

**CHINESE BUILT TRANSPORT INFRASTRUCTURE AND DEMOGRAPHIC
CHANGES IN NAIROBI METROPOLITAN REGION (2009-2019): A CASE STUDY OF
NAIROBI SOUTHERN BYPASS, KENYA**

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DECLARATION

This research project is my original work and has not been submitted for award of a degree in any other University.

Sign 

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

Sign 

Date.....

Dr .Oscar Otele, PhD

DEDICATION

I dedicate this project to my family for their support and encouragement during the entire period of my education.

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ABSTRACT

This study sought to establish the linkage between the completion of the Chinese built transport infrastructure and the demographic changes of the community living within the covered areas of the Nairobi Metropolitan region. The study adopted the modernization theory, and used longitudinal research design to establish the linkage between the completion of the transport infrastructure (Nairobi Southern Bypass) and the changes in the age structure as well as the economic status of the communities living along the covered areas. It also used both primary and secondary data. The research established that a possible linkage existed between the completion of the Nairobi Southern Bypass and the demographic changes. Specifically, the study found a possible linkage between the completion of the Nairobi Southern Bypass and the age structure as well as the economic status of the local community. The study concludes that there is linkage that exists between the Chinese built transport infrastructure and the demographic variables such as the changing age structure and economic status of a community. The study therefore, recommends that policymakers should consider demographic variables such as age structure and economic status while making decisions on the best transport infrastructure investment for achieving economic growth.

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ABBREVIATIONS AND ACRONYMS

CARI	-	China Africa Research Institute
CRBC	-	Chinese Road and Bridge Corporation
EIZ	-	Eastern Industrial Zones
GOK	-	Government of Kenya
ICT	-	Information Communication Technology
IDS	-	Institute for Development Studies
IMF	-	International Monetary Fund
KARA	-	Kenya Alliance of Residence Association
KeNHA	-	Kenya National Highway Authority
KIPPRA	-	Kenya Institute of Public Policy and Research Association
KNBS	-	Kenya National Bureau of Statistics
KNPHC	-	Kenya National Population and Housing Census
KRB	-	Kenya Roads Board
KUR	-	Kenya Uganda Railway
KURA	-	Kenya Urban Roads Authority
KURRA	-	Kenya Rural Roads Authority
LDCs	-	Least Developed Countries
MOF	-	Ministry of Finance
MoFA	-	Ministry of Foreign Affairs
MONM	-	Ministry of Nairobi Metropolitan
MoR&T	-	Ministry of Roads and Transport
NARC	-	National Rainbow Coalition
NCA	-	National Construction Authority
NESC	-	National Economic and Social Council
NMC	-	Nairobi Municipal Council
ODA	-	Official Development Assistance
OECD	-	Organization for Economic Co-Operation and Development
PRSP	-	Poverty Reduction Strategy Paper
R & D	-	Research and Development
RAP	-	Road Annuity Program

SGR	-	Standard Gauge Railways
SPSS	-	Statistical Package for Social Sciences
SSA	-	Sub-Saharan Africa
UN	-	United Nations
UNCTAD	-	United Nations Conference on Trade and Development
UNDP	-	United Nations Development Programme
W.B	-	World Bank
ZTE	-	Zing Telecommunication Equipment

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Major cities around the world such as Pretoria in South Africa, Cairo in Egypt, Luanda in Angola, Khartoum in the Republic of Sudan and Abuja in Nigeria among others and specifically those in the developing countries grapple with serious challenges arising from dilapidated and poor transport infrastructure services. Cities in the Third World particularly find it extremely hard to accommodate the growing demand for urban growing needs and essentials such as proper sanitation as well as transport infrastructure needs that come with the pressure of rapid demographic changes. These problems are often compounded by the rapid growth of urban development and the slow rate of response to such changes (Cameron, 2005).

The National Research Council (2003) argues that generally the world is urbanizing rapidly and is estimating a scenario where the entire growth in population by 2030 will occur in urban dwellings and centers. Accordingly, the Third World cities will be most affected by the rapid surge in human population. Dasgupta (2005) argue that the concentration of globalization is slowly moving from the Northern latitudes of the developed countries to Southern parts of the Third World cities. The pressure exerted by the rural –urban migration in the developing world and which is now perceived to be a universal phenomenon is worsening the already bad situation. This growth pattern has seen an extreme pressure exerted on the limited infrastructure system in the developing world.

Rapid globalization and urbanization is often experienced in the developing world where the infrastructural system doesn't have the capacity to cope with the growing nature of urban population dynamics. Such challenges are attributed to poor investment and maintenance of limited existing infrastructure system in the developing countries. Cameron (2005) states that urban growth in the urban areas of South Asia and Sub Saharan Africa bred large dwellings commonly referred to as metropolitan areas. The population surge and growth of metropolitan areas present unique challenges which are multidimensional and multilayered in nature. These challenges are attributed to financial, capacity, polarization as well as poor local governance structure.

India has witnessed a dramatic shift in her pattern of urbanization and metropolisation since 1991 with urban growth rapidly concentrating within fewer but larger urban dwellings (Singh, 2005). This has been attributed to the serious and comprehensive economic reforms adopted by the national government.

Over the last century, China has made significant impact in the various transport infrastructure projects and metropolitan reorganization in many parts of Sub Saharan Africa countries such as Kenya. Chinese investments in the transport infrastructure and metropolitan reorganization have targeted key sectors of transport economy which includes the construction of key bypasses that have greatly transformed the Nairobi metropolitan region. Kenya has immensely benefitted from the Chinese concessional loans and credit facilities advanced towards construction of some of the mega transport infrastructure projects including the Nairobi Southern Bypass and the Thika Superhighway. Onjala (2008) argues that the Chinese government having established its largest embassy in Nairobi has gone ahead to seize the opportunity to finance the construction of major transport infrastructure links in Kenya. They have used this in return to support their own economic interest through engaging their own construction firms to carry out the construction works around the country.

Transport infrastructure development in the Sub-Saharan Africa and Kenya in particular has undergone a rapid transformation in the last few decades recording a sustainable development and economic growth a scenario which has become a concern for policy makers around the world. The pivotal role that transport infrastructure plays in the transition of economies from middle to high income level economies cannot be underestimated hence it is credited for significant gains globally. Transport infrastructure being a complex system connects urban centers and human activities around the world supporting the socio economic and political systems within the metropolitan and population dynamics. According to IMF (2015), studies have tested and proven the positive relationship between the quality transport infrastructure and economy gains that comes with it. According to OECD (2014), this impact varies in different stages of a country's economic development. In low income economies for instance, transport infrastructure has facilitated the provision and access to services (UN, 2015). Eddington (2006) argues that typically the economic impact of transport infrastructure is more transformative at the

lower levels and advanced stages of economic development. During urbanization, transport infrastructure development generates both inter and intra connection in the cities around the globe. (Rodriguez, 2016).

China and Africa have enjoyed a long outstanding economic relationship since the Mao administration. According to Heng (2010), China advanced approximately over 2 billion US dollars from 1956 to 1977 in financial aid to African countries. Out of this, transport infrastructure received a substantial amount of funding during that period. In the 1970s, China funded the construction of Tanzan railway which runs through Tanzania and Zambia. The Tanzan railway acted as a key transportation corridor to the African nations. As a result of reduced focus on oil and mining in Africa from 2013, China geared her foreign direct investment towards the development of transport infrastructure. This saw China fund the completion of 1046 kilometers of transport infrastructure by building 2233 kilometers of railways and 3530 kilometers of roads. This was based on China –Africa Economic and Trade. (IOSC, 2013).

1.2 Statement of the Problem

Kenya like many African countries continue to experience demographic changes that revolve around changes in age structure and changes in economic status of her population .The population surge across the various age structures affects the level of economic engagement among the population in the country. The youth population bulge in particular has been witnessed over the decade with the youth age structure (19-24) and (25-35) growing rapidly. This has been captured in the report documented in the 2009 and 2019 Population and Housing Census. The ideal situation is that the growth of the youth population should provide a demographic dividend to the country in terms of participation in economic activities since majority of the population in this age structure are generally productive and can easily engage in labor force.

In reality however, demographic changes are influenced by variables such as migration which includes rural-urban and urban –rural migration. Availability of high quality transport infrastructure often influences migration decisions .Many people especially the youth of age structures (19-24) and adults (25-35) comprise the majority of the population affected by

migration to urban centers such as the Nairobi Metropolitan which is the urban area that attract the highest number of migrants looking for job opportunities. The last decade has witnessed migration from the rural areas of Kenya to Nairobi city where many opportunities have been created because of improved infrastructural facilities such as the Nairobi Southern Bypass. Many industries and businesses have developed along the completed Nairobi Southern Bypass hence creating job opportunities for the people. Rural-urban migration has also been on the upward trend over the last decade due to the opening up of the rural areas brought about by the completion of major infrastructural projects such as the Nairobi Southern Bypass that extended and covered parts of the rural areas outside the Nairobi Metropolitan region. This has seen some population within the elderly age structure (60 and above) migrate to the rural areas where life is relatively affordable in terms of housing and basic necessities.

Since 2000s, China has supported the construction of a number of infrastructure projects in Kenya mainly in transport and energy sectors. In transport sector, the Chinese government through its Export and Import (EXIM) Bank financed the construction of Nairobi-Thika Highway which is considered the pride of Kenya. The eight lane 50 km which covers an area that lies within the Nairobi Metropolitan was constructed at a cost of US Dollar 360 million with China through its Export and Import (EXIM) Bank financing to the tune of US Dollar 100 million .The Nairobi-Thika Highway which is located within the Nairobi Metropolitan region is the most dynamic locomotion of economic growth accounting for nearly 30 per cent of the national Gross Domestic Product (GDP). The Chinese government through a public private partnership (PPP) between the China Road and Bridge Construction (CRBC) and Kenya National Highway Authority (KeNHA) also financed the construction of the Nairobi –Mombasa Road at a cost of US Dollar 62 billion.

The completion of these infrastructure projects have improved economic activities along the areas covered and across population of different age structures with significant human settlements portraying urban characteristics. Many businesses have been opened up along the bypass including some light manufacturing industries. There has also been a significant expansion of informal sector jobs thereby absorbing majority of the youth in the labor force. This has seen an improved economic status among the majority of the population and households

living along the areas covered by the completion of these infrastructure projects. What is yet to be articulated in the literature is the connection between the completed infrastructure projects and the demographic changes. This study attempts to fill this gap by highlighting the many instances of successes where the Chinese financed infrastructure projects in Africa have economically positively impacted on the livelihoods of the people living in the areas covered and across many age structures.

1.3 Research Questions

- i. Is there a linkage between the completion of the Nairobi Southern Bypass and the population age structure of the local community, if so how is it manifested?
- ii. Is there a linkage between the completion of the Nairobi Southern Bypass and the economic status of the local community, if so how is it manifested?

1.4 Objective of the Study

To establish the linkage between the Chinese Built transport infrastructure and demographic changes in the local community.

Specific objectives include:

- i. To establish the linkage between the completion of the Nairobi Southern bypass and the population age structure of the local community.
- ii. To establish the linkage between the completion of the Nairobi Southern bypass and economic status of the local community.

1.5 Justification of the Study

This section presents both policy and academic justification.

1.5.1 Academic Justification

This study research will make valuable contribution to the body of literature on performance evaluation of Chinese funded transport infrastructure projects in Nairobi Metropolitan. The knowledge derived will be used by scholars and researchers in the fields of political economy, political science and International Relations. Scholars will find this study critical in

understanding skills transfer and Technical Corporation offered by the Chinese firms to their Kenyan counterparts in workplaces and the technical training workshops.

Notable studies include Couch and Fraser (2003) who conducted a study on the Africa's urban infrastructure decline and metropolitan reorganization. They emphasized in their findings that investment in transport infrastructure through urban regeneration could strategically become a strategic tool for economic development and poverty reduction in Africa. Other studies included Yunnan and Laundry (2016) who did a comparative study to establish the sustainable development impacts of the two Wind Farms in Ethiopia with special focus on the China financed Adama Wind Farm. The study revealed that Wind Farm Project performed well in terms of delivering sustainable development benefits such as employment creation and technology transfer. Mattlin and Nojonen (2015) also conducted a study to establish conditions attached to the Chinese lending to African countries especially towards the construction of transport infrastructure projects. Tang and Shen (2019) on the other hand conducted a study to establish whether China-financed transport infrastructure projects improve the metropolitanisation of the Sub-Saharan African region. The study focused on the impacts of the of the Ghana's Bui Dam as its case study. The primary data for the study provided comprehensive information about amounts of investments, amounts of total electricity installed and the financier.

1.5.2 Policy Justification

Data obtained from the study on transport infrastructure development will be essential in providing a basis for policy formulation and regulation of the proposed and future transport infrastructure projects in Kenya and the Nairobi Metropolitan region. Key among the policies includes the environmental and the resettlement policies which affect the livelihoods of those affected by the construction of infrastructure projects such as roads.

The re-emergence of China-Kenya relations in the 21st century is a critical and important developmental issue that deserves serious analysis in order to understand how it shapes foreign bilateral relations of Africa with China. The study will further help understand the role of transport infrastructure development as a foreign policy tool.

