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University Establishment and Its Role in Urban Population Growth in Kenya

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Abstract:
According to Universities' Act 2012 in Kenya, every county of the 47 counties in the country should have a public university. Already there are 23 universities and10 university constituent colleges in 26 counties. Most of these universities are established in small and medium urban centres. Although the universities are being established in various urban centres in Kenya, the impact of these universities on the development of these urban centres is not understood. The objective of the study was to determine the relationship between the population growth in a university and the rate of population in host urban centre. Data was collected using document content analysis. Data was analysed using descriptive techniques such as graphs and inferential statistical techniques such as regression analysis, Spearman's Rank correlation analysis, student t-test and Chi-Square test. Findings of the study revealed that, first there is causal relationship between population growth in the universities and the growth of population in the host urban centres and secondly, that the annual growth rate of population in the host urban centres increased from 2.2% to 4.0% almost doubling after establishment of universities in the urban centres. The findings of this study are to bring awareness to urban managers on the impact of a university on rate of population growth in their urban centres and prompt them to devise strategies for sustainable development of these urban centres.

Keywords: University, tertiary industry, urban centre, township, County, Urbanization, accelerated population growth, sustainable development

1. Introduction

Population trend worldwide is accelerating towards urban centres. UN Report in 2008 (Waugh, 2009) claimed that 74 per cent of total population in the developed countries lived in urban areas while 45 per cent of the total population in the developing countries lived in the urban areas. It is predicted that by 2050, 86 per cent and 67 per cent respectively will be living in urban areas. The 2009 population census in Kenya showed that urban population in the country was growing at the annual growth rate of at least 7 per cent (GoK, 2009). The Vision 2030 report of the government of Kenya predicted that by 2030 more than half of the country's population will be living in urban centres. According to Kenya Urban Review (World Bank, 2016), rate of urban growth in Kenya between 2003 and 2013 averaged 4.5% and the country is urbanizing currently at about 4% a year. There is normally a correlation between industrialization and urbanization where industry attracts labour from the rural economy (World Bank, 2016). A University is tertiary industry which attracts learners and employees. Karugu (2006) states that universities developed out of cathedral or monastery schools where teachers and students came together and formed a guild and got a charter. He goes further to state that once a university was established, it attracted students from all over Europe who were seeking knowledge. In the process towns known as college towns developed. College towns have been defined as communities dominated by university population and whose social life is dominated by university population (). Many businesses in college towns cater primary for university operations, student and staff population. That is student and staff population create demand for goods and services for their living at the university. Investors take the opportunity to start businesses which supply the required goods and services. Businesses started provide employment opportunities for job seekers. Establishment of a university in a place, like extractive or manufacturing industry may trigger urbanization.

There has been considerable increase in demand for higher education in Kenya from mid 1980 to the present time leading to increase in students' enrolment for university. In response, the government and private entrepreneurs have established many universities and constituent university colleges outside major cities especially in rural areas or in small towns. For example, twenty-three (23) public universities and ten (10) university constituent colleges in addition to seventeen (17) private Charted universities, five (5) private university colleges, thirteen (13) private universities with letters of interim Authority and one (1) registered private university have been established and authorized by the Commission for University Education (CUE) to operate in the country between 1985 and 2015 (CUE, 2015). Only five (5) of the twenty-three (23) public universities and one (1) public constituent university college are in cities such as Nairobi and Mombasa. The rest are established in small and medium urban centres with population of less than 100,000 people. The government policy is to establish a public university in each of the forty-seven (47) counties in the country (Universities

Act, 2012,). Although universities are increasingly being established in various urban centres in Kenya, their impact on the urban population growth is not known.

