus, the findings lead to the conclusion that migration and inequality are interrelated, with income inequality being a strong predictor of migration in the country. As migration intensifies, income inequality declines. This has previously been reported in several studies including (Bang et., al, 2016; de Haas, 2010, Wakajummah, 1986). While the study did not delve into the determinants of the negative relationship between migration and inequality, this has been observed in different settings. This study recommends a further analysis of the

determinants of this association between migration and income inequality in Kenya.

The use of spatial analysis improved the understanding of migration and inequality in Kenya by showing the importance of spatial factors. While previous studies only focused on the rural-urban divide in understanding migration, this analysis has shown the greater visibility of spatial factors. Clustering of migration intensities and spatial tests of the association between variables have given insights on the role that space plays in explaining demographic phenomenon. This study recommends use of spatial analysis as a robust methodology to help understand human mobility in Kenya.

The regression analysis showed that our model explained only 20 per cent of the changes in migration intensity, it would be useful to conduct further tests to establish which other factors influence migration in Kenya, especially using qualitative techniques. This study recommends further studies on factors that influence migration and inequality in Kenya. In several studies, the determinant of economic inequality shows that beyond spatial factors, other important factors include government policy, the historical contexts of regions as well as the population structure.

CHAPTER 8

SUMMARY OF FINDINGS CONCLUSION AND RECOMMENDATIONS

8.1 Introduction

This study sought to establish the relationship between migration and inequality in Kenya. The study used an exploratory approach beginning by reviewing pertinent literature on similar studies done globally and in Kenya. The results of the literature review reveal that migration and inequality studies have gained momentum globally, although most such studies focused on econometric analysis of the impact of remittances on inequality in migrant sending areas. The review of literature shows a bias towards analysis of migration and inequality, where the Gini coefficient of inequality is the main measure of the 'migration effect' while the household income and expenditure patterns depict the resultant 'impact of migrant remittances on income inequality. Such analysis of migration and income inequality has compared the effect of internal versus international remittances on inequality, concluding that domestic remittances, although contributing lower significance that international remittances, they have a higher impact on poorer households. Studies concluded that the access to opportunities within the society play a significant role in the future impact of migration and inequality. For example, migrants tend to come from households with a higher wealth status, thus the benefits of migration will disproportionately impact on the wealthier households in a given community. This finding from the literature review points to the important role that structural factors play in the analysis of migration and inequality.

Several gaps are identified from the literature review, including the larger focus on analyzing the impact of migrant remittances on inequality, at the expense of non- income inequalities; lack of studies that compared migration indicators with inequality indicators in direct analysis and few studies investigate the relationship between migration motivations and inequality. When data is considered, the literature review shows that most studies rely on census and

survey data for analysis of migration and inequality, although ethnographic studies have been used to complement such data sources occasionally. Census data presents a challenge in analysis of migration and inequality because the census data does not always collect information on motivations for migration, as was the case in Kenya. This means that other data sources need to boost the analysis including providing information on migration motivations and socio-economic characteristics of the migrant sending households. While the specialist surveys are meant to meet this gap, Kenya does not have a specialist migration survey, although a remittances survey was conducted by the World Bank (2009). Few studies looked at the respective censuses. The output of that analysis is the county specific migration intensities. The next direct measures of migration such as migration rates, ratios, or migration efficiency. In some cases, migration rates have been used only as a means of identifying suitable sample areas for further migration data collection from migrant households compared to non-migrant households.

The methodology adopted by the study aimed at answering the key study question, namely, do the regions with higher migration also have higher inequalities? While the literature review showed that most studies of this nature consider the migration history of a region, thus, focus data collection on the migration intensive regions, this study did not have access to such migration history, opting instead to consider the historical changes in migration in the counties, as the proxy for migration history. Using census data, migration data was analyzed to assess the trends and patterns over the study period, 1999 - 2009. Migration history was measured using migration intensities, a summary measure of the long-term impact of migration on population redistribution in each region. Spatial analysis was employed to show the geographical distribution of migration in the country, and to identify clusters and hotspots of migration intensities. Further analysis of the census data to generate age and sex specific measures of migration in the counties to determine the gender and other

dynamics of migrants in the county. The results were age-sex specific analysis of migration patterns across the counties.

To test the association between migration and inequality the study relied not just on bivariate correlation analysis, but on spatial analysis using ARCGIS software. This approach provided more clarity on the effects of migration and inequality within geographical spaces in Kenya. Unlike previous studies that focused on rural versus urban dichotomies, this study showed that there are geographical variations in migration in the country.

8.2   Summary of Findings

The key findings of the study which was based on four key objectives are presented herein. The first finding was that migration in Kenya is dominated by the youth (20–34-year-olds), with male youth dominating most of the migration streams. The findings corroborate previous studies that indicate that young people are highly migratory in Kenya. For example, Rempel (1976) in his observation of migration by young men from rural to urban parts of Kenya observed that younger men were highest in the total outmigrants population, with majority of migrants being men under 30 years of age (Rempel, 1976:46). the county finds that different counties had different proportions of youth migrants, with some having higher mobility among children or elderly persons. Another observation from the age-sex schedules confirms the rise in feminization of migration in the 2009 census. Most of the counties that previously had male domination of migration were reporting higher levels of female independent migration. For urbanized regions however, there is gender parity in migration profiles implying that the future patterns may show higher gender parity. The findings showed regional variations in the age and sex distribution of migrants, with the Northern region remaining male dominated across the year, implying there are other social factors that may explain the migration patterns for this region. This may have significant effects not only in the political and economic

fronts, but also the cultural and social fronts, including changing family formation structures.

A second query in this study was the nature and patterns of migration flows across the years. The findings confirmed increased migration over the years, but with flows typified by rural to rural and urban to urban movements. Migrants are no longer moving long distances but prefer to move shorter distances within their geographic regions. While the findings showed the shift to shorter distances, evidence showed the persistence of long-distance migration to the counties with major urban areas, such as Nairobi. Migrations flows also seemed to respond to the urbanization patterns in the country, which remains a colonial legacy. Peri urban areas bordering major metropolitan areas continue to receive high influx of migrants, arising from a spillover effect, for example as observed in Kajiado, Kiambu and Machakos counties that border Nairobi County. Thus, migration is leading to increased urbanization in those areas. These finding corroborates Ravenstein (1965) and Zelinsky's (1971) mobility transition hypothesis that as nations continue to experience development and economic growth, their mobility transitions also change.

When the pattern of migration flows and intensities were determined, they depicted distinct county patterns distinguishing between high potential, low potential, and migrant neutral counties. The high migration potential counties include mostly urbanized areas found in Nairobi, Mombasa, Uasin Gishu, Trans Nzoia and Nakuru counties, while the low potential is mostly found in the Northeastern and parts of Rift Valley region. Several counties were inactive migration zones in 2009 compared to 1999, and include Samburu, Mandera, West Pokot, Garissa, Nyamira, Kisii, Baringo, Laikipia, Homa Bay, Bomet, Narok, Kericho, Siaya, Migori, Kisumu, Kajiado and Nandi County.

The study also investigated several types of inequalities in the country using four measures, the county Gini, county HDI, information on proportion of households with access to water and proportion of households with access to electricity. The

findings from the analysis showed the wide differentials between counties and geographical regions, as had been highlighted in previous studies. The northern part of the country and parts of Nyanza and Eastern regions reported the lowest access to electricity, while counties neighboring Nairobi County, which hosts the capital city reported a clustering of high access to electricity. When income inequality was assesses using County Gini, the results showed that highest inequalities were found in the Coastal region and in Western and Nyanza regions. However, the Human Development Index confirms a north-south dichotomy in the country, where the northern part and parts of the Coast region generally reported lower development outcomes while the southern parts, especially those along the railway line, reported higher development outcomes. The findings confirm the assertions made by other scholars including Rempel (1981) and Oucho (2007, 2016) that unequal development is the driver of migration in the country.

