

## Recent changes on household agricultural land-use practices in Bureti Sub-county

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**Abstract:** In Kenya, over the past four decades there has been inadequate access to agricultural land and a decline in the average farm sizes leading to over sub-division of land into uneconomic units and low productivity. Agricultural land use practices such as cultivation of crops and rearing of livestock influences food security at household level. For example, most high agricultural potential regions in Kenya such as Bureti have exceeded their population density and have been associated with sharp decline in farm productivity, total household income and asset wealth. The study focused on changes on household agricultural land use practises between 2005 and 2015 in Bureti Sub-county. To achieve the objectives, the study used mixed research design that involved qualitative and quantitative approaches. Multi-stage sampling was used to identify respondents in the study area. The main research instruments were questionnaires for households and key informants. The results from the study show that there was an increase in household farming activities for food crop (13.8%), mixed farming (3.6%) and cash crops cultivation (1%) while livestock reduced by 5.4% between 2006 and 2015. Further, there was an increased household land for food crop (51.4%) and cash crops cultivation (52.8%). The study recommends that there should be intensive household mixed farming, more agricultural extension services and formulation of policies favouring small scale farming.

**Keywords:** Household, Agricultural land use, Recent changes

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### I. Introduction

Agricultural sector in Kenya has undergone major changes over the past decades [1]. Before 1970 most parts of the rural Kenya was shrub grassland and forested, and the land use was mainly livestock grazing, scattered rural settlements with people practicing rural traditional farming. Between 1970 and 1995, there was relative growth in area for most agricultural commodities in the rural areas as a result of the government support to encourage small scale farming of selected crops [1]. As the country grew and developed, agricultural activities dominated the economy with 17 percent of the total land area [2]. However, the growth rate declined from 1.5% in 1998 to 1.2% in 1999 and further dropped to 0.8% in 2000 [3]. This may be as a result of the failure in the relationship between good land use land cover practices, good economic benefits and good nutrition of the population. The rate of population growth, land fragmentations for settlements, culture and norms of land tenure affects land use land cover changes and food production [4]. Population pressure is the main cause of rural agricultural land use change in high agricultural potential areas in Kenya [1].

The purpose of deliberate land-use changes is to increase local capacity of lands to support the human enterprise, but to the contrary many land use practices instead reduces the capacity [5]. For example Kiambu County with a perfect rural – urban interface, the agricultural land at the periphery is rapidly transforming and giving way to residential developments. Rural agricultural land use changes limit the potential of the peri-urban agriculture and increases the vulnerability of the poor in terms food security and income [6].

Bureti sub-County in Kericho County is within the lower highland agro-ecological zone of the rift valley characterized as a high agricultural potential area [7]. However, like many agricultural areas of Kenya, small scale farmers in the area faces many challenges including bio-physical and socio-economic adverse effects including climate change, pests and diseases, poverty and low income which may lead to low farm yields [4]. The poverty levels in the sub-county stand at 38.7% [7]. The population of the sub-county is 306,763 people and is on the increasing trend. This has led to sub division of land, resulting in reduced land for agricultural activities hence food insecurity [8].

