



Ministry of Energy  
Republic of Kenya

FEASIBILITY STUDY  
ON  
SMALL HYDROPOWER PROJECT  
FOR 12 SITES FOR TEA FACTORIES  
IN KENYA

Final Report

Volume III.  
Supporting Report (2)  
(Social Impacts Assessment)

AUGUST 2009

**Q-Energy**  
Que Energy Limited  
Nairobi, Kenya



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This Report consists of

Executive Summary

Volume III Supporting Report (2)

(Social Impacts Assessment)

This Study was fully Supported by Government of Kenya in a 10 month Feasibility Assessment of some 12 sites for Tea Factories in Kenya.

**Table of contents**

1.1	Introduction.....	1
1.1.1	Survey objective.....	1
1.1.2	Methodology.....	1
1.1.3	Limitations and opportunities of the study.....	1
2.0	Summary of findings.....	2
3.0	Survey findings.....	6
3.1.1	Household characteristics.....	6
3.1.2	Household income/assets.....	8
3.1.4	Food crops.....	12
3.1.5	Incomes from major food crops.....	14
3.1.6	Livestock incomes.....	15
3.1.7	Off-farm economic activities.....	17
3.1.8	Overall household Income.....	18
3.1.9	Housing.....	19
3.1.10	Ownership of electrical equipment.....	19
3.1.11	Energy and energy services.....	24
3.1.12	Monthly Energy expenditure.....	30
3.1.13	Social and other amenities.....	31
3.1.14	Businesses operated at market centres.....	36
3.1.15	Value of electricity to improvement of livelihoods.....	37
3.1.16	Access to financial facilities.....	37
4.0	Conclusions and recommendations.....	39

## **1.1 Introduction**

### **1.1.1 Survey objective**

The objective of this survey is to investigate the social and economic conditions of people living around tea factories so as to establish the impact of developing local small hydro power schemes to improve on their livelihoods

### **1.1.2 Methodology**

The study used a semi - structured questionnaire to collect the primary data. The researcher managed to collect data from 142 respondents.

The survey targeted potential beneficiaries of Small hydro scheme with the sample comprising all the households within a 3km radius from the Kionyo Tea Factory, as well as those living along the area where the canal will be constructed.

Stratified sampling technique was used, where the sample was divided into four strata and random sampling done in each stratum with equal distribution in all the parts of the strata. On this site, 142 households were randomly selected, which involved 120 households around the factory within a 3km radius and 30 households along the canal.

A structured questionnaire was developed, pre tested and reviewed. This was then used to collect primary data on the social and economic status of the respondents. These were administered face to face by the interviewers who were local residents of the area and also the potential beneficiaries.

Questionnaires were administered to each randomly selected household and responses recorded. It took an average of 30 minutes to gather the necessary information for each household.

The collected data was then coded, cleaned and entered into SPSS software to build a database that was subjected to data analysis. Descriptive statistics such as percentages, correlation analysis and graphs were used to describe, analyze and present the study findings as shown below. It is important to note that the research was carried out in various homesteads in the Abogeta division in Imenti South District.

Out of the 142 survey respondents 110 men (77.5%) and 32 women (22.5%)

### **1.1.3 Limitations and opportunities of the study**

The study coincided with the rainy season which involves planting food crops and picking tea thus it took more time to locate the respondents as most of them were busy in their farms preparing land in readiness for planting and also picking tea.

The heavy rains mostly in the afternoon affected the interviewer's job and thus took more time than expected; the interviewers had to contend with rain and cold weather to collect the data.

Most respondents could not fill in the questionnaires by themselves because they could not understand it, while those who tried to fill were not exhaustive. They were therefore interviewed and their responses recorded on the questionnaire. This also enhanced probing for further information.

Most respondents could not understand the English language and the interviewers had to translate the questions to their mother tongue or Kiswahili language.

The interviewers had to convince the respondents to get the land register number which was impossible in most cases. There were also challenges getting information on the income levels and sources. Nevertheless, most of the information was obtained.

## **2.0 Summary of findings**

The survey reveals that households have access to regular incomes from cash and food crops livestock as well as off-farm economic activities. Majority of households cultivate about 1 acre of tea and half an acre of coffee. The majority of households earn between Kshs. 30,000/= and 70,000/= from tea with the average earning being Kshs. 70,000/= per year.