The most important query of this study was the nature of the relationship between migration patterns in the counties and inequalities therein. This was determined using several tests. The findings confirm that the most important explanatory variable in explaining the variation in migration intensity is income inequality measured by the Gini coefficient. A unit change in the migration intensity results in a negative change of up to 567 units in the county Gini. This study therefore accepts the hypothesis that migration and inequality are interrelated with regions with high migration corresponding with low incidence of income inequality. While the underlying factors affecting the county Gini were not analyzed in the study, these findings show that migration may have an equalizing effect on income inequality, as the change in migration intensity corresponds with a negative but high change in income Gini. Counties that recorded high county Gini values include those in the Coastal region like Tana River, Kilifi and Kwale counties, which also reported high poverty levels measured by the HDI. The findings confirm that spatial factors highly influence

migration dynamics in the country, and therefore spatial inequalities increase migration propensities in subnational units in Kenya.

8.3   Conclusions

The investigation of the relationship between migration and inequality in Kenya using several inequality measures concludes that income inequality has significant relationship with migration. A unit change in migration intensity results in negative change in income inequality. This finding confirms that migration and inequality have a negative relationship as confirmed in several studies elsewhere.

While observing the counties that recorded higher income inequality values, mainly from the Coastal region, the findings show low migration intensities which implies structural factors may be at play. This may be explained by the lower economic potential of the region as migration has been associated with wealthier more educated individuals or households. What differs between earlier studies and the current study is the choice of the migration measure. While other studies used remittances from migrants as the measure of income inequality, this study uses migration intensity, which captures the long-term effect of migration to the population distribution. Thus, this study fills that gap in knowledge, by not only highlighting the differential patterns of migration in the country but showing how these patterns correlate with the inequality patterns in the country

The analysis of inequality in the counties using access to water, access to electricity, County Gini and County HDI confirms that Kenya is a highly unequal country in terms of both income and non-income inequalities There is poorer access to basic amenities in several regions of the country leading to low development indicators. These regions include counties located in the northern frontier, Nyanza region, Coastal region, and parts of Western region. The county Gini values confirm that the highest inequality in the country is experienced in the Coastal region especially in Kilifi, Kwale and Tana River counties as well as Nyanza and Western regions. The resultant migration hotspots confirm that the

underlying reasons and impact of migration is different in the Coastal region compared to the Nyanza and Western regions.

The study also several key changes to the Kenyan migration system, when comparing the current findings to previous scholarly work. Migration is no longer dominated by young men, but there is a rise in female migration in several counties. Urban areas which have higher migration intensities are experiencing gender parity among migrants. This is complemented by a shift from long-distance moves to more localized movements especially within regional boundaries. While urban areas such as Nairobi continue to receive migrants, there is need to factor the effect of migration across the country as the county governments will trigger urban development and growth of urban areas in all parts of the country, which may increase flows of movements into these areas. The changing patterns of migration in the country indicate that there may be shifts in the motivations for internal migration. Urbanization may be escalating mobility in the country and the investments in improvements of infrastructure by the government has made movements cheaper for migrants.

What remains unclear is whether migrants are largely from the wealthy households, or they are across the wealth spectrum. This remains unexplored in this study, as the focus was on the county level migration measures. Having the analysis done at the county level as the unit of analysis has its benefits of providing subnational migration data, but this was limited by omission of household level factors that could account for migration motivations for example, intra household gender dynamics. Therefore, the study findings on the relationship between migration and inequality are only useful at the county level which may obfuscate individual household dynamics. The study recommends a future study looking at migration at the household level would yield useful information to clarify how differential access to migration and interhousehold dynamics impact on inequality.

The migration patterns reflect the collective experience of policy and developmental changes during the post-independence period up till 2009. Several changes occurred that affect migration in the country, including the freedom of movement that allowed and increased mobility in the country, the positive gains in women's movements leading to higher enrolment of girls in educational institutions, resulting in their increased potential for employment and improvements in transport and infrastructure in the country. This may mean that the push for empowerment of women has increased their participation in migration as independent actors. This may have implication in the structure and relations within the nuclear family units. A qualitative study on female migration may help to identify causal factors as well as impacts in counties that have higher female migration.

The study methodology used census data to determine the migration and inequality relationship, although several limitations were identified in the use of census data. The census data omits return migration and repeat movements as it is based on a point estimate. Additionally, the census does not allow for the capture of household or individual based factors that may contribute to inequalities. An opportunity to improve analysis will be availed in the 2019 census where migrants were asked to state the reasons for migration. Despite this, the methodology enabled the inference of migration and inequality interrelation with limited data. The innovative use of ArcGIS helped in improving the analysis of migration and inequality, especially the visualization of the spread of migration intensities in the country, as well as distribution of amenities, captured by access to water and electricity in the country.

The measurement of the migration and inequality association using the approach in this study proved to be tedious as the data from the census reports had to be analyzed thorough a lengthy process. Analysis was however limited to the county as the unit of inquiry thus ignoring household dynamics that have proven to be important predictors of migratory behavior. The use of spatial analysis software enriched the study as it reveals the role that spatial effects play

in population dynamics. For example, the findings confirmed the random clustering of migration intensities in the country, an aspect previously unknown. Thus, the analysis illuminated the significant role that spatial factors in influencing migration in Kenya. This is big contribution to the study as previous migration analysis only focused on national averages, ignoring the subnational dynamics.

A notable challenge was the inadequacy of migration theory to map out the relationship between migration and inequality especially when micro and macro factors are considered. The causal pathways remain unclear. Using the modified De Haas conceptual framework, the results show that a change in migration intensity corresponds with a decline in county Gini. What cannot be discerned is how and why the changes occur. The results of the spatial regression analysis confirmed that the inequality variables only explained up to 20 percent of the changes between migration and inequality, implying that other factors may be responsible for understanding the relationship. There may be need for a more robust model that includes background factors that influence both migration and inequality using a household-based study. Such factors have been identified in previous studies as education level of migrants, migrant household welfare status, asset ownership and place of residence if in urban or rural areas.

8.4   Recommendations for Policy Makers

Several recommendations can be made from this study. The first relates to importance of future analysis of migration in Kenya incorporating both age and gender dynamics. The study confirms that youth are the most mobile demographic group in the country. While previous studies looked at migrants as a homogeneous group, this study recommends a gender and age disaggregated analysis of migration data for future research. This will help to understand the differential impact of migrants in different ages to the changing mobility dynamics. For example, the data shows that youth have a higher preference for urbanized counties. Gender dynamics of migrants also show a shifting pattern,

from male domination of migration to increased feminization. In several urbanized counties, there is gender parity among the migrants implying that migration is equalizing opportunities for citizens. As the youth are the most mobile demographic group in Kenya, this study recommends that county governments focus on programs to support youth who migrate into their counties.

The data also shows that there is increased migration to urbanized areas. County governments will be experiencing increase in the number of urban areas owing to the flow of resources for development to the counties. As a result, it is anticipated that newer urban areas will emerge within the counties, attracting migrants. This study recommends that suitable interventions need to be put in place for counties that are net recipients of migrants as well as those who are net losers of the youthful population, to harness this demographic dividend.

This study used census data but also focused on the county as the unit of analysis. This study recommends that an in-depth survey of migration in Kenya be conducted to provide insights into the role of individual and household factors in the migratory process, and how inequalities within and between groups affect their migration propensity. A focused migration specialist survey may help to bring light to some of the important dynamics of the migration and inequality within these contexts. The literature review section confirmed that several countries in Africa are already using specialist migration survey including Egypt and Ethiopia.

The study used the migration intensity measure as the key unit of measuring impact of migration over time. The measure proved a useful indicator as it summarizes the net effect of migration not only to the receiving population but considers how population changes in the receiving areas due to contribution of migrants. In urbanized areas for example, a higher proportion of migrants is found in the population compared to non-urbanized areas. The measure also gives a good measure on the net effect on migration on the distribution of the

population by showing regions that gain population owing to migration and those where migration does not have any effect on the population change. Thus, this study recommends use of migration intensity measures in future studies looking at impact of migration on different phenomena.

