Kenya's Water Towers Protection and Climate Change Mitigation and Adaptation (WaTER) Programme

DEMOGRAPHIC AND ECONOMIC PROFILE OF 'HOTSPOTS' AND VULNERABLE AREAS ON PUBLIC AND COMMUNITY LANDS IN MT. ELGON AND CHERANGANY HILLS ECOSYSTEMS

Component 4: Science to Inform Design of Community-Level Actions and Policy Decisions

Project ReportAugust 2017

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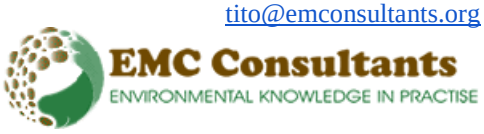

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List of acronyms

CDF	Constituencies Development Fund
ECD	Early Childhood Education
EMC	Environmental Management Consultants
FGD	Focus Group Discussion
GDP	Gross Domestic Product
KEFRI	Kenya Forestry Research Institute
KFS	Kenya Forest Service
KII	Key Informant Interview
KNBS	Kenya national Bureau of statistics
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Service
KWTA	Kenya Water Towers Authority
LVBC	Lake Victoria Basin Commission
MoL	Ministry of Lands
REA	Rural Electrification Authority
SACCO	Savings and Credit Cooperative Organization
SOP	Standard Operating Procedures
UNEP	United Nations Environment Programme
WCU	World Conservation Union
WRMA	Water Resources Management authority

EXECUTIVE SUMMARY

The links between the environment and the economy are very intricate. This report scopes out the linkages between demographics, socio-economic activities and environmental degradation, focusing on land and water resources. The overaching goal goal of this research was to provide baseline information economic growth and resource degradation in Mt. Elgon and Cherangany watersheds. Preparation of this report was done through a participatory process involving consultative planning process together with the client (KEFRI), stakeholders interviews and desktop reviews of secondary information. The document highlights salient conservation issues from the several Counties that are covered within the Mt. Elgon and Cherangany ecosystems, and it brings into perspective the degradation hotspots, economic profiles for the Counties and mitigation measures towards attaining sustainable development. The report is divided into six chapters.

Chapter one provides background information about Elgon and Cherangany Hills esosytems as some of the major water towers in Kenya. It highlights the significant roles of the water towers in storing rainwater, regulating river flows and preventing runoff, recharging ground-water aquifers, improving soil fertility, reducing soil erosion and sediment loads in river water, regulating local climatic conditions for commercial agriculture, and acting as carbon reservoirs and sinks. It also stipulates the objectives of this report.

Chapter two the study area in Mt. Elgon and Cherangayn ecosystems. The further decribes the processes undertaken during project planning, literature reviews, data collection methods and instruments, recruitment and training of research assistants, pretesting and refinement of data collection tools, field work planning, selection of project sites, data processing and analysis methods.

Chapter three decribes the county demographic profile, population size, ethinic composition, density and distribution. Eleven counties were identified in the two studies. Counties covered in Mt. Elgon Forest ecosystem are Trans Nzoia, Bungoma, Kisumu, Siaya, Busia, Vihiga and Kakamega. In Cherangany ecosystem, the counties included Uasin Gishu, Nandi, Elgeyo Marakwet and West Pokot. Vihiga was found to be the most densely populated county with

1869 persons per square kilometer, and a majority (52%) of the inhabitant were females. This exerts more pressure on land and other resources, low agricultural production leading to food insecurity, high unemployment rate and unending land disputes. About 80% of population in all the 11 counties are dominated by youths (below 40 years).

Chapter four discusses the economic profiles in the counties in regards environment and natural resources such as soils, land and land use changes, wildlife, forestry and fisheries, water sources and energy sources. Poverty levels are generally high in all counties. The main sources of energy are firewood and charcoal. The major economic activities common in all the 11 counties are crop, livestock and fish production, forestry and agro forestry, mining, tourism and industrialization. Other impotatnt sources of revenue include levies, rates, fees and entertainment taxes and charges for its services. Improving the business environment and automation of revenue collection as well as broadening the tax base can help improve the total revenue base.

Chapter five discusses the the human settlements and infrastructure in some of the major towns/cities and urban centers within Mt. Elgon and Cherangany ecosystesm. It covers human settlements, literacy levels, transport and ommunication networks, infrastructure and energy supply, industry and trade in the district. Most of the towns have emerged as either agricultural and/or trade centers due to construction of roadsand railway. Major sectorsof the economy are therefore; agro-based industries, services industry, transport and communication, tourism, mining and quarrying.

Chapter six highlights the results of field survey conducted in Mt. Elgon and Cherangany. The chapter describes the distribution of respondents by age and gender, educational levels, marital status, land tenure systems, farm sizes, land use, sources of livelihoods, perception of land degradation type; extent and severity of land degradation, root causes and conservation methods to manage to manage the problem.

Chapter seven draws key conclusion and recommendations demographic and economic profiles of the counties in the study area. The chapter further highlights roles through environmental education and information, awareness raising and public participation in sustainable livelihood and environmental management.

CHAPTER ONE: INTRODUCTION

1.1. Project Background

Kenya's water towers store rainwater, regulate river flow and prevent runoff, recharge ground-water aquifers, improve soil fertility, reduce soil erosion and sediment loads in river water, regulate local climatic conditions for commercial agriculture, and act as carbon reservoirs and sinks. Deforestation has reduced forest coverage from 12% in the 1960s to currently 6.9%. This has affected the ability of Kenya forest ecosystems to provide critical ecosystem services.

It is estimated that deforestation costs the Kenyan economy an estimated KES 5.8 billion per year. The contribution of forests to GDP is estimated to around 3.6% but climate change is estimated to cost Kenya's economy as much as KES 50 billion a year, equivalent to 2% of country's GDP hampering long-term economic growth.

Mount Elgon and Cherengany Hills are some of the major water towers in Kenya. The Water Towers play a significant role in storing rainwater, regulating river flows and preventing runoff, recharging ground-water aquifers, improving soil fertility, reducing soil erosion and sediment loads in river water, regulating local climatic conditions for commercial agriculture, and acting as carbon reservoirs and sinks.

Kenya Forest Research Institute has commissioned this study whose general objective is to provide baseline information on biophysical and socio-economic status of the two ecosystems which will be used to inform rehabilitation and conservation actions.

1.2. Objective of the study

The purpose of this study is to understand both the demographic and economic profile of the most degraded areas in the two ecosystems in vulnerable areas on public and community land. The information generated will be key to understanding the role of population increase/decrease in degradation of the ecosystems. Further, the economic profile sequence will show its relationship with degradation of the hotspots.

CHAPTER TWO: STUDY APPROACHES

2.1. Study Area

Study area for this project cover two ecosystems of Mt. Elgon and Cherangany forests. The area thus, include 11 counties which include Trans Nzoia, Bungoma, West Pokot, Busia, Kisumu, siaya, Vihiga, Kakamega counties in Mt. Elgon ecosystem and in Cherangany ecosystem include Elgeyo-Marakwet, Uashin Gishu and Nandi Counties (Fig. 1).

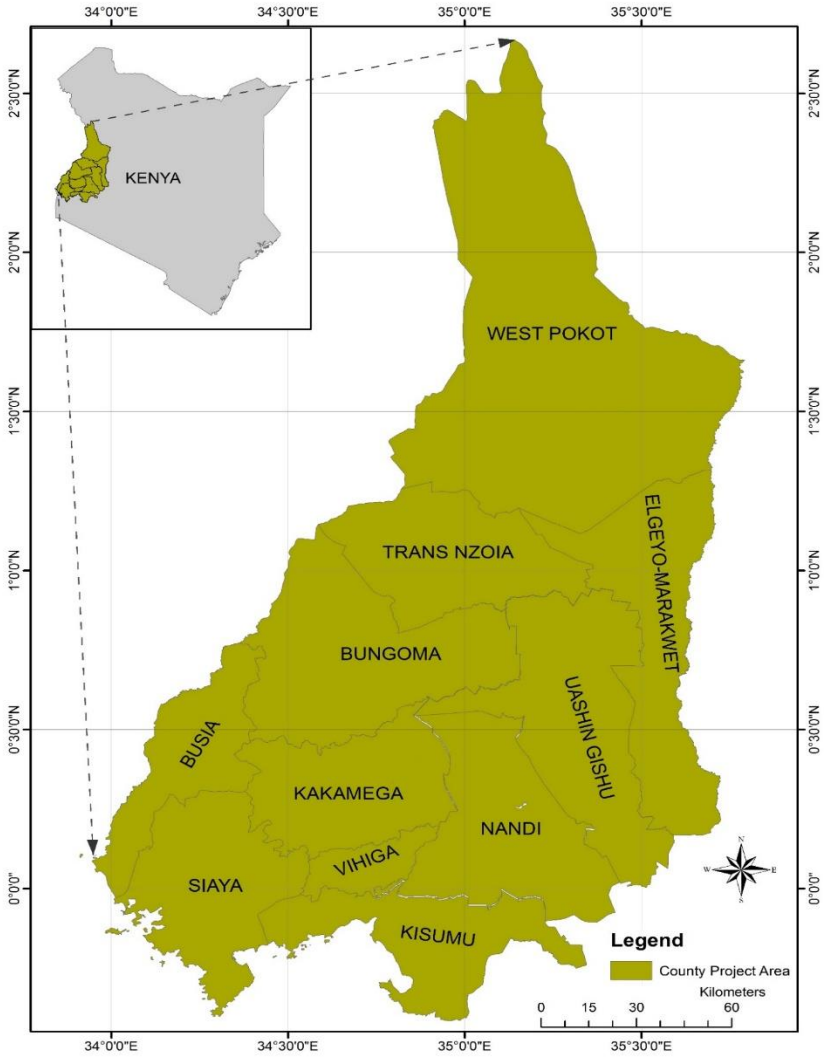

Figure 1: Geographic location of the study area

2.2. Task 1. Literature Review (Desktop Review) & Project Planning

2.2.1. Project Planning and Initial Contacts

As the initial task, we undertook a consultative planning process together with the client (KEFRI**)** in order to evaluate in detail the requirements of the assignment, the actual logistics involved, the scope of work and the eventual signing of the contract. We conducted a thorough planning process for all the project activities including mobilization, initial contacts and discussions with relevant government departments and ministries and relevant stakeholders involved in this project.

2.2.2. Literature Review (Desk Review of Secondary Information)

We conducted an in-depth desktop literature review in order to familiarize with the study objectives, increase project understanding and project background settings. The desktop review was the initial step for EMC consulting team to review and collect relevant data and information related to maps and qualitative information on human settlement and land tenure.

We will review among others; -

- Land Use Plans
- Human Settlement Maps and Reports
- Land cover land use maps
- Livelihood Reports

The review of the documents primarily helped the study team understand among others the;

- The existing land tenure systems in the project area
- The current land use practice in the project area
- The current settlement arrangement and patterns in the project area

Among the relevant secondary data which were familiar with and expected to contain the above information include among others;

1. County Integrated Development Plans
2. Water Towers Atlas of Kenya
3. Kenya Water Towers Status Report
4. Kenya Demographic Indicator Survey Report

5. Kenya Population and Housing Census Report
6. Socio-Economic Atlas of Kenya

The following will be our key sources of information for the secondary data:

Ministry of Lands	land tenure/maps
Kenya National Bureau of Statistics	Settlement patterns and demographics
Kenya Wildlife Service	Vegetation Cover
Kenya Forest Service	Vegetation Cover/ CFAs
World Conservation Union	Vegetation Cover
Lake Victoria Basin Commission	Vegetation Cover/MERECP Project
Kenya Water Towers Authority	Vegetation Cover/CFAs
United Nations Environment Programme	Vegetation Cover
County governments	Vegetation Cover/settlement patterns and demographics
Water Resources Management authority	Vegetation Cover/WRUAs
KEFRI	Vegetation Cover/ CFAs

2.3. Development of Data Collection Tools

We developed and refineed specific questionnaires and protocols for this study, which outlined the study background, rationale, objectives, study design, methodologies and procedures and timelines.

An instruction manual (Standard Operating Procedure) was developed to support standardized field data collection. This document shall guide the day-to-day activities including data collection procedures, data entry procedures and study daily logistics. This document ensured uniformity and reduced bias that may be introduced into the study as a result of different procedural approaches.

2.4. Data Collection Methods & Instruments

2.4.1. Stakeholders Interviews Using Key Informant Interviews (KIIs) Questionnaires

The study team prepared Key Informant Interview (KII) Guides to first introduce the study to the selected key informants (participants) and complete the Bio-data Form. The interviewer then obtain informed consent from the individual in order to conduct individual face-to-face interviews using the relevant study instruments. The interviewers provided clarification on questions from the respondents and check for completeness of the questionnaire.

2.4.2. Stakeholders Interviews Using Focus Group Discussion (FGD) Guides

The study team used prepared Focus Group Discussion (FGD) Guides to the selected group of participants. The interviewer then obtained informed consent from the groups in order to conduct interviews using the relevant study instruments. The interviewers provided clarification on questions from the respondents and check for completeness of the questionnaire. Focus Group Discussion interviews included representatives like:-

1. Farmers Associations
2. Women Groups
3. Youth Groups
4. Community Based Organizations
5. Community Forest Associations (group members)
6. Water Resource Users Associations (group members)
7. Wildlife Conservation Networks
8. Microfinance Institutions

2.4.3. Photographic Capture

Photographs of the actual observation was used as a way of data collection and used eventually in the final environmental compliance study report.

2.5. Recruitment & Training of Research Assistants

EMC Consultants has developed a database of over 100 local research assistants (enumerators) and database experts, with superior qualifications (bachelors degree and above) that it can

comfortably rely on for this study. These researchers have relevant experiences especially the Kenyan context as a result of undertaking various research projects in the country over the past 6 years. The researchers are equally qualified in research techniques and have undergone training in research ethics, general interviewing skills as well as data collection, entry and transcriptions.

A total of 16 Enumerators, 2 Field Supervisors and 2 Data Entry Clerks were recruited for this study. The research assistants (enumerators) were selected based on the following qualifications;

- *Experience in conducting interviews on sensitive topics for research purposes especially in Population & Development based studies, Socio-Economic Assessment, Reproductive and Public Health, Social Studies*
- *Good written and verbal skills in English and Kiswahili languages.*
- *Bachelor's degree in population studies, statistics, social sciences, health sciences or any relevant disciplines from recognized institutions*
- *Experience in data collection and Abstractions and a demonstration of good interviewing skills; Data entry skills will be an added advantage*
- *Good working knowledge of office computer applications preferably Word and Excel. Additional knowledge of any statistical package will be an added advantage*
- *Strong analytical skills and familiarity with the use of GPS equipment*

All the study staff and Research Assistants attended**1-day** study training prior to the start of the study. They also receive training on research ethics, the study aims, protocol and standard operating procedures, principles of informed consent, the study questionnaire, probing techniques, data entry techniques and briefs on KEFRI as an institution. In order to ensure proficiency with study procedures, all study members shall participate in mock participant interviews and take a pre-test and post-test quiz on the Field Standard Operating Procedures (SOPs).

2.6. Pre-Testing & Refining of Data Collection Tools

The study survey tools were pre-testedin order to validate and determine whether they are effective and if they meet all the requirements for the study. The pre-testing was done in different places for about 2 hours. The pre-site does not form part of the study sites. The final

study tools was then produced based on the findings of the pilot study, where comments were incorporated and questions framework adjusted where necessary.

The specific objectives for pre-testing the tools included;

- *To determine if the elicited responses are the actual responses targeted*
- *To determine if the scope of the questions are adequate for the study*
- *To determine if the chronological flow of the questions in the questionnaire is relevant*
- *To estimate the average time needed to administer a questionnaire.*

2.6.1. Logistical planning for fieldwork:

The team with assistance from field teams will carry out detailed planning and advance works to mobilize the fieldwork as quickly as possible following the initial national and district consultations. In addition to working out logistics (vehicles, lodging, etc.), the planning will include contacts and coordination with County, District and sub-District authorities to schedule community consultations and integrate county authorities and resettlement committees into the work plan

2.7. Fieldwork/Field Trips to Select Sub Project Sites

Under the guidance of the study Team Leader, the team carried out fieldwork and field trips to the project area. The purpose of the direct field visit trips was to determine and understand using direct expert observation and consultation.

2.7.1. Socio-cultural and Economic Analysis

The consultant undertook a detailed socio-cultural survey of the catchment area in order to understand and put into perspective the causal (socio-cultural and economic) factors that contribute to degradation of the catchments.

Specifically, the consultant undertook a survey on demography, livelihood and the extent to which they could be contributing to catchment degradation.

2.8. Spatial human Population distribution

2.8.1. Human Settlement

Human settlement distribution was capture for major towns in the two ecosystems. Satellite image extracted from Google Earth was used to show and appreciate the size, density of built up areas and the environs of the major towns.

2.9. Data Processing & Analysis Methods

Qualitative sets, the data were entered into NVIVO statistical software alongside identification parameters for qualitative analysis. Upon completion of the data entry the study team leader carried out qualitative and quantitative data analysis.

CHAPTER THREE: DEMOGRAPHIC PROFILES

3.1. Mt. Elgon Forest Ecosystem

3.1.1. Trans Nzoia County

a) Population size and composition

According to the 2009 Population and Housing Census a total of 818,757 persons were enumerated in Trans Nzoia County, 407,172 being male and 411,585 female. The growth rate was 3.7% between 1999 and 2009 which is above the national average of 3.0%. If the growth rate is maintained the total population for the County in 2013 is projected to be 949,359 persons of which 472,121 are male and 477,238 are female. By 2017 the population is projected to increase to 1,100,794. The highest proportion of the population in Trans Nzoia is Children of Age Cohorts 0-4, 5-9 and 10-14 which accounts for over 47 percent of the projected county population in 2013. The county has generally a youthful population with 740,420 of her population below 35 years of age, representing 80.9 per cent of the total projected population for the county in 2013 and only 6,512 persons in the age cohort, 80+. On the other hand, the labour force mainly of ages 15-64 years has a projected population of 459,225 persons in 2013 representing 50 percent of the total county population (Trans Nzoia County, 2013).

b) Population Density and Distribution

The population density in the county as increased from 328 persons per square kilometre in 2009 to 367 persons per square kilometre and is expected to rise further to 441 by 2017 attributed by the high population growth rate. Trans Nzoia County is a fairly densely populated and is among the top 15 densely populated counties in the country according to Kenya County Data sheets (Trans Nzoia County, 2013).