Earnings from coffee are however low compared to tea. Coffee contributes an average of Kshs. 23,500/= per year to the households sampled and a minimum of Kshs. 1500/= per year. The highest earnings from coffee are up to Kshs. 120,000/= per year. Decisions on how income from cash crops is used are mainly made by both husband and wife. Men however make decisions more often than women on resource use.

Average annual earnings for households growing maize for sale is Kshs. 15,700/=; beans - Kshs. 11,600/=; potatoes Kshs. 15,500/=; bananas -Kshs. 17,200/=; cabbages-Kshs. 15,000/=.

In most cases, food crops are grown for both subsistence and sale (57.6%). 38% of the crops are grown purely for subsistence while those grown purely for sale are only 3.6%.

Decisions on how income from food crops is spent are mainly made by both husband and wife. Women however make decisions more often than men with regard to use of incomes from food crops.

90.8% of the sampled households keep cattle, with the main products being milk, manure and meat. The average number of cattle per household is 2 animals. Sheep rearing is practiced by about half of the households sampled with the main products being meat, manure, wool and milk. The average number of sheep per household is 4 sheep. 39.4% of the households are involved in goat rearing with the main products being meat, milk, and manure. The average number of goats per household is 5.

The average annual earnings from cattle is Kshs. 25,500/=; poultry - Kshs. 16,235/=; sheep - Kshs.12,700/=; and goats -Kshs 16,200/= . Decisions on how income from livestock is spent are made by both husband and wife. Women however seem make decisions more often than men on livestock incomes. Animal products are mainly used for both subsistence and sale (67.2%); subsistence only (28.2%), sale only (4.6%)

In addition to farming, most of the members the households sampled engage in various other economic activities ranging from running retail businesses (30.5%), day casual labour (25,6%), formal employment (21.2%), running agricultural commodity businesses (20.2%), and remittances from relatives (1,5%). Majority of the households earn below Kshs. 20,000/= (39.8%); Kshs. 20,000/= to Kshs. 50,000/= (34.8%); Kshs. 50,000/= to Kshs. 70,000/= -(12.6%); above Kshs. 90,000/= (11.7%)

According to the survey, 40.7% of the sampled households earn an annual income of between Kshs. 50,000/= and Kshs. 100,000/=; followed by 17.0% earning between Kshs. 100,000/= and Kshs. 150,000/=; and 15.6% earning Kshs. 250, 000 and above.

The average number of houses per homestead for sampled households is 3 while the average number of rooms per household is 9 rooms. In majority of households, the walls are constructed with wood (95.8%), stones (68.3%), iron sheets (5.6%), mud (9.2%). All the homesteads sampled have houses that are roofed with iron

sheets; 21.8% of households have houses roofed with *makuti*/grass while 1.4% of households have houses roofed with bricks.

The most commonly owned electrical appliance is the radio owned by 95.1% of the households sampled, with the average number of radios per household being 2 radios. Radios are mostly used by all family members comprising 74.0% in the sampled households meaning that access to electricity will improve access to this facility to benefit the whole family. The fact that the radio is located in the sitting room most of the times in most of the households means that all family members can access information.

81.7% of the households own a torch with the average number being 2 torches. In most cases, torches are bought by men, although women and boys also buy sometimes. Torches are mostly used by all household members and in all rooms with the exception of the kitchen. Given that use of torches in the kitchen is minimal, it is clear that providing electricity to homes and ensuring that there are light bulbs in all rooms including the kitchen would provide better working conditions for women who are responsible for cooking. Efforts should be made to ensure that each household has a light bulb in the kitchen.

Over half of the households sampled own a radio cassette player with the average number being 1 per household. Although men are mainly responsible for purchasing radio cassette players, these are mainly located in the sitting room in used by all family members.

37% of households own black and white TVs and 26.8% own colour TVs. Access to electricity will encourage more people to purchase TVs thereby increasing access to entertainment and information for more households most of the time. Furthermore, access to electricity will provide entertainment for the whole family.

With regard to electrical appliances (video player, rechargeable batteries, TV black and white and coloured, light bulbs, electric iron and cookers), men are mostly involved in their purchase. However women are also involved to a large extent in the purchase of kitchen appliances such as electric cookers and irons. Access to electricity would not only avail quality lighting and entertainment for households but also reduce drudgery for women through use of electrical appliances in the home and kitchen.