Rapid increase in population without corresponding economic growth often leads to demand that outstrips services capacity for urban area (Moore et al 2003 Burton 2005). In developing countries such as Kenya where Master plans for small and medium size urban centres are not available and urban by-laws are rarely enforced, rapid increase in population results into unplanned urban growth with chaotic developments (Egbenta 2009). In the Kenya vision 2030 documents, the government has acknowledged the fact that urban centres in the country are poorly managed (GoK 2008). Unplanned growth and chaotic developments are associated with poverty, environmental degradation such as poor sanitation, poor sewerage system, uncollected garbage (Moore et al 2003) and vulnerability to hazards such as disease epidemic, fire outbreaks, criminal activities and flooding. This study sought to establish a hypothesis that a university can trigger urban population growth. The findings will create awareness in urban planners and administrators on challenges posed by increasing student enrolment and staff recruitment; assist urban planners to prepare strategic plans with residential, commercial and infrastructure as strategic pillars which will in turn assist local Authorities to provide required services and guide investments for sustainable developments in urban centres.

This study was undertaken in three universities located in small and medium urban centres namely Jomo Kenyatta University of Agriculture and technology (JKUAT) located in Juja township, Masinde Muliro University of Science and Technology (MMUST) in Kakamega town and Maasai Mara University (MMU) in Narok town among 33 public universities and constituent colleges established across the country. Students' enrolment and staff recruitment in each university will be examined over a period of time from the time of establishment to 2013.

2. Materials and Methods

2.1. Study Sites

The study was undertaken in three universities located in small urban centres namely Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Juja township, Masinde Muliro University of Science and Technology (MMUST) in Kakamega town and Maasai Mara University (MMU) in Narok town among the thirty-one (31) public universities and constituent university colleges established across the country. They were purposively chosen on the ground of their varied ages since establishment. The three institutions each represent a length of period in an urban centre where they are sited. JKUAT was established in 1989 in Juja township. It is now about 27 years old. MMUST was established in 2002 in Kakamega town. It is about 14-year-old and MMU was established in 2008 in Narok. It is about 8 years old. Student enrolment and staff recruitment in each institution were examined over a period from the time of establishment to 2013.The study investigated the impact of a university on population a host urban centre. Figure 1 shows the location of these urban centres in the Kenya.
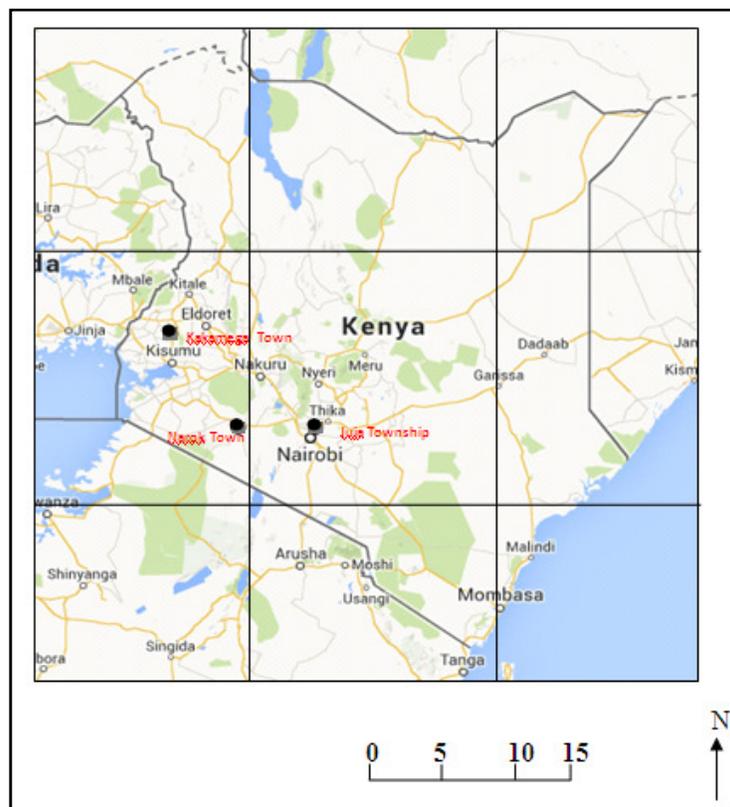

Figure 1: Map showing location of study sites in Kenya
Source: Research (2014)