Table 1: Population of Trans Nzoia county and projections up to 2017. distribution by demographic structures

Age group	2009 cencus			2013 projection			2015 projection			2017 projection		
	M	F	T	M	F	T	M	F	T	M	F	T
0-4	71,466	69,784	141,250	82,866	80,915	163,781	89,230	87,130	176,361	96,084	93,823	189,906
5-9	66,252	65,658	131,910	76,820	76,131	152,951	82,720	81,979	164,699	89,074	88,275	177,349
10-14	56,015	55,927	111,942	64,950	64,848	129,798	69,939	69,829	139,768	75,310	75,192	150,503
15-19	46,552	44,979	91,531	53,978	52,154	106,131	58,123	56,159	114,283	62,588	60,473	123,061
20-24	35,746	40,730	76,476	41,448	47,227	88,675	44,631	50,854	95,486	48,059	54,760	102,820
25-29	29,631	31,381	61,012	34,358	36,387	70,744	36,996	39,181	76,178	39,838	42,191	82,029
30-34	24,395	24,115	48,510	28,286	27,962	56,248	30,459	30,109	60,568	32,798	32,422	65,220
35-39	19,142	19,018	38,160	22,195	22,052	44,247	23,900	23,745	47,645	25,736	25,569	51,305
40-44	13,642	14,207	27,849	15,818	16,473	32,291	17,033	17,738	34,771	18,341	19,101	37,442
45-49	12,019	12,778	24,797	13,936	14,816	28,752	15,007	15,954	30,961	16,159	17,180	33,339
50-54	9,318	9,325	18,643	10,804	10,812	21,617	11,634	11,643	23,277	12,528	12,537	25,065
55-59	6,902	6,799	13,701	8,003	7,884	15,886	8,618	8,489	17,107	9,280	9,141	18,421
60-64	5,311	4,989	10,300	6,158	5,785	11,943	6,631	6,229	12,860	7,140	6,708	13,848
65-69	3,381	3,711	7,092	3,920	4,303	8,223	4,221	4,633	8,855	4,546	4,989	9,535
70-74	2,762	2,788	5,550	3,203	3,233	6,435	3,449	3,481	6,930	3,713	3,748	7,462
75-79	1,892	2,096	3,988	2,194	2,430	4,624	2,362	2,617	4,979	2,544	2,818	5,362
80+	2,627	3,201	5,828	3,046	3,712	6,758	3,280	3,997	7,277	3,532	4,304	7,836
TOTAL	407,172	411,585	818,757	472,121	477,238	949,359	508,383	513,893	1,022,277	547,431	553,364	1,100,794

SOURCE: KNBS 2011

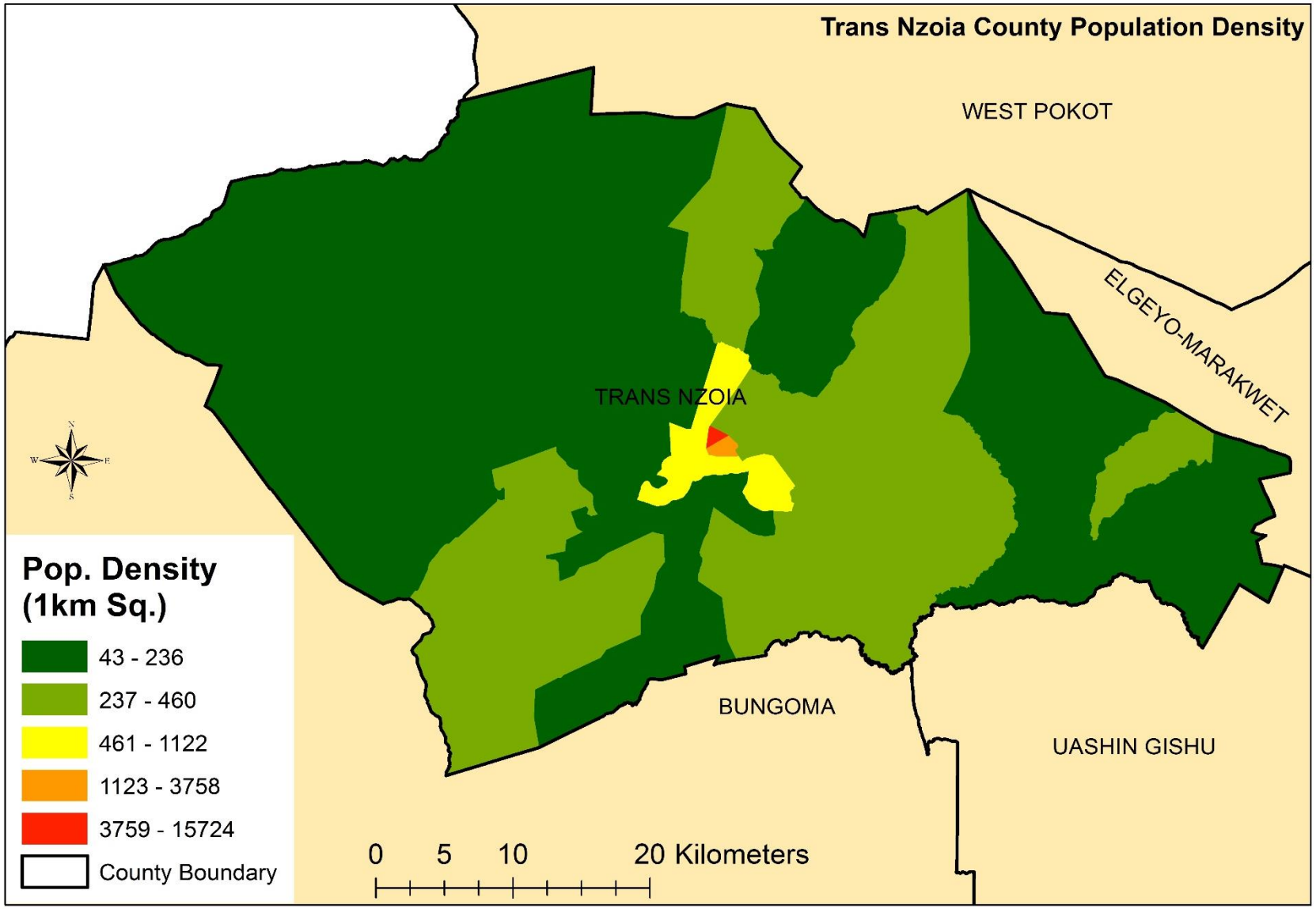

Figure 2: Spatial visualization of population density distribution in Trans Nzoia county

3.1.2. Bungoma County

a) Population size and composition

Based on the population growth rate of 3.1% the projected population of Bungoma County by 2013 is 1,557,236 (Male 760,564 Female 796,672), by 2015 the population is 1,655,281 (Male 808,449, Female 846,832) and 2017 the population is to be 1,759,499 (Male 859,350 and Female 900,149). The Male to Female ratio is 1: 1.2. The county has a growing population with varying demographics including migrations, birth rates, fertility, mortality and immigrations. The table below shows population projection by age cohorts (Bungoma, 2013).

From the table 3-1 (below), age cohorts 0-4 through to 30-34 have the highest population. These cohorts represent youthful and growing population that needs sustainable investments in quality and accessible education, career development and counseling, skills development and mentoring, health care, nutrition, recreation facilities, talent development and provision of conducive environment for socio-economic empowerment (Bungoma, 2013).

Table 2: Population projection by demographic structure (age cohort) for Bungoma county. Source: KNBS, (2009) Population and Housing Census.

	2009 (Census)			2013 (Projections)			2015 (Projections)			2017 (Projections)		
Age group	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	124,755	123,946	248,701	140,959	140,045	281,004	149,834	148,862	298,696	159,268	158,235	317,502
5-9	112,712	113,453	226,165	127,352	128,189	255,541	135,370	136,260	271,630	143,893	144,839	288,732
10-14	95,359	95,030	190,389	107,745	107,373	215,118	114,529	114,133	228,662	121,739	121,319	243,059
15-19	78,946	78,540	157,486	89,200	88,741	177,941	94,816	94,328	189,145	100,786	100,268	201,053
20-24	57,669	66,137	123,806	65,159	74,727	139,887	69,262	79,432	148,694	73,623	84,433	158,056
25-29	43,054	49,043	92,097	48,646	55,413	104,059	51,709	58,902	110,611	54,965	62,610	117,575
30-34	35,100	39,432	74,532	39,659	44,554	84,213	42,156	47,359	89,515	44,810	50,341	95,151
35-39	28, 921	30,689	59,610	32,677	34,675	67,353	34,735	36,858	71,593	36,922	39,179	76,101
40-44	21,431	23,880	45,311	24,215	26,982	51,196	25,739	28,680	54,420	27,360	30,486	57,846
45-49	19,936	21,948	41,884	22,525	24,799	47,324	23,944	26,360	50,304	25,451	28,020	53,471
50-54	15,031	16,549	31,580	16,983	18,698	35,682	18,053	19,876	37,928	19,189	21,127	40,316
55-59	11,239	12,653	23,892	12,699	14,296	26,995	13,498	15,197	28,695	14,348	16,153	30,502
60-64	8,262	9,343	17,605	9,335	10,557	19,892	9,923	11,221	21,144	10,548	11,928	22,475
65-69	5,951	7,005	12,956	6,724	7,915	14,639	7,147	8,413	15,560	7,597	8,943	16,540
70-74	4,851	5,625	10,476	5,481	6,356	11,837	5,826	6,756	12,582	6,193	7,181	13,374
75-79	3,602	4,267	7,869	4,070	4,821	8,891	4,326	5,125	9,451	4,598	5,447	10,046
80+	6,314	7,551	13,865	7,134	8,532	15,666	7,583	9,069	16,652	8,061	9,640	17,701
TOTAL	673,133	705,091	1,378,224	760,564	796,672	1,557,236	808,449	846,832	1,655,281	859,350	900,149	1,759,499

Table 3: Population projections by urban centres. Source: Kenya National Bureau of Statistics (2009), Population and Housing Census

Urban centres	2009 (Census)			2013 (Projections)			2015 (Projections)			2017 (Projections)		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Cheptais	1,852	2,047	3,899	2,093	2,313	4,406	2,225	2,458	4,683	2,365	2,613	4,978
Tongaren	1,340	1,453	2,793	1,514	1,642	3,156	1,610	1,745	3,355	1,711	1,855	3,566
Malakisi	1,690	1,822	3,512	1,910	2,059	3,969	2,030	2,189	4,219	2,158	2,327	4,485
Kimilili	19,800	21,315	41,115	22,372	24,083	46,455	23,780	25,599	49,379	25,277	27,211	52,488
Bungoma	27,669	28,198	55,867	31,263	31,861	63,124	33,231	33,867	67,098	35,323	35,999	71,322
Webuye	11,489	11,829	23,318	12,981	13,365	26,346	13,798	14,207	28,005	14,667	15,101	29,768
Chwele	3,332	3,874	7,206	3,765	4,377	8,142	4,002	4,653	8,655	4,254	4,946	9,200
Kapsokwony	1,808	1,891	3,699	2,043	2,137	4,180	2,171	2,271	4,442	2,308	2,414	4,722
TOTAL	**68,980**	**72,429**	**141,409**	**77,941**	**81,837**	**159,778**	**82,847**	**86,989**	**169,836**	**88,063**	**92,466**	**180,529**

According to the Cities and Urban Areas Act of 2011, the County has 3 Towns with a population of at least 10,000 persons. They include Bungoma 63,124 (Males 31,263 and Females 31,861), Kimilili 46,456 (Males 22,372 Females 24,084) and Webuye 26,346 (Males 12,981 and Females 13,365).

b) Population Density and Distribution

The population of Bungoma County is of mixed demographic characteristics. However, there is a tendency for most of the population to be concentrated in major Towns, urban centers and markets because of the availability of various social or economic opportunities and social infrastructural facilities. Table 3-4 shows the population distribution and density by Sub County (Bungoma, 2013)

Table 4: Population Distribution and Density by Sub County

Sub county		2009 (Census)		2013 (Projections)		2015 (Projections)		2017 (Projections)	
Size (Km2)		Population	Density (Persons /Km2)	Population	Density (Persons/Km 2)	Population	Density (Persons/K m2)	Population	Density (Persons/Km^2)
Kanduyi	318.5	229,701	721	259,536	815	275,876	866	293,245	921
Kabuchai	232.3	141,113	608	159,442	686	169,481	730	180,152	776
Sirisia	213.2	102,422	480	115,725	542	123,012	577	130,757	613
Kimilili	181.2	132,822	733	150,074	828	159,522	800	169,566	936
Tongaren	378.4	187,478	496	211,829	560	225,166	595	239,343	633
Webuye East	161.8	101,020	626	114,141	706	121,327	750	128,966	797
Webuye West	242.6	129,233	533	146,009	602	155,212	640	164,984	680
Mt Elgon	956.6	172,377	180	194,766	204	207,029	216	220,064	230
Bumula	347.8	178,897	514	202,133	581	214,860	618	228,388	657

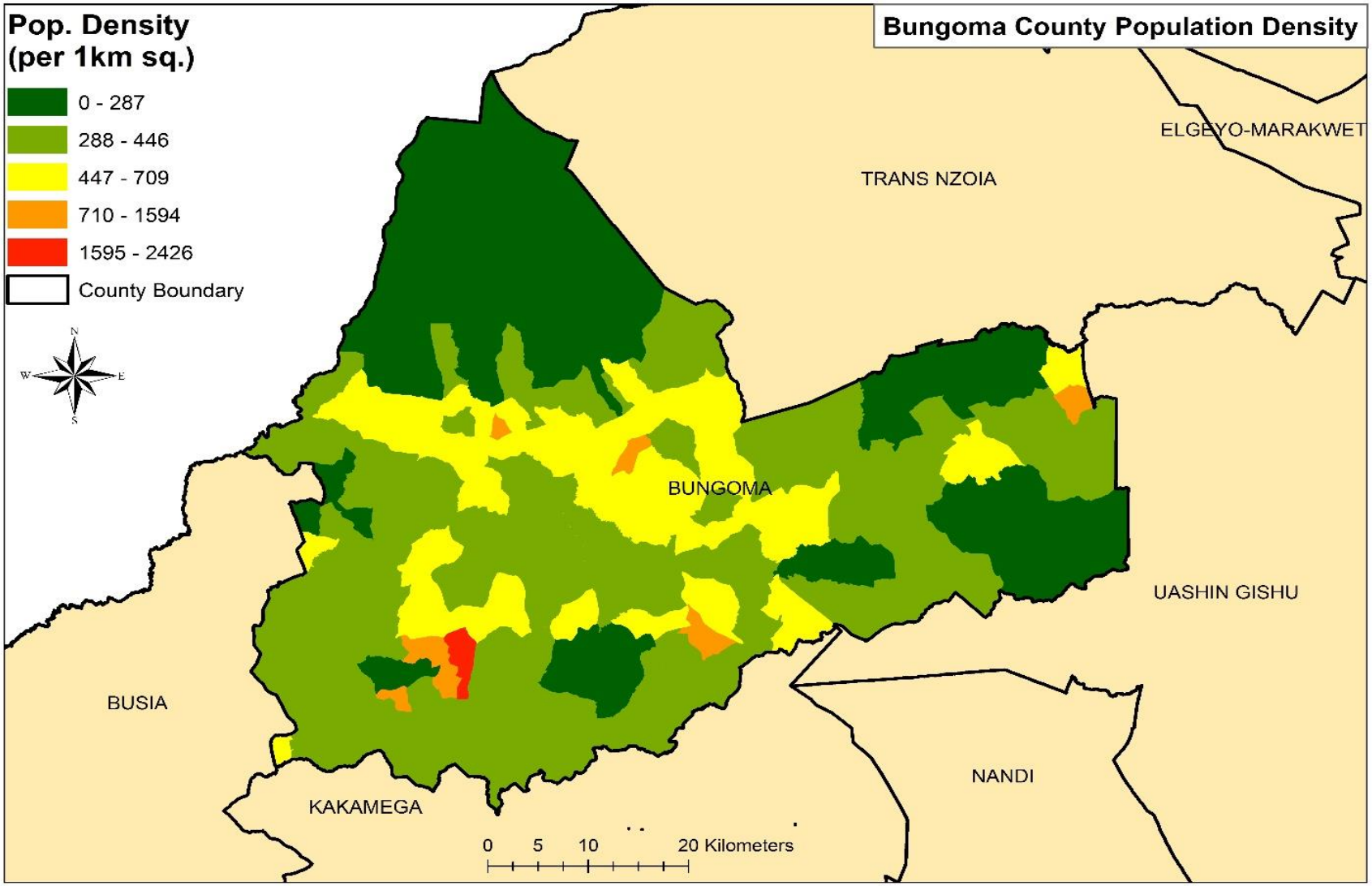

Figure 3: Spatial visualization of population density distribution in Bungoma county

3.1.3. Kisumu County

According to the Population and Housing Census 2009 the population of Kisumu County was estimated at 968,909 persons 474,687 being males and 494,222 females. The population density in Kisumu County is influenced by climatic conditions, soil composition, topography and infrastructure and land ownership. The table below shows the population density by sub-county (Kisumu County Integrated development plan 2013-2017).

Table 5: Population density by sub-county. Source: Kenya National Bureau of Statistics, 2013

Constituency	**Area**	**Population**	**Density (Km2)**
Kisumu East	135.9	150,124	1,105
Kisumu west	212.9	131,246	616
Kisumu central	32.7	168,892	5,165
Seme	190.2	98,805	519
Nyando	413.2	141,037	341
Nyakach	357.3	133,041	372
Muhoroni	667.3	145,764	218
Total	**2,009.5**	**968,909**	**482**

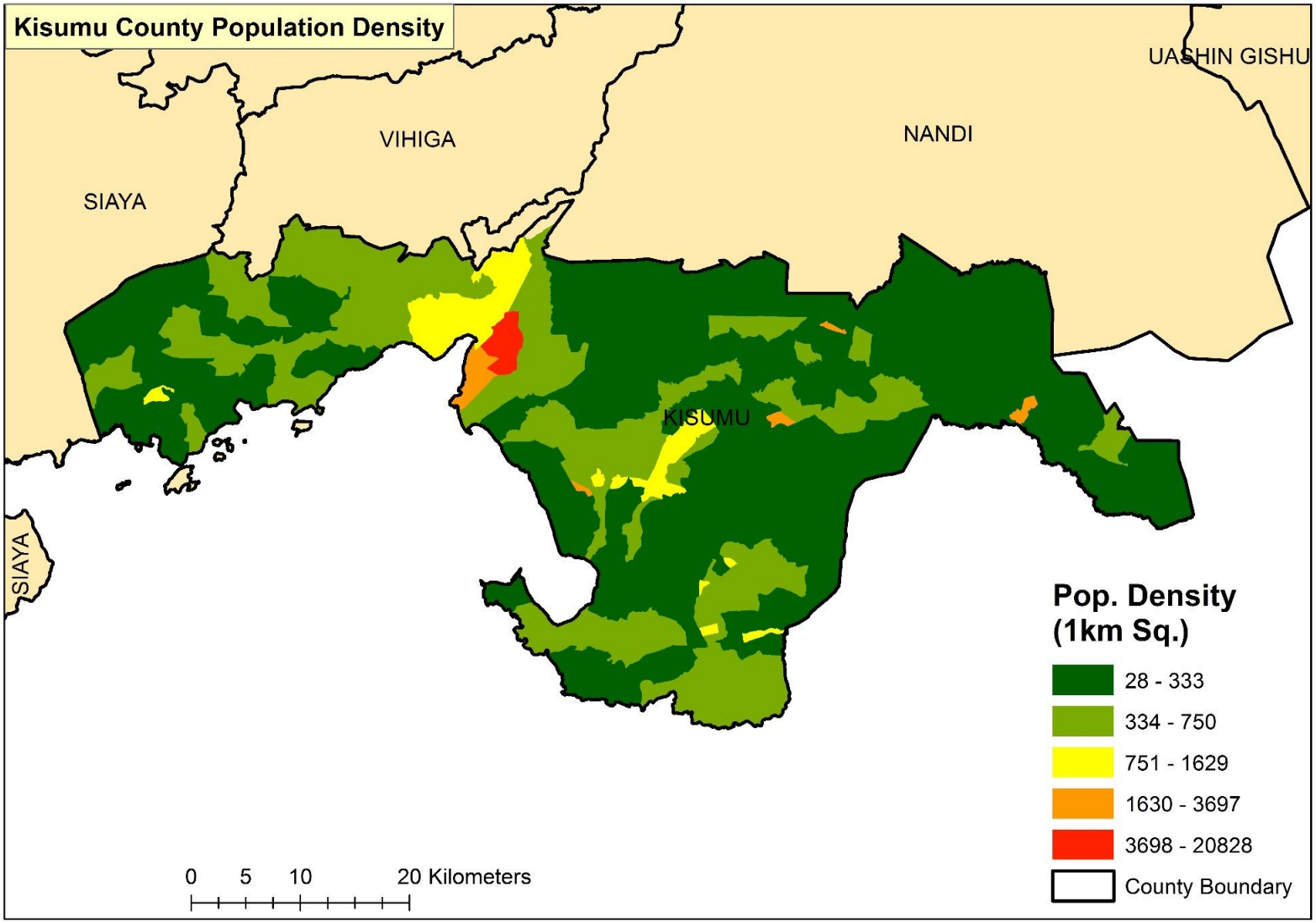

Figure 4: Spatial visualization of population density distribution in Kisumu county

3.1.4. Siaya County

As per the 2009 Population and Housing census the total population of Siaya County was estimated to be 842,304, 398,640 being males and 443, 654 females. The rural areas of the county have the most populated with 751,464 persons and the urban areas have 90,840 persons. The population is comprised mainly of youth, women and children. The highest population lies between age group 15-65 who are the working group though most are unemployed increasing the rate of dependency (Kenya Population and Housing Census, 2009).