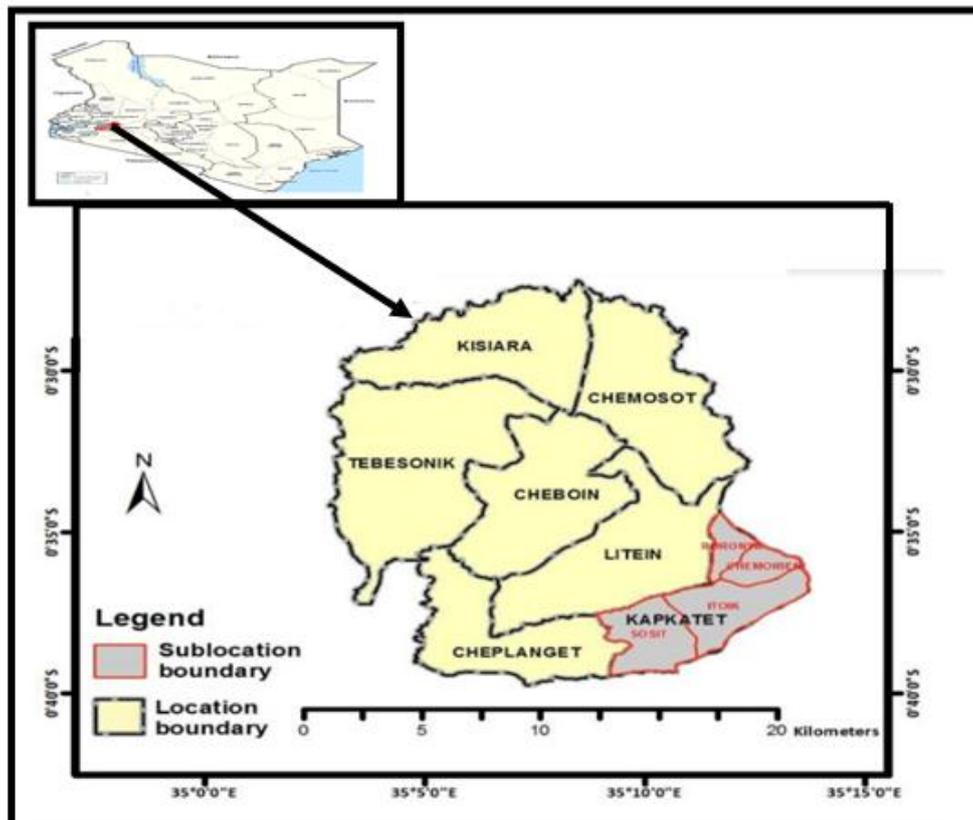
The Kenyan government has identified agriculture as a central pillar to its economic advancement. This is reflected in policies such as National Food and Nutrition Security Policy that are supporting rural communities at various stages of agricultural value chain. The current national agricultural policy aims to raise yields of key crops and livestock and transform land use by putting idle land in existing farming areas into productive agricultural land use [9]. The agricultural sector in densely populated rural areas continues to face

many development challenges. Among the challenges is the changing agricultural land use pattern that may be attributed to a variety of factors. Changes in agricultural land use are likely to affect household food security levels. Against this background, the present study analyzed recent changes in agricultural land-use in Bureti sub-county. This makes it necessary to establish the different land uses at household level.

## II. Material and Methods

### Description of the study site

The study was conducted in Bureti Sub-County within Kericho County as shown in Figure 1. It lies between latitudes  $0^{\circ}25''$  and  $1^{\circ}$  South and longitude  $35^{\circ}$  East. Bureti Sub-County has an area of  $185 \text{ km}^2$  and comprised of seven locations and fifty three Sub-locations [7].



**Figure 1: Location of the study area**

### Research Design

The study used mixed research design that combined qualitative and quantitative approaches. These included household survey and Key Informants interview. Mixed research design was used to collect data about a population of interest at a point in time. The population of interest in the study included rural households practicing small scale farming and key informants concern with agriculture in Bureti sub-county. This design facilitated acquisition of data from a sample of households. Household was considered to be the main unit of decision making in matters concerning land use, food consumption and expenditure. It was relatively cheap and easy to conduct since all the variables are measured at simultaneously. Thus, it made it possible to elicit responses from the respondents on research themes within a short period of time.

### Target Population

The target population for this study was 63,656 households in Bureti Sub – County [8]. The households are distributed across 7 locations Kisiara, Tebesonik, Cheboin, Chemosot, Litein, Cheplanget and Kapkatet.

### Sample Size and Procedure

The sample design was implemented in three phases including stage one, stage two and stage three.