2.1.1 Juja Town

Juja is a small urban centre with a population of 40,446. It is situated at latitude 1.18330^0S and longitude 37.1167^0E. The urban centre is located in Kiambu County in Central Kenya. The dominant ethnic community in the surrounding areas is Kikuyu who engage in agriculture and business for livelihood. Juja is located 40 kilometres North East of Nairobi city and 8 kilometres South West of Thika town. Figure 2 shows the site map of Juja town. The area around the urban centres is semi arid region and, therefore, receives very low rainfall annually. The urban centre lies at an altitude of 1422 metres above sea level. The area has black cotton soil which becomes water logged during the wet season. The main crops grown around the town are sisal on the Southern and Eastern parts and coffee on Northern and Western parts. In 1989 when Jomo Kenyatta University College of Agriculture and Technology was established, Juja township was a market centre with just three shops owned by foreign investors who were operating sisal business. The urban centre does not have any manufacturing industry.
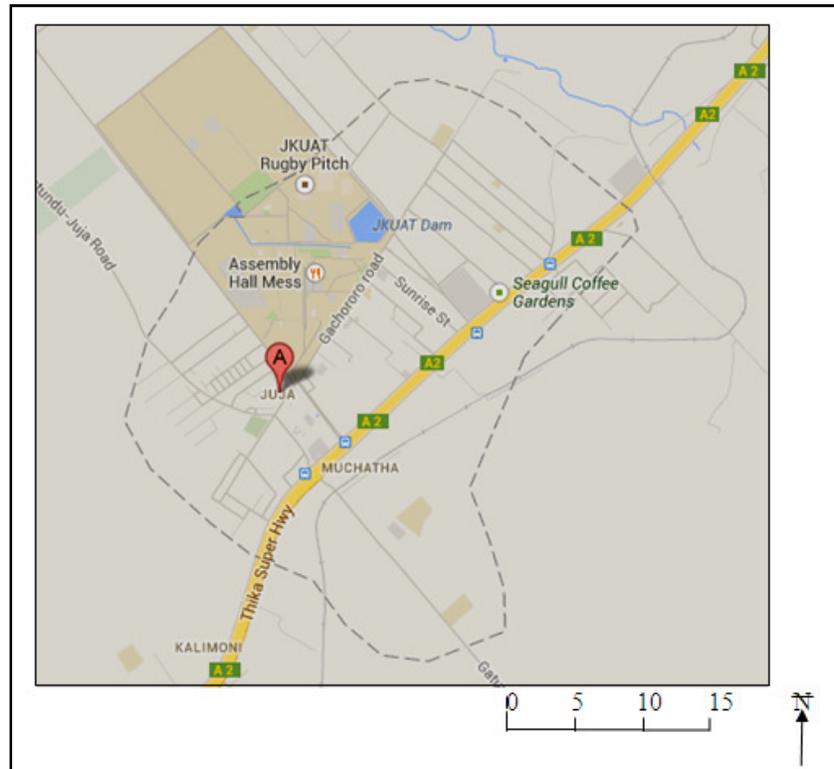

Figure 2: Site map of Juja town in Kiambu County, Kenya
Source: Researcher (2014)

 2.1.2. Kakamega Town

According to 2009 census, Kakamega town has a population of 91,768 people. It is located in Kakamega county in Western Kenya. It is the headquarters of the Kakamega County. Kakamega town is about 500 Kilometres west of Nairobi city and about 52 Kilometres north of Kisumu city. The town is situated at latitude 0.2833^0N. and longitude 35.8667^0E. It is surrounded by densely populated area. The ethnic community surrounding Kakamega town is Isukha of Luhya tribe who are basically crop farmers. Figure 3 shows the site map of Kakamega municipality. The town is located in the tropical equatorial rain forest and lies at an altitude of 1575 metres above sea level. It receives high rainfall throughout the year (Kenya Met., 2013) because of the influence of the tropical forest. Its location near equator makes it have high temperatures all the year around. The climate of Kakamega town can be described hot and wet climate. It does not experience marked dry or wet seasons. The soils are rich and productive in agricultural crops such as sugar cane, tea, maize and forest products such as timber.