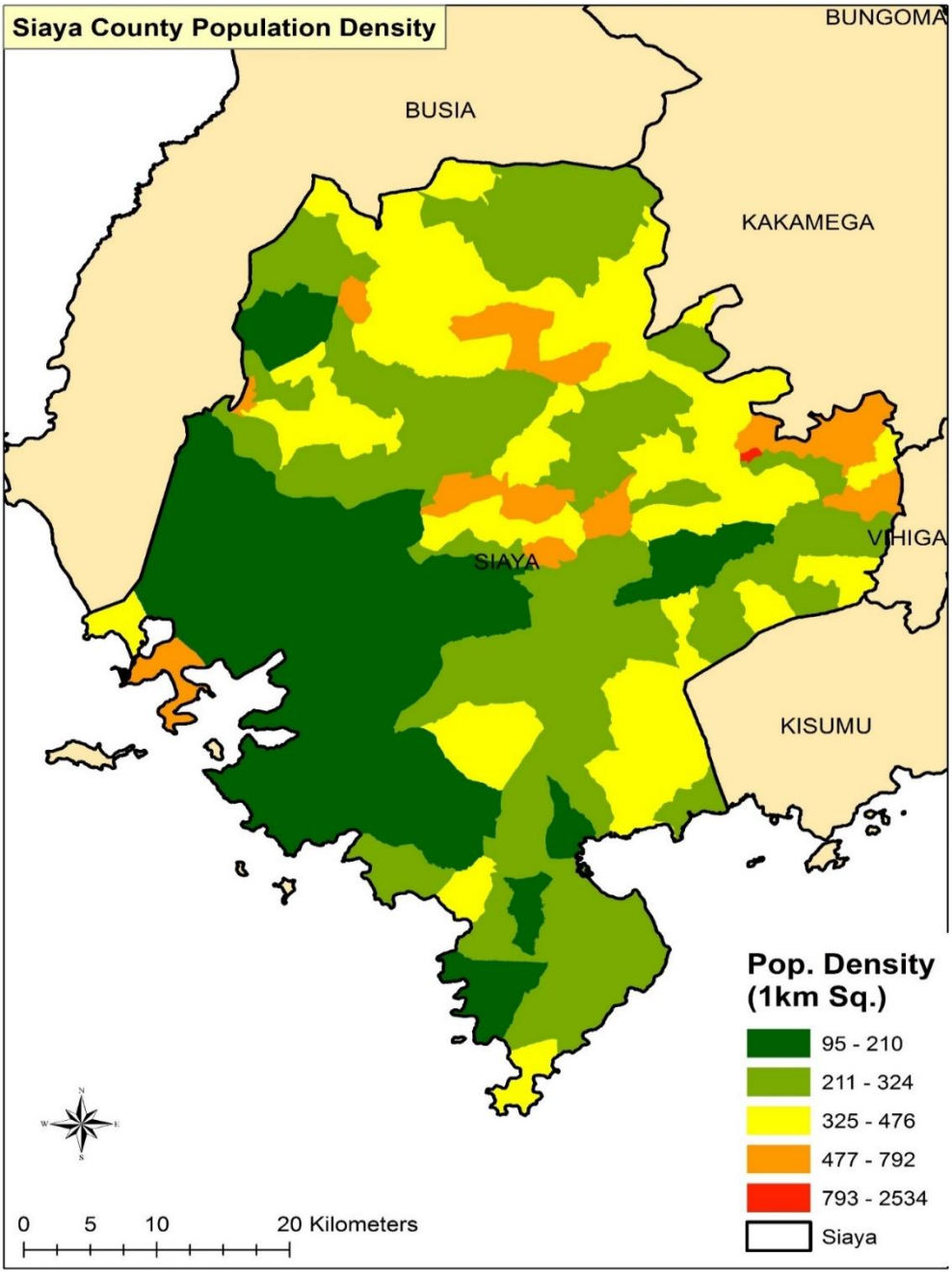

Figure 5: Spatial visualization of population density distribution in Siaya county

Table 6: Population projection for Siaya county. Source:KNBS 2011

Age group	2009 census			2012 projected			2015 projected			2017 projected		
	M	F	T	M	F	T	M	F	T	M	F	T
0-4	71,362	70,716	142,078	75,099	74,420	149,519	79,029	78,313	157,342	81,766	81,026	162,71
5-9	60,960	60,710	121,670	64,153	63,889	128,042	67,509	67,232	134,742	69,847	69,561	139,408
10-14	58,296	56,248	114,544	61,349	59,194	120,543	64,559	62,291	126,850	66,795	64,448	131,243
15-19	49,220	47,825	97,045	51,798	50,330	102,127	54,508	52,963	107,471	56,396	54,797	111,193
20-24	32,725	41,443	74,168	34,439	43,613	78,052	36,241	45,895	82,136	37,496	47,485	84,981
25-29	25,961	30,135	56,096	27,321	31,713	59,034	28,750	33,373	62,123	29,746	34,528	64,274
30-34	20,359	22,328	42,687	21,425	23,497	44,923	22,546	24,727	47,273	23,327	25,583	48,910
35-39	14,793	17,932	32,725	15,568	18,871	34,439	16,382	19,859	36,241	16,950	20,546	37,496
40-44	11,118	16,082	27,200	11,700	16,924	28,625	12,312	17,810	30,122	12,739	18,42	31,165
45-49	10,390	15,486	25,876	10,934	16,297	27,231	11,506	17,150	28,656	11,905	17,744	29,648
50-54	9,074	14,541	23,615	9,549	15,303	24,852	10,049	16,103	26,152	10,397	16,661	27,058
55-59	8,414	12,265	20,679	8,855	12,907	21,762	9,318	13,583	22,901	9,641	14,053	23,694
60-64	7,712	11,083	18,795	8,116	11,663	19,779	8,541	12,274	20,814	8,836	12,699	21,535
65-69	5,107	7,732	12,839	5,374	8,137	13,511	5,656	8,563	14,218	5,852	8,859	14,711
70-74	5,175	7,173	12,348	5,446	7,549	12,995	5,731	7,944	13,675	5,929	8,219	14,148
75-79	3,539	5,464	9,003	3,724	5,750	9,475	3,919	6,051	9,970	4,055	6,261	10,316
80+	4,159	6,155	10,314	4,377	6,477	10,854	4,606	6,816	11,422	4,765	7,052	11,818
Total	398,364	443,318	841,682	419,227	466,535	885,762	441,162	490,946	932,108	456,441	507,949	964,390

3.1.5. Busia County

Busia county covers an area of 1,134.4 square kilometer with a total population of 743,946 persons. The number of males are 356,119 and females 387,827. The growth rate from 1999 to 2009 was estimated to be 3.03% per year which is slightly higher than the national growth rate explaining the rapid increase in population. The population density of the county is 655.8 inh/km^2. (Kenya Population and Housing Census, 2009). Below is a table showing population of the sub counties in Mt. Elgon forest ecosystem.

Table 7: Population size by sub-county in Busia

Sub county	Male	Female	Total	No. of Households	Area Km^2	Density
Funyula	44,267	49,233	93,500	18,411	265.1	353
Nambale	45,488	49,149	94,637	18,672	237.8	398
Butula	57,025	64,845	121870	25,148	247.1	493
Teso North	57,418	60,529	117,947	22,917	261	452
Teso South	66,692	71,295	137,924	24,451	299.6	460
Matayos	53,577	57,768	111,345	23,278	196.2	568
Budalangi	31,718	35,005	66,723	15,033	188.3	354

Source: KNBS 2013

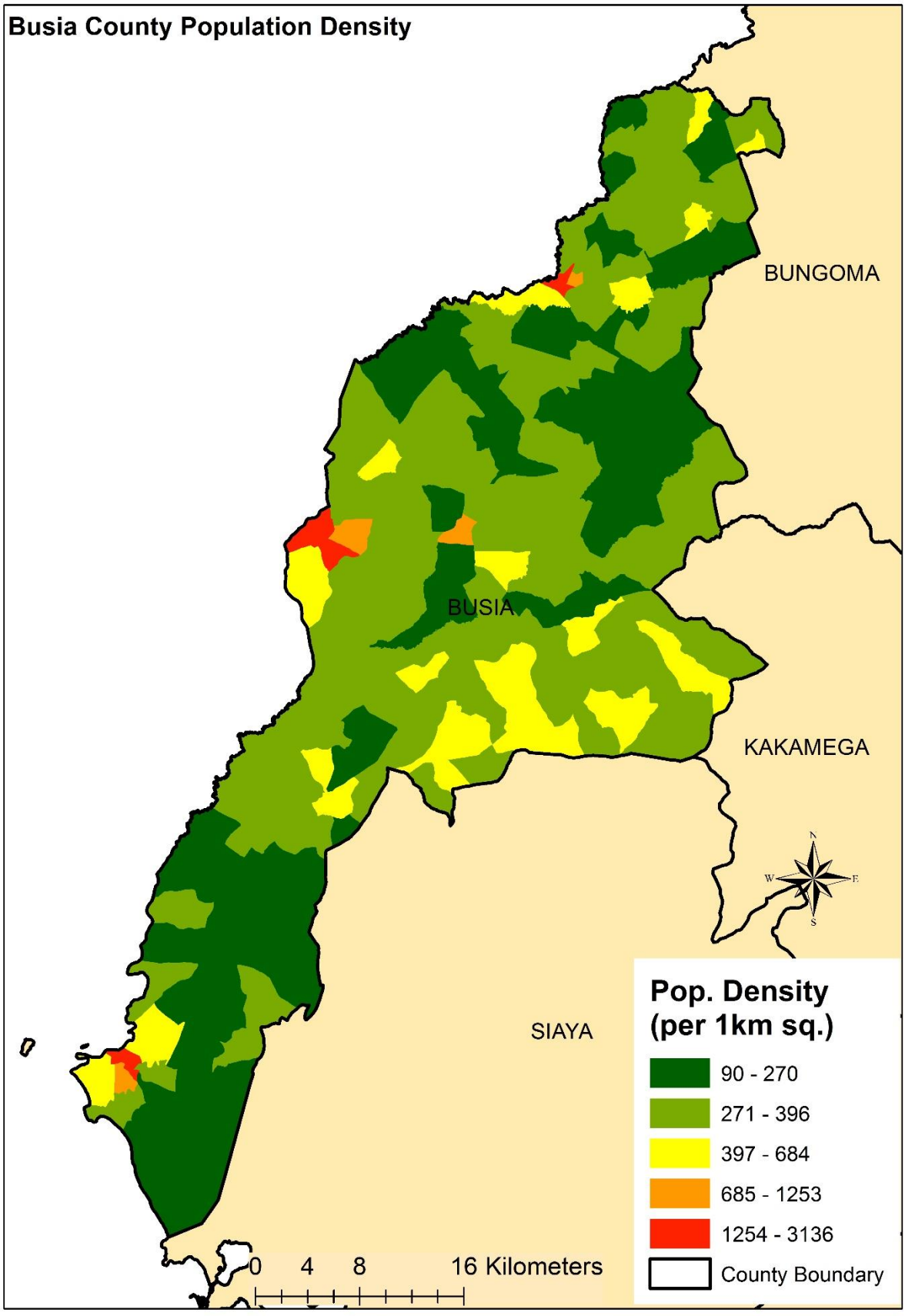

Figure 6: Spatial visualization of population density distribution in Busia county

3.1.6. West Pokot

a) Population and composition

The population of the county is estimated at 631,231 persons as per 2013 projections. This population consists of 313,746 males and 317,484 females giving sex ratio of 100:101. The county inter-censal growth rate is 5.2 percent which is higher as compared with the national average of 3.0 percent. If current trends are constant, the county population is expected to grow to 700,414 and 771,180 in 2015 and 2017 respectively. The youth (aged 15-34 years) population estimate is 196,830 forms 31 percent of the County population. The proportion of the population aged below 14 years and above 64 years comprises about 55 per cent of the total population. These age groups are dependants and their proportion is higher than the population in the labour force to provide basic needs (15-64 years) which constitutes 45 per cent (West Pokot County, 2013).Below is a table showing the county population of special age groups.

Table 8: Population Projections for selected age groups in West Pokot county. Source: Population and Housing Census, 2009

Age Cohort	2009 (Census)			2013 (Projected)			2015 (Projected)			2017 (Projected)		
Male		**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Under 1 year	10,669	10,461	21,130	13,136	12,880	26,016	14,576	14,291	28,867	16,173	15,858	32,031
Under 5years	49,362	48,160	97,522	60,775	59,295	120,070	67,436	65,794	133,230	74,827	73,005	147,832
Pre-School (3-5 yr)	29,899	28,731	58,630	36,812	35,374	72,186	40,847	39,251	80,098	45,323	43,553	88,876
Primary(6-13yr)	69,885	67,758	137,643	86,043	83,425	169,468	95,474	92,568	188,042	105,938	102,713	208,651
Secondary (14-17yr)	25998	23,438	49,436	32,009	28,857	60,866	35,517	32,020	67,537	39,410	35,529	74,939
Labour force(15-64yrs)	112,108	118,907	231,015	138,029	146,400	284,429	153,157	162,445	315n,602	169,943	180,249	350,192
Youth (15-34yrs)	77,115	82,752	159,869	94,945	101,885	196,830	105,351	113,052	218,403	116,898	125,443	242,340
Reproductive female (15-49yrs)	-	107,365	107,365	-	132,189	132,189	-	146,677	146,677	-	162,753	162,753
Aged (65+)	6,409	7,422	13,831	7,891	9,138	17,029	8,756	10,140	18,895	9,715	11,251	20,966

b) Population Density and Distribution

Population distribution in the county is influenced by climatic conditions and socio-economic development. Urban areas and high potential agricultural areas have high population distribution and density. The population density is expected to increase from 69 in 2013 to 76 and 85 persons per square km in 2015 and 2017 due to the high population growth (West Pokot, 2013).

Table 9: Population density per sub-county in West Pokot county

Sub-County/Constituency	Pop. 2009	Density (persons/ Sq. Km)	Pop. 2013	Density (persons/ Sq. Km)	Pop. 2015	Density (persons/ Sq. Km)	Pop. 2017	Density (persons/ Sq. Km)
North Pokot/Kacheliba	156,011	39	192,083	49	213,135	54	236,495	60
Pokot Central/Sigor	85,079	40	104,750	50	116,231	55	128,970	61
Pokot South	132,100	103	162,643	127	180,469	141	200,249	156
West Pokot/Kapenguria	139,500	77	171,754	94	190,579	105	211,466	116
TOTAL	**512,690**	**56**	**631,231**	**69**	**700,414**	**76**	**777,180**	**85**

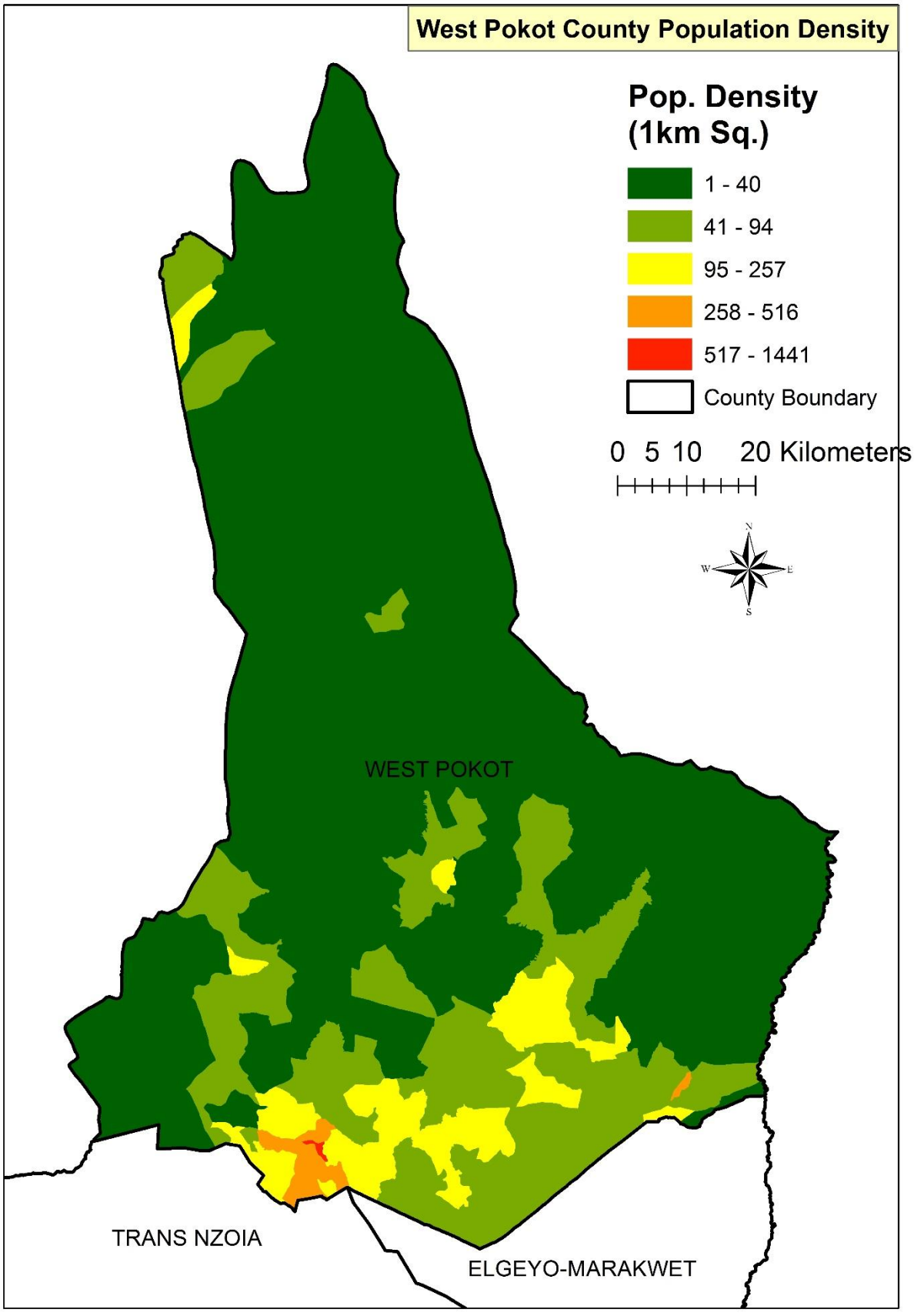

Figure 7: Spatial visualization of population density distribution in West Pokotcounty

3.1.7. Vihiga County

According to the 2009 National Population and Housing Census, Vihiga County had a population of 554,622, with a population density of 1044 persons per square km, one of the highest in the country. 47.8 % of the population were male while 52.2% were female. The county population is estimated to have grown to 572,577 persons in 2012 and is projected to grow to 603,856 persons in 2017. The female male ratio was estimated at 0.9:1. The county demographic profile depicts a youthful population comprising of 46 per cent of persons aged below 15 years. This means that a lot of resources have to be allocated towards education, health and youth programmes for sustainable Human Development in the future. The county has one of the highest population densities in the country at 1078 persons per square km compared to the national average of 66 persons per Km². The effect of this is manifested in the pressure on land and other resources, food insecurity which has made the county a net importer of almost all foodstuff, high unemployment rate, and endless land disputes. The table below shows population and population density by constituency (Vihiga, 2013).

Table 10: Population projections by constituency in Vihiga county. Source: Kenya Bureau of Statistics, 2013

CONSTITUENCY	Area Km2	Pop 2009	Density	Pop 2012	Density	Pop 2015	Density	Pop 2017	Density
Hamisi	156.4	148,259	948	156,594	1001	165399	1058	174698	1117
Emuhaya	94.5	89,147	944	94150	996	99453	1052	105044	1112
Vihiga	90.2	91,616	1016	96767	1073	102208	1133	107954	1197
Sabatia	110.9	129,678	1169	136,968	1235	144670	1305	152,804	1377
Luanda	85	95,923	1132	101316	1192	107012	1259	113,029	1329
County	531	554,622	1044	585795	1103	618742	1165	653529	1231

Table 11: Population Projections for age groups in Vihiga county. Source:KNBS 2011.