The study findings will serve as foundations upon which future comparative research on metropolitan change and policies will be adopted towards enhancing such changes particularly in cities and countries in the midst of poverty experienced in such countries. The data will further provide a basis for formulating policies and regulations to ensure proper functioning of already constructed and proposed transport infrastructure projects.

1.6 Scope and Limitations of the Study

The study focused on Chinese Built Transport Infrastructure and metropolitan reorganization between the periods 2009 to 2019 with specific focus on the case study of Nairobi Southern Bypass. The study focused on the periods between 2009 and 2019 to capture the period before and after the completion of Nairobi Southern bypass since the construction started in 2012 and was completed in 2016. This also enabled the study to utilize the 2009 and 2019 Housing and Population Census to obtain statistical data for the changing age structure and economic status before and after the completion of the Nairobi Southern bypass.

On the limitations of the study, much time and high cost implication was experienced in collecting the data. In order to deal with this challenge, sufficient preparation was done so as to allow respondents enough time to respond to the questionnaires. Questionnaires were made as precise as possible to avoid ambiguity which could result to time wastage. Enough budgets were allocated for the study to deal with challenges of cost implications.

1.7 Literature Review

This section will review the literature on the Chinese Built transport infrastructure and metropolitan reorganization with specific focus on the case of the Nairobi Southern bypass.

1.7.1 Global Perspective on Chinese Built Transport Infrastructure and Demographic Variables

Christopher and Govind (2015) conducted a comparative study to examine the process of transformation and evolution of metropolitan reorganization in the cities of India and Africa. They incorporated three variables in the study namely: political, financial and social motivation in their study. Qualitative data was collected and used with the aim of explaining observations

empirically about the phenomena under investigation and how to utilize such observations to build study theory for analysis and comparison. The study findings revealed that infrastructure quality is not the sole motivator for metropolitan reorganization. The study noted that political goals or motivations are equally important and accompany each reorganization effort documented. They argue that due to dire need infrastructure systems in the cities of the Third World countries and the demand for more comparative urban research, there is little effort to compare and document how infrastructure deficit is used in the metropolitan reorganization. This study therefore, aims to fill an important shortcoming in urban scholarship which is the absence of comparative and contrasting analysis across the sub Saharan region.

Gopakumar (2013) did a study on the urbanization and metropolitan reorganization in Chennai and Bengaluru in India. Chennai and Bengaluru cities are metropolitan areas that also act as important reform centers in India. Both cities experienced rapid population surge and serious shortage of critical urban services. The two cities were found to have been strong proponents of market liberalization economic growth and hence the study argued that comparing the two cities controls for macroeconomic imperatives could be seen to be critical in independently driving the metropolitan change. Governments of both cities embarked on solving issues of infrastructure development and economic growth as a result of population growth combined. The study concluded that social pressures significantly contributed to Bengaluru's metropolitan reorganization and urbanization. Due to Bengaluru's global rise and the migration of many English speaking middle class Indians to the city combined with international consumerism and a growth in real estate development fueled by the combination of business and government have since created a constituency that sees metropolitan reorganization and associated infrastructure systems as means to a global Bengaluru city.

Amina (2016) did a study on the planning, coordination and implementation of Jerusalem Light Railway (JLR) with specific focus on the routing, naming and security regimes which also formed part of controversies of the railway planning. The contentiousness was based on the political infrastructure and the politics of infrastructure with reference to the construction of the city of Jerusalem which became a major debate of the urban planning. According to this study, the debate on the politics of infrastructure itself sets out debate on important features of cities in

conflict highlighting how urban infrastructure adds to political contestation and how identifications are manifested. The study concluded that planning, coordinating and implementing infrastructure took place against the background of certain political agenda and ideologies during the construction of the Jerusalem Light Train (JLT). The study further concluded that Jerusalem Rail Train is the outcome of politics of infrastructure as a site of political contestation.

The European Environmental Agency (EEA, 2002) conducted a study to evaluate urban hierarchy of the Czech Republic, Hungarian and Polish systems. They used the databases of the populations from 1950 to 2002 produced by the statistical office of the Czech Republic, the Central statistical office of Hungary and the central statistical office of Poland. The threshold of 10,000 inhabitants per square kilometer was chosen to lead the relevant and appropriate results for the three countries under study. The study results revealed that the concentration of activities led to extreme inequalities between capital cities and the rest of the urban system in the three countries. The study revealed that metropolitisation in Central Europe since contributed to rise in the predominance of the capital cities. The study concludes that the role of metropolitisation in orientating the spatial dynamics of urban systems and growth of cities has been crucial in the process of globalization.

1.7.2 African Perspectives on Chinese Built Transport Infrastructure and Demographic Variables

Couch and Fraser (2003) conducted a study on the Africa's urban infrastructure decline and demographic variables such as economic status. They emphasized in their findings that investment in transport infrastructure through urban regeneration could strategically become a strategic tool for economic development and poverty reduction in Africa hence uplifting economic status of the population. Collier (2016) also did a comparative study and established that African countries should pay attention to urban regeneration hence prioritize the same in its local policy formulation through incorporating critical and significant solutions. Corkin and Burke (2008) did a study to establish the motives behind Chinese investment in transport infrastructure development in Africa. They used a case study of 1976 when a railway was completed in Zambia. In their findings, they stated that ideological motives were the dominant

factors behind the transport infrastructure investment. The study found that as a result of this China and Africa established a long lasting relationship that saw growth of trade between the two increased by 700%. This eventually necessitated the establishment of the forum for African and Chinese Cooperation in 2000.

Tang and Shen (2019) conducted a study to establish whether China-financed transport infrastructure projects improve the economic status of the Sub-Saharan African region. The study focused on the impacts of the of the Ghana's Bui Dam as its case study. The primary data for the study provided comprehensive information about amounts of investments, amounts of total electricity installed and the financier. China role in transport infrastructure financing has become very significant in Africa. The study, however noted that most research on the impact of China-financed transport infrastructure focused on the resettlement of the local communities while only a few investigated the potential socio-economic and political impacts of China financed transport infrastructure projects might have brought to the Sub Saharan Africa region. The study employed the use of qualitative literature review and quantitative analysis.

Mattlin and Nojonen (2015) conducted a study to establish conditions attached to the Chinese lending to African countries especially towards the construction of transport infrastructure projects. The study focused on five African countries namely Nigeria, Congo, Angola, Sudan and Zambia. The study found that while focusing on African countries, China interest is on the Africa's natural resources hence they would exchange transport infrastructure financing in for access to the natural resources in Africa. The Chinese financing for the completion of the Ghana's Bui dam project in 2017 and the Atuabi Gas pipeline project in 2014 were solely in exchange for the export sales of cocoa beans and oil respectively to Chinese firms hence infrastructure for resource loans. The study concluded that Chinese financing and lending to Africa is not necessarily condition free but comprises conditions not similar to those of the Western development agencies.

Wasike (2000) did a study on the transport policies affecting infrastructure within the Nairobi Metropolitan region. Accordingly, he states that the Kenyan government adopted public policies on transport infrastructure which are found on Sessional Papers and the Development Plans

generated over the years. The study however, noted that often lack of credible statistical data impedes precise evaluation of the status of the road network in many African countries such as Kenya. Earthcare Services Ltd (2017) did a study on the environmental and social impact of the Nairobi Southern Bypass that connects Mombasa Road at Ole Sereni and ends at the intersection with the Nairobi-Nakuru Highway in Kikuyu town. The consultant employed a participatory approach that entailed both field study and public participation. The study identified the environmental and social issues that are likely to be significant. The study employed both desk review and field study.

1.7.3 China Completed Infrastructure Projects and Demographic Variables

Hopkins (2019) conducted a study using China-Africa Loan Database and the Demographic Health Survey (DHS) Program Database to estimate the impact of the China financed Bui Dam in Ghana .A two difference to difference model was used to identify change of livelihood and the level of access to electricity and electrical appliances among over 29,000 local households receiving electricity transmitted from the Bui Dam. The study found that after completion of the Bui Dam, the likelihood of the households living in the treatment region where the Dam was built and having access to electricity increased by 4 per cent. The study further found that the urban households witnessed an average 14.5 per cent increase in the likelihood of accessing electricity.

SAIS (2016) did a study to investigate the developmental impacts of the Chinese funded Eastern Industrial Zone (EIZ) in Ethiopia. The study focused on the employees work experience, age structures, training with and learning from resident companies. The study adopted a cross-sector analysis of local workers experiences where a total of 204 local workers across the 16 resident Chinese companies were surveyed. The study concluded by arguing for concrete and targeted policy implementation by the Ethiopian government to enforce skills transfer by foreign investors, building of linkage between companies and local training institutions and organizing zone wide skills sessions. The study found that despite the early difficulties experienced, the Eastern Industrial Zones (EIZ) managed to grow and attract more investors from different parts of China and also around the world.

Yunnan and Laundry (2016) did a comparative study to establish the sustainable development impacts of the two Wind Farms in Ethiopia with special focus on the China financed Adama Wind Farm. The study revealed that Wind Farm Project performed well in terms of delivering sustainable development benefits such as employment creation and technology transfer. A similar study was conducted to establish the Chinese involvement in the Cameroon Hydropower sector. The study discovered that foreign investment and expertise in hydropower holds potential for Cameroon energy supply and securing the county's broader economic development.

1.7.4 Research Gaps in the Literature Review

Notable transport infrastructure such as the Standard Gauge Railways commonly known as SGR and the Nairobi Southern Bypass attracted both criticism and praises in equal measures. The critical voices doubted the impact of such projects on the China-Africa relations with regard to economic growth and development. By analyzing the first hand data and some supplementary data, the critiques concluded that the Chinese Road and Bridge Cooperation (CRBC) being the contractor made certain decisions based on the interest of the Chinese government, a claim that was not supported by any evidence. These two projects and other transport infrastructure developments projects in the region have instead generated positive economic impact in the country and the region.

Lack of policies for donor financed projects in Africa, Asia and Latin America has been attributed to the failure of the political environment of these countries. Controversies around project costs, land acquisitions, compensation local procurement and employment are common issues that are never captured by the project and policy makers in Sub Saharan Africa. The study of SGR and the Nairobi Southern bypass among other transport infrastructure projects in Kenya have shed light on the Socio political environment to be given due consideration while undertaking projects of such magnitude in the region. Kenya has considerably succeeded in solving issues around socio-political environment.

Evidently, the literature reveals that foreign aid for infrastructure development affects the recipient countries economic growth. Unlike China, when other donors introduced such aid with conditionalities, many African countries suffered the consequences that came with such

conditionalities. In the long term however, some of those conditionalities benefitted some of those countries. Conditions such as trade liberalizations of the money markets immensely benefitted some African countries. Most of the previous studies never emphasized on the repercussions of aid conditionalities on a country's socio economic growth and development. This study therefore, aims to contribute towards the debate on foreign aid conditionalities in relation to economic growth and development.

1.8 Modernization Theory

The study was guided by the modernization theory.

1.8.1 Modernization Theory

Modernization theory emerged in the era of Enlightenment with the firm belief that technological progress would confer on humanity a greater control over nature. The modernization theory is used to explain the process of modernization within societies. It refers to the model of progressive transition from a pre modern to a modern society. This theory originated from the ideas of German sociologist Max Weber (1864-1920) which provided the basis for the modernization paradigm developed by Talcott Parsons (1902-1974). Antonio de Condorcet (1765-1804) was among the first philosophers to be associated with linking the technological innovation and cultural control by arguing that technological advances and economic growth would inevitably bring changes in peoples moral values. Adam Smith (1776) and Karl Marx (1818-1883) propagated competing models of modernization with Smith advocating a capitalist version and Marx advocating communism .Both ideologies were committed to economic growth ,social progress and modernization and they both brought broader mass participation in politics (Moore,1966).

W.W. Rostow (1960) in his version of the “Stages of Economic Growth” argued that progress must pass through five stages and for the underdeveloped countries in particular, the critical stages were the second, the transition stage, the third stage and the takeoff into self-sustaining growth stage. Rostow argued that the external intervention could propel a country from the second to the third stage and once such a country reaches maturity, it could have a larger energized middle class.

1.8.2 Application of the Modernization Theory to this Study

As argued by the proponents of modernization theory, the need for greater interaction between the developed and developing countries is of paramount importance in realizing economic development especially in the developing countries. Developing countries such as Kenya have continued to gain from high level technical and financial assistance from China towards financing her transport infrastructure projects including the construction of the Nairobi Southern bypass. The interaction between the two countries has essentially resulted to economic gains for Kenya through the transformation of her transport infrastructure to the international standards hence improving the economic status of her population living along the Nairobi Southern bypass and other bypasses financed by the Chinese government. The technical assistance provided by the Chinese has enabled Kenya to move her transport infrastructure programs from the transitional stage to the modern stage of development. Kenya has by extension benefitted from the technological transfers offered by the Chinese government for the modernization of her transport infrastructure programs.