The findings from the study show that as migration increases, income inequality reduces. The finding imply that development policy should focus on improving equitable outcomes. The existing levels of inequalities in the country can be traced to the colonial legacy that favored certain regions over others. This discriminatory policy was extended and perpetuated in different political regimes in the country, leading to a highly inequal country. There is therefore need for county governments relying on the new constitution to improve equitable development in their counties thereby reducing the developmental inequalities. This will help to curb high influx of migrants in the developed parts of the country leading to congestion and other planning problems. thus, the study recommends the use of migration statistics to improve county planning processes to ensure that counties burdened by high influx of internal migrants are still able to meet their service delivery needs. For the counties recording loss of human capital, the study recommends that county governments put in suitable interventions to curb the outflow of migrants.

In generating data for migration analysis and data visualization proved a challenge. When faced with multiple years of analysis, the process of generating contingency tables and migration flows between counties becomes tedious. There is need to use innovative software that allows for data visualization of intercounty migration flows as the contingency tables become distorted when the units of measure are many, as the 47 by 47 county analysis showed. Using the ARCGIS software is highly recommended as it enabled not only the spatial analysis of the data, but also allowed the generation of spatial maps that improve data visualization. Using visualized data helps in improving the communication of research results to policy makers, who may at times be put off by large data bases. There are other innovative approaches to mapping the intercounty

migration flows such as the use of choropleth maps and chord diagrams and this would be highly recommended for use by future researchers of migration. Chord diagrams capture both the size and direction of the flows between migrant origin and destination areas, while choropleth maps show the intensity of migration measures using different coloring patterns.

8.5   Areas for future research

The study of migration and inequality in Kenya has yielded several key results that help explain how changes in migration correspond to changes in inequality, but also highlighted areas where there are still gaps in knowledge. The review of migration patterns in Kenya for instance show that there is a shift with migration system characterized by shorter localized movements and higher attracting for urban areas. The changing patterns of migration in the country may need further investigation in the context of devolution. While the data confirms that migration is high in the urbanized counties, there is evidence that newer urban areas are increasingly attracting migrants. Counties contiguous to the capital city of Nairobi and other cities like Mombasa and Kisumu, are attracting migrants owing to the spillover effect.

Using the ARCGIS maps, the findings show huge spatial variations in migration intensity. Several regions are no longer active migration zones, while some counties have shifted from being net attractors of migrants to net sending regions. Migration hotspots identified as high- high hotspots in the Lake Victoria region and the low-low hotspots at the Coastal region also warrant further study especially in the context of devolution in Kenya, where respective county governments need to harness their demographic dividends. Clustering of migration intensities and spatial tests of the association between variables have given insights on the role that space plays in explaining demographic phenomenon. This study recommends use of spatial analysis in future migration studies to improve the understanding of the migration process.

Understanding the drivers of county migration will be an imperative agenda for devolved governments especially in the counties identified as hotspots. The county Gini values showed higher income inequality in the Coastal region especially in Kwale, Kilifi and Tana River counties. This warrants further investigation. The patterns of migration in the Coast and Nyanza regions which all had higher income inequality levels need to be further investigated to determine the drivers of migration and inequality in the region.

The age and sex analysis of migration data confirms the increased feminization of migration in the country, with dominance of female migrants in several counties. Patterns of increased feminization of migration across all age groups of migrants in the country may have implications to the family formation and economic structure of the counties. The study did not determine if the women migrants were accompanying their spouses or joining their families in the destination areas as implied in some of the past studies on migration in Kenya, but the findings indicated the need for gendered policy response to migration in Kenya especially looking out for the vulnerabilities that face female migrants. Additionally, a study that investigates the patterns of migration against the gendered patterns of migration could help elaborate on the feminization of migration in Kenya. These findings differ from earlier studies that had focused on male migrants and therefore concluded that women are not active migrants, only making associational moves to join their spouses or families. The changes arising from increased feminization of migration warrant further investigation to understand the social, economic, and demographic impacts to society. This study therefore recommends that future research should investigate the drivers of increased feminization of migration as well as the gendered impact of migration in Kenya.

The phenomenon of higher child migration along the border communities needs further investigation to determine the motivational factors. This could be a case of independent movement by young children against the norm of associational moves with their parents. There is also a distinct pattern of migration in the

Northeastern region, which remains largely dominated by male migration. This study therefore recommends further research on two key areas, first establishing the drivers of higher child migration at the border points, and secondly, a focused study on the mobility patterns and trends in the Northern frontier counties of Kenya. The 2019 census contained questions on reasons for migrating, which could provide useful insights into the observed county migration patterns. While possible factors could be cultural, but additional research may yield further insights. Mobility patterns within the border communities will illuminate the dynamics of international migration, which is characteristics of such areas, and the nature of flows across the two borders. Additionally, the aspect of return migration, also requires further research.

A notable challenge of the study was the inadequacy of migration theory to map out the relationship between migration and inequality, especially when micro and macro factors are considered. The causal pathway remains unclear. Additionally, there may be reverse causation such that migration is changing patterns of inequality in both origin and destination areas. This aspect requires further research to clarify the causal pathways.

In terms of methodology, this study interrogated the migration and inequality nexus using the spatial unit as the level of analysis. Using the county as the unit of analysis resulted in the illumination of the spatial zones where migration intensity is high or low, or the variations of inequality occur. There is however limited information on why the variation occurs. To understand the drivers and impacts of inequality and migration, future research should focus on the household as the unit of analysis, including the unique intrahousehold inequalities that may improve the understanding of drivers of migration and inequality. Additionally, migration occurs within a social context, so a future study should consider the political, geographical, social, economic and other factors affecting migration and inequality in the respective regions. Such localized studies can improve the knowledge of how migration and inequality interphase. To improve knowledge on how migration and inequality interrelated,

there is need to consider the generational effects of migration on inequality, gender inequalities and migration, a qualitative study focusing on origin and receiving areas of migrants, especially in the high migration hotspot areas to identify drivers and impacts of migration on inequality. There may be great value in considering migrants and migrants households as the unit of analysis in future studies.

The study findings showed that the choice of inequality variables was limited as the regression analysis showed that the model could only explain 20 per cent of the variations between migration and inequality. In several studies, the determinants of economic inequality showed that beyond spatial factors, other important factors include government policy, the historical contexts of the regions as well as the population structure. The study model focused on only the migration process and inequality outcomes in the counties, largely ignoring the effect of household-based dynamics and migrant related factors, such as education, occupation of migrants. investigation of factors influencing the declining income inequality in regions with higher migration intensities in the country.

The analysis of migration history relied on estimates generated from lifetime migration data which has limitations enumerated in this study. Future research should consider the use of recent migration data to determine if the results of the analysis will be different.

Finally, the study identified the lack of a comprehensive panel data for migration analysis. While the census data was used in this analysis, it faces several challenges including the lag time between censuses, that would limit timely analysis. A recommendation for policy makers is to initiate a migration survey, that would enable analysis to be done at micro level – allowing for household and individual migrant characteristics to be tracked over time. This is a rallying call to support the push for a specialist migration survey to support future migration studies in the country.