Prior to the establishment of the University in 2002, Kakamega was an administrative town with no major industry. Only two residential estates existed; one for public civil servants and the other one for business people and their employees. The estate for public civil servants is Mulimani Estate while that of the other residents is Amalemba. The main economic activities were retail shops, petrol stations, transport services such as *boda boda* bicycle transporters within and around town, limited banking services and limited social services. Currently the town has several universities operating in the CBD other than MMUST which is located on the eastern outskirts of the town. These universities include, University of Nairobi, Kenyatta University, Jomo Kenyatta University of Agriculture and Technology, Mount Kenya University.

Many businesses such as supermarkets, banks, taxis, mini matatus, retail shops, restaurants, motor vehicles bazaars, jua Kali sheds, entertainment clubs, hawkers in fruits, green vegetables motor vehicle repair garages have recently been started in town. Many residential estates have come up residential houses continue being built in the urban centre.
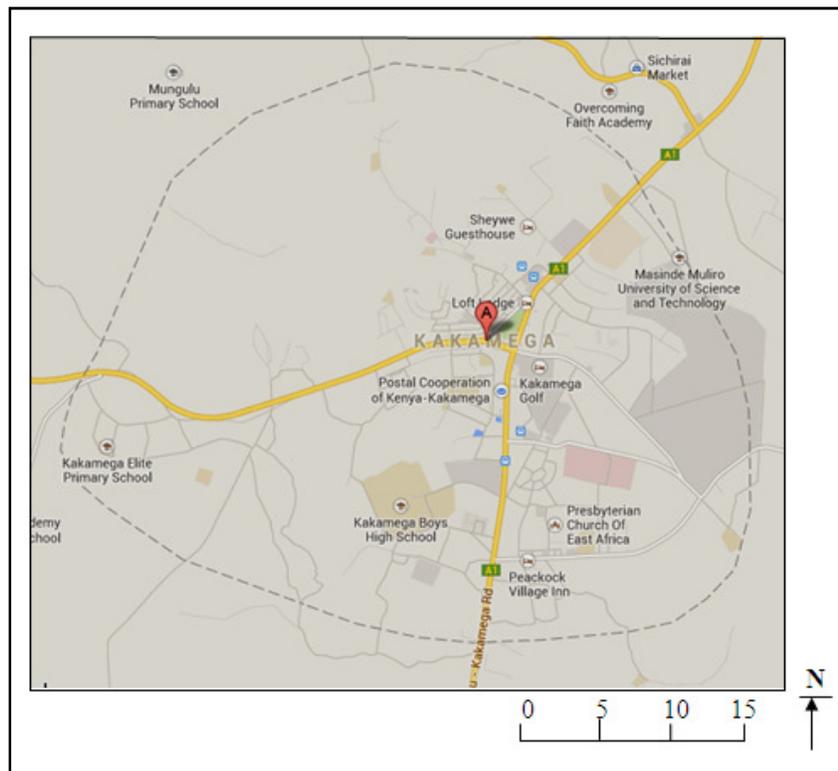
Figure 3: Site map of Kakamega town in Kakamega County, Kenya
Source :Researcher (2014)

2.1.3. Narok Town

Narok town has population of 67,505 people according to 2009 census. It is located in Narok County in South Rift region of Kenya. It is the headquarters of Narok County. The town is about 250 kilometres south west of Nairobi City. Narok town is situated in savannah grassland region at latitude 1.0833^0 S. The region receives seasonal rains in two regimes – the long rains falling between March and May and short rains between August and September. The average rainfall received range from 500 to1800mm per annum. The town is lies at an altitude of 1827metres above sea level. The area has black cotton soils rich in agricultural production. The main crops produced in the hinder land are Maize and wheat. It does not have any manufacturing industry. The Figure 4 shows the site map of Narok town. The Community in the hinterland is the Maasai who are livestock herders.