**i. Stage one sampling method**

Stage one involved purposive sampling where the study area was divided into clustered administrative units (locations) to have a clear comparison of agricultural land use practises. The research used purposive sampling to select two locations based on their differences in population density. Population density was used as criteria for clustering the administrative units because it depicts the concentration of people, households and agricultural land uses within the study area. Kapkatet location with population size of 22,733 and area of 33.5 square kilometres and Tebesonik with population of 20,912 and area of 66.1 square kilometres [8] were chosen since they had the highest and lowest population densities in Bureti sub-County.

**Table 1: Number of households in Bureti Sub-County**

Administrative units	Total population	Area (square kilometres)	Population density	Number of Households
Bureti Sub-county	306,763	319	642	63,656
Kapkatet Location	22,733	35.5	640	3,245
Tebesonik Location	20,912	66.1	316	570

**Source: Kenya National Bureau of Statistics (2010)**

**ii. Stage two sampling method**

Stage two involved probability sampling to select study households from the study cluster using the formula (Newey and McFadden 1994).

$$n = \frac{[Z^2 PqN]}{e^2(N - 1) + Z^2}$$

Where: n = sample size

P = population

q = 1-p

Z = 1.96 of confidence level

e = margin of error

N = size of the population

We take P as 50% to give a representative sample with a minimal error making

q = 1-p i.e. 0.5

e = 0.05%

N = 3,245 households

Hence;

$$n = \frac{[1.96^2 \times 0.5 \times 0.5 \times 3245]}{0.05^2(3245 - 1) + 1.96^2}$$

$$n = \frac{3116}{11.95} = 261 \text{ households}$$

**iii. Stage Three sampling method**

At stage three, the 261 households were selected randomly using list of households in census enumeration areas of Kenya National Bureau of Statistics.

**Sampling of Key Informant Interview**

Purposive sampling technique was used to select twelve key informants based on their knowledge on agriculture in Tebesonik and Kapkatet locations. The key informants included: 2 agricultural extension officers and agricultural offices respectively with each from Tebesonik and Kapkatet locations, 4 community leaders from the Kapkatet Location and Tebesonik Location, 4 leaders of community based organizations and youth groups associated with agricultural projects.

**III. Data Analysis**

Data was coded and keyed into computer for analysis. Both descriptive and inferential statistics have been used for data analysis, using the Statistical Package for Social Sciences (SPSS) computer software version 17.0. The descriptive statistics was used to describe and summarize the data inform of graphs, tables, frequencies and percentages.

**Table 1:** Summary of Data Analysis

Objectives	Variables	Method of Analysis
1. To evaluate recent changes on household agricultural land-use practices in Bureti sub-County	<ul style="list-style-type: none"> <li>• Land under cash crop</li> <li>• Land under food crops</li> <li>• Land under livestock</li> <li>• Land under mixed farming</li> </ul>	Descriptive statistics

#### IV. Result and Discussion

This section presents the results and discussion of the findings of this study in response to the specific objectives of the study which was to evaluate recent changes on household agricultural land-use practices in Bureti sub-County.

##### Changes in Household Agricultural Land Use Practices

To understand the changes in household agricultural land use practices in Bureti Sub-County, household farming activities between the two periods, changes in household agricultural land between 2006 and 2015. The findings are presented in subsequent sections below.

##### Household farming activities between the year 2006 and 2015

The results of the main farming activities in Bureti Sub-county are as shown in table 2.

**Table 2:** Main farming activity in 2006 and in 2015

Main household farming activity	% in 2006	% in 2015	% change in number of respondents practicing the farming activities between 2006 and 2015
Food crop cultivation	13.9% (29)	13.1% (33)	+ 13.8%
Cash crop cultivation	18.8% (40)	17.5% (44)	+ 1%
Livestock keeping	17.7% (37)	13.9% (35)	- 5.4%
Mixed farming	49% (103)	55.6% (140)	+3.6%