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Table A.1: Lifetime Migrants by Age and County of Residence 1989-2009

County	1989			1999			2009		
	00-19	**20-34**	**35+**	**00-19**	**20-34**	**35+**	**00-19**	**20-34**	**35+**
Nairobi	27	51	23	25	50	24	24	50	26
Nyandarua	60	17	24	31	26	43	32	24	44
Nyeri	42	37	21	34	39	27	35	35	30
Kirinyaga	39	35	26	30	37	33	30	36	34
Muranga	45	32	23	36	36	27	47	25	28
Kiambu	33	44	23	30	44	25	28	45	27
Mombasa	31	46	23	26	49	24	26	48	26
Kwale	34	36	30	25	39	36	29	36	35
Kilifi	39	39	22	32	43	25	33	40	27
Tana River	42	35	23	40	30	30	38	31	31
Lamu	40	36	25	24	39	36	25	25	50
Taita Taveta	45	30	24	35	36	29	34	35	31
Marsabit	56	15	29	41	30	29	39	31	31
Isiolo	48	16	36	34	33	34	30	35	35
Meru	54	14	32	31	41	28	35	36	29
Tharaka Nithi	45	15	40	31	36	32	36	35	29
Embu	-	-	-	30	35	35	30	33	37
Kitui	69	11	20	37	31	32	37	30	33
Machakos	53	11	36	33	40	26	31	40	29
Makueni	-	-	-	27	28	45	25	27	48
Garissa	35	43	22	33	40	26	38	37	25
Wajir	37	41	21	33	39	28	7	88	5
Mandera	35	45	20	33	35	32	49	26	25
Siaya	48	26	26	50	26	24	45	30	25
Kisumu	39	38	23	37	37	26	35	39	26
Homa Bay	-	-	-	37	23	30	35	35	30
Migori	40	31	29	32	34	34	34	34	32
Kisii	-	-	-	33	40	27	35	39	26
Nyamira	-	-	-	32	37	31	49	25	26
Turkana	37	47	16	36	44	19	51	33	16
West Pokot	37	40	23	32	37	31	32	37	31
Samburu	42	35	24	37	37	26	34	41	25
Trans Nzoia	36	32	32	30	31	38	31	30	39
Uasin Gishu	33	37	31	29	37	34	29	39	33
Elgeyo Marakwet	42	28	30	35	37	27	35	37	28
Nandi	38	33	28	32	34	34	32	32	36
Baringo	41	35	24	37	36	26	34	37	29
Laikipia	42	34	25	32	32	37	26	30	44
Nakuru	36	35	30	20	42	38	27	37	36
Narok	40	31	29	32	34	33	32	35	33
Kajiado	34	40	26	30	43	28	29	45	27
Kericho	40	36	24	37	37	26	33	39	28
Bomet	-	-	-	37	29	35	52	27	21
Kakamega	55	27	17	38	32	30	36	32	33

Vihiga	-	-	-	45	34	21	42	31	27
Bungoma	42	34	24	36	34	29	37	33	30
Busia	50	28	22	40	33	27	58	22	20

(-) denotes no data because in 1989 the county was still part of an existing county, for example, Vihiga was part of Kakamega district.

Table A.2: Sex Ratios of Lifetime in Migrants, 1989

County	00-19 Years			20-34 Years			35+ Years		
	Males	Females	Sex Ratio	Males	Females	Sex Ratio	Males	Females	Sex Ratio
Nairobi	105647	130282	**81.1**	274782	174815	**157.2**	143070	56027	**255.4**
Nyandarua	15636	15335	**102.0**	13916	16578	**83.9**	20630	22618	**91.2**
Nyeri	9907	10386	**95.4**	9399	8542	**110.0**	5137	4799	**107.0**
Kirinyaga	5622	5451	**103.1**	5354	4381	**122.2**	3951	3322	**118.9**
Muranga	11595	11538	**100.5**	7949	8306	**95.7**	6247	5842	**106.9**
Kiambu	25169	28570	**88.1**	41352	30238	**136.8**	22790	13779	**165.4**
Mombasa	38220	41085	**93.0**	72093	45288	**159.2**	40893	18444	**221.7**
Kwale	6500	6665	**97.5**	7596	6635	**114.5**	6860	4985	**137.6**
Kilifi	7721	7975	**96.8**	8396	7130	**117.8**	5267	3687	**142.9**
Tana River	3786	3640	**104.0**	3604	2457	**146.7**	2542	1475	**172.3**
Lamu	3628	3226	**112.5**	3767	2382	**158.1**	2604	1665	**156.4**
Taita Taveta	7622	7632	**99.9**	5774	4420	**130.6**	5230	2923	**178.9**
Marsabit	2921	2693	**108.5**	857	652	**131.4**	1670	1252	**133.4**
Isiolo	3893	3795	**102.6**	1326	1189	**111.5**	3239	2477	**130.8**
Meru	5850	5876	**99.6**	1576	1577	**99.9**	3854	3056	**126.1**
Embu	5366	5695	**94.2**	1627	2111	**77.1**	4821	4892	**98.5**
Kitui	10318	10153	**101.6**	1360	1820	**74.7**	2867	3206	**89.4**
Machakos	18172	17419	**104.3**	4195	3463	**121.1**	6448	4442	**145.2**
Garissa	2339	2287	**102.3**	3309	2254	**146.8**	1828	1066	**171.5**
Wajir	1150	1013	**113.5**	1635	744	**219.8**	719	515	**139.6**
Mandera	748	674	**111.0**	1282	531	**241.4**	519	311	**166.9**
Siaya	444	538	**82.5**	124	401	**30.9**	119	409	**29.1**
Kisumu	1105	1391	**79.4**	1165	1324	**88.0**	716	770	**93.0**
Migori	701	762	**92.0**	340	776	**43.8**	384	681	**56.4**
Turkana	1473	1520	**96.9**	2602	1135	**229.3**	997	273	**365.2**
West Pokot	4536	4683	**96.9**	5833	3931	**148.4**	3502	2190	**159.9**
Samburu	1878	1836	**102.3**	1914	1201	**159.4**	1321	793	**166.6**
Trans Nzoia	25945	27275	**95.1**	22253	24190	**92.0**	24452	22299	**109.7**
Uasin Gishu	28842	31419	**91.8**	36840	31215	**118.0**	31906	25132	**127.0**
Elgeyo Marakwet	24173	22812	**106.0**	15530	15965	**97.3**	17319	16466	**105.2**
Nandi	16127	16621	**97.0**	14794	13550	**109.2**	14043	10291	**136.5**
Baringo	4835	4997	**96.8**	4823	3521	**137.0**	3496	2122	**164.8**
Laikipia	3936	4272	**92.1**	3595	3066	**117.3**	2866	1970	**145.5**
Nakuru	65995	68351	**96.6**	67826	63386	**107.0**	61325	50338	**121.8**
Narok	19363	19748	**98.1**	14060	15876	**88.6**	15262	13570	**112.5**
Kajiado	11507	11481	**100.2**	15277	11203	**136.4**	10211	7207	**141.7**
Kericho	23082	23451	**98.4**	24290	17741	**136.9**	19872	7966	**249.5**

Kakamega	24262	26720	**90.8**	10355	14860	**69.7**	7185	8816	**81.5**
Bungoma	12689	14705	**86.3**	9250	12518	**73.9**	7387	8338	**88.6**
Busia	10429	11820	**88.2**	4630	8076	**57.3**	3510	6198	**56.6**