The town is the home for Maasai Mara University. The University started in 2008 as a constituent college of Moi university. It was upgraded to fully fledged university in 2013. It has current population of student and staff is 7,028 and 657 respectively.
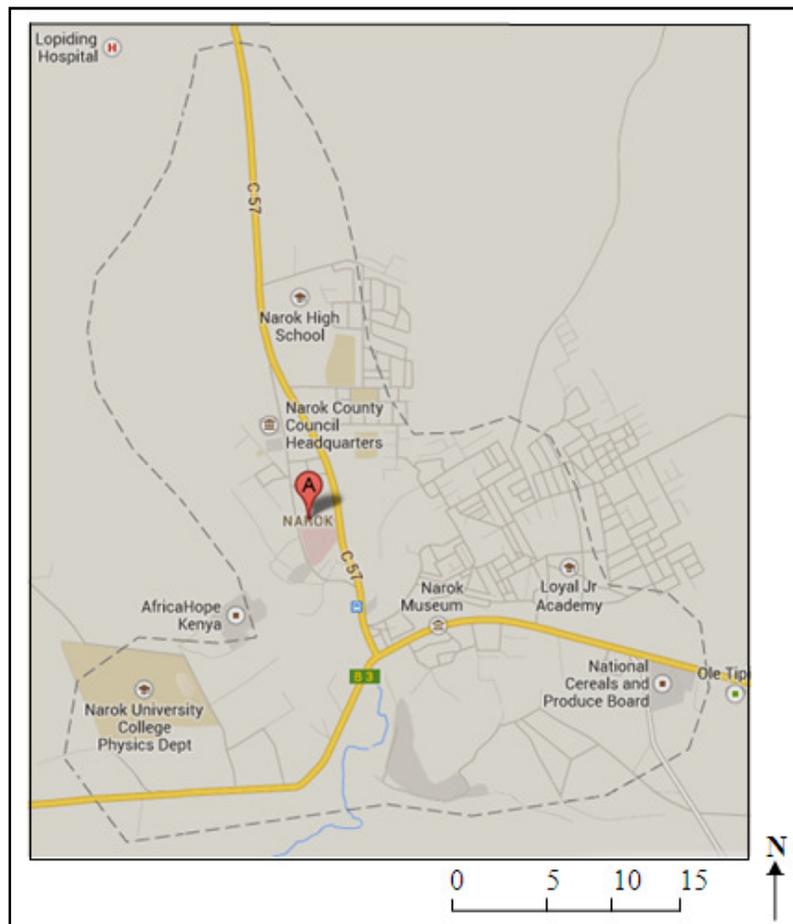
Figure 4: Site map of Narok town in Narok County, Kenya
Source:Researcher (2014)

3. Study Population

The study population comprised university students and the general public residents in the urban centres. Annual data on students in the universities was collected from universities records between the year when the university was established to 2013 and annual data on general public residents in the urban centres was calculated using data collected from National Census records from 1979 to 2009. The National Census in Kenya is held every 10th year. To get the annual population in the urban centres from the base year, the rate of annual growth was calculated using the following equation (G.W. Barclay, 1958):

$\quad$ Log $\frac{p2}{p1}$ =n log (1+r).. 3.1

$\quad$ Where: p_1 is the number of people in the population at the base year initial date

$\qquad\qquad$ p_2 is the number of people in the population at the later year later date

$\qquad\qquad$ r is the annual rate of population growth

$\qquad\qquad$ n is the exact number of years between p_1 and p_2

Tables of annual population in universities and annual population in urban centres were drawn and bar graph was drawn. Simple regression analysis was performed on population growth in universities against population growth in the host urban centres to determine causal effect between the two variables. The null hypothesis was that "there was no relationship between growth of population in the universities and the growth of population in the urban centres". Spearman's Rank Order Correlation analysis was also performed to test the significance of relationship between the growth of population in the universities and the growth of population in the urban centres. The null hypothesis was that "there was no significant relationship between growth of population in the universities and the growth of population in the urban centres".