All family members have access to and use of all electrical appliances with the exception of the electric cooker/coil which is predominantly used by women and girls. Men and boys tend to have higher access to all appliances compared to women while girls alone seem not to be involved in purchase of appliances or use of all appliances with the exception of the electric cooker.

Kerosene is the most commonly used type energy for lighting in most households followed by firewood, solar and generators. Only 15 households out of the sampled 142 use electricity for lighting, while only 3 households use electricity for cooking. Regarding household expenditure on energy for lighting, households using kerosene and firewood spend more than those using electricity and rechargeable batteries. The main source of energy for cooking is firewood comprising 95.1% of the households; kerosene -8.5%; electricity – 2.1% and LPG -1.4%. There is possibility that increased access electricity will result in increased use of electricity for cooking.

For households with no electricity, the approximate average distance from the nearest electricity line is 1.8 km; with a minimum of 0.01km and a maximum of 8km. 74.4% of the respondents are less that 2km from the electricity line.

Women and girls are mainly responsible for firewood collection. The average time spent collecting firewood is 1.5 hrs. Considering that firewood is not only used for cooking by most households but also for lighting and heating, access to electricity will contribute to reduction of drudgery for women and girls. This will also allow more study time for girls.

Majority of households (57.1%) have noticed a change in the type and volume of energy they consume in relation to their family needs, while 42.9% have not noticed any change. Majority of respondents said that firewood and kerosene are very expensive (46.2%); demand for energy has increased in the household (18.5%); collection of firewood takes a lot of time and is tiresome (12.3%); firewood is inadequate due to shortage of trees (6.2%); fee for electricity is cheap (6.2%); cutting down of trees is prohibited by the government (3.1%); expenses in kerosene reduced after switching to electricity (3.1%); cost of purchasing kerosene reduced drastically after purchasing a Solar Home System (1.5%).

There is clear indication that once electricity is installed in households, expenditure on energy will reduce as it will replace kerosene for lighting.

84.8% of the respondents said they would like to change to a different form of energy while 15.2% said they are satisfied with the kind of energy they are using comprising those already using electricity and some with Solar Home Systems.

The main reasons why most households are not connected to electricity although they would like to are: because electricity connection fee is too high (32.14%), electricity is not accessible/ homes are far from the transformers (34.5%), and lack of electricity connection fees (17.9%). Other reasons include untrustworthy leaders selected in rural electrification programme who once embezzled cash, high maintenance cost/very expensive, high wiring expenses and electricity is expensive especially in cooking. This clearly demonstrates that there are a large percentage of households who would be ready for connection to electricity if it was available close to their homes. The project could consider financing mechanisms that could enable more households to connect to electricity.

Further more 68.3% of respondents said they have access to financial facilities such as cooperatives; another 44.4% said they have access to merry go rounds and social networks and 14.8% have access to credit from MFIs. Households could be encouraged to these could be used to finance connections to households. Some community members are even familiar with other financial sources such as CDF, and LASDAP which could be mobilised.

With regard to household energy expenditure, the survey revealed that the average monthly expenditure on energy accounts for a high percentage of the household budget. Average monthly expenditure on electricity for those using is Kshs. 319/=. While majority of households depend on kerosene and fuelwood for cooking, lighting and warming they pay more for these energy forms than those using electricity with the average monthly expenditure on firewood being Kshs. 1550/= and majority of households spending between Kshs. 500/= and Kshs. 1500/=.

Average monthly expenditure on kerosene is also higher than electricity (Kshs. 438/=) with majority of households spending between Kshs. 150/= and Kshs. 600/=. Average monthly expenditure on rechargeable batteries is Kshs. 134/= with the majority of households spending between Kshs. 100/= and Kshs 250/= while majority spend between Kshs. 50/= and Kshs. 250/= on dry cells. This means that household expenditure on energy would be reduced if households invested in electricity connection, since combined expenditure on different energy forms such as kerosene, charcoal, firewood, kerosene, candles etc. per household is quite high. This also means that majority of households would be able pay for electricity once connected.