Table A.3: Sex Ratio of In Migrants, 1999

County	00-19 Years M	00-19 Years F	Sex Ratio	20-34 Years M	20-34 Years F	Sex Ratio	35+ Years M	35+ Years F	Sex Ratio
Nairobi	145324	192999	**75.3**	372777	298999	**124.7**	214836	112505	**191.0**
Nyandarua	23215	22803	**101.8**	15626	22159	**70.5**	29297	35032	**83.6**
Nyeri	11377	11767	**96.7**	11964	14945	**80.1**	8074	10459	**77.2**
Kirinyaga	5590	5626	**99.4**	6098	7647	**79.7**	5565	6455	**86.2**
Muranga	8558	9062	**94.4**	6305	11327	**55.7**	4509	8715	**51.7**
Kiambu	44180	52810	**83.7**	72089	69778	**103.3**	44529	36040	**123.6**
Mombasa	41578	47500	**87.5**	97562	70239	**138.9**	54168	28260	**191.7**
Kwale	5068	5395	**93.9**	8295	8007	**103.6**	8460	6653	**127.2**
Kilifi	9883	10917	**90.5**	14583	13400	**108.8**	9327	7106	**131.3**
Tana River	4678	4354	**107.4**	3619	3273	**110.6**	3912	2946	**132.8**
Lamu	2215	2237	**99.0**	4017	3132	**128.3**	3706	2874	**128.9**
Taita Taveta	6249	6689	**93.4**	7173	5873	**122.1**	6348	4306	**147.4**
Marsabit	2176	2072	**105.0**	1734	1442	**120.2**	1639	1359	**120.6**
Isiolo	3255	3488	**93.3**	3213	3398	**94.6**	3888	2859	**136.0**
Meru	6393	6554	**97.5**	9325	7926	**117.7**	6576	5037	**130.6**
Tharaka Nithi	1789	1928	**92.8**	1516	2790	**54.3**	1610	2203	**73.1**
Embu	6293	6688	**94.1**	6665	8733	**76.3**	7258	8356	**86.9**
Kitui	4879	4823	**101.2**	3100	5130	**60.4**	3857	4694	**82.2**
Machakos	11758	12067	**97.4**	13884	15210	**91.3**	9759	9181	**106.3**
Makueni	7282	7049	**103.3**	6080	8901	**68.3**	10501	13126	**80.0**
Garissa	2272	2192	**103.6**	3270	2150	**152.1**	2069	1434	**144.3**
Wajir	656	626	**104.8**	906	584	**155.1**	614	473	**129.8**
Mandera	567	477	**118.9**	761	352	**216.2**	594	430	**138.1**
Siaya	22266	24389	**91.3**	7020	17075	**41.1**	5049	17697	**28.5**
Kisumu	32370	40357	**80.2**	29976	41502	**72.2**	20254	30619	**66.1**
Homa Bay	17716	24584	**72.1**	7495	30592	**24.5**	6357	28605	**22.2**
Migori	13315	19378	**68.7**	10243	24202	**42.3**	10809	23166	**46.7**
Kisii	6008	7613	**78.9**	4544	12061	**37.7**	2685	8283	**32.4**
Nyamira	5856	6741	**86.9**	4194	10405	**40.3**	4243	7726	**54.9**
Turkana	1727	1909	**90.5**	2765	1692	**163.4**	1454	504	**288.5**
West Pokot	2105	2363	**89.1**	2314	2839	**81.5**	2377	1981	**120.0**
Samburu	1312	1390	**94.4**	1411	1319	**107.0**	1159	798	**145.2**
Trans Nzoia	27210	28647	**95.0**	26008	31275	**83.2**	34779	35433	**98.2**
Uasin Gishu	30998	35312	**87.8**	42536	42910	**99.1**	41567	35669	**116.5**
Elgeyo Marakwet	4036	4547	**88.8**	4045	5127	**78.9**	3504	3204	**109.4**
Nandi	16025	17808	**90.0**	16723	18293	**91.4**	18674	16866	**110.7**
Baringo	5304	6114	**86.8**	5113	6059	**84.4**	4572	3502	**130.6**

County	00-19 Years M	00-19 Years F	Sex Ratio	20-34 Years M	20-34 Years F	Sex Ratio	35+ Years M	35+ Years F	Sex Ratio
Laikipia	22333	22135	**100.9**	20665	23866	**86.6**	25693	25802	**99.6**
Nakuru	64256	69578	**92.4**	84728	83795	**101.1**	79001	71405	**110.6**
Narok	14839	15192	**97.7**	15245	16515	**92.3**	15683	15161	**103.4**
Kajiado	15876	17647	**90.0**	25515	22883	**111.5**	17515	13850	**126.5**
Kericho	25219	26760	**94.2**	28197	24249	**116.3**	22783	13980	**163.0**
Bomet	3478	4488	**77.5**	1965	4224	**46.5**	3119	4355	**71.6**
Kakamega	25158	29822	**84.4**	15178	30948	**49.0**	16527	27775	**59.5**
Vihiga	5010	6264	**80.0**	2233	6213	**35.9**	1208	4142	**29.2**
Bungoma	13798	16573	**83.3**	10233	18152	**56.4**	10199	14331	**71.2**
Busia	10351	12426	**83.3**	6531	12404	**52.7**	5390	10103	**53.4**

Table A.4: Sex Ratio of In Migrants, 2009

	0-19 Years M	0-19 Years F	Sex Ratio	20-34 Years M	20-34 Years F	Sex Ratio	35+ Years M	35+ Years F	Sex Ratio
Nairobi	222075	267384	**83.1**	510986	519033	**98.4**	326394	208774	**156.3**
Nyandarua	32511	31422	**103.5**	20034	28149	**71.2**	38464	49249	**78.1**
Nyeri	18774	19591	**95.8**	17406	21185	**82.2**	13318	19436	**68.5**
Kirinyaga	7968	8478	**94.0**	8367	11452	**73.1**	8235	10295	**80.0**
Muranga	54945	53628	**102.5**	25836	32246	**80.1**	28221	36775	**76.7**
Kiambu	67700	77632	**87.2**	108599	120418	**90.2**	72071	63857	**112.9**
Mombasa	63700	72275	**88.1**	125544	121047	**103.7**	84415	50560	**167.0**
Kwale	8702	9484	**91.8**	10743	12282	**87.5**	12135	9764	**124.3**
Kilifi	18567	19754	**94.0**	21499	25062	**85.8**	16745	13957	**120.0**
Tana River	5422	5360	**101.2**	4659	4030	**115.6**	4892	3859	**126.8**
Lamu	4970	4574	**108.7**	5708	3991	**143.0**	6897	11967	**57.6**
Taita Taveta	7575	7546	**100.4**	8231	7570	**108.7**	8262	5928	**139.4**
Marsabit	3458	3073	**112.5**	3258	1960	**166.2**	2926	2257	**129.6**
Isiolo	4248	4266	**99.6**	5114	5014	**102.0**	5550	4405	**126.0**
Meru	13975	14330	**97.5**	15229	13919	**109.4**	12456	10612	**117.4**
Tharaka Nithi	3800	4057	**93.7**	2796	4833	**57.9**	2406	3844	**62.6**
Embu	8280	8708	**95.1**	8083	10534	**76.7**	9437	11515	**82.0**
Kitui	6950	6894	**100.8**	4475	6904	**64.8**	5463	7232	**75.5**
Machakos	24919	25592	**97.4**	31312	33497	**93.5**	23261	22835	**101.9**
Makueni	11103	10938	**101.5**	10060	14563	**69.1**	18933	24106	**78.5**
Garissa	5760	5111	**112.7**	6142	4660	**131.8**	4312	2824	**152.7**
Wajir	2484	1950	**127.4**	2232	50054	**4.5**	1672	1007	**166.0**
Mandera	2941	2456	**119.7**	1723	1104	**156.1**	1542	1166	**132.2**
Siaya	24343	26497	**91.9**	11541	22049	**52.3**	7106	20802	**34.2**
Kisumu	38815	46678	**83.2**	39529	56135	**70.4**	23483	39828	**59.0**
Homa Bay	21681	27514	**78.8**	11719	38757	**30.2**	7588	34940	**21.7**
Migori	19593	24710	**79.3**	13304	31320	**42.5**	12603	29075	**43.3**
Kisii	9829	11353	**86.6**	7475	16509	**45.3**	4396	11396	**38.6**
Nyamira	37804	38764	**97.5**	14703	24497	**60.0**	17255	23434	**73.6**
Turkana	5063	5148	**98.3**	3656	2975	**122.9**	2119	1163	**182.2**
West Pokot	2264	2642	**85.7**	2792	3011	**92.7**	2591	2233	**116.0**
Samburu	2033	2083	**97.6**	2817	2086	**135.0**	1876	1144	**164.0**
Trans Nzoia	37027	38917	**95.1**	32702	41249	**79.3**	45852	49445	**92.7**
Uasin Gishu	45858	51347	**89.3**	63408	68974	**91.9**	57226	53525	**106.9**
Elgeyo Marakwet	5146	5895	**87.3**	5120	6485	**79.0**	4450	4377	**101.7**
Nandi	18726	20502	**91.3**	17275	22112	**78.1**	21928	23074	**95.0**
Baringo	5573	5875	**94.9**	5792	6828	**84.8**	4942	4710	**104.9**
Laikipia	20764	20872	**99.5**	21722	25609	**84.8**	33779	36272	**93.1**