A comparison between the rate of population growth in the urban centres before and after establishment of the universities was undertaken. This was to establish the effect of a university on the rate of population growth in the urban. The comparison was done by calculating the annual population growth rate of combined population in all urban centres before and after establishment of universities. The equation 3.1 was used to calculate the annual population growth rates. The *t*-test for independent samples was performed to test for significance difference in the rates of population growth in the urban centres before and after establishment of universities. The null hypothesis (H_0) was that there is no difference betwen the rates of population growth before and after establishment of universities in the urban centres. The alternative hypothesis (H_1) was that there is difference between rates of population growth before and after establishment of university in the urban centre

4. Results and Discussion

4.1. Relationship between Population Growth in Universities and Population Growth in the Host Urban Centres, Kenya
The relationship between population growth in the universities and that in the urban centres in which these universities are located is as indicated figure 5
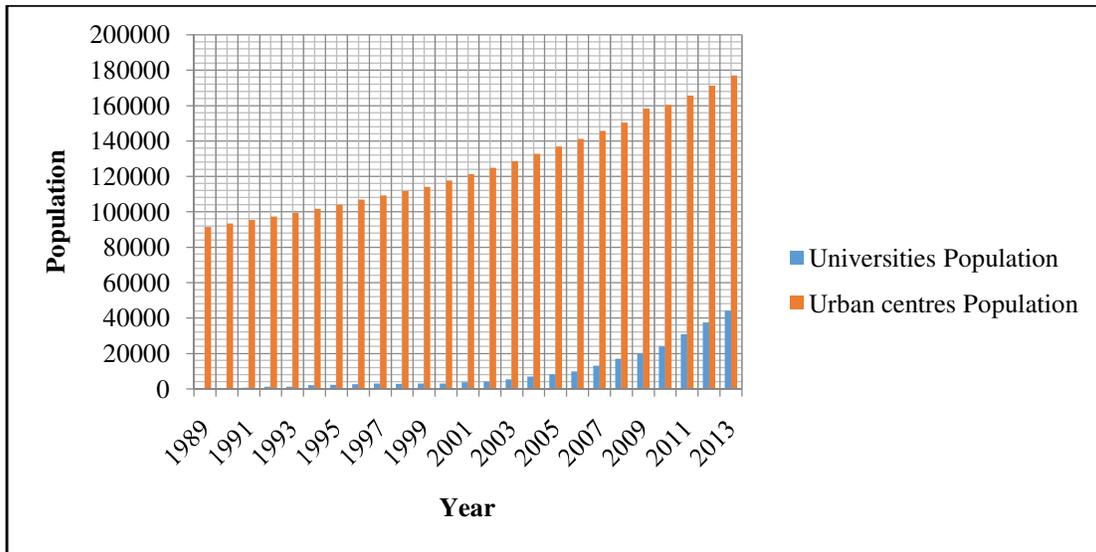

Figure 5: Annual population in universities and urban centres understudy

Population growth in urban centres started to accelerate in about 2005 and continued thereafter. This is also the time when university enrolment in the country started to grow faster as more universities were being established in various urban centres and individual universities were increasing their capacities through expansion of infrastructure and development of more programmes (CUE, 2014). The analysis of variance (ANOVA) associated with the regression performed is as shown in the ANOVA Table 1. I

ANOVA						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.100E10	1	1.100E10	64.198	.000[a]
	Residual	1.886E9	11	1.714E8		
	Total	1.289E10	12			
a. Predictors: (Constant), university population						
b. Dependent Variable: Total urban population						