Modernization theory attempts to identify the demographic and social variables that contribute to both the economic and social development of a population. This theory stresses not only the process of change among the population but also the response to that change. For instance, the modernization theory explains the impact of the transport infrastructure project on the population across the various age structure of the population in terms of household changes such as settlement decisions. This would include migration decisions of the population to the areas urbanized by the modernization of the transport infrastructure projects. This theory would further link modernization to the process of industrialization which entails the need to update the traditional methods in transport, communication and production.

The modernization theory prominence and widely used in political science literature and other social sciences makes it highly applicable in this study. This theory therefore, contains the important ingredients within the discipline of political science that is crucial for the comprehension and analysis within the development and underdevelopment discourses. This theory will further help understand the scholar's arguments on the various stages of economic growth as espoused by W.W .Rostow in his version of the "Stages of Economic Growth" and

how countries undergo transition to various levels of economic growth. Further literature of modernization theory is also discussed within the evolutionary model of societies from the traditional to modern as argued by Talcott Parsons.

Modernization theory explains how transport infrastructure becomes increasingly sophisticated through the process of modernization making the population to become more urban and mobile. Simultaneously, with the sophistication of transport infrastructure facilities, the level of economic and social life of the population increases and intensifies due to expansion and accessibility of investment opportunities, progress in technological progress and economic mobility and growth.

Many African countries including Ethiopia, Tanzania, and Democratic Republic of Congo among others have had their transport infrastructure facilities modernized through financing from their traditional economic partners and multilateral institutions (NEPAD/OECD,2011).The Chinese government through her large scale firms has over the years engaged in Kenya's transport infrastructure modernization. This has been done through the Chinese concessional loans and grants towards the construction and modernization of the transport infrastructure projects such as the Nairobi Southern bypass to the global standards as outlined in the Kenya Metro 2030 policy document.

Modernization theory does not exhaustively describe the continuous interaction and technological transfer from the Chinese to African states such as Kenya It is important to note however, that China and Africa enjoy mutual economic relationship and technological transfers which are essential for the modernization of Africa's various sectors of economic growth such as transport infrastructure. Africa economic growth before the 2000 launch of the Forum on China –Africa Cooperation remained close to global growth rates. After 2000, the continent's growth rate maintained a 2 percentage point lead over world growth rate. This has been witnessed particularly in areas of Infrastructure development where the relationship between Africa and China has thrived tremendously.

1.9 Definition and Operationalization of Key Concepts

1.9.1 Chinese Built Transport Infrastructure

Zhang (2009) defines Chinese Built Transport Infrastructure as the connectivity of large scale infrastructure investment that began in the 1990s and which includes the roads, railways, ports, airports and airways. This has been one of the major engines of the Chinese economy which has seen China significantly improve within and between China and other countries.

In this study, Chinese Built Transport infrastructure is defined as the large scale transport infrastructure projects financed and developed by the Chinese government in Kenya and have stimulated economic growth within the Nairobi metropolitan in particular and country in general. The Nairobi Southern bypass is an example of the Chinese Built Infrastructure project.

1.9.2 Demographic Changes

Demographic is broadly viewed as the study of social and economic characteristics of populations (Shryock & Siegel, 1976, P.1). These characteristics include sex, age, marital status, ethnic composition, family structure, educational attainment, labor force characteristics and patterns of health and morbidity. In the context of this study, demographic changes means changes in age structure and changes in economic status of the population settled along the Nairobi Southern Bypass.

1.10 Research Hypotheses

Hypothesis

Main Hypothesis

There is a linkage between Chinese Built transport infrastructure and demographic changes

Sub-Hypotheses

- i. There is a linkage between completion of the Nairobi Southern Bypass and age structure of the local community
- ii. There is a linkage between completion of the Nairobi Southern Bypass and economic status of the community.

1.11 Research Methodology

This research methodology section comprised the research design, data collection methods, target population, sampling technique, validity and reliability issues and method of analyzing the data collected and ethical considerations.

1.11.1 Methodology

The study utilized qualitative approaches to collect both primary and secondary data .Focus group discussion and key informant interviews were the tools used to collect primary data while secondary data was obtained from the statistical data on the population figures from the areas covered by the Nairobi Southern Bypass documented by the Kenya National Bureau of Statistics (KNBS) through the 2009 and 2019 Population and Housing Census.

The focus group discussion (FGD) and the key informant interviews were guided by the sampling techniques, criteria and sample size. Purposive sampling technique was used to select the three sub counties and sub locations for the purposes of triangulating the data and gaining depth through qualitative data. Local administrators, community residents and businessmen selected from the three sub counties via referral sampling participated in the key informant interviews done.

A sample size of 60 guided the selection of key informants. Using purposive and referral techniques ,the samples were drawn from knowledgeable scholars such as heads of departments of the Policy, Strategy and Compliance, Highway, Planning and Design, Road Asset and Corridor Management and Head of Development at the Ministry of Roads, Transport and Infrastructure Development, Kenya Institute for Policy Affairs, National Council of Population and Development ,Kenya National Bureau of Statistics, Expatriates from the Embassy of the People’s Republic of China, heads of Policy, Planning and Resources, Economic and Commercial offices, Economic and Business Affairs, Infrastructure Development Affairs, Budget and Planning Bureau, Office of the Global Partnerships and the Office of the Chief Economist. Due to the prevailing corona virus (COVID-19) situation in the country, technology was widely employed in conducting the interviews. This included zoom and phone interviews and where appropriate arrangements were made, personal interviews were conducted.

1.11.2 Research Design

This study employed a longitudinal research design which enabled thorough in depth analysis and examination of events and phenomena over a long period of time. Longitudinal research design was also chosen because of its suitability for understanding demographic trends and their drivers over a long period of time.

1.11.3 Data Collection Strategies

Both primary and secondary data were used in this study. Secondary data sources included relevant journals and publications on transport infrastructure projects and development. They included desk research from sources such as literature review comprising of an initial desk view of all written material on the subject and data from the Government of the People's Republic of China, Government of Kenya (GoK), Ministry of Roads and Transport, DATA (online) and various publications including economic survey and statistical abstract for various years from Kenya National Bureau of Statistics(KNBS),Kenya National Highway Authority (KeNHA), Kenya Urban Roads Authority(KURA) .

1.11.4 Target Population

The Kenya National Bureau of Statistics (KNBS) staff, the local administrators, businessmen and the locals living in the areas covered by the Nairobi Southern Bypass was the targeted population for the study.

1.11.5 Sampling Technique

This study employed the use of purposive sampling which involves the selection of a target group based on the knowledge and expertise of the individual in the area transport infrastructure.

1.11.6 Validity and Reliability Issues

The questionnaires designed for the study were subjected to both the face and content validity processes. All aspects or domains of the questionnaires covering the subject of interest were designed and covered in the questionnaires. Copies of the questionnaires were shared with the experts in the field of study to ascertain and confirm the appropriateness and adequacy of the

instruments and also to incorporate the suggestions of such experts with regard to the structuring of the questionnaires.

1.11.7 Data Analysis

The conclusion of the study was generated from the qualitative data. The data collected was structured and organized in line with the objectives and questions for ease of analysis.

1.11.8 Ethical Issues

Ethical issues were considered in two dimensions, that is, consent and confidentiality. Participants provided their informed consent before participating in the research interviews. A high level of confidentiality was observed when carrying out analysis by reporting the findings in anonymous way that did not allow individuals to be identified.

CHAPTER TWO

HISTORICAL AND CONTEXTUAL BACKGROUND OF DEMOGRAPHIC CHANGES IN NAIROBI METROPOLITAN

2.1 Introduction

This chapter presents a historical and contextual background of Nairobi Metropolitan. This background is critical in understanding the foundation and evolution of the organizational structures brought about by infrastructural development which has led to the entire reorganization of the Nairobi Metropolitan region to date. This chapter presents four main areas namely; the colonial foundation of Nairobi (1899-1992), establishment of Nairobi Metropolitan, administrative structure and settlement of the Nairobi Metropolitan region and the Infrastructure as the driver of Nairobi Metropolitan region.

2.2 The Colonial Foundations of Nairobi; 1899-1992

Historical background of Nairobi can be traced to the year 1899 when it acted as a point of interconnection during the British Imperial expansion. Nairobi acted as a stopover location during the construction of the Uganda railway which began in Mombasa all the way to Lake Victoria. As a result of the railway construction, the railway administrative functions were transferred from Mombasa to Nairobi which was considered convenient location for the colonial civil servants working for the British East African Protectorate. As a result, Nairobi city rapidly expanded to become a commercial and employment Centre attracting commercial and trading activities (United Nations World Urbanization Prospects, 2010). Nairobi is therefore, seen an embodiment of colonialism in the African continent city characterized with colonial traits that have defined its structural architecture and management styles since her transition to independence. It therefore, gained the status as a point of coordinating transportation activities within the region and thereafter a key administrative center (Achola, 2002). Original and official physical expansion of Nairobi which occurred in 1910 saw the administrative boundary expands from a mere 3.84 kilometer square in 1910 to 696 kilometer square. After 1910, other official expansion of Nairobi city occurred in 1921, 1926 and 1964 (Achola, 2015).

In 1900 there was the establishment local government and Nairobi was considered as the city hence it was first incorporated. The colonial administration divided the city into various zones

namely the Railway center, Indian bazaar, European business and administrative Centre, Railway Quarters, Washman estate, European Residential quarters and the Military Barracks which was based at the outskirts of the city. In 1907, Nairobi was named the regional capital as a result of its improved infrastructure system. This subsequently saw a rapid population surge in the capital reaching around 20,000 people in 1910 (Obudho et al, 2001).

The arrival of other nationalities such as the India and Pakistani communities who together with the Africans and British nationals settled within the colonial administration to assist in the construction of the railway also boosted Nairobi's population. The demographic pressure coupled with the economic challenges that emanated from the surrounding rural areas and towns exerted considerable pressure on the growth and expansion of Nairobi. Due to the rapid population growth of the city, the Municipal Council regulations governing the city of Nairobi were officially incorporated in 1900 which for the first time in the history of the county defined the boundaries of the emerging urban centers adjacent to Nairobi city. The Municipal council of Nairobi was then formed in 1919 with corporate rights thus making Nairobi a municipality. In 1948, a colonial city Master Plan for Nairobi was formed as an elaborate plan for the city. The plan outlined future roadmap for Nairobi's future development plans, demarcated land use for future expansion and extension of infrastructure networks. This plan was however, not fully adopted and instead a different functional concept was adopted to establish a contemporary city able to accommodate the demands of the growing number of Africans working and earning meager wages in the industries. The present structural plan of Nairobi therefore, significantly and greatly borrows from this plan. In March 1950, Nairobi gained the city status courtesy of the incorporation by the Royal Charter (Achola, 2002).

Between 1910 and 1950, there was influx of male African population in Nairobi. These African male citizens were based in Nairobi basically for the duration of work in the railway construction. The period was marked with lack of clear structured and systematic economic planning for the city and its metropolitan. The Africans working in the railway construction site gained skills and basic education while their Asian counterparts occupied intermediate positions in businesses. Soon after 1945, Nairobi's population was nearly 100,000 people which prompted a new structure planning scheme dubbed "Nairobi Master Plan for Colonial Capital". This was

further motivated by zoning which subsequently fostered socio spatial segregation both deliberately and inadvertently within the city (Medrad, 2010).

By 1963 when Kenya attained independence, the immigration laws were relaxed and this led to abrupt rise in the population growth of Nairobi. The new nation also inherited several challenges as well as existing infrastructure and resources. The rapid population growth experienced in the city at the time was a major challenge that demanded immediate action. The rise in population just before and after independence was occasioned by the increased number of the African population who migrated into the capital since the rules hindering the Africans access to the city by the colonial government were eased. Nairobi further experienced population surge at the rate of 12.2 percent between 1962 and 1969 hence further complicating the challenges of the city (Agwanda, 2004). In 1960s and 1970s, there was the policy of inheritance was encouraged with the aim of promoting the needs and welfare of the Africans in Nairobi unlike the Indian communities. Such policy included the cancellation of trading licenses which clearly affected thousands of Indians who predominantly occupied major business positions in the city. This eventually saw many Indians in their thousands migrate from Nairobi. Rapid immigration of people from the rest of the country to Nairobi city presented major socio economic and infrastructural challenges posing undue pressures in the city. Major Organizations such as the World Bank started advancing development funding towards solving such challenges in Nairobi (Lindsdale, 2012).

Due to a series of sectorial pressures in 1967, studies were commissioned to deal with specific consequences of high and rapid population growth Nairobi was experiencing at the time. In 1973, an ad hoc study group known as “The Nairobi Urban Study Group” was established to initiate the 1973 Nairobi Metropolitan Growth Strategy plan and subsequently offer guidance to the city’s physical expansion, growth and development to the year 2000 (Nairobi Urban Study Group,1973). Many recommendations of this Study Group however, were not implemented hence very little was achieved. Some of the notable recommendations included the devolving of the alternative service centers and also extension of the city boundary to the desired directions as and when required. However, some of these recommendations were not implemented.