Age Group	Census 2009			Projections 2012			Projections 2015			Projections 2017		
	M	F	T	M	F	T	M	F	T	M	F	T
0-4	43,398	42,941	86,339	44,806	44,329	89,135	46,258	45,766	92,024	47,253	46,751	94,004
5-9	42,250	41,239	83,489	43,612	42,582	86,194	45,026	43,962	88,988	45,995	44,908	90,903
10-14	38,164	38,961	77,125	39,408	40,231	79,639	40,686	41,535	82,221	41,561	42,429	83,990
15-19	31,384	31,550	62,934	32,411	32,577	64,988	33,462	33,633	67,095	34,181	34,356	68,537
20-24	17,840	23,311	41,151	18,416	24,078	42,494	19,013	24,859	43,872	19,422	25,394	44,816
25-29	13,551	18,384	31,935	13,995	18,985	32,980	14,449	19,601	34,050	14,760	20,023	37,783
30-34	12,051	15,823	27,874	12,449	16,333	28,782	12,853	16,863	29,716	13,129	17,226	30,355
35-39	10,575	13,219	23,794	10,930	13,651	24,581	11,285	14,095	25,380	11,527	14,397	25,924
40-44	8,825	11,322	20,147	9,113	11,693	20,806	9,408	12,072	21,480	9,611	12,331	21,942
45-49	8,096	11,004	19,100	8,354	11,361	19,715	8,624	11,729	20,353	8,810	11,982	20,792
50-54	7,738	10,152	17,890	8,001	10,487	18,488	8,260	10,827	19,087	8,438	11,060	19,498
55-59	7,310	8,526	15,836	7,540	8,800	16,340	7,784	9,084	16,868	7,952	9,280	17,232
60-64	6,296	6,938	13,234	6,509	7,172	13,681	6,720	7,405	14,125	6,865	7,564	14,429
65-69	4,585	5,551	10,136	4,747	5,726	10,473	4,901	5,911	10,812	5,006	6,039	11,045
70-74	4,095	4,926	9,021	4,258	5,095	9,353	4,396	5,258	9,654	4,491	5,371	9,862
75-79	2,991	3,353	6,344	3,119	3,495	6,614	3,220	3,609	6,829	3,289	3,687	6,976
80+	3,549	4,706	8,255	3,553	4,761	8,314	3,668	4,916	8,584	3,747	5,021	8,768

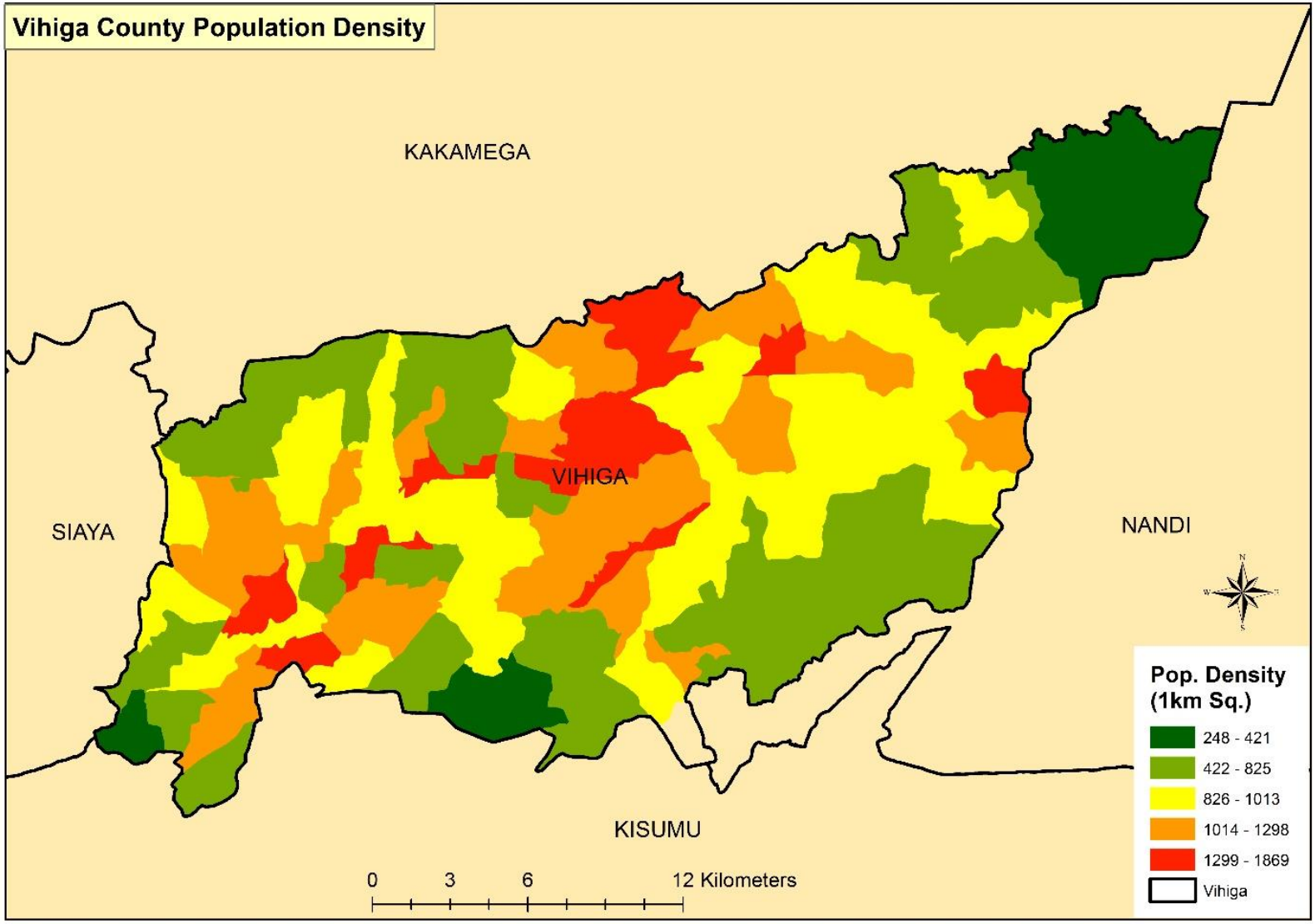

Figure 8: Spatial visualization of population density distribution in Vihiga county

3.1.8. Kakagema County

Kakamega County covers an area of 3,051.2 square kilometre with a total population of 1,660,651 according to the 2009 population and housing census. The population growth rate was estimated to be 2.51 per annum bringing the projected total population by 2012 to 1,823,108 (males 879,348 and females 943,760). The total projected population by 2017 is estimated to be (1,940,149 (males 935,800 and females 1,004,348. The rural areas (1,425,084) are more populated than the urban areas (235,567) though the population in urban areas is increasing rapidly because of rural urban migration by especially the youth to find employment and education. The population of persons below 40 years is highest with females being more. This are the working group who contribute most to the labour force in the county. Persons between age group 0-14 are also highly populated depicting the high growth rate. Below is a table showing population of all sub counties in the Cherengany Forest ecosystem.

Table 12: Population size by gender and by subcounty in Kakamega county. Source: KNBS, Population and Housing Census, 2009

Sub county	Males	Females	Total	No. of households	Area (Km^2)	Density
Kakamega Central	142,280	152,114	297,394	65,121	419.7	709
Kakamega South	49260	55,409	104,669	23,144	143.6	358
Kakamega North	99,716	105,450	205,166	40,635	427.4	480
Kakamega East	76,809	82,666	159,475	35,177	445.5	358

Table 13: Population Projections for selected age groups in Kakamega county. Source: Population and Housing Census, 2009

Age Cohorts	2009 cencus			2012 projections			2015 projections			2017 projections		
	M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
0-4	144867	145810	290677	150392	162924	313316	162105	175613	337718	170416	184618	355034
5-9	129308	130604	259912	134474	145681	280155	144948	157206	301974	152379	165078	317457
10-14	111990	112046	224036	115912	125572	241485	124941	135352	260293	131346	142292	273638
15-19	92960	92096	185056	95745	103724	199469	103202	111802	215004	108493	117535	226028
20-24	67208	81914	149122	77153	83583	160736	83162	90093	173255	87426	94712	182138
25-29	50651	60028	110679	57264	62035	119299	61724	66867	128591	64888	70296	135184
30-34	42394	49033	91427	47303	51245	98548	50987	55236	106223	53601	58068	111669
35-39	34190	38820	73010	37774	40922	78696	40716	44110	84826	42804	46371	89175
40-44	26714	32143	58857	30451	32989	63440	32823	35559	68382	34506	37382	71888
45-49	24773	28881	53654	27760	30073	57833	29922	32415	62337	31456	34077	65533
50-54	20125	23491	43616	22566	24447	47013	24324	26351	50675	25571	27702	53273
55-59	16224	17894	34118	17652	19123	36775	19027	20612	39639	20003	21669	41672
60-64	12347	13390	25737	13316	14426	27742	14353	15549	29902	15089	16346	31435
65-69	8274	10672	18946	9803	10619	20422	10566	11446	22012	11108	12033	23141
70-74	7160	8143	15303	7918	8577	16495	8534	9246	17780	8972	9719	18691
75-79	4961	6302	11263	5827	6313	12140	6281	6805	13086	6603	7154	13757
80+	6279	7886	14165	7329	7939	15268	7899	8558	16457	8304	8997	17301
TOTAL	**797112**	**863539**	**1660651**	**859195**	**930794**	**1789989**	**926112**	**1003289**	**1929401**	**973596**	**1054729**	**2028325**

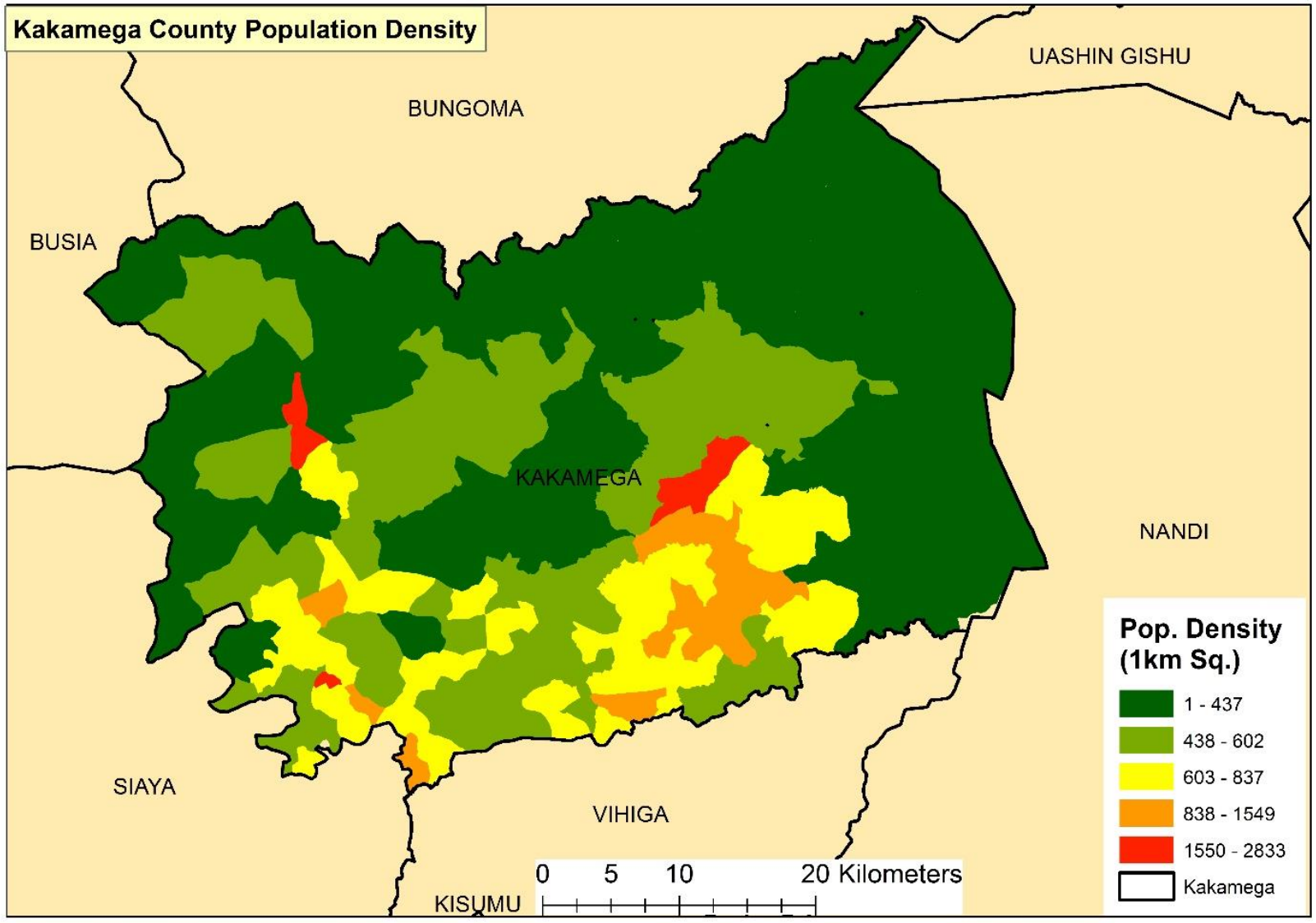

Figure 9: Spatial visualization of population density distribution in Kakamega county

3.2. Cherengany Forest Ecosystem

3.2.1. Uasin Gishu County

The total population of Uasin Gishu county according to the Population and Housing census 2009 was 894, 179. At an inter-censual growth rate of 3.8% the total population is projected to grow to 1,211,853 by 2017. The population density of the county is 237 persons per square kilometre which is expected to increase to 362 persons per square kilometre by 2017. The population of age group 0 to 14 was 41.4% of the total while age group between 15 and 64 who are the economically active contributed to 55.7 % of the total. The age group under one year is projected to grow from 29,175 in 2009 to 39,539 by 2017, while that aged between 2 and 5 years is expected to grow from 162,559 in 2009 to 220,311 by 2017. Age group 15 and 29 years comprises of the youth and is expected to grow from 284,278 to 385,273 by 2017. The youth fall in the reproductive age group and they are dependants due to limited employment in the county (Uasin Gishu, 2013).

Table 14: Population Projections for age groups in Uashin Gishu county. Source: KNBS 2011

AGE GROUP	2009 CENSUS			2012 PROJECTIONS			2013 PROJECTIONS			2014 PROJECTIONS		
	M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
0-4	71,764	71,102	142,866	75,707	75,554	151,261	77,944	77,977	155,921	80,340	80,521	160,861
5-9	62,466	60,871	123,337	65,291	64,197	129,488	66,717	65,862	132,579	68,147	67,514	135,661
10-14	54,302	53,253	107,555	57,171	56,295	113,466	58,585	57,912	116,497	59,994	59,570	119,564
15-19	49,264	52,356	101,620	52,963	55,389	108,352	54,661	56,991	111,652	56,288	58,619	114,907
20-24	52,521	55,055	107,576	58,419	58,672	117,091	61,374	60,236	121,610	64,217	61,790	126,007
25-29	41,583	44,278	85,861	45,389	48,989	94,378	47,514	51,213	98,727	49,862	53,343	103,205
30-34	33,071	31,223	64,294	36,200	35,662	71,862	37,898	38,201	76,099	39,646	40,751	80,397
35-39	25,899	23,168	49,067	28,420	25,405	53,825	29,704	26,652	56,356	31,043	28,102	59,145
40-44	18,676	16,653	35,329	20,904	18,470	39,374	22,178	19,496	41,674	23,481	20,559	44,040
45-49	14,066	12,422	26,488	15,363	13,658	29,021	16,071	14,314	30,385	16,864	15,019	31,883
50-54	9,980	8,743	18,723	10,985	9,759	20,744	11,544	10,328	21,872	12,124	10,913	23,037
55-59	7,405	6,950	14,355	8,071	7,558	15,629	8,426	7,902	16,328	8,807	8,290	17,097
60-64	5,025	4,851	9,876	5,499	5,243	10,742	5,764	5,459	11,223	6,039	5,688	11,727
65-69	4,049	4,012	8,061	4,330	4,303	8,633	4,489	4,463	8,952	4,668	4,634	9,302
70-74	2,779	2,860	5,639	2,943	3,044	5,987	3,040	3,149	6,189	3,143	3,260	6,403
75-79	1,939	2,108	4,047	2,003	2,198	4,201	2,041	2,254	4,295	2,088	2,317	4,405
80+	3,574	4,759	8,333	3,267	4,348	7,615	3,161	4,203	7,364	3,076	4,088	7,164
Total	458, 363	454, 664	913, 027	492, 925	488, 744	981, 669	511, 111	506, 612	1,017, 723	529, 827	524, 978	1,054, 805

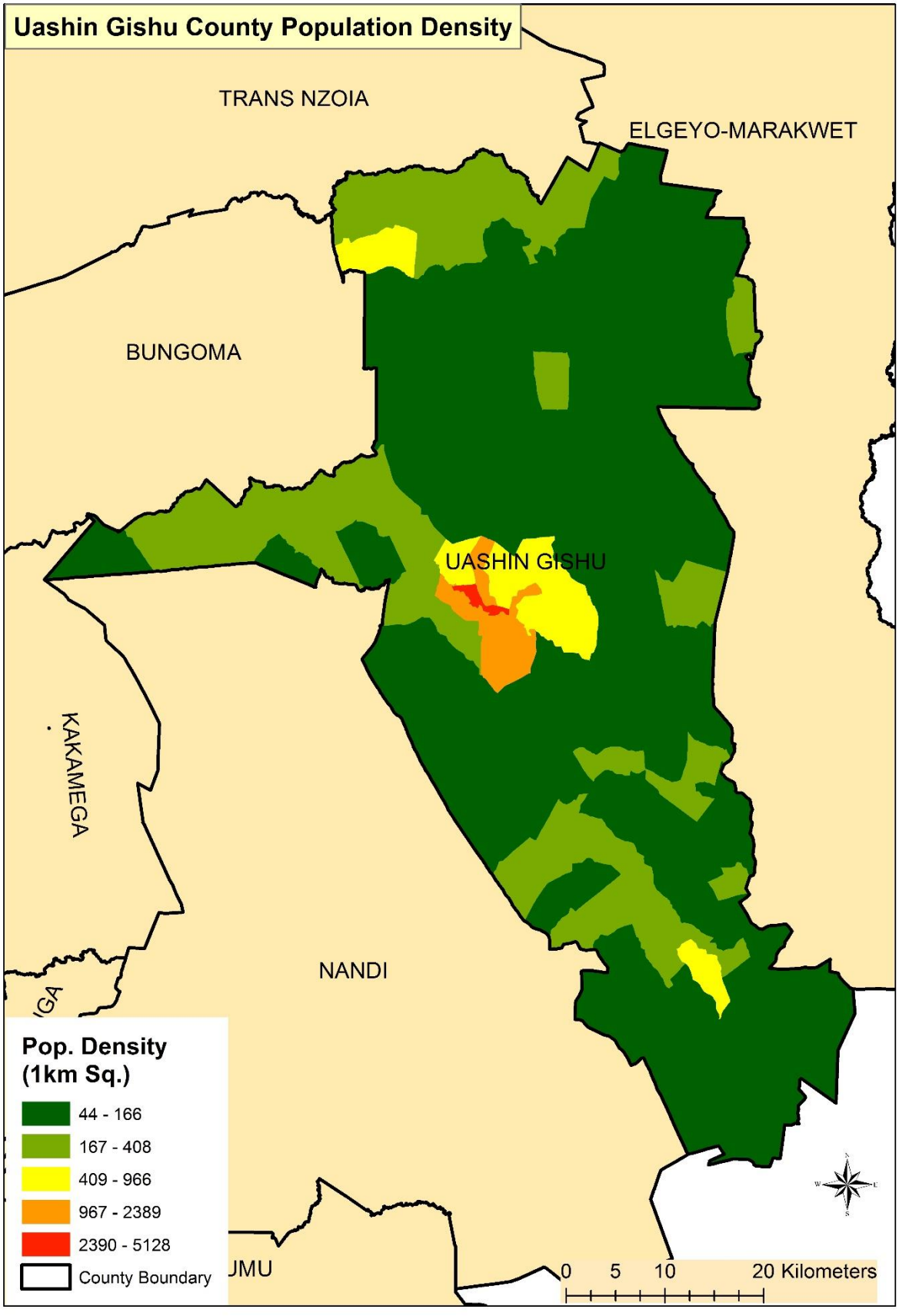

Figure 10: Spatial visualization of population density distribution in Uashin Gishu county

3.2.2. Elgeyo Marakwet County

a) Population size, density and composition

According to the 2009 National Population and Housing Census, the county's total population was 370,712. The 2012 population projection was 401,989 of which 200,066 were male and 201,923 female depicting a male and female ratio of almost 1:1. The inter-census population growth rate for the county is 2.7 percent per annum. The population of the county is divided into three broad age groups that is 0-14years constituting of children, 15-64years constituting of the economically active group and 65 years and above constituting of the aged. The county has a high concentration of the population in the county are the children (age group 0-14). However, the greater proportion falls within the working group indicating high labour force and low dependency ratio. There are variations in population distributions and densities within the county with the average density being 123 persons per km^2. Keiyo North has the highest population density of 148 persons per km^2 while Marakwet East has the lowest with 109 persons per km^2. The population of the county has been increasing year in year out exerting pressure on both the natural resources and social amenities. (Kisumu County,2013)

Table 15: Population Projections for age groups in Elgeyo Marakwet county. Source: KNBS 2011

Age Cohort	2009 (Census)			2015 (Projections)			2017 (Projections)		
	M	F	T	M	F	T	M	F	T
0-4	30727	30270	60997	36131	35593	71724	38135	37568	75704
5-9	29947	28614	58561	35213	33646	68860	37167	35513	72680
10-14	26653	26282	52935	31340	30904	62244	33079	32619	65698
15-19	21080	20388	41468	24787	23973	48761	26162	25304	51466
20-24	15828	17487	33315	18612	20562	39174	19644	21703	41347
25-29	12765	13853	26618	15010	16289	31299	15843	17193	33036
30-34	10277	10516	20793	12084	12365	24450	12755	13051	25806
35-39	8377	8296	16673	9850	9755	19605	10397	10296	20693
40-44	5875	5927	11802	6908	6969	13878	7291	7356	14647
45-49	5573	5928	11501	6553	6970	13524	6917	7357	14274
50-54	4413	4333	8746	5189	5095	10284	5477	5378	10855
55-59	3506	3275	6781	4123	3851	7974	4351	4065	8416
60-64	2933	2955	5888	3449	3475	6923	3640	3667	7308
65-69	2007	2367	4374	2360	2783	5143	2491	2938	5429
70-74	1632	1851	3483	1919	2177	4096	2025	2297	4323
75-79	1059	1189	2248	2451	1398	2643	1314	1476	2790
80+	1848	2681	4529	2173	3152	5325	2294	3327	5621
TOTAL	184500	186212	370712	216946	218959	435906	228983	231108	460092