	0-19 Years M	0-19 Years F	Sex Ratio	20-34 Years M	20-34 Years F	Sex Ratio	35+ Years M	35+ Years F	Sex Ratio
Nakuru	78746	82596	**95.3**	105021	111508	**94.2**	107723	103763	**103.8**
Narok	23408	23298	**100.5**	25463	25629	**99.4**	25229	21863	**115.4**
Kajiado	34689	38647	**89.8**	55856	58136	**96.1**	38762	29425	**131.7**
Kericho	15441	16917	**91.3**	17974	19578	**91.8**	15060	12374	**121.7**
Bomet	46171	46149	**100.0**	22394	25283	**88.6**	19344	18135	**106.7**
Kakamega	34739	39811	**87.3**	22094	43977	**50.2**	22700	45135	**50.3**
Vihiga	9027	10524	**85.8**	3740	10531	**35.5**	3222	9340	**34.5**
Bungoma	22346	25613	**87.2**	15223	27673	**55.0**	15237	24512	**62.2**
Busia	106714	108363	**98.5**	34588	46869	**73.8**	33058	42890	**77.1**

Table A.5: Sex Ratios of Out Migrants, 1989

County	0-19 Years M	0-219 Years F	Sex Ratio	20-34 Years M	20-34 Years F	Sex Ratio	35+ Years M	35+ Years F	Sex Ratio
Nairobi	52528	51312	**102.4**	9419	10047	**93.7**	3920	4087	**95.9**
Nyandarua	13419	13582	**98.8**	9010	10545	**85.4**	4856	5545	**87.6**
Nyeri	24858	26134	**95.1**	39644	37125	**106.8**	38053	31854	**119.5**
Kirinyaga	5835	6691	**87.2**	8766	8013	**109.4**	7017	4527	**155.0**
Muranga	23951	26036	**92.0**	52115	41644	**125.1**	48166	36893	**130.6**
Kiambu	37363	38004	**98.3**	44506	45871	**97.0**	47384	45871	**103.3**
Mombasa	19273	18929	**101.8**	6418	6084	**105.5**	3855	3158	**122.1**
Kwale	3641	10229	**35.6**	13450	10283	**130.8**	11760	10567	**111.3**
Kilifi	9375	8888	**105.5**	15816	6962	**227.2**	9383	4353	**215.6**
Tana River	1885	1790	**105.3**	1884	1252	**150.5**	1092	649	**168.3**
Lamu	1895	1990	**95.2**	1714	1680	**102.0**	2135	1830	**116.7**
Taita Taveta	6100	6867	**88.8**	10556	9285	**113.7**	6080	3270	**185.9**
Marsabit	2087	2067	**101.0**	3290	1667	**197.4**	2765	1524	**181.4**
Isiolo	2417	2513	**96.2**	2273	1945	**116.9**	2193	1531	**143.2**
Meru	8357	9102	**91.8**	16202	10548	**153.6**	9095	4413	**206.1**
Embu	5537	6119	**90.5**	9159	6436	**142.3**	4874	2712	**179.7**
Kitui	14829	14044	**105.6**	29501	15253	**193.4**	18245	7200	**253.4**
Machakos	26241	28710	**91.4**	64348	41562	**154.8**	41292	20858	**198.0**
Garissa	2445	2369	**103.2**	1569	1074	**146.1**	1136	760	**149.5**
Wajir	3705	3523	**105.2**	2620	2212	**118.4**	3127	2305	**135.7**
Mandera	2134	1991	**107.2**	2246	1730	**129.8**	2076	1449	**143.3**
Siaya	30082	37134	**81.0**	45210	35489	**127.4**	28745	12494	**230.1**
Kisumu	23939	27847	**86.0**	29581	22087	**133.9**	17611	6909	**254.9**
Migori	911	938	**97.1**	421	851	**49.5**	428	717	**59.7**
Turkana	7185	5716	**125.7**	7299	5117	**142.6**	7903	5362	**147.4**
West Pokot	2157	2171	**99.4**	1583	1331	**118.9**	1044	795	**131.3**
Samburu	3147	3004	**104.8**	3201	2182	**146.7**	3188	2656	**120.0**
Trans Nzoia	10761	12270	**87.7**	8230	8278	**99.4**	4216	3921	**107.5**
Uasin Gishu	12719	13029	**97.6**	7763	8059	**96.3**	4765	4450	**107.1**
Elgeyo Marakwet	5926	6125	**96.8**	4526	4177	**108.4**	3264	2894	**112.8**
Nandi	9835	10864	**90.5**	12220	12495	**97.8**	14306	14802	**96.6**
Baringo	7850	8080	**97.2**	7823	6940	**112.7**	5669	5302	**106.9**
Laikipia	3936	4272	**92.1**	3595	3066	**117.3**	2866	1970	**145.5**
Nakuru	65995	68351	**96.6**	67826	63386	**107.0**	61325	50338	**121.8**
Narok	19363	19748	**98.1**	14060	15876	**88.6**	15262	13570	**112.5**
Kajiado	11507	11481	**100.2**	15277	11203	**136.4**	10211	7207	**141.7**
Kericho	23082	23451	**98.4**	24290	17741	**136.9**	19872	7966	**249.5**

Kakamega	24262	26720	**90.8**	10355	14860	**69.7**	7185	8816	**81.5**
Bungoma	12689	14705	**86.3**	9250	12518	**73.9**	7387	8338	**88.6**
Busia	10429	11820	**88.2**	4630	8076	**57.3**	3510	6198	**56.6**

Table A.6: Sex Ratios of Out Migrants, 1999

County	00-19 Years			20-34 Years			35+ Years		
	M	F	Sex Ratio	M	F	Sex Ratio	M	F	Sex Ratio
Nairobi	57502	56827	**101.2**	20737	22784	**91.0**	8366	8656	**96.6**
Nyandarua	11395	13715	**83.1**	20204	23870	**84.6**	10200	10933	**93.3**
Nyeri	25095	28794	**87.2**	49078	55507	**88.4**	51891	49831	**104.1**
Kirinyaga	6161	8127	**75.8**	12561	16309	**77.0**	10155	9596	**105.8**
Muranga	28460	34817	**81.7**	63032	68354	**92.2**	60768	57217	**106.2**
Kiambu	31990	35718	**89.6**	49037	58679	**83.6**	57380	61491	**93.3**
Mombasa	20361	20735	**98.2**	10592	11537	**91.8**	6211	5554	**111.8**
Kwale	8738	9148	**95.5**	13702	10018	**136.8**	8498	5670	**149.9**
Kilifi	11297	13018	**86.8**	21040	13120	**160.4**	12722	6409	**198.5**
Tana River	2734	2787	**98.1**	3378	2426	**139.2**	2211	1433	**154.3**
Lamu	2056	2253	**91.3**	2109	2444	**86.3**	2554	2324	**109.9**
Taita Taveta	6383	7944	**80.3**	13086	14781	**88.5**	9000	6896	**130.5**
Marsabit	3308	3447	**96.0**	5916	3883	**152.4**	4228	2175	**194.4**
Isiolo	3286	3454	**95.1**	3521	3180	**110.7**	3083	2337	**131.9**
Meru	7687	9976	**77.1**	18333	17368	**105.6**	10961	6949	**157.7**
Tharaka Nithi	4282	5548	**77.2**	11398	10823	**105.3**	5687	4277	**133.0**
Embu	6803	8400	**81.0**	15328	15464	**99.1**	8717	6781	**128.6**
Kitui	22402	22797	**98.3**	47579	32347	**147.1**	26188	13064	**200.5**
Machakos	27330	33638	**81.2**	60406	57472	**105.1**	49929	39301	**127.0**
Makueni	14575	17184	**84.8**	36997	30704	**120.5**	20014	12152	**164.7**
Garissa	6073	5862	**103.6**	4773	4161	**114.7**	3118	2490	**125.2**
Wajir	4481	4531	**98.9**	4439	4044	**109.8**	4763	3822	**124.6**
Mandera	3432	3603	**95.3**	4635	3683	**125.8**	3636	2751	**132.2**
Siaya	37068	50484	**73.4**	55991	61449	**91.1**	38768	37500	**103.4**
Kisumu	34065	44435	**76.7**	39091	48817	**80.1**	25340	34988	**72.4**
Homa Bay	24964	35910	**69.5**	35176	42041	**83.7**	21500	29638	**72.5**
Migori	12496	18293	**68.3**	14453	20382	**70.9**	7700	12259	**62.8**
Kisii	25718	27459	**93.7**	39002	33689	**115.8**	26186	18697	**140.1**
Nyamira	13087	14743	**88.8**	21194	22141	**95.7**	14248	13404	**106.3**
Turkana	6666	5410	**123.2**	9313	6193	**150.4**	10258	7100	**144.5**
West Pokot	4096	4294	**95.4**	3160	3141	**100.6**	1981	1729	**114.6**
Samburu	4356	4091	**106.5**	5262	3997	**131.6**	4634	3857	**120.1**
Trans Nzoia	14973	17665	**84.8**	14774	17189	**86.0**	7569	7336	**103.2**
Uasin Gishu	17209	18681	**92.1**	12782	15810	**80.8**	8432	8877	**95.0**
Elgeyo Marakwet	7440	8096	**91.9**	9604	10406	**92.3**	9939	10042	**99.0**
Nandi	10998	12695	**86.6**	14609	17286	**84.5**	18890	19897	**94.9**
Baringo	9228	9318	**99.0**	12124	11445	**105.9**	10105	9871	**102.4**