Unlike during the colonial era when Nairobi was racially segregated, the City became both cosmopolitan and multicultural due to the migration. The population comprised of high number African population at approximately 95 percent, followed by the Asians at about 4 percent and Europeans at about 1 percent. The population shot rapidly over the years and in 1962 the population of Nairobi stood at 267,000 which then grew to 828,000 in 1979. In 1989, the population grew to 1.3 million people and 3.1 million in 2009 (UN Habitat, 2006). In 2009, Nairobi's population which stood at 3.1million accounted for 25 percent of the Kenya's urban population which was 12.4 million people and 8 percent of the country's entire population of 38.6 million people (Gok, 2009). The annual growth rate of Nairobi's population has varied over time. For instance, in 1906, Nairobi experienced approximately 17 percent of growth, 7 percent in 1944 and 6 percent in 1962. Between 1969 and 1989, Nairobi's population grew at an annual average rate of 5 percent (CIA, 2012).

A key growth strategy was constituted in 1973 by the Nairobi Metropolitan with the aim of drafting and developing guidelines and structures to guide on matters of employment, transportation and land use. This strategy's aim of devolving services and functions applied up to the year 2000 and later suffered lack of proper political strategy to manage development and implement general infrastructure systems. During this period, the city compiled large debts which saw a decline in service provision. Due to its rapid expansion and lack of adequate spatial planning scheme, the result was poor basic infrastructure and congestion within the city (Opiyo, 2011).

The restructuring policy adopted and carried out in 1990 resulted in huge public sector job losses and redundancies of high proportions hence making Nairobi's economy undergo difficult changes. Nairobi's formal economy stagnated at the expense of informal and unregulated activities which continued to flourish. Political instability and insecurity experienced in the neighboring countries of Somalia, Burundi and Rwanda led to the migration of refugees from these countries to Nairobi resulting in the declining standards of living and a rise in inequality as a result of pressure exerted on the limited social services. In 1993, a campaign dubbed "The Nairobi We Want" sought to deal with challenges affecting the quality of life and people's general welfare issues under the leadership of the city mayor with the intention of returning the

council to the forefront of the Urban governance index. This goal ultimately raised Nairobi's profile of leadership and strategy needs and a period of local reforms was initiated. The government agencies as well as the private sector bodies immensely supported the Nairobi city council since the 1990s especially in the infrastructural and key services delivery. The formation of partnerships such as Nairobi Central Business District Association was stimulated during this period in order to address the quality of life and general welfare issues of housing, poverty and investment revenue (Mitullah, 2003).

In the late 1990s, Nairobi city was faced with many challenges including poor service delivery. As a result of such challenges, Reform Program Initiative affiliated to the Local Government initiated several key policy and legal reforms which led to the introduction of Local Authorities and Transfer Fund (LATF) in 1999/2000. The authority's mandate was to equip local authorities such as Nairobi city with basic services (Owuor et al, 2006). Several initiatives have emerged to deal with the rapid population growth and size and also in response to the provision of critical urban services in the city. Some of the key initiatives include the Nairobi Central Business Association and the Neighborhood Association among others.

Prior to the NARC government taking over power, the construction of infrastructure network within the Nairobi metropolitan region and by extension the whole country was undertaken by the cowboy contractors who were associated with shoddy work that did not meet any international standards and design. Many road infrastructure systems within the metropolitan region were poorly done to the level of meeting the needs of the inhabitants of the metropolitan region. Such infrastructure systems could not demonstrate any technical or professional skills to ensure compliance. In order to end such shoddy work in the infrastructure sector, the government strengthened the regulatory body such as the National Construction Authority (NCA) to streamline, overhaul and generally regulate the construction of infrastructure network (NCA, 2015).

When the National Rainbow Coalition (NARC) Government came to power in December 2002 under President Mwai Kibaki, the overall economic recovery was the priority agenda for the Government. An Economic Recovery Programme was prepared to come up with the strategy on

how best to revive the ailing economy. Existing policy documents namely the Poverty Reduction Strategy Paper (PRSP), policy proposals of the NARC Manifesto as well as the Post-Election Action Plan were incorporated. All this was prepared under the Ministry of Planning and National Development. As a critical component of development, the government set out to modernize the status of Nairobi metropolitan as a first class city through the implementation of physical infrastructure programs. This was scheduled in Chapter five of the strategy paper as the government realized that infrastructure development was a key organ needed to realize economic growth. President Kibaki's aim of prioritizing infrastructural development was informed by the need to decongest transport in urban centers such as the Nairobi metropolitan region where transport congestion had resulted to time wastage critical for economic growth over the years. This resulted to the earmarking of construction of the Nairobi Southern bypass which would facilitate transport of commodities and people and ease congestion within the metropolitan region (Economic Recovery Strategy for Wealth and Employment Creation, 2003).

2.3 Establishment of Nairobi Metropolitan

The establishment of Nairobi Metropolitan can be traced back to the history of the general election held in the country in December 2007. This election ushered in one of the country's darkest periods in her history owing to its highly contested nature and the outcome which was marred with serious political crisis that took months to resolve. The outcome was the formation of the coalition arrangement of governing the country which brought together both sides of the competing political divide. The new government sought to marshal more public and private resources and to further gain political will so as to hasten social welfare and economic development of the Nairobi metropolitan region. The office of the prime minister alongside other cabinet portfolios was created as due to the new governing structure brought about by the formation of the coalition arrangement of government (Gok, 2008).

The presidential decree in December 2007 paved way for the formation of the Metropolitan Ministry responsible for Nairobi in 2008. The process of creating a framework strategy document known as the Nairobi Metro 2030 was subsequently established through the mandate bestowed on the newly created Ministry of Nairobi Metropolitan through a presidential circular No.1 of May 2008. The circular outlined among other things the duties and functions of various

government agencies. It further mandated the newly established Ministry of Nairobi Metropolitan to facilitate the development of an integrated spatial growth and development strategy which would lead to ultimate realization of a comprehensive strategic program for the provision of general social welfare and infrastructural services. Nairobi metro 2030 envisioned Nairobi to be in the league of global cities around the world, that is, a city that is highly attractive to investment in various sectors such as tourism and also highly competitive both regionally and globally. Information and Communication Technology (ICT) was singled out as critical to the city's realization of the vision hence it was deemed necessary to tap into the ICT sector. Accordingly, this was seen to enable the city become a center of business excellence and further realize improvements in regional transit and traffic management, infrastructure and environmental quality. To facilitate better management and coordination of the metropolitan region, the Ministry of Metropolitan Development expanded the Nairobi Metropolitan Region from 695 kilometers square to 32,000 kilometers square (GoK, 2008).

Since 2008, the national government engaged various stakeholders concerning the development of Nairobi and strategies of global and regional positioning. For instance, creation of the Ministry of Nairobi Metropolitan Development through the Nairobi Metro 2030 strategy as a means of committing the city to attracting investment and tourism thus making Nairobi one of the most preferred destination for visitors around the world. The strategy document indicated the city's intention of creating a specially created identity filtered through investment especially in the infrastructure development and essential services delivery (Nairobi Metro 2030). Nairobi is Kenya's capital and premier city inhabited by approximately 4.3 million people and occupying a land area of 695 square kilometers. The recently created Nairobi Metropolitan region occupies an area of 32,000 square kilometers with an estimated population of 10.4 million people (Ministry of Nairobi Metropolitan). The city lies between 1600 and 1850 meters above the sea level on the South Eastern edge of Kenya's agricultural heartland and its high elevation gives it a temperate climate despite its close proximity to the equator (United Nations Census, 2019).

Initially, the metropolitan vision contained in the Nairobi Metro 2030 at the time lacked statutory authority and by extension the governing structure for the region and hence it was incumbent on the national government ministry to facilitate regional cooperation and coordination. Initially, the

motivation for structuring the metropolitan area were driven by technical desires but later the political events following the year 2008 in Nairobi that eventually defined the structure and future character of the city (Gok, 2008).

The Nairobi Metro 2030 proposed that the Metropolitan region be constituted of fifteen independent local authorities. These include the City Council of Nairobi, Municipal Council of Kiambu, Municipal Council of Limuru, Municipal Council of Kajiado, Town council of Karuri, Town Council of Kikuyu, Town Council of Tala/Kangundo, county council of Masaku, County council of Olkejuado, County council of Thika. The National Economic and Social Council (NESC) prepared a cabinet memorandum which was then approved leading to eventual establishment of the Ministry of Nairobi Metropolitan Development. The ministry engaged the services of Kenya Institute of Public Policy and Research (KIPPRA) in consultation with and other stakeholders in the preparation of the Nairobi Metro 2030 Strategy. The Strategy formulation process adopted peered into the future development prospects of Nairobi by examining the anticipated factors associated with urbanization together with the internal and external challenges of the metropolitan region (Ministry of Nairobi Metropolitan Region, 2008).

2.4 Administrative Structure and Settlement of the Nairobi Metropolitan Region

Nairobi metropolitan region covers approximately 32,000 kilometers square which comprises of fifteen local authorities and the County council of Nairobi covering an area of approximately 684 kilometers square. The Nairobi metropolitan region therefore, consists of the county councils of Kiambu, Olkejuado, Masaku and Thika and the municipal councils of Ruiru, Kiambu, Limuru, Mavoko and Machakos and town councils of Karuri, Kikuyu, Kajiado and Kangundo (Ministry of Nairobi Metropolitan Development, 2009).

The population of Nairobi metropolitan comprises of inhabitants from different cultures around the globe unlike during the pre-independence period when a significant population comprised of the Europeans who worked as the colonial administrative officers as well as railway construction workers. The other part of the population comprised of people of Asian origin. A few Africans however, worked as casual laborers, domestic servants and shop attendants. After independence, the population of Nairobi grew rapidly owing to the rural urban migration. In the 1970s for

instance, the population of Africans in Nairobi metropolitan increased to about 83% while that of the Europeans dropped to 4% and subsequently the Asian population also dropped to 14%. Since then, there has been a remarkable growth rate of population in Nairobi as a result of development experienced in urban areas driven by various factors (Nevanlinna, 2006).

Nairobi metropolitan region contributes approximately 60 % of the country's GDP. The population growth experienced in the Nairobi metropolitan region is fueled by the migration of people from the rural areas to urban centers at an estimated rate of 9.8 % per year. Despite the obvious challenges of development that the Nairobi metropolitan faces just like other metropolians around the continent, it remained attractive to many migrants from different parts of the world since it provided a labor market for the region. This resulted to the ever rising population within the metropolitan hence exerting undue pressure on the social services. Between 1969 to 1999 for instance, the population of the metropolitan grew at a constant rate of 5 per cent (UN Habitat, 2008). The changing demographic pattern especially due to the bulging youth population poses a serious challenge to the realization of the metropolitan's full potential. Nairobi metropolitan is also home to some of the biggest informal settlements across the region and the continent at large. Some of the informal settlements include Kibra, Mathare, Kawangware, Mukuru which are characterized by poor housing, poor and inadequate social amenities, poor health conditions, environmental degradation and insecurity. These slums are among the largest slums in the Sub Saharan Africa and they continue to expand in terms of the population growth hence straining the few social amenities within the Nairobi metropolitan region.

Today, significant portion of Nairobi metropolitan urban areas is constituted of poorly planned structures which led to the development and sprouting of scattered settlements that has remained one of the most striking hurdles faced in the planning of the city. Over 180 informal settlements have been identified in Nairobi metropolitan region. It's also noted that about 55% of the total Kenya's urban population inhabit the poorly developed informal settlements which constitutes only about 5% of Nairobi metropolitan residential areas set aside for residential use. Residents inhabiting such informal settlements within the city continue to experience challenges related to the deterioration of public utilities, inadequate drainage systems and constrained infrastructural

facilities among others. Nairobi metropolitan urban center currently suffers serious inequalities in different categories of development such as infrastructure and housing with estimated 60% of its population living in about 6% of the total acreage in very poor conditions (GoK, 2008).

Nairobi Metropolitan area population is projected to grow to around 10.8 million people by 2022 and 14.3 million people by 2030. Subsequently, it's estimated that the population of Kenya will be at 61.5% which will predominantly be urban. The Nairobi metropolitan region will constitute the bulk of the projected population total. The expanding population of Nairobi constitutes a mix of multi-racial and multi ethnic culture which provides a mix of diversity in different sectors of the metropolitan area (Isocarp, 2010).

2.5 Infrastructure as the Driver of Nairobi Metropolitan Region

At inception, infrastructure development coupled with social welfare concerns were the key drivers behind the idea of Nairobi metropolitan region. The Nairobi Metro 2030 which was a key policy document clearly illustrated the goals upon which the infrastructural system as a key driver of the metropolitan region was anchored. For instance, deploying a world class infrastructure and utilities taking cognizance of the different needs of the population in the region was critical in driving the agenda of the metropolitan region. The need to fully equip the metropolitan region with the most effective, efficient and enabling transport system was to ensure that it operates within the world class standards hence enabling it to offer efficient and accessible economic prospects that meets the needs of the people of Nairobi metropolitan region. Developing an internally competitive and accommodative economy for the prosperity of Nairobi area was equally driven by the relationship between the quality of infrastructure development and social fragmentation. This would in turn ensure a safe and secure environment by creating a world class governance system that ultimately transform the quality of life of the inhabitants of Nairobi metropolitan (GoK, 2008).