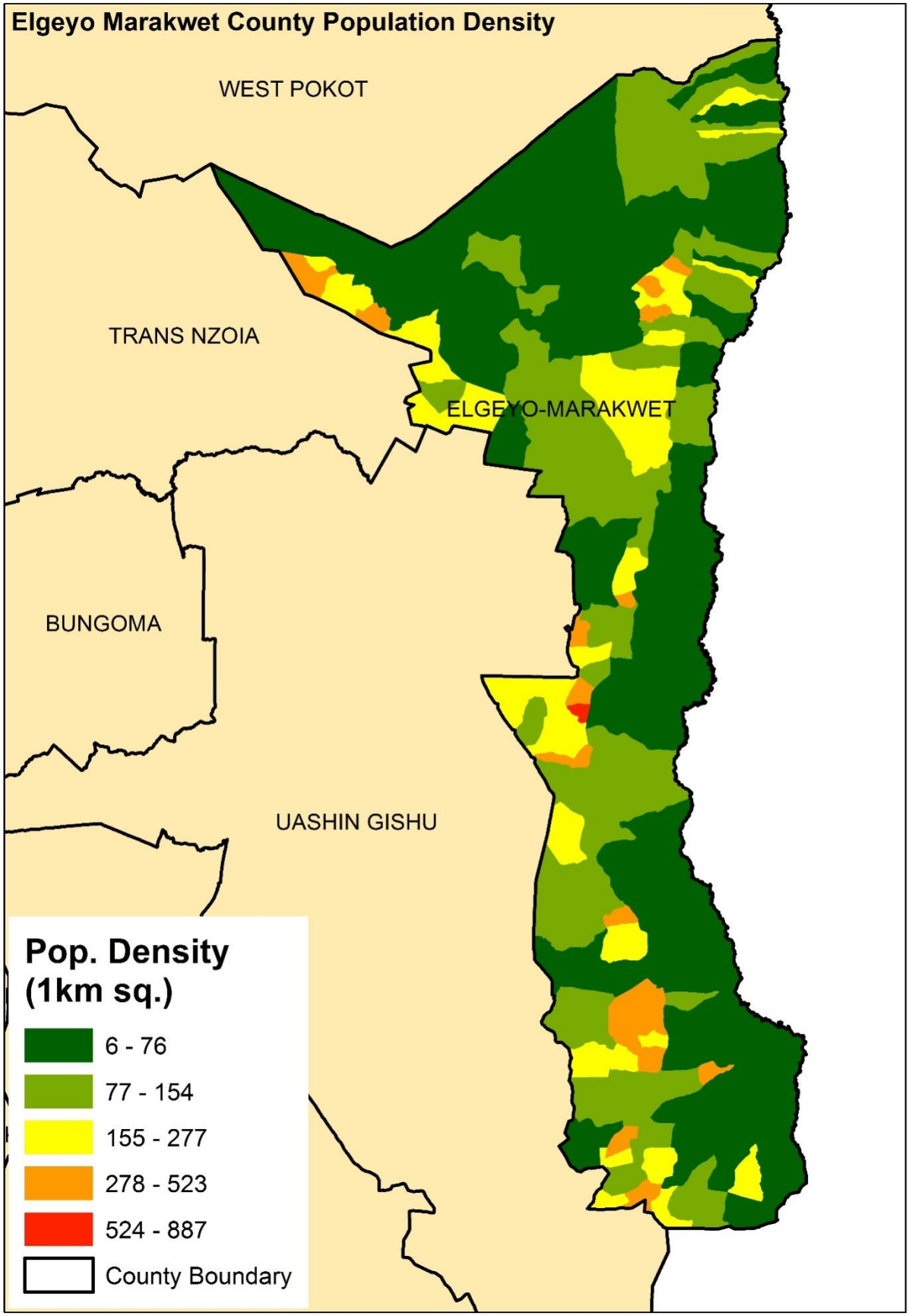

Figure 11: Spatial visualization of population density distribution in Elgeyo Marakwet county

3.2.3. Nandi County

The County has a population of 813,803 comprising of 406,907 males and 406,896 females (as per the 2012 projections). The county's inter-censual growth rate stands at 3.1 percent which is slightly higher than the national growth rate of 3.0 percent. There is a higher population concentration of children of ages 0-9 years (31.7%) which explains the high population growth rate. The projected population density as per 2017 is estimated to be 331 persons per square kilometre. The table below shows population by age and gender cohorts. (Nandi County,2013).

Table 16: Population Projection by Gender and Age Age Cohorts in Nandi county. Source: KNBS, Kenya Population and Housing Census (2009)

	2009			2012			2015			2017		
AGE	**M**	**F**	**TOTAL**	**M**	**F**	**TOTAL**	**M**	**F**	**T**	**M**	**F**	**T**
0 – 4	62,568	61,177	123,745	67,623	66,120	133,743	75,356	73,682	149,038	80,181	78,398	158,579
5 – 9	58,351	56,946	115,295	63,066	61,547	124,613	70,278	68,586	138,861	74,777	72,976	147,750
10–14	49,662	50,073	99,735	53,675	54,119	107,794	59,813	59,813	120,121	63,642	64,168	127,810
15–19	41,260	40,158	81,418	44,594	43,403	87,997	49,694	49,694	98,060	52,874	51,462	104,337
20–24	34,146	38,371	72,517	36,905	41,171	78,076	41,163	46,214	87,339	43,758	49,172	92,930
25–29	28,789	29,224	58,013	31,115	31,585	62,700	34,673	35,197	69,870	36,893	37,450	74,344
30–34	23,558	22,582	46,140	25,461	24,407	49,868	28,373	27,198	55,571	30,190	28,942	59,128
35–39	19,189	18,389	37,578	20,739	19,875	40,614	23,132	22,690	45,259	24,590	23,565	48,156
40–44	13,381	13,061	26,442	14,462	14,116	28,578	16,116	15,731	31,847	17,147	16,738	33,885
45–49	11,755	11,988	23,743	12,705	12,957	25,662	14,158	14,438	28,596	15,064	15,363	30,427
50–54	8,873	8,420	17,293	9,590	9,100	18,690	10,696	10,141	20,828	11,370	10,790	22,160
55–59	6,950	6,616	13,566	7,512	7,151	15,663	8,370	7,968	16,339	8,906	8,478	17,385
60–64	5,103	5,052	10,155	5,515	5,460	10,975	6,146	6,085	12,231	6,539	6,474	13,014
65–69	3,698	3,915	7,613	3,997	4,231	8,228	4,454	4,715	9,169	4,739	5,017	9,756
70–74	3,030	2,919	5,949	3,275	3,155	6,430	3,649	3,516	7,165	3,883	3,741	7,624
75–79	2,095	2,324	4,419	2,264	2,512	4,776	2,523	2,799	5,322	2,645	2,978	5,662
80+	3,921	5,121	9,042	4,238	5,535	9,773	4,722	6,167	10,890	5025	6,563	11,587
Total	**376,488**	**376,477**	**752,965**	**406,907**	**406,896**	**813,803**	**453,442**	**453,429**	**906,881**	**482,469**	**482,455**	**964,925**

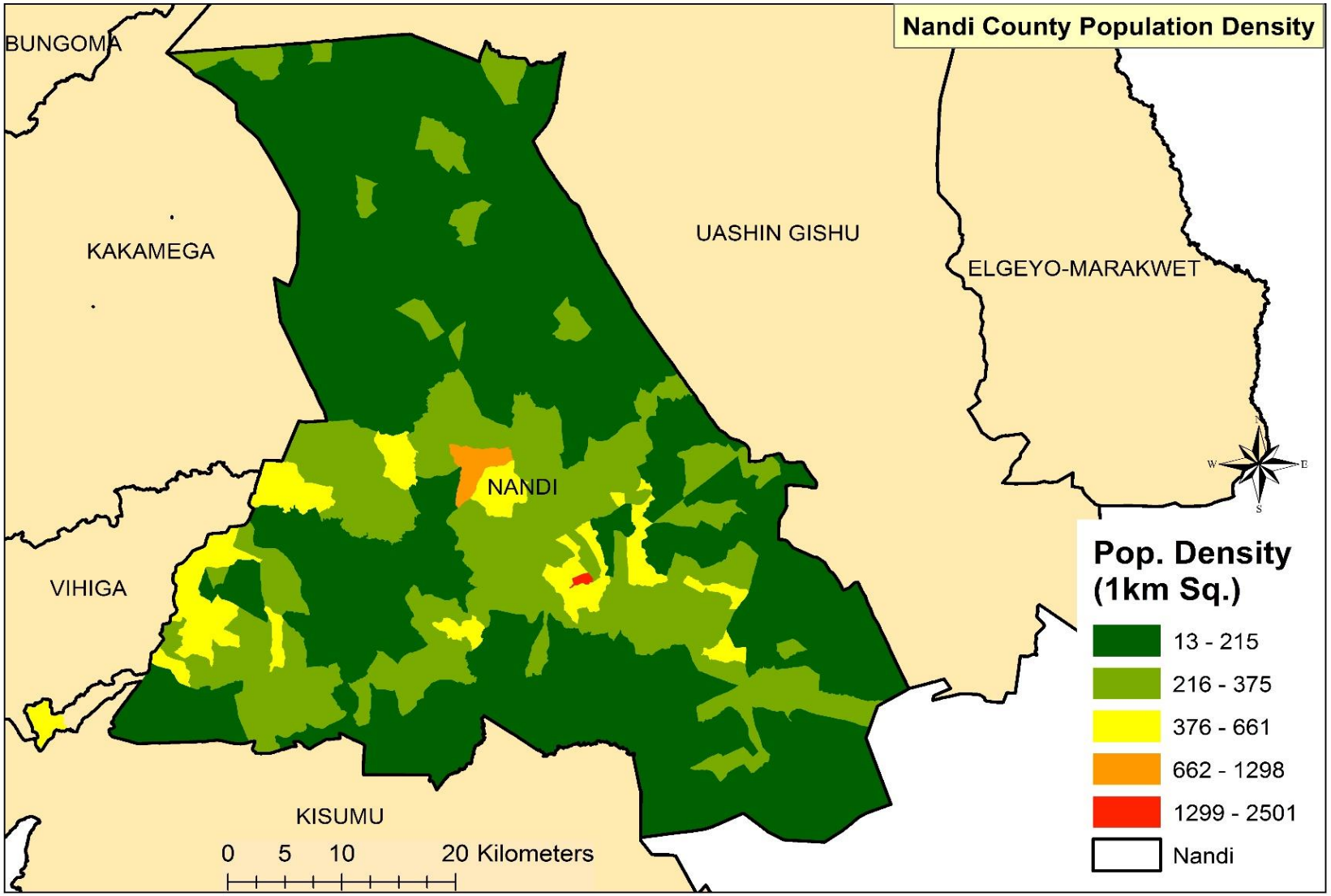

Figure 12: Spatial visualization of population density distribution in Nandi county.

CHAPTER FOUR: ECONOMIC PROFILES OF COUNTIES IN CHERENGANY FOREST ECOSYSTEM

4.1. Cherengany Forest Ecosystem

4.1.1. West Pokot County

The 2009 population and housing census covered the labor status of west Pokot. The main variable was work for pay by level of education. The other variables included family business, family agricultural holdings, volunteer, retired, fulltime student, incapacitated and no work. In West Pokot County, 3% of the residents have no formal education, 7% of those have a primary education and 26% have a secondary level of education or above are working for pay. Therefore the unemployment rate is high in the county due to high illiteracy levels increasing the rate of dependency (West pokot, 2013).

The largest source of energy in the county is firewood used by 91% of the population and charcoal used by 7% of the population explaining the high rate of degradation of the forest lands in the county. Kacheliba and Sigor, have the highest level of firewood use in West Pokot County at 98% each with Kapenguria having the lowest share, 82%. The female headed household use the highest percentage of charcoal than the male headed households in the county. Only 3% of residents in West Pokot County use electricity as their main source of lighting. A further 24% use lanterns, and 25% use tin lamps. 47% use fuel wood. Electricity use is equal by gender with 3% of both male headed households and female headed households using it. (West Pokot, 2013).

In West Pokot County, 13% of residents have homes with cement floors, while 86% have earth floors. Less than 1% has tile and 1% have wood floors. In West Pokot County, none of the residents have homes with concrete roofs, while 27% have corrugated iron sheet roofs. Grass and makuti roofs constitute 68% of homes, and 4% have mud/dung roofs.

Sources of water in the county that are improved include protected spring, protected well, borehole, piped into households and rain water collection while unimproved sources include pond, dam, lake, river, unprotected spring, unprotected well and water vendor. 25% of residents

use improved sources of water, with the rest depending on unimproved sources. A total of 27% of residents in West Pokot County use improved sanitation, while the rest use unimproved sanitation. Use of improved sanitation is equal by either gender with both male and female headed households at 27%. Pokot South constituency has the highest share of residents using improved sanitation at 48%.

The major activities in the county related to revenue collection are; crop, livestock and fish production, forestry and agro forestry, mining, tourism and industrialization

In West Pokot County, Internal Revenues include levies, rates, fees and entertainment taxes and charges for its services. Improving the business environment and automation of revenue collection as well as broadening the tax base can help improve the total revenue base.

4.1.2. Nandi County

Nandi County has a population of about 752,965 people according to (Kenya census 2009). Majority of the population are Kalenjins, followed by Luos, Kisii and Kikuyus who work at tea plantations. Their stable food is Mursic, milk and vegetables (Nandi County, 2013). According to Nandi county report, there are only two major towns, being- Kapsabet and Nandi hills. The county experiences a cool we climate with two rainy seasons, with major economic activities being agricultural and dairy farming.

According to the county integrated development plan report, Nandi has only two referral hospitals in Kapsabet and Nandi hills. It also indicates that there are about 744 primary schools, 155 secondary with one private university-Baraton University. The major tourist attraction sites include Koitalel Arap Samoei museum and South Nandi Forest. The major source of transport is roads that people use for long distances but most use foot for short distances. It has high dependency on agricultural products since agriculture is the main source of transport. Business wise there are 8 commercial banks and 7 micro financial institutions in the county, with major shopping centers being Kapsabet and Nandi hills (Nandi County, 2013).

Jobs in Nandi County are postdated on the county website, same to tenders but most youths are unemployed increasing the dependency rate. Poverty level is about 47, 4% and has county to increase due to the reliance on only resources are Arable land, forests, livestock, pasture, water, and medicinal plants. However, devolution has come as a sigh of relief to the people of Nandi County since national resources are devolved at the county level (Nandi County, 2013).

Main Economic Activities generating revenue to the county include; Tea, Coffee, Sugarcane, Pyrethrum, Dairy Farming, large scale farming of maize and Sports (athletics).
The local revenues sources are; Taxes, Fees, Fines, Rates, Accruals, Cess, County Civil Society Organizations, Appropriations-In-Aid, Co-operatives and Societies

4.1.3. Elgeyo Marakwet County

The County of Elgeyo Marakwet has a population of 370,712 as per Kenya census of 2009. Job opportunities are for qualified skilled personnel and tenders are posted on the county website. Literacy levels at the county stands at 48.5%, with women having 47.4% and 49.8% for men. There are 410 primary schools, 91 secondary schools, 12 Youth polytechnics,,one teachers training college, and two medical training colleges. The county Integrated development plan reports that Escarpments and beautiful Kerio Valley are major tourist attractions; there are different wild animals like elephant's baboons, antelopes, birds, and snakes earning the county revenue improving its economy (Elgeyo, 2013).

The major source of income of the community is crop farming, Dairy farming, and cash crops like tea, pyrethrum, and passion fruits. Lowland areas are for fruits like mangoes and oranges Avocados, and Pawpaws. Roads is the major means of transport but most are in bad shape making transportation hard especially during the rainy season.
Poverty level is 66.5 % (Market East and West), 45.3% in (Keiyo sub county). Dependency ratio in the county is high due to limited employment for the working age group and dropping out of schools by the youth especially for girls due to early pregnancy. The natural resources in the county that benefit the people are Kerio Valley reserve, Arable Land, Cherenganyi Hills, and River Kerio. There are two district hospitals, 89 dispensaries, with prevalent diseases being Malaria, Diarrhoea, Bronchopneumonia, and respiratory tract infection and urinary tract infections due to poor sanitation according to the county development plan, 2013.

The county government main source of revenue are levies on products and services generated through different economic activities in the county like (livestock, subsistence farming, fluorspar mining, small business), Taxes, Fees, Fines, Rates, Accruals, Cess, County Civil Society Organizations, Appropriations-In-Aid, Co-operatives and Societies. The county is also planning to source revenue through levies on the Exploitation of natural resources such as

conducive climatic conditions for sports training, forests, Escarpments and sceneries for tourism attraction, while at the same time utilizing stakeholders for investments in county projects.

4.1.4. Uasin Gishu County

Uasin Gishu County is divided into six sub-counties: Turbo, Soy, Ainabkoi, Moiben, Kessess and Kapseret with the main source of income being agriculture especially planting of maize. The sub-counties are further subdivided into fifty one locations and ninety seven sub-locations. The county has an extensive road network comprising of 549 km of marrum, 300km of tarmac and 377 km of earth roads. It also has railway transport with 8 railway stations within the county. there is an inland container depot. The Moi International Airport and two airstrips are also located in Uasin Gishu easily making it the region's service hub (Uasin Gishu, 2013).

Financially the county has witnessed significant growth due to the presence of a branch of central bank of Kenya 21 Commercial banks, 108 urban and 4 rural Saccos and 5 major micro financing institutions.

The education facilities are fairly developed with 2 public universities namely, Moi University and University of Eldoret. It also has 2 private universities and constituent colleges of major universities. There is also a National Polytechnic, a Technical Training Institute and several private commercial colleges. There are 576 ECD centres in terms of basic education, 422 primary schools and 129 secondary schools (Uasin Gishu, 2013).

Firewood and charcoal remains the major source of energy with about 85% of the households using them major source of fuel. The overdependence of these sources of energy has led to negative implications on the forests increasing the need to plant trees to balance the environment. Currently, 30 trading centers, 33 secondary schools and 12 health centers are not connected to electricity even with that the infrastructural facilities including water supply, roads and hospitals are insufficient to meet the needs of the growing population and the coming up of urban centers without proper planning (Uasin Gishu, 2013). Since the county is the home of champions it has a sports development programme to nature talents that puts Kenya in the global Arena.

Main Economic Activities large-scale maize, wheat farming, dairy farming, sports (Athletics), manufacturing and agro processing. Revenue sources are; Taxes, Fees, Fines, Rates, Accruals, Cess, County Civil Society Organizations, Appropriations-In-Aid, Co-operatives and Societies.

4.2. Mt. Elgon Forest Ecosystem

4.2.1. Vihiga County

Vihiga County is divided into four administrative Sub-counties namely Hamisi, Emuhaya, Sabatia and Vihiga. The county is further subdivided into nine divisions, 37 locations, and 129 sub-locations. The County covers a total area of 531.0 Km2. Emuhaya Sub-County is the most expansive sub-county at 173.5 Km2, followed by Hamisi 156.4 Km2, Sabatia 110.9 km2 and Vihiga at 90.2Km2. The main activity in the county is agriculty which is the main source of income for manyhouseholds and the county. The road network in the county is fairly good with tarmac covering 16% of the total road network (1,058.2km) (Vihiga, 2013).

There are several financial institutions tin the county including banks, saccos and microfinances which boost the growth of the county. There are 107 Adult learning centres and 16 tertiary colleges in the county. Among the public colleges are Kaimosi Teachers Training College and Friends Kaimosi Institute of Technology. Private colleges include Vihiga Teachers College, St Joseph's Teachers College and Goibei Teachers College (Vihiga, 2013).

The County has a total of 209 trading centres with 192 of them connected with electricity. Some 49 health centres and 164 schools have also been connected with electricity. Urban household access to electricity is 10.8 per cent whereas the rural household access to electricity is 5.3 per cent. The main source of cooking fuel is firewood which accounts for 84.8per cent of total cooking fuel whereas the main source of lighting fuel is paraffin accounting for 88.7 per cent of total population. Feasibility studies have been undertaken to revive a hydroelectric power station at Kaimosi dam meet the increasing demand for electricity in the county. Efforts will also be made to promote solar as an alternative source of energy to minimize destruction of forests and environmental degradation (Vihiga, 2013).