##### Source of data: Field survey, 2017

There are different farming activities that households practice including subsistence farming, commercial farming and mixed farming. The extent of the farming activities practiced depend on its contribution to increased food supply, reduced dependency on purchasing food and increased income from the sales of the agricultural produce [10]. Table 2 shows that most households practice mixed farming in the year 2006 (49%) and 2015 (55.6%). This study concurred with research on the contribution of farming [11]. They were of the opinion that diversification of agricultural activities should be understood in the context of increased household access to food, reduced dependency of purchasing food and increased income from the surplus agricultural products. Further, the finding on the wide spread mixed farming in the year 2006 and 2015 are in line with study on smallholder mix range of crops which found out that food crops, cash crops, semi-cash crops (banana) and horticultural crops were at lesser extent with livestock depending on individual situations (Raul, 2013). The findings that mixed farming was dominated by most farmers in Bureti sub-county in the year 2006 and 2015 contradict a study on land use in Keumbu in Kisii County which revealed that most of the farmers practice food crops cultivation [4]. The findings on the difference in number of farmers practicing food crop cultivation, cash crop cultivation and livestock keeping in the year 2006 and 2015 are in agreement with the study view that the number of households practicing different farming activities varies in within different agricultural regions than livestock farming [12].

From table 2, there was an increase in number of households practicing food crops cultivation (13.8%), cash crops growing (1%) and mixed farming (3.6%) between the year 2006 and 2015. However there was a decrease in the number of households practicing livestock keeping between the year 2006 and 2015.

##### Changes in households agricultural land use between the year 2006 and 2015

Household agricultural land uses like other aspects of the environment are subject to change. As a result of the time difference, smallholder farmers were asked if they noted changes in proportion of land under cash crops and food crops between 2006 and 2015. This was to examine if there were recent changes in agricultural land uses. Table 3 shows the changes in proportion of land under cash crops and food crops.

**Table 3:** Change in land under cash and food crops

Response	Increase Cash Crop	percentage	Increase Food crop	Percentage
Yes	131	51.4%	134	52.8%
No	124	48.6%	120	47.2%
Total	255	100%	254	100.0%

##### Source: Field survey, 2017

According to table 3 most of the respondents were of the opinion that increased land under cash crop and food crop between 2006 and 2015 was 51.4% and 52.8% respectively. These findings contradict the research views on agricultural land use change in Kiambu County showed that agricultural land in the area reduced over a period of ten years from 39.7% to 15.8% thus reducing cash and food crops production [2]. Table 3 shows the changes in land under food crops, cash crops, livestock and mixed farming according to the selected socio-economic characteristics.

## **V. Summary, Conclusion And Recommendations**

### **Summary of Findings**

This study focused on agricultural land use practices that were dominant in Bureti Sub-County including food crops cultivation, cash crops cultivation, livestock keeping and mixed farming and their influence on household food security. Mixed farming was found to be the main agricultural activity in the year 2006 (49%) and in the year 2015 (55.6%) in Bureti Sub-County. Further agricultural land use change between 2006 and 2015 was more pronounced in food crops cultivation (+13.8%) and least on livestock keeping (-5.4%). It was also found out that there was an increase in land under cash crops (51.4%) and food crops (52.8%) in the study area between the year 2006 and 2015.

### **Conclusion**

Based on the findings of this study, Mixed farming practiced by the majority of the households in Bureti sub-county have been as a result of the increasing demand for food by the increasing population in the area and the reduced land sizes by the majority of the small scale farmers who require food crops, cash crops and livestock to meet their daily needs.

As a result of the changes in agricultural land use practices in the study area, there has been improved food security. More households in Bureti sub-County are food accessible, produce enough food that can enable them to have three meals in a day and they are able to purchase other foodstuffs.

### **Recommendation**

There is need for intensive household mixed farming incorporating food crops, cash crops and livestock keeping, and sustainable farming inputs since it is the most preferred farming system in Bureti sub-County. Therefore, smallholder farmers in the study area should use higher inputs in cash and food crops cultivation such as certified seeds and inorganic fertilizers, and practice dairy farming. As a result, there will be increased farm output within the limited reducing farm sized. This will in the long run make household in the area food secure and financially stable due to the sales of the surplus household farm output.

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