Laikipia	8015	8703	**92.1**	8319	8948	**93.0**	5207	5269	**98.8**
Nakuru	31070	33837	**91.8**	28851	31801	**90.7**	18669	19689	**94.8**
Narok	11003	11259	**97.7**	6977	6999	**99.7**	4274	3544	**120.6**
Kajiado	4774	4950	**96.4**	5398	4881	**110.6**	2994	2474	**121.0**
Kericho	17188	18860	**91.1**	17925	19597	**91.5**	19475	19060	**102.2**
Bomet	15310	16056	**95.4**	17915	16577	**108.1**	16410	14981	**109.5**
Kakamega	44046	55253	**79.7**	69942	73061	**95.7**	52118	44126	**118.1**
Vihiga	30965	35578	**87.0**	51637	51026	**101.2**	46851	39402	**118.9**
Bungoma	23186	29526	**78.5**	33283	37621	**88.5**	27167	26274	**103.4**
Busia	17429	23575	**73.9**	25241	25755	**98.0**	15922	13071	**121.8**

Table A.7: Sex Ratios of Out Migrants, 2009

County	00-20 Years			20-34 Years			35+ Years		
	M	F	Sex Ratio	M	F	Sex Ratio	M	F	**Sex Ratio**
Nairobi	96403	96403	**100.0**	35860	40403	**88.8**	18483	18567	**99.5**
Nyandarua	26818	31232	**85.9**	58001	69945	**82.9**	46461	43334	**107.2**
Nyeri	29189	32462	**89.9**	61606	75038	**82.1**	76079	78848	**96.5**
Kirinyaga	7767	9299	**83.5**	17940	25499	**70.4**	15935	18295	**87.1**
Muranga	33268	38949	**85.4**	83077	78821	**105.4**	84467	86648	**97.5**
Kiambu	55002	58708	**93.7**	63436	81516	**77.8**	74341	84538	**87.9**
Mombasa	28936	29480	**98.2**	17572	20055	**87.6**	11674	11044	**105.7**
Kwale	17121	18534	**92.4**	21841	20961	**104.2**	15779	11230	**140.5**
Kilifi	22137	24363	**90.9**	30127	27218	**110.7**	22396	14633	**153.1**
Tana River	6320	6359	**99.4**	5787	5516	**104.9**	4584	4211	**108.9**
Lamu	3505	3946	**88.8**	3680	4768	**77.2**	4060	4165	**97.5**
Taita Taveta	9136	10336	**88.4**	15569	20296	**76.7**	13373	13195	**101.3**
Marsabit	6406	6308	**101.6**	8898	6791	**131.0**	6739	3749	**179.8**
Isiolo	6905	6861	**100.6**	5850	5831	**100.3**	4561	3761	**121.3**
Meru	8772	10881	**80.6**	18908	24608	**76.8**	13116	11405	**115.0**
Tharaka Nithi	10937	13359	**81.9**	22801	30403	**75.0**	15337	14374	**106.7**
Embu	9269	11349	**81.7**	22387	29632	**75.6**	14837	13890	**106.8**
Kitui	35574	37481	**94.9**	64738	60320	**107.3**	42834	24058	**178.0**
Machakos	36193	42397	**85.4**	78406	90449	**86.7**	72269	63002	**114.7**
Makueni	24920	28477	**87.5**	59114	63772	**92.7**	36104	27187	**132.8**
Garissa	9044	8637	**104.7**	8932	54501	**16.4**	6075	4791	**126.8**
Wajir	6930	6273	**110.5**	6615	5988	**110.5**	6145	5009	**122.7**
Mandera	8939	8790	**101.7**	9405	9808	**95.9**	6931	7640	**90.7**
Siaya	46024	57314	**80.3**	71346	81962	**87.0**	46127	49940	**92.4**
Kisumu	38301	46806	**81.8**	45303	60792	**74.5**	27690	41179	**67.2**
Homa Bay	33600	43587	**77.1**	44914	57740	**77.8**	26378	38644	**68.3**
Migori	20914	25774	**81.1**	22933	32035	**71.6**	12050	18140	**66.4**
Kisii	73290	76206	**96.2**	82486	78200	**105.5**	57319	45472	**126.1**
Nyamira	16331	18213	**89.7**	27436	30728	**89.3**	17639	17969	**98.2**
Turkana	6188	5694	**108.7**	7653	5238	**146.1**	10156	6742	**150.6**
West Pokot	6717	6800	**98.8**	5393	5574	**96.8**	4536	3953	**114.7**
Samburu	5855	5795	**101.0**	6689	5428	**123.2**	6627	5890	**112.5**
Trans Nzoia	20976	23770	**88.2**	22583	29026	**77.8**	14570	14555	**100.1**
Uasin Gishu	26162	28312	**92.4**	19939	25161	**79.2**	14766	16642	**88.7**

Elgeyo Marakwet	11860	12950	**91.6**	12686	15995	**79.3**	14573	15148	**96.2**
Nandi	17969	20057	**89.6**	20374	25786	**79.0**	24840	26483	**93.8**
Baringo	15120	16094	**93.9**	18205	20175	**90.2**	17301	15979	**108.3**
Laikipia	14286	15004	**95.2**	16475	19095	**86.3**	10571	10632	**99.4**
Nakuru	40842	44161	**92.5**	43204	50551	**85.5**	27336	27115	**100.8**
Narok	11015	11681	**94.3**	10754	11747	**91.5**	6524	5803	**112.4**
Kajiado	8117	8119	**100.0**	9082	7831	**116.0**	5883	4865	**120.9**
Kericho	58542	58328	**100.4**	37847	41684	**90.8**	36769	36612	**100.4**
Bomet	15350	16415	**93.5**	19801	20663	**95.8**	20009	19155	**104.5**
Kakamega	56650	67127	**84.4**	83987	97533	**86.1**	65596	62149	**105.5**
Vihiga	43419	49107	**88.4**	64596	76354	**84.6**	64920	65968	**98.4**
Bungoma	124803	130090	**95.9**	67661	81161	**83.4**	63584	66951	**95.0**
Busia	23942	28516	**84.0**	32228	35603	**90.5**	22101	21526	**102.7**

Table A.8: Per Cent Outmigrants in Counties, 1999-2009

County	1999			2009		
	00-19	20-34	35+	00-19	20-34	35+
Nairobi	65	25	10	63	25	12
Nyandarua	28	49	23	21	46	33
Nyeri	21	40	39	17	39	44
Kirinyaga	23	46	31	18	46	36
Muranga	20	42	38	18	40	42
Kiambu	23	37	40	27	35	38
Mombasa	55	30	16	49	32	19
Kwale	32	43	25	34	41	26
Kilifi	31	44	25	33	41	26
Tana River	37	39	24	39	34	27
Lamu	31	33	36	31	35	34
Taita Taveta	25	48	27	24	44	32
Marsabit	29	43	28	33	40	27
Isiolo	36	36	29	41	35	25
Meru	25	50	25	22	50	28
Tharaka Nithi	23	53	24	23	50	28
Embu	25	50	25	20	51	28
Kitui	27	49	24	28	47	25
Machakos	23	44	33	21	44	35
Makueni	24	51	24	22	51	26
Garissa	45	34	21	19	69	12
Wajir	35	33	33	36	34	30
Mandera	32	38	29	34	37	28
Siaya	31	42	27	29	43	27
Kisumu	35	39	27	33	41	26
Homa Bay	32	41	27	32	42	27
Migori	36	41	23	35	42	23
Kisii	31	43	26	36	39	25
Nyamira	28	44	28	27	45	28
Turkana	27	35	39	29	31	41
West Pokot	46	34	20	41	33	26
Samburu	32	35	32	32	33	34
Trans Nzoia	41	40	19	36	41	23
Uasin Gishu	44	35	21	42	34	24
Elgeyo Marakwet	28	36	36	30	34	36
Nandi	25	34	41	28	34	38
Baringo	30	38	32	30	37	32
Laikipia	38	39	24	34	41	25