Main Economic Activities in the county are include tea, maize, dairy farming, millet, cassava. Revenue sources are; Taxes, Fees, Fines, Rates, Accruals, Cess, County Civil Society Organizations, Appropriations-In-Aid, Co-operatives and Societies.

4.2.2. Kakamega County

Agriculture is the main activity in most households in Kakamega County according to The County's Integrated Development plan, 2013. The main financial institutions include banks, Sacco and micro finances which have contributed to the growth and development of the county. The main form of transport is roads but the county has a railway line with one railway station. The main source of energy just like most households in Kenya is firewood and charcoal leading to degradation and diminishing forest cover. This has necessitated measures to like tree planting to manage the forests and mitigate climate change (Kakamega, 2013).

The average land holding size in Kakamega County is 0.57 ha. Generally the Southern and central regions have lower average land holding compared to the northern region. The land has been sub-divided into small uneconomic portions in the southern and central regions due to the high population. There is need to encourage optimal use of land through diversification of economic activities and also reduce over reliance on land as the main and only source of livelihood (Kakamega, 2013).

Kakamega County has 1,943 ECD centres, 2,463 primary schools and 807 secondary schools. It has one full-fledged public university namely the Masinde MuliroUniversity of Science and Technology and several others such as Mt Kenya University, Jomo Kenyatta University of Science and Technology and the University of Nairobi are some of the universities that have established branches in the County. It also has a host of other tertiary institutions. Due to the high enrolment in schools the county has 83.6 per cent and 83.3 percent of its population who can read and write respectively. On the other hand those who are able to read and write are 83.1 per cent (Kakamega, 2013).

The County has several socio economic development challenges which cut across the country and the sub counties within. The challenges include population pressure, poor road networks, inadequate clear and clean water, Food insecurity, limited resources, constraining political

environment, weak industrial development, Inadequate health personnel and high dependency ratio due to unemployment of the active age group. (Kakamega, 2013).

Main Economic Activities in the county that raises revenue include Large-Scale Sugarcane farming, Mixed Farming, Commercial businesses, 'Boda-Boda' Transport business, Home of Mumias Sugar Company.

4.2.3. Trans Nzoia County

Trans Nzoia County is generally an agricultural county either livestock or crop production which is rich in agricultural produce. The main means of transport is road therefore it has a vast road network of 4,060.94 Km in total comprising tarmac roads (154 Km), 1, 67.07 Km of gravel, 786.37 km of earth road and 2,953.5 km of rural roads. Most of the roads are in poor condition and are impassable especially during the rainy season. This has made it difficult to transport goods to and from the market constraining business. The county also has railway transport and an air strip (Trans Nzoia, 2013).

The major means of communication in the county in most households according to the Population and Housing census, 2009 covering over 60% of the households. This has led to the decline of people using the postal services though they remain relevant for the percentage that is not yet familiar with technology. Financially the main financial institutions include banks, SACCOs and microfinances which has improved the financial sector in the country through money transfers and loans for business has also improved livelihoods (Trans Nzoia, 2013).

Trans Nzoia County has 761 Early Childhood Development centres (ECD) , 483 primary schools, 169 secondary schools (151 public and 18 private), 18 youth polytechnics, six satellite campuses of (University of Nairobi, Jomo Kenyatta University of Agriculture and Technology, Mt. Kenya University, Moi University, Laikipia University and Kisii University). In addition, it has one technical institute (Kitale Technical Institute), one teachers' college and one Medical Training School. There is still a challenge in reducing the illiteracy levels by providing education due lack of adequate resources to provide quality education and a conducive environment for learning (Trans Nzoia, 2013).

The main sources of energy are firewood, kerosene, charcoal and electricity used for lighting and cooking purposes. Access to the sources varies depending on the area (either rural or urban). Most households however use firewood and charcoal as fuel reducing the tree cover

percentage. According to the Population and Housing census, 2009, the housing types in the county are varied depending on the affordability and access. Most household's roofs are iron sheets followed by grass and lastly asbestos.

The average farm size in the County is 0.607. However, this varies across the constituencies within the County. For instance, in Saboti Constituency, the average farm size is one and half hectares for small scale farming and thirty hectares for large scale farming. For Cherangany Constituency, the average farm size for small scale farming is 0.60705 hectares and 80.94 hectares for small and large scale farming respectively, while for Kwanza Constituency the average farm size for small scale farming is four hectares and 30 hectares for large scale farming (Trans Nzoia, 2013).

Trans Nzoia County contributes around 18% of the forests (natural, plantations, bamboo, moorland and grass). The main forest areas per Sub County are Trans Nzoia East (Kapolet and Kapolet Trust Land Forest), Trans Nzoia West (Saboti, Sosio, Kitale Township and Kitalale forest) and Kwanza (Suam, Kimothon and Kiptogot forest). Therefore, forest management and conservation practices have been encouraged in this area in order to mitigate and adapt to climate change (Trans Nzoia, 2013).

Main Economic Activities include Horticulture, large scale maize & wheat farming, tea, coffee, commercial Businesses.

Revenue sources are; Taxes, Fees, Fines, Rates, Accruals, Royalties, Cess, County Civil Society Organizations, Appropriations-In-Aid, Co-operatives and Societies, and sale of boarded government assets.

4.2.4. Bungoma County

According to the Kenya National Highways Authority (KENHA) Bungoma County has 221 tarmac roads which are used by people as the main source of transport. The main form of communications are telephones which have taken the place of postal services. There has been an increasing number of financial institutions in the county with branches of banks increasing in number improving the financial capacity of the county.

According to the 2009 Population and Housing census, the main sources of energy in the County include: firewood (93.4%), charcoal (4.7%) and biomass residue (3.5%). the main sources of lighting fuel include: paraffin (96.65%), firewood (3.8%), and dry cells (2.3%). Electricity connectivity stands at a mere 1.5%. Efforts to increase the connectivity are ongoing through matching up facilities between Constituencies Development Fund (CDF) and Rural Electrification Authority (REA). There is potential for wind energy, solar and hydro power plants along Kuywa and Nzoia rivers.

The County does not have adequate quality housing for both urban and rural populations. The housing sector is characterized by low levels of urban home ownership and unplanned settlements. This is due to high cost of land and construction materials. The County has 2,880.78 Km2 of arable land mainly for crop farming and livestock production. The average holding size in the County for small scale farm sizes is 1.5 acres, while for large scale farms is 10 acres. This implies that land sizes are declining due to fragmentation of land into uneconomical units (Bungoma, 2013).

The area under food crops is 201,654.6 Ha amounting to 70%, while that under cash crops is 86,423.4 ha or 29.9%. Most of the agricultural activities are rain-fed, meaning that farmers only Plant during the rainy seasons. Nzoia Sugar Company has about 50,000 hectares of land under sugar cane. Dependency on rain-fed agriculture exposes families to instances of food insecurity because of unpredictable weather patterns (Bungoma, 2013).

The county has the following options for revenue sources. The internal and external measures. Internal means include; taxes, fees, fines, rates, accruals, County civil societies and Appropriations in Aid (AIA). Internal sources of county revenue are; Parking fees, Advertisement, Bus park fees, Burial fees, Defaulting vehicles, Area rate, Towing/ Breakdown charges, Land rent, Auction ring, Government houses, Slaughter house fees, Cess, Market fees, Hire of stadium, Carriers/ Loaders with commodities, Hire of machines/ equipments, Market premises, Fire services, Impound fees, Nursery schools, Conservancy fees, Development control fees, Single business permit, Occupation/ Compliance certificate, Survey feees, Way Leave charges, Billboards, Vehicle branding, royalties, accruals and annual events.

4.2.5. Kisumu County

Kisumu County is one of the cities in Kenya that has seven sub-counties namely: Kisumu East, Kisumu West, Kisumu central, Nyando, Seme, Nyakach and Muhoroni. The total length of tarmac road is 286km, gravel surface 725.6 km and earth surface 956.6 km. Kisumu is traversed by main track roads that link Nairobi to Kampala through Busia and also a road that links Kisumu to Tanzania through Kisii. There is also a railway line that links Nairobi to Kampala that has been used for transport of goods to and from Kenya to Uganda improving the import and export ties between the two countries. A key form of transport that has increased the economy of Kisumu County is The Kisumu International Airport which was recently improved. (Kisumu, 2013).

The main form of communication just like any city is telephones which have reduced the use of postal services. The courier services have also reduced the popularity of postal services though they are still relevant to the people who are not in touch with technology. The most popular networks are Safaricom, airtel and orange. Financial institutions in the county are quite vast though most are concentrated in the urban centres. The institutions include SACCOs, banks and microfinances. (Kisumu, 2013)

There is a total of 997 Early Childhood Development (ECD) centres in Kisumu County and a total of 655 primary schools. The county has 158 secondary schools. Other educational institutions in the county include 3 universities, 5 university campuses, 1 national polytechnic, 1 medical training college and Kenya Utalii College Kisumu Campus. There are also a number of private institutions in the County offering tertiary education. (Kisumu, 2013).

The main source of energy for cooking in Kisumu County is firewood which accounts for 60% of all energy sources. Charcoal comes second at 17.1 per cent followed by paraffin at 6.9 %, gas (LPG) accounts for 2.5 per cent. For lighting, paraffin is the most commonly used source of energy in the county accounting for 79.3 % of all energy sources followed by electricity at 18.3 %. Electricity as a source of energy is becoming more important in the county with increase in coverage over the last few years especially through the Rural Electrification Programme. A number of trading centres and secondary schools in the county have been connected to the national grid currently. An increased number of households have also been connected to the

national grid. With the implementation of the laptop project, it is expected that the remaining centres and primary schools will be electrified. (Kisumu, 2013).

The main wall material for houses in the county is mud/wood accounting for 49.6 % followed by mud/cement 21.2 %, bricks/blocks 21.2 %and stone houses only account for 3.2 %. The main materials for the floor are earth 55.2 %; cement 42.4 % and tiles 1.5 %. Over 85% of the households use iron sheets with grass thatched household being less than 7% (Kisumu, 2013).
Lake Victoria is a key feature in Kisumu County since it is a source of income through selling of fish by fishermen and vendors, source of water and a tourist attraction. The Lake has negative effect from water hyacinth, overfishing and reduction in water levels due to destruction of water towers like Mt. Elgon hence the need to protect and rehabilitate the water towers.

The sources of revenue in Kisumu County are mainly share of national revenue and Revenue from local sources. The major local sources included; Parking fees accounting for 28%, Mobilizing land rates and other property taxes under the County government 19%, Single business permits 16%, Market fees 12%, Sign boards, promotions, advertisements, Refuse collection fees, Building plans inspection and approval Fees, Fire Fighting Services Fees Food handlers Fees, Food Hygiene License Fees, Court Fines, Sale of County Acts, Lease Fees from KIWASCO and other water companies, Boda Boda Fees, Hire of Stadia and Social Halls, Cess Fees (Quarry and Sugarcane).

4.2.6. Busia County

Busia County is divided into seven administrative Sub-counties namely Funyula, Budalang'i, Butula, Matayos, Nambale, Teso North and Teso South. These Sub-counties are further divided into 10 divisions, 60 locations and 181 sub-locations under the former provincial administration. The County has a total of 583.1 km of roads managed by different authorities and agencies. Of these, 58.6 km are of tarmac, 377.5 km are gravel surface while earth surface roads cover 147.0 km. The County is traversed by only 11 km of railway and served by one railway station at Malaba 11border crossing point which is a key entry point into the Republic of Uganda. (Busia, 2013).

The main form of communications by many households is telephone and though the county has 23 post offices the most people use courier services and mobile phones to pass information. The

main financial institutions in the county include banks, SACCOs and micro finances. (Busia, 2013).

The county has 459 Early Childhood Development Centres, 450 Primary schools and 105 Secondary schools, 17 Youth Polytechnics and 3 University constituent colleges. The three university constituent colleges are located in Busia town, Nambale market and at Alupe Sub-County hospital in Teso South. Adult learning and continuous education centres are being rejuvenated with at least five such facilities established in every Sub-county. There are also privately owned educational institutions at all levels that complement the public ones. (Busia, 2013).

According to the 2009 Population and Housing Census, firewood remains the main source of energy with 97.85 per cent of the households relying on it for cooking and heating. On the other hand, 1.9 per cent of the households use kerosene while 0.45 per cent uses Liquid Petroleum Gas (LPG). The majority of the population (89.55 per cent) in the County rely on kerosene as the main source of lighting and 3 per cent use electricity. Electricity is mainly used in the urban centres.

The county has over 80trading centres with two towns and three established urban centres mainly at the respective Sub-county headquarters. Some of the main urban centres and markets include: Busia, Nambale, Malaba, Bumala, Funyula, Amagoro, Sio Port, Port Victoria, Butula and Ang'urai, among others. Most of the markets in the county are open air markets which are unplanned and the main activity is sale of agricultural produce (Busia, 2013)

Due to the raise in population there is no adequate shelter and housing especially in the urban centers. The land uses in the county include agriculture, mining, construction of County land uses include: Agriculture, forestry, mining, construction of human settlements, and business, social and public amenities. The average land holding size in Busia County is 2.34 Hectares. This is characterized with the minimum small holder owning less than 0.4 Hectares, while the average large scale holder owns 6 Hectares of land. Large land holders are found in Teso North and Teso South Sub-counties while small holders are concentrated around Matayos Sub-county implying uneven land holdings in the county (Busia, 2013).

Poverty and unemployment levels continue to grow in the county increasing the dependency level and if the population continues to increase the situation will be worse in the future since the demand for resources will be higher than the available resources. Poor sanitation and lack of pure clean water are some of the challenges that led to health risks in the area leading to death of some persons (Busia, 2013).

The main sources of local revenue within the county are; Taxes, Fees, Fines, Rates, Accruals, Cess, County Civil Society Organizations, Appropriations-In-Aid, Co-operatives and Societies, Development of Special Economic Zones (SEZs), Special Investment, Taxes (SIT), County Investment Incentive Framework, Research Initiatives, Wealth and Employment creation Tool/Equipment Bank, Royalties and Annual Events.

4.2.7. Siaya County

The County is divided into six administrative sub-counties namely; Gem, Ugunja, Ugenya, Siaya, Bondo and Rarieda. Siaya sub-County is the largest covering an area of 605.8 km2 and has the most locations. The sub counties are further divided into wards with the county having a total of 30 wards. The village constitutes the lowest administrative unit in the county. Roads are the main source of transport and they have improved as there has been an increase in tarmac roads (Siaya, 2013).

The main forms of communication are telephones though are also postal services and courier services that help people pass information. Just like most counties the financial institutions mainly include banks, SACCOs and microfinances (Siaya, 2013).

There are 636 primary schools, 179 secondary schools, six tertiary institutions, 12 special education schools, one public university and 13 special units in regular primary schools. School enrolment is 57,592 pupils at pre-primary level, 232,691 pupils at primary school level, 33,780 students at secondary school level, 2,759 at tertiary level, 1,847 in the university and 104 in the youth polytechnics. Basic literacy rate stands at 80 % showing that most people in the county are educated hence competition for jobs that require educational background (Siaya, 2013).

The main sources of lighting in the County include: tin lamps, lantern, electricity, pressure lamps, gas lamps, and wood fuel and solar. The main sources of cooking fuel used in the

households include firewood constituting 82.5 %, charcoal at 13.6 % while 1.3 % of the households use paraffin. These indicate that the demand for wood fuel is high and continues to rise. This has negatively impacted on the forest cover within the County and there is urgent need for up scaling agro-forestry programmes (Siaya, 2013).

The roofing types in the county are mainly iron sheets, the floors are mostly mud and a few are cemented and the walls are either mud/wood or mud. This is so due to the high poverty levels in the county. The housing units are only 20% of the total demand which is lower than the demand. Land in Siaya County are mostly privately owed. Approximately 2059 square kilometres of land is arable and a major form of land use is peasantry agriculture. Only small portion of Siaya town has been set aside for industrial use. There is need to demarcate more land for industrial use in major urban centres in the county (Siaya, 2013)

CHAPTER FIVE: MAJOR TOWNS/CITIES AND URBANIZATION

5.1. Cherengany Forest Ecosystem

5.1.1. Eldoret Town, Uashin Gishu County

Eldoret Municipality is the Headquarters of Uasin Gishu County in western Kenya. The town lies south of the Cherengani Hills, with local elevations that vary from about 2100 metres above sea level at the Eldoret International Airport to more than 2700 metres in nearby areas. Sosiani River, a tributary to Nzoia River flows through the town from east to the west. Eldoret municipality has an estimated area of 147.9 sq. km. According to the 2009 Kenya National Census, Eldoret had a population of 289,380, with a growth rate of 4.9%; currently one of the fastest growing towns in Kenya. The town is located half-way between Nairobi (330 km) and Kampala (308 km), the capital cities of Kenya and Uganda respectively. Eldoret town is surrounded by prime agricultural lands and acts as a trading centre for Uasin Gishu economy which is driven by large-scale grain farming, dairy and horticultural farming. The town is also a local manufacturing hub with a number of nationally recognised manufacturing industries, including Raiply Woods, Rupa Textiles, Kenya Pipeline Company, Kenya Co-operative Creameries as well as maize, wheat and pyrethrum factories all within the town. The high urban population growth rate has led to the sprawling of the town into the peri-urban areas.

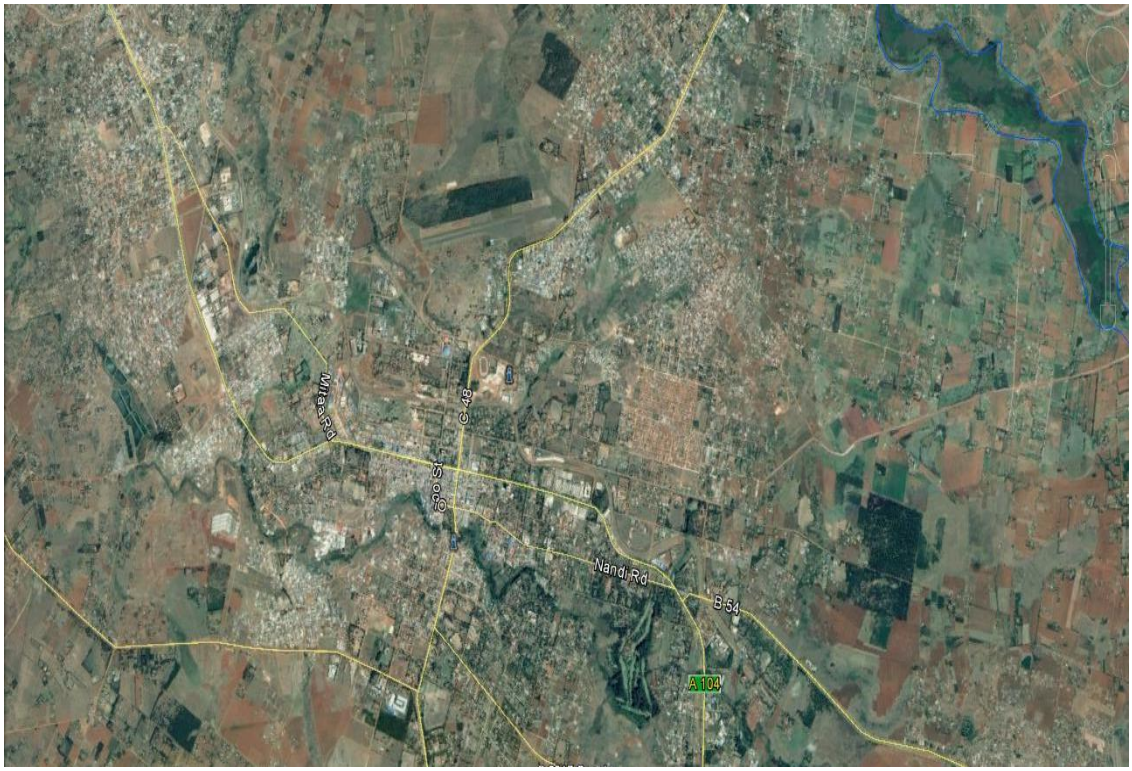

Plate 1: Eldoret Town, Uashin Gishu County. (Source – Google Earth)

5.1.2. Kapsabet Town, Nandi County

Kapsabet is a town in is the capital of Nandi County. According to the 2009 National Population Census, Kapsabet municipality has a total population of 86,803 with a density of 1157 persons per sq. km.