The Nairobi Metropolitan Region is undoubtedly one of the fastest and rapidly expanding in the East African region. Like other metropolis around the continent and globally, infrastructure plays a pivotal role in addressing the challenges that come with dynamics of rapid population growth and physical expansion that has seen the metropolis extend to the adjacent towns. Due to its

unique dynamics and historical development of the infrastructural facilities that differ from others in the continent and around the world, the optimal design principles were thus initiated in order to address the various aspects of infrastructure within the Nairobi metropolis. This would equally enable easy decision making in terms of monitoring and managing the infrastructure as a driver of the metropolitan region (Ostrom, 2009).

The government and the civil society organizations played and continue to play critical role in the infrastructure growth within the Nairobi metropolitan region. They have demonstrated this through playing the roles of advocacy and increased investment in the infrastructure development within the metropolitan region. In 2016 for instance, the Kenya Alliance of Residents Association (KARA) conducted an analysis based on both quantitative and qualitative data to coordinate the creation of infrastructure based criteria report card for Nairobi metropolitan region. The report provided an overview of the citizens' participation and perception of infrastructure systems in the metropolis with the aim of improving it. Subsequently, the report clarified that the need to improve infrastructure to improve the livability and competitiveness were critically important in driving the original metropolitan plan (World Bank, 2008).

Increased involvement in infrastructure development within the Nairobi metropolitan both by the public and private sectors has significantly contributed to the effectiveness and efficiency of the infrastructure system within the region. Various critical entities and regulations have been put in place to manage the infrastructure system. The Roads Annuity Fund was established under the Public Finance Management in 2015 in order to ensure payment of levies is met by the appointed government agency towards the development and maintenance of road infrastructure under the Road Annuity Program (RAP). In 2016 the Government further established fifteen-year USD 300 million to fund infrastructure projects around the country. Significant amount was meant to fund infrastructure development within the Nairobi metropolitan region. The fund acted as a bridge between the private and public sectors essentially eliminating the barrier between the private and public participation in infrastructure development (KURA, 2016). As a driver of the metropolitan region, the treasury further increased the budgetary allocation towards infrastructure development. For instance, from 2012 to 2019 the government intensified efforts

in enhancing infrastructure development through a national budgetary allocation. During the 2018/2019 budgetary allocation to infrastructure, a total of kshs 418.8 billion which is 13.6% of the national budget was allocated to infrastructure development (National Treasury, 2019).

2.6 Conclusion

From the pre-colonial period to date, infrastructural development has been cited as a key pillar towards the realization of the country's economic growth. The establishment of the Nairobi city as a stop over by the colonial government during the construction of the Uganda Railway opened up the Nairobi metropolitan region at the initial stages of development. This subsequently paved way for the rapid growth of the metropolitan both in terms of the population and physical expansion. The establishment of the Nairobi Metropolitan by the NARC government was a milestone in the overall structuring of the Nairobi metropolitan region. The Metro 2030 vision which is a policy document envisaged the Nairobi city in the global league of the cities with internationally approved infrastructural systems that mirror the world class cities around the world. The infrastructural system in Nairobi metropolitan has influenced the administrative and settlement patterns. This has seen fifteen different municipal authorities spring up to comprise the Nairobi metropolitan region owing to their population growth, physical expansion and rising economic activities.

The prioritization of the infrastructural development by the NARC government which included the construction of the major bypasses within the Nairobi metropolitan region such as the Southern bypass was critical towards decongesting the metropolitan region. The construction of the Southern bypass has significantly contributed to economic growth within the metropolitan since there is ease of transport of commodities and people along the Southern corridors. This has reduced both the time spent and the cost of transportation which would ultimately weigh down on the economy of the metropolitan region that is the biggest contributor to the country's GDP.

The Nairobi Southern Bypass which covers a length of 29.6 kilometres is one of the major bypasses that was designed with the aim of easing the perennial traffic congestion .Others included the Northern and the Eastern bypasses. Figure 3.1 represents the map outlining where the road starts at the junction of the Nairobi – Mombasa Road and the Likoni Road which is approximately 10 kilometres South East of the Nairobi’s Central Business District (CBD). The road then loops through the South Western suburbs of Nairobi to include the Northern environs of the Nairobi National park, Uhuru gardens, Langata, Kibra and Dagoretti.

Table 3.1: Financial details of the Nairobi Southern bypass

Source	Contribution (USD)	Per cent	Notes
Exim Bank of China	153 Million	85.0	Loan
Government of Kenya	27 Million	15.0	Investment
Total	180.0 Million	100.0	

Source: The National Treasury (2015)

According to Table 3.1 above, the Chinese government through its China’s Export and Import (EXIM) Bank approved a preferential buyer credit worth US Dollar 153 million in 2011 towards the Southern bypass project. This represented 85 per cent of the total contribution, while the Government of Kenya invested a total of US Dollar 27 million which was 15 per cent of the contribution. A total of US Dollar 180 million was therefore contributed towards the construction of the Nairobi Southern bypass. During the negotiations for the earmarked project, the Chinese State Council which is a key institution involved in negotiating loan agreements played a crucial role through the visit by the Chinese Vice Premier Wang Quishan in March 2011. The loan facility was offered on concessional terms which comprised 2% interest rate and a grace period of 7 years with a repayment period of 12 years (The National Treasury, 2015). Further condition stated that the government of Kenya was to meet a management fee and a commitment fee each of 0.2 % of the project value. A further 35 % government grant was qualified as part of the concessional terms agreement.

The construction of the Nairobi Southern Bypass did not go without its share of disputes and concerns from the locals ranging from environmental issues to wildlife. The Government of

Kenya through the Kenya National Highways Authority (KeNHA) proposed the construction of the Nairobi Southern Bypass through the Nairobi National Park covering a distance of 4km and 120 km width within the national park. Concerns were raised and committees were formed by several civil society groups to oppose such a move. A lot of arguments were put forth to support the opposition of such a move. The civil society movements argued that encroaching on the national park would set a dangerous precedent in the long run where there will be increased demand for encroaching parts of the Nairobi National Park for private use by individuals or organisations. The arguments were further advanced in the interests of the wildlife migration where they argued that the construction of the Nairobi Southern bypass through the Nairobi National Park would cut off migration routes for many of the wildlife in the park .It was cited that thousands of wildlife migrate out of the Nairobi National Park through the southern edge of the park. The nature of sound produced during the construction of the bypass was also a key concern to the conservationists who argued that loud noise produced during the bypass construction would interfere with the normal wildlife behaviour in the park.

Key areas of concern to the conservationists included the environmental and socio economic impacts the Nairobi Southern Bypass would have both on the people living around the park and the wildlife. Some of the environmental concerns included the potential loss of the biodiversity such as the wildlife and the biodiversity, loss of landscape due to aesthetic degradation, noise pollution, deforestation and loss of vegetation cover as well as reduced ecological and hydrological connectivity. On the other hand, the conservationists expressed concern over the socio economic impact that the Nairobi Southern impact would have on the inhabitants of the areas covered by the bypass. They included potential land dispossession and loss of landscape among others.

3.3 Demographic Changes in Nairobi

This section focuses on two specific sub variables of the dependent variables namely the changing age structure and the changing socio- economic status of the population distribution along the Nairobi Southern Bypass. Given that the construction began in 2009, to understand whether the infrastructure has had any influence on the demographic changes, the study used the 2009 and 2019 Housing and Population census for Nairobi County to determine the changing age

structure. The study also employed data on labour force obtained from the 2009 and 2019 Housing and Population census to determine changes in the socio economic status of the population before the construction of the Nairobi Southern Bypass.

3.3.1 Changes in Age Structure

This sub-section examines the data relating to the changing age structure prior to the construction of the Nairobi Southern Bypass. Table 3.2 shows the general trends in changes in age structure in Nairobi metropolitan for the ages between 0 to 60 and above in both the 2009 and 2019 Housing and Population Census.

Table 3.2: General Trends in Changing Age structure, 2009 and 2019

2009			2019		
Age Structure	Total	Percent (%)	Age structure	Total	Percent (%)
0-4	397,161	12.8	0-4	524,987	12.1
5-9	306,877	9.9	5-9	432,712	10.0
10-14	246,969	8.0	10-14	378,550	8.7
15-19	270,064	8.7	15-19	351,853	8.1
20-24	477,396	15.4	20-24	563,019	13.0
25-29	462,753	14.9	25-29	583,548	13.5
30-34	324,129	10.5	30-34	495,470	11.4
35-39	229,632	7.4	35-39	345,796	8.0
40-44	146,601	4.7	40-44	253,162	5.8
45-49	107,003	3.5	45-49	174,932	4.0
50-54	66,576	2.1	50-54	113,949	2.6
55-59	39,285	1.3	55-59	76,601	1.8
60 and above	25,167	0.8	60 and above	43,984	1.0
Total	3,099,613			4,338,563	

Source: KNBS (2009, 2019)

The changes in age structure of a population greatly determines among other things the population in schools, working, not economically engaged or retired (NCPD, 2015).It also determines involvement in politics and security related matters.

According to Table 3.2, the composition and structure of the Nairobi Metropolitan population has changed over the decade across the various age structures. Accordingly, the youth age structure (20-24) comprised the highest rate of population at 15.4 per cent followed by age structure (25-29) at 14.9 per cent. The children age structure (0-4) accounted for 12.8 per cent of the population whereas age structure (5-9) comprising of young people constituted 9.9 per cent of the population .According Table1.1 above, the population in age structures (10-14) and (15-19) comprised 8.0 and 8.7 respectively. The table also shows a decline in the level of population representation with an increase in the age structures especially from age structure (30-34) towards age structure 60 and above. The declining trend shows that age structure (30-34) is represented at 10.5 per cent, (35-39) at 7.4 per cent while (40-44) comprises 4.7 per cent of the population. The age structures (45-49), (50-54) and (55-59) comprises 3.5, 2.1 and 1.3 per cent respectively. The elderly of age structure 60 and above had the least representation of the population at 0.8 per cent. It is therefore, clear from the findings in Table 3.2 above that the age structures (20-24), 25-29) and (30-34) are the most dormant at 15.4, 14.9 and 10.5 percent respectively.

In 2019, Table 3.2 shows that the youth population of age structures (20-24) and (25-29) had the highest presentation of 13.0 and 13.5 per cent respectively .Children aged (0-4) also consisted of significant level of population at 12.1 per cent followed closely by age structure (30-34) consisting of 11.4 per cent. The findings also demonstrate a declining representation of the population from age structure 35 through to 60 and above with the elderly population at age structure 60 and above constituting the least representation at 1.0 per cent.

From the table 3.2 above, it was established that in a period of ten years, there was a significant growth of the general population representation. From the age structures 30 to 60 and above, there was a significant surge in the population from each age structure with age structure (40-44) gaining the highest level at 1.1 per cent followed by age structure (30-34) at 0.9 per cent.

3.3.2 Data on Economic Status, 2009 and 2019

This sub- section examines the data relating to the changes in economic status prior to and after the construction of the Nairobi Southern bypass. Table 3.3 shows the economic status of the two sub counties of Nairobi West and Nairobi North before the construction of the Nairobi Southern bypass within Nairobi Metropolitan.

Table 3.3: Economic Status of the sub counties before the Construction of the Nairobi Southern Bypass

Sub county	Total	Working	Seeking work/no work available	Economically inactive	Unclassified
Nairobi West	593,857	301,754(50.8)	51,571(8.7)	206,935(34.8)	33,597(5.7)
Nairobi North	907,207	458,223(50.5)	99,313(10.9)	303,171(33.4)	46,500(5.1)

Source: KNBS (2009)

From table 3.3 above, both Nairobi West and Nairobi North demonstrated different levels of economic status before the construction of the Nairobi Southern bypass.

Nairobi West had 50.8 per cent of its population economically engaged whereas 34.8 per cent were economically inactive. 8.7 per cent were either seeking work or had no work available for them. 5.7 per cent of the population in Nairobi West could not be classified as working, seeking work or economically inactive since they were unaccounted for.

According to the table 3.3, Nairobi North had 50.5 per cent of its population economically active while 33.4 per cent were economically inactive. 10.9 per cent of the population of Nairobi North were seeking work while 5.1 per cent of the same population remained unclassified.