County	1999			2009		
	00-19	20-34	35+	00-19	20-34	35+
Nakuru	40	37	23	36	40	23
Narok	51	32	18	39	39	21
Kajiado	38	40	21	37	39	24
Kericho	32	33	34	43	29	27
Bomet	32	35	32	29	36	35
Kakamega	29	42	28	29	42	29
Vihiga	26	34	21	25	39	36
Bungoma	30	34	29	48	28	24
Busia	40	33	27	32	41	27

Table A.9: Revised Weighted Net Migration Rates for Persons below 20 years of age, 1999 and 2009

RNMI Per 1000	2009	1999
Net in migration		
1000+	Bomet, Kisii	Nairobi
100-999	Nairobi, Busia, Nakuru, Mombasa, Nyamira, Uasin Gishu, Kajiado, Trans Nzoia, Kisumu, Laikipia	Mombasa
20-99	Narok, Muranga, Nandi, Migori, Kiambu, Homa Bay	Laikipia, Uasin Gishu, Trans Nzoia, Kajiado, Kiambu, Nyandarua, Kericho, Nakuru
1-19	Machakos, Meru, Embu, Nyandarua, Isiolo, Turkana, Lamu, Garissa	Nandi, Narok, Tana River, Migori,
0		Lamu, Isiolo
Net outmigration		
-1 to -19	Kirinyaga, Marsabit, Wajir, West Pokot, Mandera, Tana River, Samburu, Elgeyo Marakwet, Taita Taveta, Kilifi, Baringo, Tharaka Nithi, Makueni, Kwale, Siaya, Kitui, Nyeri	Mandera, Wajir, Meru, West Pokot, Marsabit, Embu, Tharaka Nithi, Taita Taveta, Kirinyaga, Turkana, Kilifi, Samburu, Garissa, Kwale, Baringo, Elgeyo Marakwet, Makueni, Nyamira, Kitui, Bomet, Kisumu, Kisii, Bungoma, Busia
-20+	Kakamega, Vihiga, Kericho, Bungoma	Machakos, Homa Bay, Nyeri, Muranga, Vihiga, Kakamega, Siaya

Table A.10: Revised Weighted Net Migration Rates for Persons aged 20-34 years, 1999 and 2009

RNMI Per 1000	2009	1999
Net in migration		
1000+	Nairobi	Nairobi
100-999	Vihiga	Mombasa
20-99	Nyandarua, Bungoma,	Laikipia, Uasin Gishu, Trans Nzoia, Kajiado, Kiambu, Nyandarua, Kericho, Nakuru
0-19	Kiambu	Nandi, Narok, Tana River, Migori, Lamu
0	Samburu, Mandera, Nyamira, West Pokot, Kisii, Baringo, Garissa, Laikipia, Homa Bay, Bomet, Narok, Kericho, Siaya, Migori, Kisumu, Kajiado, Nandi	Isiolo
Net outmigration		
-1 to -19	Trans Nzoia, Uasin Gishu, Kirinyaga, Nakuru, Nyeri, Kakamega, Turkana, Elgeyo Marakwet, Wajir	Mandera, Wajir, Meru, West Pokot, Marsabit, Embu, Tharaka Nithi, Taita Taveta, Kirinyaga, Turkana, Kilifi, Samburu, Garissa, Kwale, Baringo, Elgeyo Marakwet, Makueni, Nyamira, Kitui
-20 to -99	Marsabit, Kitui, Tana River, Isiolo, Taita Taveta, Tharaka Nithi, Muranga	Bomet, Kisumu, Kisii, Bungoma, Busia, Machakos, Homa Bay, Nyeri, Muranga, Vihiga, Kakamega, Siaya
-100 to -999	Embu, Makueni, Kwale, Lamu, Meru, Busia, Kilifi, Machakos	
-1000+	Mombasa	

Table A.11: Matching Districts to Counties

REGION	COUNTY	DISTRICTS
NAIROBI	Nairobi	Nairobi West, Nairobi East, Nairobi North, Westlands
CENTRAL	Nyandarua	Nyandarua North, Nyandarua South
	Nyeri	Nyeri North, Nyeri South
	Kirinyaga	Kirinyaga
	Murang'a	Murang'a North, Murang'a South, Gatanga
	Kiambu	Kiambu, Kikuyu, Limuru, Lari, Githunguri, Thika East, Thika West, Ruiru, Gatundu
COAST	Mombasa	Mombasa, Kilindini
	Kwale	Kwale, Kinango, Msambweni
	Kilifi	Kilifi, Kaloleni, Malindi
	Tana River	Tana River, Tana Delta
	Lamu	Lamu
	Taita Taveta	Taita, Taveta
EASTERN	Marsabit	Marsabit, Chalbi, Laisamis, Moyale
	Isiolo	Isiolo, Garba Tulla
	Meru	Imenti Central, Imenti North, Imenti South, Igembe, Tigania
	Tharaka Nithi	Meru South, Maara, Tharaka
	Embu	Embu, Mbeere
	Kitui	Kitui North, Kitui South, Mwingi, Kyuso
	Machakos	Machakos, Mwala, Yatta, Kangundo
	Makueni	Makueni, Mbooni, Kibwezi, Nzaui
NORTHEASTERN	Garissa	Garissa, Lagdera, Fafi, Ijara
	Wajir	Wajir South, Wajir North, Wajir East, Wajir West
	Mandera	Mandera Central, Mandera East, Mandera West
NYANZA S	Siaya	Siaya, Bondo, Rarieda
	Kisumu	Kisumu East. Kisumu West, Nyando
	Homa Bay	Homa Bay, Suba, Rachuonyo
	Migori	Migori, Rongo, Kuria West, Kuria East
	Kisii	Kisii Central. Kisii South, Masaba, Gucha, Gucha South
	Nyamira	Nyamira, Manga, Borabu
RIFT VALLEY	Turkana	Turkana Central, Turkana North, Turkana South
	West Pokot	West Pokot, Pokot North, Pokot Central
	Samburu	Samburu Central, Samburu East, Samburu North
	Trans Nzoia	Trans Nzoia West, Trans Nzoia East, Kwanza

REGION	COUNTY	DISTRICTS
	Baringo	Baringo, Baringo North, East Pokot, Koibatek
	Uasin Gishu	Eldoret West, Eldoret East, Wareng
	Elgeyo Marakwet	Marakwet, Keiyo
	Nandi	Nandi North, Nandi Central, Nandi East, Nandi South, Tinderet
	Laikipia	Laikipia North, Laikipia East, Laikipia West
	Nakuru	Nakuru, Nakuru North, Naivasha, Molo
	Narok	Narok North, Narok South, Trans Mara
	Kajiado	Kajiado Central, Loitoktok, Kajiado North
	Kericho	Kericho, Kipkelion, Buret
	Bomet	Sotik, Bomet
WESTERN	Kakamega	Kakamega Central, Kakamega South, Kakamega North, Kakamega East, Lugari, Mumias, Butere
	Vihiga	Vihiga, Emuhaya, Hamisi
	Bungoma	Bungoma South, Bungoma North, Bungoma East, Bungoma West, Mt Elgon
	Busia	Busia, Teso North, Samia, Bunyala, Teso South