Plate 2: Kapsabet Town, Nandi County. (Source – Google Earth)

5.2. Mt. Elgon Forest Ecosystem

5.2.1. Bungoma Town

Bungoma Town is the headquarters of Bungoma County and hosts a municipal council. The town was established as a trading centre from the construction of Kenya Uganda Railway in the 1920s. The town covers a total land area of 51 sq km.There are no large industries within Bungoma, although some industrial centers are found within the vicinity of the municipality such as Nzoia Sugar Factory and Pan Paper Mills located about 25 km in Webuye town. During

the 2009 population census, Bungoma municipality has an urban population of about 120,000 which has since more than almost doubled today due to the huge influx from rural areas coupled with a high population growth rate of over 4% per annum. The major economic activity in Bungoma town is farming that supports agro-cottage industries and businesses. Bungoma town is endowed with extensive wet grasslands on both the western and eastern boundaries. The River Khalaba, which is the major river, runs across the eastern boundary forming a rich riparian wetland. The Mashambani and Sinoko wards partly covered with patches of marshes. Construction activities in real estate development are the major threat to wetlands in the municipality through drainage, dredging deposition of fill material, dyking and damming. In addition, agro-chemicals contribute to pollution of surface run-off, air and water, changing nutrient levels and release of toxic chemicals in these wetlands.

Plate 3: Bungoma Town, Bungoma County (Source – Google Earth)

5.2.2. Busia Town, Busia County

Busia town is the headquarters of Busia County. The town was established as a market centre in the 1930s and later grew as an important gate way to Uganda and Central Africa. The Municipal Council covers an area of 44 sq. km. According to the 2009 census, the Busia town has a total population 51,981, and population density is estimated at 1,133 persons per sq km. The main economic activity is trade in farm produce and poultry products across the Kenya-Uganda

border. However, the main economic activity in the entire Busia County is dominated by subsistence agriculture, forestry, mining, human settlements, fishing, gazetted and non-gazetted forested areas. There is serious degradation of District lands through continuous cultivation, bush burning and deforestation among other factors. People have been forced to use poor farming methods such as those mentioned above due to population pressure leading to negative consequences of soil erosion and loss of soil fertility and the problem of reduction in agricultural production. Fragile ecosystems such as river banks, wetlands and forest reserves have been degraded through deforestation and wetland drainage.

Plate 4: Busia Town, Busia County (Source – Google Earth)

5.2.3. Kisumu City

Kisumu is the third largest city in Kenya, and the headquarters of Kisumu County. The city area covers an area of approximately 417 sq. km, of which 297 km is dry land and approximately 120 km under water. The city population was approximately 345,312 (1999 census). The population density is 828 per sq. km with a growth rate of about 2.8% p.a. The city was established as a railway terminus and internal port in 1901, and has since gradually developed to become the leading commercial/trading, fishing, industrial, communication and administrative

centre in the Lake Victoria basin, an area that traverses three provinces of Nyanza, Western and western Rift Valley. In addition, Kisumu serves as a regional transport hub that links Kenya to the East African Countries via Rail, Road, Water and Air. The inland oil depot and containerised cargo serve the wider great lakes region. The present land use in the surrounding area of Kisumu includes small-scale rain-fed mixed farming, large-scale sugar cane farming, fishing, small-scale river-irrigation, and settlement infrastructure. The agricultural sector has underperformed in the region due to frequent droughts alternating with severe floods and poorly drained black cotton soils of the flat plains. The result has been rapid rural-urban migration in such of better livelihoods leading to unplanned and uncontrolled urban expansion

Plate 5: Kisumu City, Pop Density, Kisumu County (Source – Google Earth)

5.2.4. Kitale Town, Trans Nzoia

Kitale is the is an agricultural town located between Mt. Elgon National Park and Cherengani Hills Forest. The town was founded in 1908 by white settlers and is among the most diverse towns in the country. The arrival of the Kenya Uganda rail in 1926 promoted growth of the town during these early stages. According to Kenya National Bureau of Statistics, Kitale had an estimated population of 280,787 people in 2009 according to the 2009 population census (KNBS 2009) with a rapid population growth rate of about 7%. Kitale town is the administrative capital of the Trans-Nzoia County. The main cash crops grown in the area are

sunflower, tea, coffee, pyrethrum, beans and maize. Environmental threats are caused by rural-urban migration, largely as a result of decreasing economic opportunities in the outlying farmlands and recurrent drought in northern Kenya, in-migration from other urban centres, and natural growth.

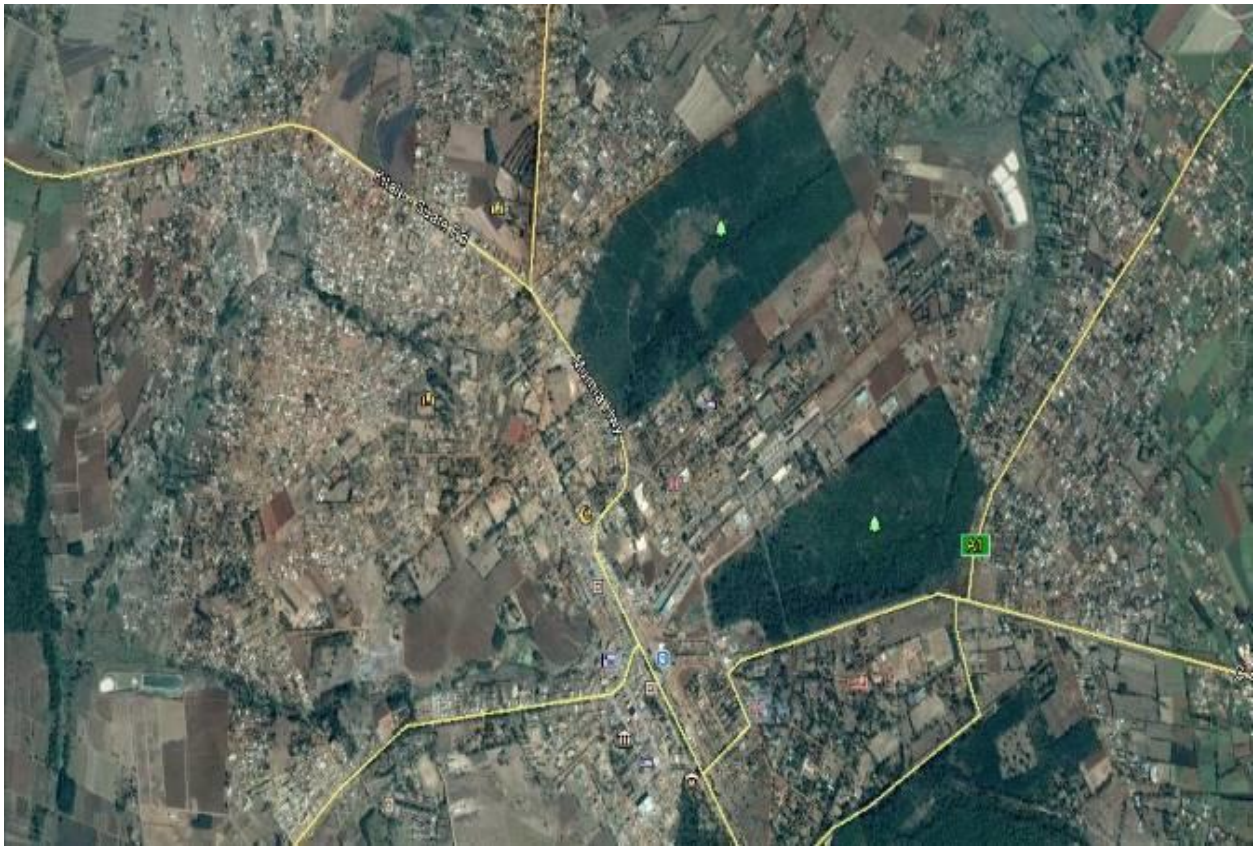

Plate 6: Kitale Town, Trans Nzoia

5.2.5. Siaya Town, Siaya County

Siaya town is the headquarters of Siaya County. Siaya forms municipal council with population of 45,353 people.

Destruction of forests and wetlands in the county, and the resultant biodiversity loss, is also a key environmental challenge. Population growth, agricultural expansion, over-dependence on wood fuels, and low levels of afforestation have accelerated deforestation in the county. Loss of forests and wetlands can have consequences for ecosystems and food security.

Plate 7: Siaya Town, Siaya County

5.2.6. Vihiga Town, Vihiga County

Vihiga county is located along the road between Kisumu and Kakamega, and five kilometres north of the equator Vihiga has a population of 118,696 (2009 census).

Mbale is a town in western Kenya, the central town and headquarters of Vihiga County. It is also called Maragoli, after the indigenous inhabitants of the area. The town is located at the middle of two major towns i.e. Kakamega and Kisumu, and is home to the annual Maragoli Cultural Festival, which is held every 26 December.

Mbale's population is around 60,000 people of different races which include the Luhya, Kikuyu, Kisii and Luo, Asians.

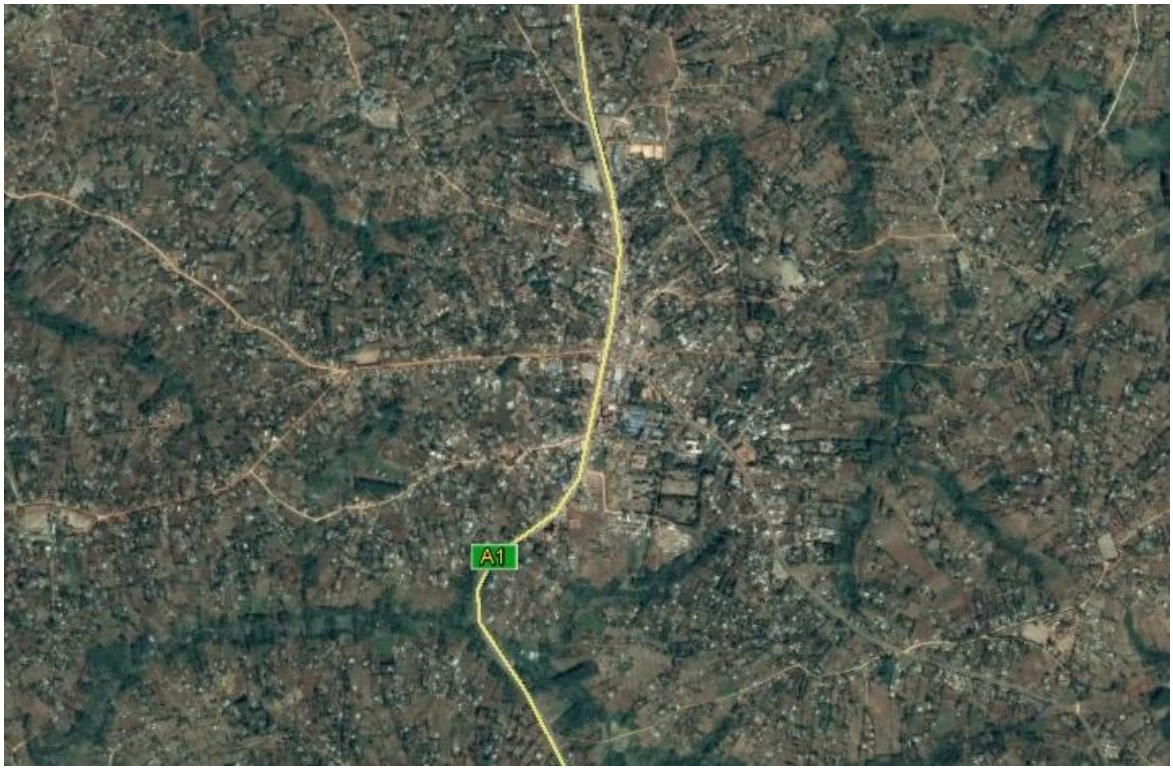

Plate 8: Mbale town in Vhiga county

5.2.7. Kakamega Town, Kakamega County

Kakamega town in western Kenya is located about 30 km north of the Equator. It is the headquarters of Kakamega County. Kakamega town was established by British colonial government for defensive purposes. The Municipality has a population of 99,987 (2009 Census). Kakamega town is one of the fastest growing towns in the country with an estimated population growth rate of 4.0%. Major economic activities include mixed subsistence farming of crops and livestock, commercial and small scale industrial activities. The main environmental threats are deforestation to create more land for cultivation and human settlements.

Plate 9: Kakamega Town, Kakamega County

5.2.8. Other Towns

Plate 10: Kapenguria Town, West Pokot County

Plate 11: Kapcherop Town, Elgeyo-Marakwet County

CHAPTER SIX: FIELDWORK RESULT AND DISCUSSION

6.1. Introduction

EMC research team departed to the field on July 11th, 2017 from Nairobi to Kitale Town. First day was used for setting up field logistics, reconnaissance and pre-testing of questionnaire in Mt. Elgon area. Pre-testing of questionnaire was performed to ensure questions are relevant and underscore the main objectives of the exercise. Reconnaissance involved identification of areas for conducting survey which assisted on adjustment of activities to fit within planned days. Five days was committed for administration of questionnaire while the last days was used for travelling back to Nairobi. We adopted a strategy of involving the local youths to assist in administering the questionnaire in order to cover sufficient sample size.

Fieldwork was conducted in the upper catchments of Mt. Elgon and Cherangany ecosystems where there environment degradation has occurred in the recent especially on areas around major forests.

The questionnaire was structured in a way that it captures interrelationships of human socio-economic activities with land degradation in Mt. Elgon and Cherangany ecosystems. Thus, the following areas were covered and survey conducted.

- **Socio-economic characteristics of the households**: Aspects that were covered in this area included sources of livelihood and incomes. We focused mostly on sources that relates with environment resources in order to determine the contribution of the environment to livelihood of the local communities.

6.2. Selection of Participants

Participants were selected through the local administrators (local Chiefs and/or Sub-Chiefs). Criteria were set for selecting the participants. The candidate must have:

- An O-Level certificate
- National Identification Card
- Must come from the administration area e.g. location or sub-location
- Person with ethical integrity in the village
- Female candidates are mostly preferred

Participants were taken through the questionnaire in order to familiarize themselves with the questions. The training was performed in order for participants to understand answers expected for each questions. In addition, the participants evaluated understand how to interpret questions into local languages.

Training Kelvin Kibet at Kaptama

Training Peter Mara at Kaboywa

Plate 12: Photographs showing instruction exercise on how to fill questionnaire and understand content of questions.

Table 17: List of participants trained on filling questionnaire

Name	Sublocation	Mobile Phone	Ecosystem
Lydia Cheptoo	Endebess	0791425725	Mt. Elgon
Fredrick Matwoyi	kiboroa	0726514925	Mt. Elgon
Brian Musani	Kapkomon	0711611872	Mt. Elgon
Peter Kwalia Mara	Kaboywa	0716133460	Mt. Elgon
Kennedy Ndiema	Chesito	0702277571	Mt. Elgon
Alex Kibet Naibei	Kaptama	0715228418	Mt. Elgon
Kelvin Kibet Chebonya	Terem	0708775372	Mt. Elgon
Geofrey Kibet	Tywondet	0712563803	Mt. Elgon
Anita Jepkemoi Kiplagat	Kipsero	0797279917	Cherangany
Brian Kiplagat	Kapsowar		Cherangany
Kimutai Justine	Cheles	0700687208	Cherangany
Nicholas Kutto	Kapchemutwa	0722368686	Cherangany
Faith Kimaiyo	Singore	0741619236	Cherangany
Ruth Chelimo	Kipsero	0724791883	Cherangany
Edwin Kiptoo	Kapcherop	0711877255	Cherangany
Anthony Biwott	Kapcherop	0720254413	Cherangany

Table 18: List of field activities and itinerary during the survey

Date	Activity	Area
July 11th	Travelling from Nairobi to Kitale	
July 12th	Setting up field logistics and pre-testing questionnaire	
July 13th	Administering questionnaire	Endebes and Saboti, Trans Nzoia County
July 14th	Administering questionnaire	Kaptama, Chesito and Kaboywa,
July 15th	Administering questionnaire	Terem, Bungoma County
July 15th	Travelling From Kitale to Eldoret to Kapsowar	
July 16th	Administering questionnaire	Iten, Uashin Gishu
July 17th	Administering questionnaire	Kapsowar, Elgeyo Marakwet County
July 18th	Administering questionnaire	Kapcherop, Elgeyo Marakwet County
July 19th	Travelling from Eldoret to Nairobi	

6.3. Distribution of respondents by age and gender

The respondents are not equally distributed in the category of age and gender. Results from In Mt. Elgon ecosystem, total number of respondents interviewed was 129 represented by 95(74%) males and 34(26%) females (Table 19). Males of 33(25.6%) households were in the age category of 36-50, 26(20.2%) in the age group of 51-65 years, 17(13.2%) in the category of 26-35 years, 14(10.9%) in 18-25 years and 5(3.9%) >65 years. Females were 45(34.9%) in 36-50 years, 33(25.6%), 28(21.6), 16(12.4%) and 7(5.4%) in these age ranges. In Cherang'any, the total number of respondents was 46, represented by 33 (72%) males and 13(28%) females (Table 1b). Males of 13(28.3%) households were in the age category of 36-50, 11(23.9%) in the age group of 51-65 years, 9(19.6%) in the category of 26-35 years, 0(0%) in 18-25 years and 0(0%) >65 years. Females were 13(28.3%) in 36-50 years, 11(23.9%), 9(19.6), 28(21.7%) and 3(6.5%) in these age ranges.

This survey revealed that the participation of youth (ages 18-35 years old) in the local economies is nearly one third (34.1%) and (41.3%) in Mt. Elgon and Cherang'any, respectively. However, these findings are inconsistent with reported by Awiti & Scott (2016), which show about 80% of Kenya's population is below 35 years. The sample size use in this survey was

smaller may perhaps contribute to the wide discrepancy. The differences in these results The underrepresentation of women in this survey can be attributed to patriarchal relations in African families that control land and other resources for production (Asiyanbola 2005); Wamue-Ngare & Njoroge 2011).

Table 19: Distributions of respondents by gender and age in Cherang'any

Age	Gender				Total	
	Male		Female			
	Frequency	%	Frequency	%	Frequency	%
18-25	0	0.0	10	21.7	10	21.7
26-35	9	19.6	0	0.0	9	19.6
36-50	13	28.3	0	0.0	13	28.3
51-65	11	23.9	0	0.0	11	23.9
>65	0	0.0	3	6.5	3	6.5
Total	33	71.7	13	28.3	46	100

6.4. Educational level of the respondents

Educational backgrounds of the respondents indicate a high level of literacy the area residents. According to Table 20, sampled households of Mt. Elgon study area were 37.8% primary education, 22% were O-level secondary education, 12.6% had A-level secondary education. The percentages of respondents with College and University education were 9.4% and 6.3% respectively. Respondents with no formal education constitute 11.8% of the sampled population. This implies the overall literacy level among the respondents is estimated at 88.2%. In Cherang'any study area, educational backgrounds of the sampled households were 29.3% primary education, 17.1% O-level secondary education, 19.5% A-level secondary education, 22% College education. The proportion of respondents with no formal education was 12.2% (Table 21, and Figure 14). Here, the overall literacy level among the respondent here can be estimated at 87.2%. The literacy levels of the respondents in the two study areas are higher than the national level. According to Kenya National Bureau of Statistic (2007), the national adult literacy rate is estimated at 61.5%. This is an advantage in the area since educated farmers would be more inclined to adopt sustainable land management practices (Saguye 2017). The majority of the respondents who have attained primary and secondary levels of educations

indicate that many the of primary school leavers who cannot not continue with tertiary education join farming as a source for their livelihood.