Table 3.4: Distribution of Population by Sub county and Economic Status, 2019

Sub county	Total	Working	No work available/seeking work	Persons outside labour force	Not stated
Langata	173,427(24.3)	83,422(48.1)	14,024(8.1)	75,905(43.8)	76(0.04)
Kibra	161,903(22.7)	69,420(42.9)	19,254(11.1)	73,180(45.1)	49(0.04)
Dagoretti	378,448(53.0)	182,767(48.3)	40,294(10.6)	155,215(41.0)	172(0.05)
Total	713,778	335,609(47.0)	73,572(10.3)	304,300(42.6)	297(0.04)

Source: KNBS (2019)

From Table 3.4 above, Langata Sub County representing 24.3 per cent of the entire population of the three sub counties also had 48.1 per cent of its population economically engaged while 8.1 per cent were seeking work. 43.8 per cent represented persons outside the labour force whereas 0.04 per cent of the population could not be accounted for. Kibra Sub County with a population representation of 22.7 per cent had 42.9 of the population economically engaged and 11.1 per cent seeking work. 45.1 per cent represented persons outside labour force whereas 0.04 per cent was unaccounted for. Dagoretti sub county represents the highest population rate of the three at 53.0 per cent with 48.3 per cent of its population economically active while 10.3 per cent are seeking work. 42.6 per cent of the persons were outside the labour force in Dagoretti sub county and a 0.04 per cent could not be accounted for.

3.4 Linking Infrastructure to Demographic Changes

This section focuses on the linkage that exists between the infrastructure development (Nairobi Southern Bypass) and the demographic mainly the changing age structure and the economic status. Whereas the above data provides an indication of the linkage between the Bypass and the demographic changes, according to a senior population analyst at the Kenya National Bureau of Statistics (KNBS) to get a better understanding of the linkage between the two variables data from the lower administrative units (sub-locations) would be useful. Therefore, to understand the linkage, the study used the 2009 and 2019 Housing and Population Census for the Mutuini, Bomas and South C sub locations that were covered by the Nairobi Southern Bypass. To further

enhance understanding of the linkage, the study incorporated the views of the administrators and the locals from the communities.

3.4.1 Demographic Changes at the Lower Administrative Units

This sub section examines the data relating to the distribution of the population by age structure and economic status at the lowest administrative units which is the sub -locational levels prior to and after the construction of the Nairobi Southern bypass. The lowest administrative levels include the three sub locations of Mutuini, Bomas and South C as demonstrated in tables 3.5 and 3.6 below.

Table 3.5: Changes in the age structure

2009				2019	
Sub-location	Age structure	Total	Percent (%)	Total	Percent (%)
MUTUINI		5,033	8.4	6,966	11.9
	5-14	1153	23.0	1,471	12.1
	15-17	345	6.9	386	5.5
	18-24	856	12.0	1,091	15.7
	25-34	1177	23.3	1,632	23.4
	35-64	1322	26.3	2,111	30.3
	65 and above	205	4.1	275	3.9
BOMAS		13,639	22.7	25,534	43.5
	5-14	2887	21.2	5,229	21.7
	15-17	734	5.4	1,465	5.7
	18-24	3053	22.4	4,488	17.6
	25-34	3669	26.9	6,209	24.3
	35-64	3098	22.7	7,403	30.3
	65 and above	198	0.7	440	1.7
SOUTH C		41,443	68.9	26,196	44.6
	5-14	7,594	18.3	5,344	20.4
	15-17	2,044	4.9	1,632	6.2
	18-24	9,817	23.7	4,385	16.7
	25-34	11,907	28.7	5,474	20.9
	35-64	9,344	22.5	8,250	31.5
	65 and above	737	1.8	1,111	4.2

KNBS (2009, 2019)

Table 3.5 shows the changing age structure of the lowest administrative units of Mutuini, Bomas and South C before the construction of the Nairobi Southern bypass. In Mutuini sub location the total population of the age structures was 8.4 per cent in 2009 with the age structure (35-64) having the highest population representation at 26.3 per cents followed by age structure (25-34) at 23.3 per cent whereas (5-14) had 23.0 per cent. Age structures (18-24) and (15-17) had 12.0 per cent and 6.9 per cent respectively while the elderly age structure of 65 and above had 4.1 per cent of the population which accounted for the lowest population representation in Mutuini sub-location in 2009. In 2019, the overall population age structure was 11.9 per cent which was an increase of 3.5 per cent from 2009. The age structure (35-64) had the highest representation of 30.3 per cent followed by (25-34) at 23.4 per cent whereas age structure (5-14) and (15-17) was 12.1 and 5.5 per cent respectively.

According to the table, Bomas sub-location with an overall population age structure representation of 22.7 per cent in 2009 the age structure (25-34) was the highest with a representation of 26.9 followed by 22.7 per cent for age structures (35-64). The age structure (18-24) was at 22.4 per cent whereas age structures (5-14) and (15-17) had 21.2 and 5.4 per cent respectively. The elderly population of age structure 65 and above had the lowest population representation at only 0.7 per cent in 2009. In 2019, Bomas sub location overall age structure representation was 43.5 per cent up from 22.7 per cent in 2009. The age structure (35-64) had the highest age structure at 30.3 per cent followed by (25-34) at 24.3 per cent while age structure (5-14) was 21.7 per cent. The age structures (17.6) and (15-17) was at 17.6 and 5.7 respectively while the elderly was the least at 1.7 per cent only.

In South C, the overall age structure in 2009 was 68.9 per cent with (25-34) representing the highest population representation at 28.7 per cent followed closely by age structure (18-24) at 23.7 per cent. Age structure (35-64) constituted 22.5 per cent of the population distribution. Age structures (5-14) and (15-17) had 18.3 and 4.9 per cent respectively. The elderly of age structure 65 and above constituted only 1.8 per cent of the population of South C sub location in 2009. In 2019, South C sub –location had an overall age structure population representation of 44.6 per cent with the highest representation of 31.5 per cent belonging to age structure (35-64) followed by age structure (25-34) and (5-14) at 20.9 and 20.4 per cent respectively. Age structure (18-24)

had 16.7 per cent while (15-17) had 6.2 per cent. The elderly age structure of 65 and above had the lowest representation at only 4.2 per cent in South C in 2019.

Table 3.6: Changes in economic structure

Sub-Location	2009			2019		
	Total	Employed	Unemployed	Total	Employed	Unemployed
Mutuini	5,033	2610	388	6,966	3311	323
Percent (%)	8.4	51.9	7.7	11.9	47.5	4.6
Bomas	13,639	7767	965	25,534	11824	888
Percent (%)	22.7	56.9	7.0	43.5	46.3	3.5
South C	41,443	24,431	2,970	26,196	10311	718
Percent (%)	68.9	59.0	7.2	44.6	39.3	2.7

KNBS (2009, 2019)

Table 3.6 above shows the economic status of the population in the lowest administrative units of Mutuini, Bomas and South C sub locations. According to Table 3.6 above, in 2009, 51.9 per cent of the population in Mutuini were employed hence economically engaged while 7.7 per cent were not employed. Accordingly, the findings from the table shows that in 2019 47.5 per cent of the population in Mutuini sub location were economically engaged with 4.6 per cent of the same population being unemployed which was a drop in the unemployment rate by 3.1 per cent. 41.9 per cent were completely engaged in either working, employed or looking for work while 0.3 per cent could not be accounted for in any of the categories.

According to the findings in Table 3.6 above, Bomas sub location recorded employment rate of 56.9 per cent and 7.0 per cent unemployment rate which was a significant decline in the rate of unemployment by 3.5 per cent in the same sub-location. Bomas sub location had 46.3 per cent of its population economically engaged with a 3.5 per cent unemployed while 44.3 per cent remained economically and 2.1 per cent could not be determined.

In 2009, 59.1 per cent of the population of South C sub-location was employed and 7.2 per cent were not economically engaged. According to table 1.5, 39.3 per cent of the population in South

C sub location was economically active whereas 2.7 per cent remained unemployed. This was a significant drop in the rate of unemployment from 7.2 per cent in 2009 to 2.7 per cent in 2019. At the same time, 51.3 per cent of the population of South C was economically inactive and 2.7 per cent could not be determined.

From the findings in table 3.5 and 3.6 above, it can be clearly established that there was significant changes in the age structure across the three sub locations prior to and after the construction of the Nairobi Southern bypass. The population of age structure (35-64) for instance demonstrated a significant trend in population growth of 4.0 per cent in Mutuini sub location over a ten year period and 0.3 per cent growth in Bomas sub location over the same period of ten years. South C sub location on the other hand experienced population growth among the age structure (35-64) at a rate of 9.0 per cent. The age structure (25-34) saw a population growth of 0.4 per cent over a ten year period in Mutuini sub location.

The findings in tables 3.5 and 3.6 also show a steady decline in the unemployment rate across the three sub locations of Mutuini, Bomas and South C over a ten year period. Mutuini sub location experienced a 3.1 per cent decline in unemployment rate. Bomas sub location had a 3.5 per cent decline over a period of ten years. South C on the other hand saw its unemployment rate decline from 7.2 per cent to 2.7 per cent hence a decline of 4.5 per cent in unemployment level in a period of ten years. The reduction in the rate of unemployment was a clear indication that the bulk of the population was absorbed in the economic activities created by the Nairobi Southern Bypass.

The changing age structure across the three sub locations was greatly influenced by the completion of the Nairobi Southern Bypass. It is worth noting that before the construction of the bypass ,the population representation across the age structures within the three sub locations was relatively low .For instance, in Mutuini sub-location ,before the construction of the Nairobi Southern Bypass, the overall population representation was 8.4 per cent .After the construction of the bypass, the population representation rose to 11.9 per cent .It was equally noted that after the construction of the Nairobi Southern bypass, age structures (18-24), (25-34) and (35-64) rose from 12.0,23.3 and 26.3 per cent respectively to 15.7, 23.4 and 30.3 per cent respectively.

Individuals within these age groups are people who are still actively involved in labor force and hence easily took advantage of the opportunities that the completion of the Nairobi Southern bypass offered. On the other hand, children age group (5-14) and the elderly (65 and above) had their population decline from 23.0 and 4.1 per cent to 12.1 and 3.9 per cent respectively. The population within the children and the elderly categories do not engage in labor force and hence could not benefit from the benefits of such an infrastructure facility. The youth population of age structure (18-24) and the working population age structures (25-34) and (35-64) are attracted to the various opportunities offered by such infrastructure development including job opportunities as well as economic investments such as businesses.

Other factors that attracted the population from these active age structures include favorable business environment created along the Nairobi Southern bypass. Many business opportunities in the transport and hotel industries sprung up along the Nairobi Southern bypass. These businesses offered the majority of those falling within the age structures (18-24) and (25-34) job opportunities. The Nairobi Southern bypass also easily connect many people to the Nairobi's industrial area where most of the people of the age structures (18-24), (25-34) and (35-64) work. Moreover, much of the government of Kenya's effort for economic development is focused on "growth poles" such as Nairobi which is the largest urban center with the largest industrial activity hence attracting the highest population of the economically active people within the labour force. It is therefore, clear that cheap transport offered due to the completion of the Nairobi Southern Bypass has attracted the population in the age structures (18-24),(25-34) and (35-64) across the three sub locations since majority can easily commute from and to their work places such as industrial area.

Many youth of age structures (18-24) and adults (25-34) as well as (35-64) are the biggest consumers of technology. It is apparent that transport infrastructure of the magnitude of the Nairobi Southern bypass came with technological investments such as improved internet connectivity along the areas covered. Majority of the population within these age structures have significantly invested in technological advancement such as internet connectivity that have opened up business opportunities in industries such as cyber cafe and mobile money transfer services that heavily rely on both internet and electricity connectivity.

The rates of unemployment across the three sub -locations have considerably dropped since the completion of the Nairobi Southern Bypass. For instance, Mutuini dropped from 7.7 per cent in 2009 to 4.6 per cent in 2019 while Bomas sub-location unemployment dropped from 7.0 per cent in 2009 to 3.5 per cent in 2019 and South C dropped from 7.2 per cent to 2.7 per cent. This is an indication that due to the completion of the Nairobi Southern bypass, many people across the three sub-locations were involved in economic activities. The Nairobi Southern bypass offered opportunities in the construction and transport industries majorly .These multiplier impacts are usually expressed in terms of employment creation. The construction industry created a significant amount of direct employment to the population while significantly, the indirect effects of construction on the local industries and the people and many other business activities that moved to the covered areas due to the activities along the Nairobi Southern bypass have also been recorded.

The construction of the Nairobi Southern bypass affected the growth of population along the adjacent towns. The growth and development of human settlement along the Nairobi Southern bypass has been significantly experienced. The areas adjacent to Bomas and South C sub-locations have been characterized by increased human activities such as small trade businesses including eateries and hence the emergence of new settlements. Some of the areas that have experienced such population surge are the small towns adjacent to Mutuini Sub location such as Mutege, Kabiria and Ruthimitu. The construction of a major infrastructure facility such as the Nairobi Southern bypass has consequently increased the rate of urbanization within the Nairobi metropolitan region. Kenya, like many developing countries continue to experience rapid urbanization growth brought about by the expansion of the road transport infrastructure (UN Habitat, 2008). This has been noted in the improved economic status and well-being as well as changes in the age structures of different population across the three sub locations as a result of the completion of the Nairobi Southern bypass. Peoples socio-economic status have improved while people of different age structures have settled along the areas covered due to the direct and indirect benefits that the bypass continues to offer. Its therefore, estimated that due to such rapid urbanization growth ,the Nairobi metropolitan region is estimated to grow to 10.8 million by 2022 and 14.3 million by 2030 hence the need to utilize infrastructure to assist in the reorganization of the metropolitan region.