Table 1: Analysis of Variance I

The observed *F*-ratio in the ANOVA Table is 64.198 as compared with critical value of 3.18 found in the *F*-distribution Table using 1 and 12 degrees of freedom respectively for numerator and denominator. The null hypothesis was rejected and it is concluded that there was casual relationship between population growth in the universities and the growth of population in the urban centres. A scattergram with a line of best fit and $R^2=0.8349$ in Figure 6 shows that the two variables are highly correlated.
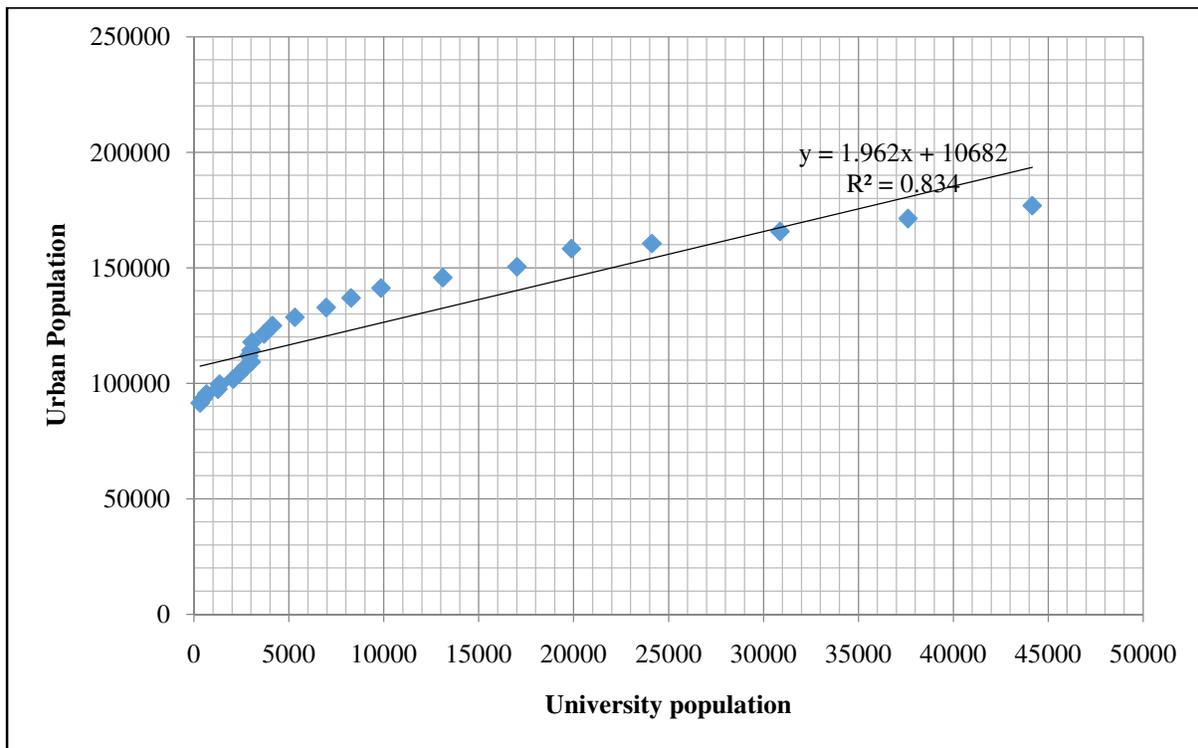
Figure 6: A scatter gram with a line of best fit.

Spearman's Rank Order Correlation analysis was also performed to test the significance of relationship between the growth of population in the universities and the growth of population in the urban centres. The analysis showed there is highly significant (P<0.01) relationship between the population growth in the universities and the population growth in horst urban centres. The R value was 0.9137 and the two-tailed P value was 0. The value of R^2 (the coefficient of determination) was 0.8349. The null hypothesis was, therefore, rejected. This confirmed that there is significant causal relationship between growth population in the universities and that in the urban centres.

4.2. Rate of Population Growth in Urban Centres before and after Establishment of Universities

The rate of population growth in urban centres before and after establishment of universities is shown in Table 2.