Table 20: Educational status of the respondents in the Mt. Elgon

Level of Education	Male	Female	Total	%
No Formal Education	11	4.0	15	11.8
Primary Level Education	30	18.0	48	37.8
O-Level Secondary Education	24	4.0	28	22.0
A-Level Secondary Education	13	3.0	16	12.6
College Education	11	1.0	12	9.4
University Education	6	2.0	8	6.3
Total	**95**	**32.0**	**127.0**	**100**

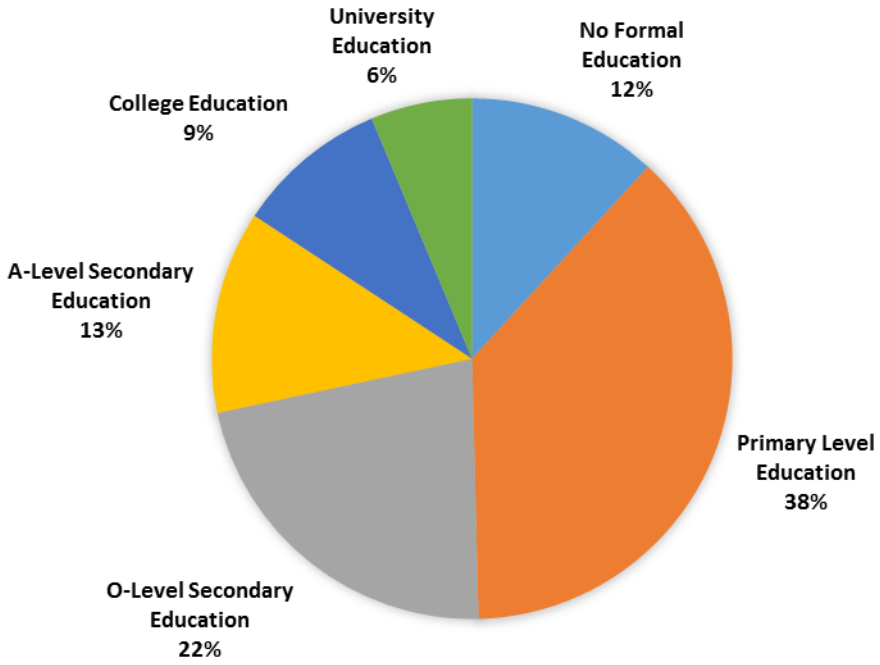

Figure 13: Educational status of the respondents in Mt. Elgon

Table 21: Educational status of the respondents in the Cherang'any

Level of education	Male	Female	Total	%
No Formal Education	3	2	5	12.2
Primary Level Education	8	4	12	29.3
O-Level Secondary Education	4	3	7	17.1
A-Level Secondary Education	7	1	8	19.5
College Education	7	2	9	22.0
University Education	0	0	0	0.0
Total	**29**	**12**	**41**	**100**

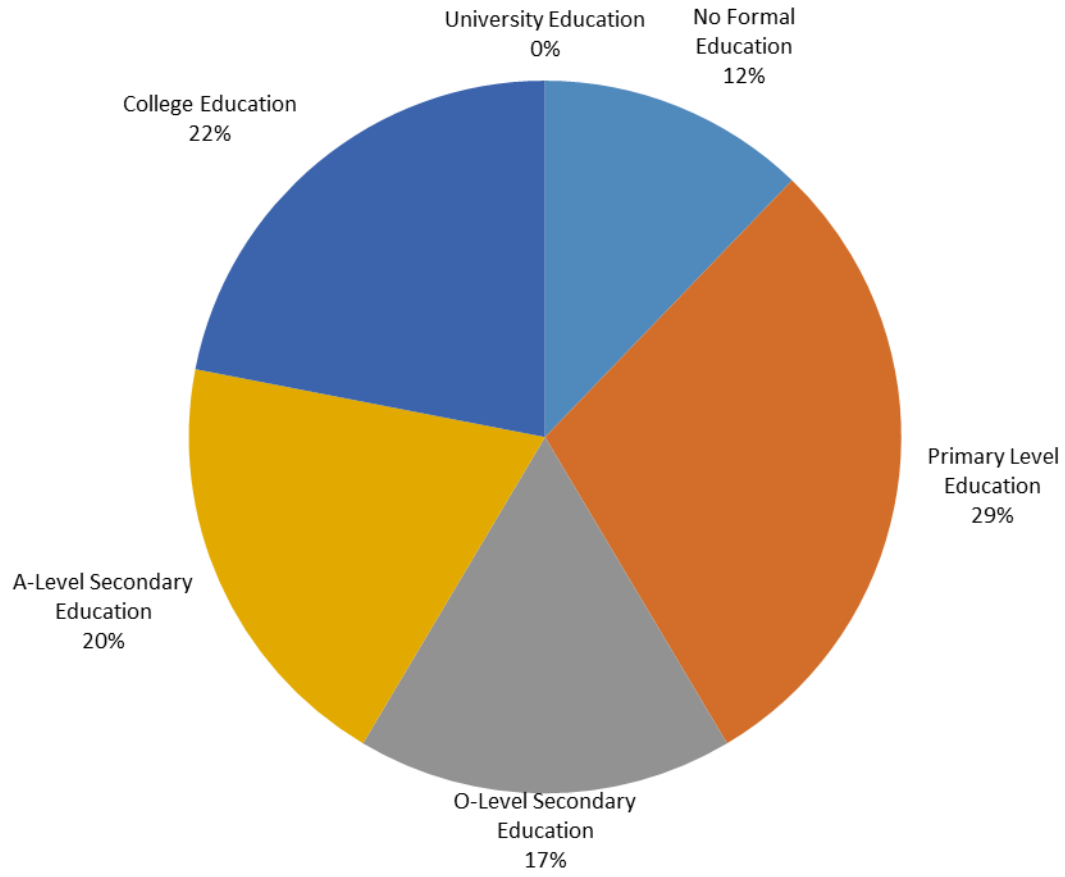

Figure 14: Educational status of the respondents in Cherang'any

6.5. Marital status and family sizes

Data summary for Mt. Elgon reveals that 79(80.47%) of the respondents were married, whereas 3(3.19%) divorced, 10(10.64%) windowed, 2(2.13%) single (Table 22). Majority 45(40.43%) respondents had at least 5-8 household members. Respondents with family size between 0-4

constituted 24(25.53%) and respondents with family size at least 9 and above formed 27(28.72%). Large households would require more land for crop cultivation leading to environmental degradation. At household members would provide readily available and cheap farm labour. However, the amount of labour needed to complete farm work depends on the age, education level and health status of the households. Most households with large sizes are forced to look for more employment as casual labourers' in other households at the expense of working in their own farms (Takane2008). In Cherang'any, 35(76.1%) of the respondents were married, whereas 3(3.19%), 10(10.64%), 2(2.13%) of the respondents were divorced, windowed and single respectively (Table 23). Majority 21(45.6%) respondents had at least 0-4 household members. Respondents with family sizes of 5-8 members constituted 14(30.4%) and respondents with family size at least 9 and above formed 11(23.9%). A Change in the distribution of marital status may influence the size and structure of the households.

Table 22: Marital status and family size of the respondents in Mt. Elgon

Category	**Family size**			**Total**
	0-4	5-8	>9	
Married	21 (22.34%)	35 (37.23%)	23 (24.46%)	79 (80.47%)
Divorced	1 (1.1%)	1 (1.1%)	1 (1.1%)	3 (3.19%)
Widowed	0 (0%)	7 (7.45)	3 (3.19%)	10(10.64%)
Single	2 (2.13%)	0 (0%)	0 (0%)	2 (2.13%)
Total	**24 (25.53%)**	**45 (40.43%)**	**27 (28.72%)**	**94 (100%)**

Table 23: Marital status and family size of the respondents in Cherang'any

Category	**Family size**			**Total**
	0-4	**5-8**	**>9**	
Married	14(30.4%)	11(23.9%)	10(21.7%)	35(76.1%)
Divorced	0(0%)	0(0%)	0(0%)	0(0%)
Widowed	1(2.2%)	2(4.3%)	1(2.2%)	4(8.7%)
Single	6(13.0%)	1(2.2%)	0(0%)	7(15.2%)
Total	**21(45.6%)**	**14(30.4%)**	**11(23.9%)**	**46(100%)**

6.6. Socio-economic and livelihood characteristics

The five most important sources of livelihood recorded in all the households are shown in Figures 15& 16. In Mt. Elgon the three main sources of livelihood were crop farming in 80(44.7%), small stock livestock farming 55(30.7%) and casual labour 23(12.8%). These constituted nearly 88% of all livelihood sources among the respondents. The main sources of livelihood in Cherang'any were crop farming in crop farming in 48(29.8%), small stock livestock farming 37(23%), small trading 19(11.8%), casual labour 17(10.6%), bee keeping and government employment were both tied at 13(8.1%). Together the five sources of livelihood contributed to about 91% of household incomes.

The majority of farmers cultivated on moderate slope and moderate steep slopes were landscape segments with high risk of land degradation and low levels of soil fertility resulting in low crop yields. Major crops grown in the study area include maize, beans and potato grown during the long rainy season. Maize and potato are the staple food and source of income. Feed for livestock which is the second most important source of livelihood cultivated fields, fallows and crop residue after harvesting.

The agronomic requirements of non-native crops can have serious ecological implications in their new habitats. The amount of environmental degradation observed in these areas support the evidence that cultivation of cereal crops which requires fine-tilled soil bed and single cropping of fields encourage soil degradation in the highlands areas (Woldeamlak, 2003).

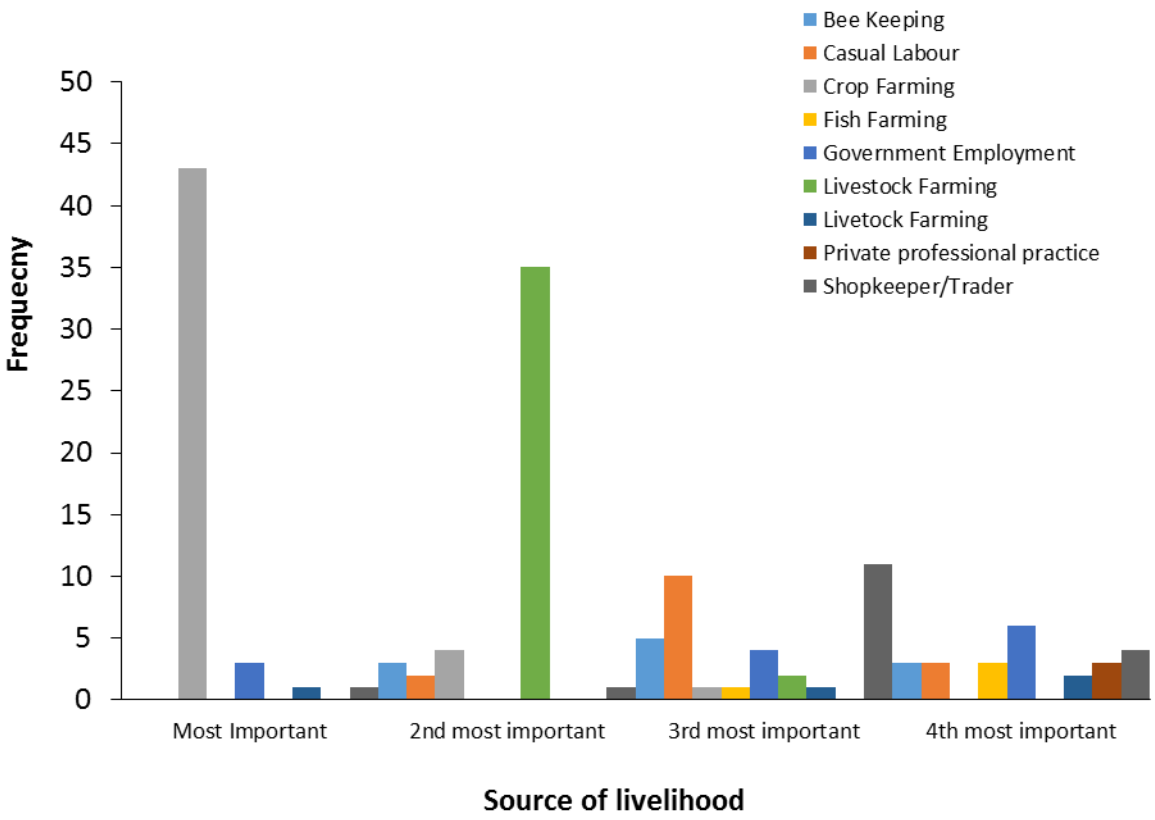

Figure 15: Main sources of livelihoods in Mt. Elgon

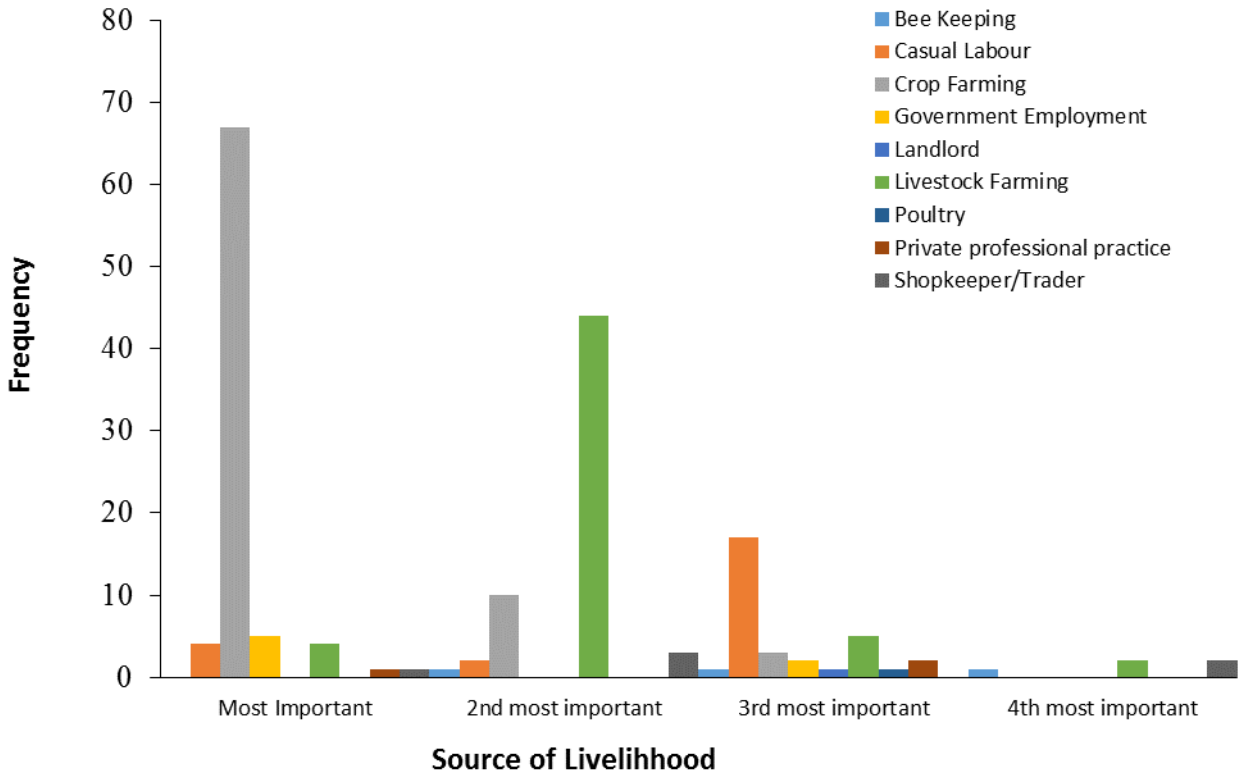

Figure 16: Main sources of livelihoods in Cherang'any

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1. Conclusions

Demographic profile, population size, ethinic composition, density and distribution are described for eleven counties in the two studies. Counties covered in Mt. Elgon Forest ecosystem are Trans Nzoia, Bungoma, Kisumu, Siaya, Busia, Vihiga and Kakamega. In Cherangany ecosystem, the counties included Uasin Gishu, Nandi, Elgeyo Marakwet and West Pokot. Vihiga was found to be the most densely populated county with 1869 persons per square kilometer, and a majority (52%) of the inhabitant were females. This exerts more pressure on land and other resources, low agricultural production leading to food insecurity, high unemployment rate and unending land disputes. About 80% of population in all the 11 counties are dominated by youths (below 40 years).

Poverty levels are generally high in all counties. The main sources of energy are firewood and charcoal. The major economic activities common in all the 11 counties are crop, livestock and fish production, forestry and agro forestry, mining, tourism and industrialization. Other impotatnt sources of revenue include levies, rates, fees and entertainment taxes and charges for its services. Improving the business environment and automation of revenue collection as well as broadening the tax base can help improve the total revenue base.

Most of the towns have emerged as either agricultural and/or trade centers due to construction of roadsand railway. Major sectorsof the economy are therefore; agro-based industries, services industry, transport and communication, tourism, mining and quarrying.

The survey indicates that:

- The respondents were dominated by males in all the study areas. There was fair age representation between youthful and old respondents.
- Majority of the respondents were literate.
- Marriage was highly prevalent, with large family households. The most common number of households was 5-8 members.
- The most important sources of livelihood are crop farming and small livestock keeping that is practiced on small farm sizes ranging 2-4 acres. Majority of respondents had secure land tenure of ancestral or privately owned land. Land cover was dominated by crops and settlements.

7.2. Recommendation

Two important conclusions can be made from this study;

- Promote education and awareness on general literacy and on environment
- Diversification on secondary and tertiary sources of income should be initiated in the upper catchment to reduce pressure on land by land related socio-economic activities.

REFERENCES

1) Asiyanbola, A. (2005). Patriarchy, male dominance, the role and women empowerment in Nigeria. In Poster presentado en la XXV International Population Conference Tours, Francia.
2) Awiti, A., Scott, B. (2016). The Kenya Youth Survey Report. East Africa Institute, 1-4. Available at: http://ecommons.aku.edu/eastafrica_eai/17
3) Bungoma County Integrated Development plan (2013-2017), Kenya
4) Bungoma County Integrated Development plan (2013-2017)
5) Bungoma County Government. (2013). First County integrated development plan, 2013-2017. Bungoma County Government.
6) Busia County Integrated Development plan (2013-2017), Kenya
7) Busia County Government. (2013). First County integrated development plan, 2013-2017. Busia County Government.
8) Elgeyo Marakwet County Government. (2013). First County integrated development plan, 2013-2017. Elgeyo Marakwet County Government.
9) Environmental Management and Conservation Act (EMCA) 1999
10) Food and Agricultural Organisation of the United Nations, FAO 2002.Gender and Accessto Land. Series title: FAO Land Tenure Studies, Rome, Italy
11) Grace Cheserek, (2005). Indigenous Knowledge in Water and Watershed Management: 'Marakwet' Conservation Strategies and Techniques.Moi University Summer School 2005
12) Human Rights Watch HRW, (2003). Double Standards: Women's Property Violations in Kenya, March, Volume 15, No. 5(A).
13) Kakamega County Government. (2013). First County integrated development plan, 2013-2017. Kakamega County Government.
14) Kandagor. R.d(1993). The economic transformation of the Tugen of Kenya, 1895-1963. East Africana collection.
15) Kenya National Bureau of Statistics: Population and Housing Census, 2009, Kenya
16) Kisumu County Integrated Development plan (2013-2017), Kenya
17) Kenya National Bureau of Statistics: Population and Housing Census, 2009
18) Kenya National Bureau of Statistics (KNBS). (2010). Kenya Economic Survey 2010 Highlights. Nairobi: KNBS.
19) Kenya National Bureau of Statistics (KNBS). (2011). 2009 Kenya Population and Housing Census. Nairobi: KNBS.

20) Kenya National Bureau of Statistics (2007). Kenya national adult literacy survey report. Nairobi: Kenya National Bureau of Statistics.
21) Kisumu County Government. (2013). First County integrated development plan, 2013-2017. Kisumu County Government.
22) KNBS. (2009). The 2009 Kenya population and housing census. KNBS.
23) Martin, D. M. and F.O. Hashi 1992. Gender: The Evolution of Legal Institutions and Economic Development in Sub-Saharan Africa. Working Paper No. 3. Washington, D.C: World Bank.
24) Nandi County Government. (2013). First County integrated development plan, 2013-2017. Nandi County Government.
25) NDMA. National Drought Management Authority West Pokot County. Drought monthly bulletin for July 2014.
26) Peters, A. R., Domingue, G., Olorunshola, I. D., Thevasagayam, S. J., Musumba, B., & Wekundah, J. M. (2012). A survey of rural farming practice in two provinces of Kenya. 1. Demographics, agricultural production and marketing. Age, 55, 70-0.
27) Republic of Kenya (1989) National Development Plan 1989-1994, Nairobi: Government Shipton P, 1989. Bitter Money: Cultural Economy and some African meanings of forbidden commodities. American Ethnological society monograph series no.1, Washington DC, USA.
28) Siaya County Government. (2013). First County integrated development plan, 2013-2017. Siaya County Government.
29) Trans Nzoia County Government. (2013). First County integrated development plan, 2013-2017. Trans Nzoia County Government.
30) Uasin Gishu County Government. (2013). First County integrated development plan, 2013-2017. Uasin Gishu County Government.
31) Vihiga County Integrated Development plan (2013-2017) , Kenya
32) Vihiga County Government. (2015). County budget review and outlook paper 2015
33) Wamue-Ngare, G., & Njoroge, W. N. (2011). Gender paradigm shift within the family structure in Kiambu, Kenya. African Journal of Social Sciences, 1(3), 10-20.
34) West Pokot County Integrated Development plan (2013-2017) , Kenya
35) West Pokot County Government. (2015). COUNTY FISCAL STRATEGY. West Pokot County Government.