In other African countries including Kenya, infrastructure investments such as transport infrastructure provide significant multiplier effects on economic development. A research in Egypt for instance showed that an increase in infrastructure expenditure from 5 to 6 per cent of the country's gross domestic product (GDP) would lead to increase in the annual GDP per capita growth rate by 0.5 per cent in a ten year period. Road transport infrastructure such as the Nairobi Southern bypass has been critical in enhancing mobility and connectivity through effective transportation by reducing travel time and costs associated with it. Due to the improved transport system brought about by the construction of the Nairobi Southern bypass, the city has recorded a reduced level of traffic congestion especially along the Northern corridor. There has been enhanced public transport safety and security which has improved by approximately 40 per cent and subsequent increase in overall economic productivity.

The outcome of Chinese investment in the transport infrastructure development has been immense especially in the low income countries of Africa and Asia .In Angola for instance, the Chinese government has continued to play a key role in the national reconstruction of the country's transport infrastructure programs. Before Chinese involvement in Angola's infrastructure development programs, it's estimated that the labor force in Angola was seven million people, with the unemployment rate which was also estimated to be half of the country's population .According to OECD African Economic Outlook (2008), Angola had exceptionally high unskilled labor force at 68 percent within the age structure (25-29), 74 percent within (20-24) and 94 percent within (15-19). China involvement in transport infrastructure development which led to investment in telecommunication companies such as Zhong Xing Telecommunication Equipment Company (ZTE) created jobs for the majority of the youth in age structures (24-29) in Luanda. The local people and enterprises have benefited from the investments and skills transfer brought by the transport infrastructure and other infrastructural investments. Further, Chinese investment in transport infrastructure in Angola has marked a period of rapid infrastructural regeneration. The rehabilitation of vital roads in Angola by the Chinese government has promoted investment and sustainable economic growth hence improved socio economic status.

In Ethiopia, the construction of Ashegoda and Adama Wind Farm projects funded by the Chinese government saw the locals immensely benefitting from the increased infrastructure associated with the projects such as access to roads and water pumps hence their improved socio economic status. The Chinese government through their Vergnet and HydroChina training programs designed trainings that impacted skills that benefitted the youth through creation of employment both on long term and short term basis.

Ghana experienced different levels of social welfare before and after the construction of the Bui Dam. Approximately 29,000 local households started receiving electricity transmitted from Bui Dam after its completion. There was significant improvement in the social welfare of the population living near the region where the dam was constructed as the access to electricity improved by 4 per cent among those households. The urban households witnessed an average of 14.5 per cent increase in their likelihood of accessing electricity hence such access to electricity was noticed to be predominant in urban and wealthy households. In making the comparison of time period before and after the construction of the Bui dam the 2008 indicators before the completion of the dam were used and also 2014 indicators after the construction of the dam were utilized. In explaining the socio- economic differences brought by the impact of the Bui dam, the household differences before and after the construction of the dam was considered as well as the households of the population living within and outside the regions that were covered by the construction of the Bui dam. To this end, the government of Ghana published that the completion of the dam significantly contributed to among others job creation, water supply and improved health facilities in the local communities. There was considerable significant vertical and horizontal socio economic impact on the population. In comparison to Ghana, before the construction of the Nairobi Southern bypass, the area covered had poor road infrastructural facilities that and deplorable housing conditions around the areas. The area was characterized with lack of roads, poor sewer systems, pathetic waste disposal as well as lack of physical infrastructure such as schools and health facilities. The smaller towns in the metropolitan region had very little household access level to electricity, water supply and waste disposal. This was coupled with increased unemployment and prevalent poverty (Ministry of Nairobi Metropolitan Department, 2008). Similarly, after the completion of the Southern bypass, there was significant access to essential services such as electricity, sewerage system, health facilities and schools to

the local communities as was eluded by the locals interviewed. This resulted to the improved social welfare by the locals residing in the areas covered by the Nairobi Southern bypass.

3.4.2 Relocation Decisions

To assess the influence of the completion of the Nairobi Southern Bypass on settlement in the areas covered by the bypass, the study probed the locals and administrators from those areas.

3.4.2.1 Local Community

Respondents to this category included businessmen and tenants along the Southern bypass. According to one businessman:

“I am a resident and a businessman from this sub location (Mutuini) having lived here for nearly one decade. As a businessman dealing in fresh produce such as vegetables, I experienced first-hand benefits that the Nairobi Southern bypass that passes through our sub location has had on our lives and particularly my business. To begin with, it has become more easy, efficient and convenient to transport my produce to Nairobi which is my biggest market for my produce. Initially before the completion of the Nairobi Southern bypass, it took approximately four hours to transport farm produce from my farm in Mutuini sub-location to the market in Nairobi. This was necessitated by the poor road transport system at the time. Massive wastage of farm produce was the order of the day. The cost of doing business was exorbitant as a result of high cost of fuel consumption due to poor roads. After the construction of the Nairobi Southern bypass, first, the cost of operation has drastically gone down two fold since I don't spend as much in fuel. Secondly, it takes under one hour for the goods to arrive in the market hence no wastage incurred due to delays in transportation. In addition; the market in Nairobi has considerably expanded along the Nairobi Southern bypass. Many hotels have been built along the bypass due to increased business activities and human settlement hence additional market for my produce. The overall result has been improved economic status on the general population living and working near the bypass”.

This was further corroborated by a resident who has lived in the area for the past seven years noting that:

“I am a resident of South C sub-location who has lived here in South C estate for over twenty years. I have seen changes that occurred around this area since the construction of the Nairobi Southern bypass. This bypass has immensely benefitted the locals around here through power connectivity to various social amenities such as schools and hospitals that were not connected before. During the construction of the bypass, many people were displaced and compensated to pave way for the construction of the bypass. I happen to be one of the beneficiaries of the compensation scheme that was offered. Most of us lived in slums and after the construction of the bypass, better housing units were built and a majority of the displaced people occupied the improved units that were built .People also relocated to this place due to better amenities such as schools and hospitals thanks to the completion of the Nairobi Southern bypass. People of different age structures settle in South C sub-location and its environs because of the favorable work environment. There is ease of movement to work places such as industrial area and Nairobi’s Central Business District (CBD)”.

3.4.2.2 Local Administrator

Interviewed local administrators comprised chiefs and assistant chiefs. One chief remarked that:

“As a local administrator having worked as a chief in Bomas sub-location from the time of the construction of the Nairobi Southern bypass, i witnessed the expansion of this 29.6 kilometer bypass since its commissioning. The bypass started at the Nairobi-Mombasa road junction and the Likoni road in Nairobi’s industrial area. The construction of the bypass then passed through the South Western suburbs of Nairobi where it passed through Langata, Lenana. It also covered some slum areas including Silanga, Gatwekera and Mugumoini. What was clearly witnessed is the relocation of the people to areas covered after the completion of the Nairobi Southern bypass. Before the construction of the Nairobi Southern bypass ,the general population across the area structure in this area was relatively low. The economic activities were also limited to just small scale trade and hence unfavorable economic status among the households that resided around this area. The population and human settlement along the bypass went up with many business activities coming up. The youth in particular migrated and settled in the neighboring estates such as Olympic, Silanga and Gatwekera. They were attracted by the job opportunities

offered by the Nairobi Southern bypass especially in the construction and transport industries .Some of the youth who relocated also opened up their small businesses and engaged in various trading activities due to the expansion of markets along the bypass”.

Another local administrator remarked that:

“I have been an assistant chief of South C sub location and also lived here for the last twelve years. Having lived here that long, I clearly recall how this this area and its environs experienced rapid growth and expansion after the completion of the Nairobi Southern bypass. The population has increased considerably with majority of the youth and those active in the labor force coming to settle and working around. From my estimation, majority of the people in the age structure 19 to 35 comprised the biggest population that migrated to this area. Most of them were attracted by the creation and expansion of the markets hence they were able to trade and sell their wares in those markets. Others were also absorbed in the jobs that were created in the building and construction industries brought by the construction of the Nairobi Southern bypass. Generally, there is increased economic activity in this area since the completion of the Southern bypass”.

A Chief from Mutuini Sub-location also remarked as follows:

“Mutuini sub-location and the market centers around it have seen some considerable growth witnessed especially after the completion of the Nairobi Southern bypass. Initially, the market centers were very small with little economic activities but after the completion of the Southern bypass, these markets have expanded in terms of businesses and other economic activities including transport both public and private. Many people also migrated and settled in this area due to economic activities that it offered as a result of the Southern bypass. It’s easier for instance to transport farm produce from this area to Nairobi where there is ready and bigger market. Transport is no longer a hindrance since the road is efficient for transportation .Human population has also grown due to the cheap and affordable housing units put up by investors who took advantage of the Southern bypass”.

From the above personal interviews, it follows that the decision to relocate was informed by the creation of job opportunities as well as business opportunities and the resultant improved economic status across the various age structures associated with the construction of the Nairobi

Southern Bypass. This implies that there is connection the completion of the Nairobi Southern Bypass and demographic changes. This finding has implications for the existing literature on China-Africa relations and the broader theoretical context of foreign aid and sovereignty as discussed in the section below.

3.5 Discussions on the Findings

This section focuses on the analysis of the China –Africa Relations in light of the socio-economic impacts of the Chinese funded projects in Africa. It also focuses on the foreign aid and economic changes.

3.5.1 Implication for China –Africa Relations

From the study findings, it was established that a linkage existed between the infrastructure development (Nairobi Southern Bypass) and the demographic changes which includes the changing age structure and economic status of the population living in the areas covered by the Nairobi Southern bypass.

Population across various age structures increased over the decade in the sub counties and lowest administrative units covered by the bypass. Notable age structures include the youth (18-24), (25-34) and the working age structure (35-64). These age structures are considered to be economically active and the major beneficiaries of infrastructure development (Nairobi Southern bypass) and the spillover benefits that came with it. High levels of relocation and settlement along the areas covered by the Nairobi Southern bypass was witnessed among these age structures.

The levels of unemployment dropped among the population across the sub-locations and sub counties covered by the Nairobi Southern Bypass. The infrastructure development (Nairobi Southern bypass) offered both direct and indirect employment that saw many people absorbed into the work force. The completion of the Nairobi Southern bypass opened up business opportunities in various industries and sectors such as the construction and transport. Many people were employed in the construction sites and transport which included both public and

private transport services. Markets were opened up due to efficient transport systems that enabled agricultural and other products to be transported to and from Nairobi.

In many African countries, Chinese funded infrastructure development programs have had immense positive impacts in the economies of such countries .In Ghana, the construction and completion of Bui Dam in 2013 significantly contributed to the supply of power to the nearby regions. In addition, other benefits have included provision of water supply, job creation and improved health and school facilities to the local communities. The Bui Dam which is located at the boundary between the Northern and Brung Ahafo region saw a total of 240 kilometer of power transmission lines built to transmit power generated from the Bui Dam to four major towns namely Sawla, Techiman, Kintampo and Sunyani. These regions had relatively low access to electricity before the completion of Bui Dam. Improvement of household access to electricity in the region is attributed to the completion of Bui Dam. The contributions of the Bui Dam to the local community is much similar to those of the Nairobi Southern bypass in Kenya which also provided job opportunities, electricity connectivity to the nearby schools and health centers and hence overall improved socio economic welfare of the locals.

Just like in Kenya, however, the construction of the Chinese funded hydropower infrastructure project (Bui Dam) did not escape the fair share of environmental and local community concerns .According to the report by the Environmental and Justice Organization Liabilities and Trade 2015, construction of Bui Dam resulted in 21 percent annexation of Bui National Park along with forced relocation of more than 1200 people to pave way for the construction of the Dam. The resettlement process created major concerns among the local communities due to conflicts and loss of habitat in the Bui National Park.

In Ethiopia, the establishment of the Chinese funded Eastern Industrial Zone (EIZ) located some 32 kilometer South of Addis Ababa has resulted to socio economic benefits to the locals and the larger Ethiopian economy. The Eastern Industrial Zone (EIZ) is credited with recruiting many Ethiopians than Chinese expatriates contributing a much higher workforce localization rate in Ethiopia hence job creation. They further provide trainings and skills development to the locals hence building and improving their capacity. Just like in the case of the Chinese funded transport

infrastructure project (Nairobi Southern bypass) in Nairobi, the Ethiopian Eastern Industrial Zone (EIZ) has created job opportunities to majority of the population who are in the youth category or adults of age structure (16-28). A significant number of approximately 93 percent come from Oromia region where the Eastern Industrial Zone (EIZ) is located and particularly the nearby towns of Dukem and Debra Zert. This is the case with the Nairobi Southern bypass where the majority absorbed in the labor force is drawn from the nearby sub-counties of Bomas, South C and Mutuini. The Adama Wind Farm Project in Ethiopia similarly benefitted the community through employment creation and training programs to enhance their skills. Approximately 100 Ethiopian engineers were employed in the long term while the locals also benefitted from a significant portion of short term employment opportunities.