Urban Centre Establishment	% Growth rate Before university establishment	% Growth rate after university the normal growth	Percentage change from Rate
Juja	1.8	5.5	3.7
Kakamega	1.5	2.4	0.9
Narok	2.5	6.4	3.9
Overall	2.2	4.0	1.8

Table 2: Rate of population growth in urban centres before and after universities establishment

The t-test for independent samples was performed to test for significance difference in the rates of population growth in the urban centres before and after establishment of universities. The null hypothesis (H_0) was that there is no difference between the rates of population growth before and after establishment of universities in the urban centres. The alternative hypothesis (H_1) was that there is difference between rates of population growth before and after establishment of university in the urban centre. The rejection level was decided as α=0.05. The calculated value for t was 3.06. The critical value for t at 2 degrees of freedom at α=0.05 in the t-table was 2.45. Since the calculated value for t was greater the critical value for t, the null hypothesis was rejected and the alternative hypothesis that there was significant difference between the rates of growth of population before and after establishment of universities in the urban centres. It is concluded that the population in the urban centres grew faster after establishment of universities in these centres. It grew at one point eight (1.8%) percent above the normal growth of two point two (2.2%) percent.
The growth of university population encourages investment in hostels, in food outlets such hotels and restaurants, in entertainment business such as night clubs and games facilities and in salons sund barber shops and in financial business such as banks and MPesa kiosks. The owners of the investments may not manage the businesses but employ people to manage these businesses for them. The employees need social services such housing and accommodation, food and other social amenities including health facilities,

education facilities for their children, domestic water and sewerage systems. For instance, increased population may result in higher chances of sick cases cropping up as stated by Carol (2014, www.populationeducation.org)

> "Diseases spread more quickly among people who live in close proximity to   each other. Currently, over 50% of the global population lives in the urban areas. With more people living in dense conditions, there is more frequent contact between more individuals allowing disease transmission to easily occur".

Health facility established will require doctors and nurses to treat the ailing patients. Whether or not the facility is put up by the urban authority or by private individuals the urban council will have to employ workers just like private health investors. These employees will also require other services. Children of the incoming population will need a school. A school employs teachers who also require the goods and service and so the spiral will continue. Thus employees' needs and demands for goods and services provide further opportunities for investment and employment hence increased rate of urbanization.

The Urban Authority should ensure Physical Plans and Policies are in place to guide the investors as they invest in businesses in urban centres. This is because fast growing population has implication on infrastructural development and provision of social services in the urban centres. The increased population will put strain on provision of social services such as housing, water for domestic use, sewerage and sanitary facilities.

5. Conclusions and Recommendations

The study established that there was significant causal relationship between the growth of population in the universities and that in the urban centres. It showed that the growth of population in the universities accelerates growth of population in urban centres. The comparison of the rates of population growth in the urban centres before and after establishment of universities confirmed this relationship by showing that population in the urban centres grew at a higher rate after establishment of the universities than before. That is, the annual population growth rate of the urban centres before establishment of universities was 2.2% and 4.0% after establishment of the universities. Thus, the population of the urban centres grew at an annual rate of 1.8% above or almost twice the normal annual growth rate before the Universities were established. This annual population growth rate of urban centres compares well with the World Bank urban review on Kenya which stated that rate of urban growth in the country between 2003 and 2013 averaged 4.5% and that the country is urbanizing currently at about 4% a year (world Bank 2016).

The increasing university population has created demand for goods and services which in turn has attracted investors in the urban centre. The investors have invested in the businesses that supply the required goods and services to both university population and the general public. The businesses have created employment opportunities which have attracted people seeking employment. In the process, urbanization has been triggered. Establishing of universities in small and medium size urban centres is contributing significantly to accelerated urbanization in the country.

Urban Authorities in towns where universities are established should partner with the universities to use the suitable programmes, staff expertise and technology for systematic development of their urban centres. The Urban Authorities should engage professionals to develop plans, institute laws which will guide the growth of the urban centres. They should devise strategies for raising adequate funds for implementation of plans, laws and regulations and developing human resource. The strategies should include reducing revenue wastage through proper budgeting and elimination of corruption at revenue collection points and partnering with private sector, international financial organizations among others.

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