3.5.2 Implication for Foreign Aid and Socio-Economic Changes

Demographic changes as a result of a Chinese built infrastructure projects also has implications on understanding the influence of foreign aid on internal sovereignty. Sovereignty is defined as freedom of a nation or society to pursue its end without external control or influence (Brown, 2013). Scholars around the world have however, widely argued that foreign aid especially to the African countries is a tool used by the donor community to advance their internal sovereignty. Hans Morgenthau even described aid to Africa as “baffling” as he described it as a proliferation of foreign policy tool. Subsequently aid scholars have advanced arguments that donors use aid to further their political interests often at the expense of recipient welfare. In her collaboration with the African countries, China has emphasized on its policy of non-interference in the internal affairs of the aid recipient countries while also acknowledging and appreciating the potential of some of the African countries that have vast resources such as oil in Angola .This is a concept widely explained and acknowledged by the dependency theory as argued by Walter Rodney in his seminal book “How Europe underdeveloped Africa”. The result of China engagement with African countries in light of the dependency theory is seen in terms of partners engaged in a win –win relationship and not exploitation. The Angolan government for instance was keen on collaborating with the China government because other than supporting its needs for economic development, it also respected her internal sovereignty by not attempting to alter the choices and aspirations of the Angolan government.

China aid model is geared towards economic development for the African continent. It is for that reason that China through its Export and Import (Exim) Bank offers a package loan that constitutes investment by the Chinese companies, transport and other infrastructure building projects ,concessional loans, debt reliefs ,project investments, training and technical assistance. All these have greatly contributed to improving the socio economic development in the recipient countries. This study appreciates the literature on the modernization theory which suggests that poor countries are underdeveloped or undeveloped because of their archaic traditional social, political and economic structures. Accordingly for these countries to develop and industrialize, they must also urbanize hence the need to develop proper modern infrastructure systems. They can achieve this by employing a variety of means such as political and economic intervention.

In Kenya for instance, the decision to build the transport infrastructure (Nairobi Southern bypass) was informed by the need to decongest traffic from the Nairobi's Central Business District (CBD) and enhance economic growth .The ultimate goal was also to industrialize the country by modernizing its transport infrastructure systems as contained in the Metro 2030 policy document. This was the government of Kenya policy decision and not influenced by the Chinese government which financed the infrastructure (Nairobi Southern bypass) project.

Brown (2013) incorporated both the conceptual and analytical analysis in understanding the nature of relationship that existed between internal sovereignty of developing states and influence of foreign assistance to such states. In his study, he viewed sovereignty as a right and authority on one hand and political issues of policy formulation and implementation on the other hand. In his analysis, Brown argues that it is fundamentally important to see clearly areas in which aid does and does not impact on the recipient country hence affecting her policy making process. In this regard, Brown rejects the notion that aid that is advanced to African countries undermines their internal sovereignty. Accordingly, he concludes that sovereign rights are the basis upon which relations are conducted. As has been demonstrated by the aid from the Chinese government towards infrastructure development to most African countries such as that advanced to Kenya towards the construction of the Nairobi Southern bypass, the recipient countries benefit immensely from the impact of such aid.

This study argues that African countries have in fact been significant actors in such engagements. African countries have engaged with China particularly in areas of trade and transport infrastructure development. Kenya for instance has actively engaged with China in transport infrastructure development of the Nairobi southern bypass and the Thika superhighway among other infrastructure projects.

3.6 Conclusion

The construction of the Nairobi Southern bypass within the Nairobi Metropolitan region impacted significantly on the lives of the people living along the areas that were covered by the bypass. The effects were felt across various demographic changes such as the economic and age structures of the people. It also affected people across different sub counties covered such as Nairobi West and Nairobi North (Census, 2009). Other areas included Mutuini Sub County, Bomas and South C sub counties (Census, 2019). Population size is a very fundamental demographic factor affecting transport infrastructure within any metropolitan region such as Nairobi. As the population expands so does the need to expand the capacity to provide proper infrastructural services such as roads which ultimately affect the number of households within a population. As was noted the Nairobi Southern bypass affected some of the low income areas that ultimately had larger household sizes. The growth of households normally increases resulting in the increased number of hookups to essential services such as water, sanitation, power and telecommunications.

Many African countries are driven by the effective Chinese model of economic development. The cooperation between China and African countries has been perceived by many as a good asset for African development. China bases its cooperation on infrastructure development as witnessed in case study of the construction of the Nairobi Southern bypass in Kenya among other bypasses. Similarly, the case study of construction of the Bui Dam in Ghana and the involvement of the urbanization process in Angola, infrastructure development is the key area of cooperation between China and these African countries. In the cases of Kenya just like Angola and Ghana, China adopted the form of FDI contrary to DAC countries aid model which normally lacks commercial loans and infrastructure projects. During the financing of the Nairobi Southern bypass, China offered package loan to the government of Kenya that included investment by the

Chinese companies which essentially provided employment and skills development to the locals living in the areas covered by the bypass. It was also accompanied with the concessional loans, debt relief, project investment training and technical assistance that translated to economic activity to various people of different age structure within the covered areas.

African policy makers having realized the importance of streamlining Africa-China engagements in terms of infrastructure development are encouraging their governments that going forward and as such engagements transitions from donor relationships it is also increasingly important that such African countries develop their own infrastructure capacity. This could be both the soft and hard infrastructure capacity to enable service maintenance and expansion of the mega transport infrastructure projects in the absence of the donor funding. This could be made possible through a robust and demand driven China-Africa capacity building initiatives. Diversification of financing options for transport infrastructure projects across the African continent would be extremely useful. Available options would include incorporating other financial institutions and the Africa Grow Together Fund initiative. This would enable countries within the African continent to integrate their infrastructure development initiatives with those of China while also encouraging strategic engagement with China.

CHAPTER FOUR

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

4.1 Summary

This research was aimed at establishing the linkage between the Chinese Built transport infrastructure and the demographic changes in the local communities within the Nairobi Metropolitan region with specific reference to the Nairobi Southern Bypass. The study adopted a longitudinal research design that enabled an in depth understanding of the situation over a long period of time which span over a decade. In addition, the 2009 and 2019 Population and Housing Census from the Kenya National Bureau of Statistics (KNBS) were used to collect the secondary data. Primary data was obtained through the focus group discussion (FGD) and the key informant interviews conducted to the local community members, local administrators and businessmen residing in the covered by the Nairobi Southern Bypass. Qualitative technique was adopted for data analysis where the relationship between the dependent variable and the Independent variable was established. The descriptive statistics established that there was a linkage between the completion of the Nairobi Southern Bypass and the demographic variables which included the changing age structure and economic status.

4.2 Conclusion

The study whose aim was establish the linkage between the Chinese built transport infrastructure and the demographic changes in Nairobi Metropolitan region explored the relationship between the completion of the transport infrastructure (Nairobi Southern Bypass) and the changing age structure as well as economic status of the local community residing in the areas covered by the Bypass .In this respect ,the study supported the overall study hypothesis that there existed a possible linkage between Chinese built transport infrastructure and demographic changes. Consequently, the study reveals that a possible linkage existed between the completion of the Nairobi Southern Bypass and the changing age structure of the local community. The age structure of a population influences the demand for specific types of infrastructure. A youthful and vibrant population implies, all other things equal, a greater demand for infrastructure related to provision of job opportunities. The study discovered that consequently, the demand for the transport infrastructure facility complements and enhances the productivity of the private sector This implies that transport infrastructure facility often attract some level of economic activity as

it opens up business opportunities and creates both formal and informal jobs where people are absorbed to offer labor services. This confirms an argument by UNCTAD (2017) that migration surge in the urban areas is as a result of economic agglomeration brought about by among others availability of transport infrastructure, trade and communication networks. The UNDP (2006) projections suggest that many developing countries especially in the African continent will begin to experience urbanization particularly in the second quarter of the century with the bulk of the urban population likely to be dominated by the youth and the working age population .This therefore, reinforces the importance of providing economic infrastructure such as the transport infrastructure needed to boost private investments in services and manufacturing. This therefore confirmed the main study hypothesis that a linkage existed between the Chinese Built transport infrastructure and the demographic changes.

The second hypothesis confirms existence of a linkage between the completion of the Nairobi Southern Bypass and economic status of the local community. This means that infrastructure facility is essential for improving the economic activity of an area. The study concluded that investment in transport infrastructure attracts investments including opening up business opportunities and jobs in the formal and informal sectors hence attracting economic engagement. This in turn improves the economic status of the people living around those areas.

4.3 Recommendations

From the study findings the following recommendations are considered pertinent:

There is need for the government to improve the regulatory framework to increase attractiveness and bolster funding and investment in transport infrastructure development .This should be done through identifying areas of transport infrastructure that are the best means of achieving economic growth and subsequent modalities of financing such investments. Policymakers should therefore, study the demographic projections data including the population trends to help inform the choice about the transport infrastructure investment and its economic impact on the population covered by such transport infrastructure.

The government should adopt resolutions contained in the transport infrastructure policies, strategies and programs set out at the regional, sub- regional and international entities as well as

ministerial conferences and Heads of States summits. The 2005 Addis Ababa Ministerial and Heads of States conference for instance which sets out a declaration of reducing the proportion of rural population living beyond 2 km an all season mode of transport by half in order to improve access to inputs and markets and generation of employment opportunities especially to the youth through the expansion of transport infrastructure facilities is an ideal policy for consideration.

Develop and implement capacity building programs among the youthful and productive age structures (19-35) to upgrade their knowledge and skills on transport infrastructure development matters. Policies geared towards developing skilled personnel in the transport infrastructure organization is vital in providing appropriate powers and technical capacity among the productive age structure hence the ability to regulate and enforce policies on infrastructure development.

Policymakers and researchers should improve adherence to international standards and use China's development experience in the transport infrastructure sector. This should be done with reference to the selected demographic indicators including the changing age structure and economic status.

4.4 Areas for Further Research

To build on the existing work further studies need to be carried out to establish the effect of the completion of other modes of infrastructure projects such as railways, airways and waterways on the demographic variables of the population living in the areas covered by such modes of infrastructure facilities. This will see the sample size expanded hence drawing a conclusive report that provides information which is sufficient for policy development.

Policy oriented transport infrastructure research in developing countries such as Kenya should be adopted through establishing transport infrastructure research centers in Universities and institutions of higher learning. This is informed by the fact that relevant data and literature in transport infrastructure development is limited in the developing countries hence hindering the empirical analysis of policies governing transport infrastructure development.

Conducting comparative research on metropolitan change and policies to be adopted towards enhancing such changes particularly in cities and countries in the midst of poverty experienced in the developing countries. The data will further provide a basis for formulating policies and regulations to ensure proper functioning of already constructed and proposed transport infrastructure projects.

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APPENDICES

APPENDIX1: INTERVIEW GUIDE FOR THE LOCAL ADMINISTRATORS

1. How would you describe the population in terms of size and composition in your area of jurisdiction before the completion of the Nairobi Southern Bypass?
2. How would you describe the population in terms of size and composition in your area of jurisdiction after the completion of the Nairobi Southern Bypass?
3. Describe the dominant age structure of the population in your area after the completion of the Nairobi Southern Bypass?
4. Which economic activities dominated your area before the completion of the Nairobi Southern Bypass?
5. Which parts of your area of jurisdiction were covered by the Nairobi Southern Bypass?
6. How did these areas respond to the expansion of the Nairobi Southern Bypass?
7. Did the completion of the Nairobi Southern Bypass contribute to the growth of any economic activity in the areas covered under your jurisdiction?
8. What economic effects did those economic activities bring to the people living in your area of jurisdiction?

**APPENDIX 11: QUESTIONNAIRE GUIDE FOR THE LOCAL
COMMUNITIES**

SECTION A: BASIC INFORMATION

1. Gender (tick as appropriate)
Male ()
Female ()
2. Kindly indicate your residence.....
3. Nationality.....
4. Occupation (tick as appropriate)
Employed ()
Not employed ()
5. Marital Status (tick as appropriate)
Single ()
Married ()
Widowed ()
6. Highest level of education (tick as appropriate)
Primary ()
Secondary ()
Tertiary ()
Others.....
7. Age (tick as appropriate):
18 - 25 ()
26 - 35 ()
36 - 45 ()
46 - 55 ()
56-60 ()
Over 60 years ()

SECTION B: DEMOGRAPHIC FEATURES

8. How would you describe the population size across different age structure of the areas covered before the completion of the Nairobi Southern Bypass?
9. How would you describe the composition of the population size across different age structure of the areas covered after the completion of the Nairobi Southern Bypass?
10. Describe the change in population size of the children age structure (5-19) and the elderly (60 and above) after the completion of the Nairobi Southern Bypass.
11. In your opinion, which population age structure dominated the areas covered after the completion of the Nairobi Southern Bypass?
12. In your opinion what factors motivated the migration of the dominant population to this locality after the completion of the Nairobi Southern Bypass?
13. Which are some of the economic activities brought about by the completed Nairobi Southern Bypass?
14. Compare the economic activities of the population in this area before and after the completion of the Nairobi Southern Bypass.
15. Has there been improvement or deterioration in the economic status of the population living along the completed Nairobi Southern Bypass?
17. Which sectors of economic activities attracted the highest population of the youth age structure in this area?