About 76 of the households interviewed have bought an average of 2 rechargeable batteries in the last five years with some purchasing a total of 8 batteries. The cost range was mainly between Kshs. 4001 to Kshs. 5000/= comprising 46.8%; Kshs. 3001 to Kshs. 4000/= (20.8%); Kshs. 2001 to Kshs.3000/= (15.6%); Kshs. 5000 and above (14.3%) and only 2.6% costing Kshs. 2000/= and below. This clearly demonstrates that people in this community are keen to acquire alternative energy options and would therefore be ready to invest in electricity connection. Furthermore they travel an average distance 3.5 km to the nearest battery charging facility.

The survey revealed that the average distance households travel to social amenities such as schools, health centres, markets, schools etc. is 2km. Majority of respondents travel an average of 11 and 13km to the nearest Hospital or Maternity facility respectively.

Although majority of households have piped water comprising 60.1% which is obtained freely, 23.5% collect water from rivers, while a further 15.8% rely on rain water.

Majority of respondents said that the local Dispensaries and Health Centres are not well equipped to handle cases of complicated conditions and maternal deliveries because of lack of proper structures, equipment and facilities; lack of trained personnel to handle the cases; shortage of staff and poor transport. A smaller proportion of households said that the health facilities are able to handle complicated cases include: use electrical equipment for testing diseases; experienced Doctors and Nurses available in case of complicated cases and the fact that there are no new diseases reported in the area.

Local primary Schools mainly use electricity (39.3%), generators (26.4%) with a few (2.9%) using solar. A further 31.4% of Primary Schools are not using any energy type. Provision of electricity to those using generators will greatly reduce costs while access to electricity by the schools without will provide more study time hence improved performance.

Local Secondary Schools mainly use electricity (64.0%), with a sizeable number using generators (19.9%), while 15.4% of Secondary Schools have no access to clean energy for lighting. These would greatly benefit from electrification. Local churches use both electricity and generators and those using generators as well as those with no access would benefit from the electrification project.

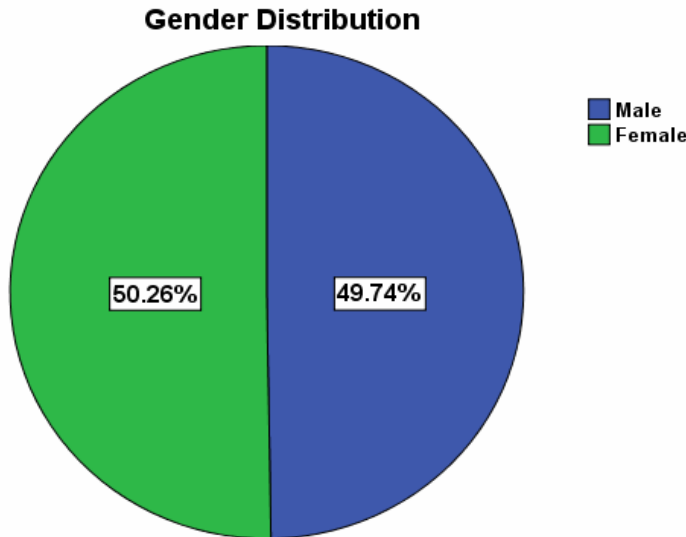
There is a range of businesses that are operated by women and men at market centres. The most common businesses operated by women are salons, hotels, tailoring shops, kiosks grocery shops and health clinics. Key businesses operated by men include butcheries, hotels, barber shops, pubs, shoe repair, carpentry shops, TV/radio repair shops, welding and pool tables among others. All these businesses operated by both women and men would increase earnings if electricity was available as this would either increase working hours as well as improve quality of services. Availing to electricity to market centres would also encourage establishment of other businesses and increase efficiency of others.

Most of the respondents said that access to electricity would improve livelihoods of people in their community. There would be benefits such as creation of employment opportunities; improvement on livestock rearing; making work easier through use of machines; better services in hospitals and dispensaries; reduction of cost, time and energy spent seeking services; improvement of markets; increasing business opportunities; improving peoples overall economic base; improving lighting in homes; people becoming more enlightened e.g. by buying TVs and Computers; improving security in homes and market centres; improvement of factories; improvement of schools; establishment of electrical services; improvement of agriculture; increasing working hours since people can work day and nights; environmental conservation/sanitation and improving *jua kali* sector. Others felt that access to electricity would contribute to reduction of stress through listening to music and reducing crime rate by opening business opportunities for the youth.

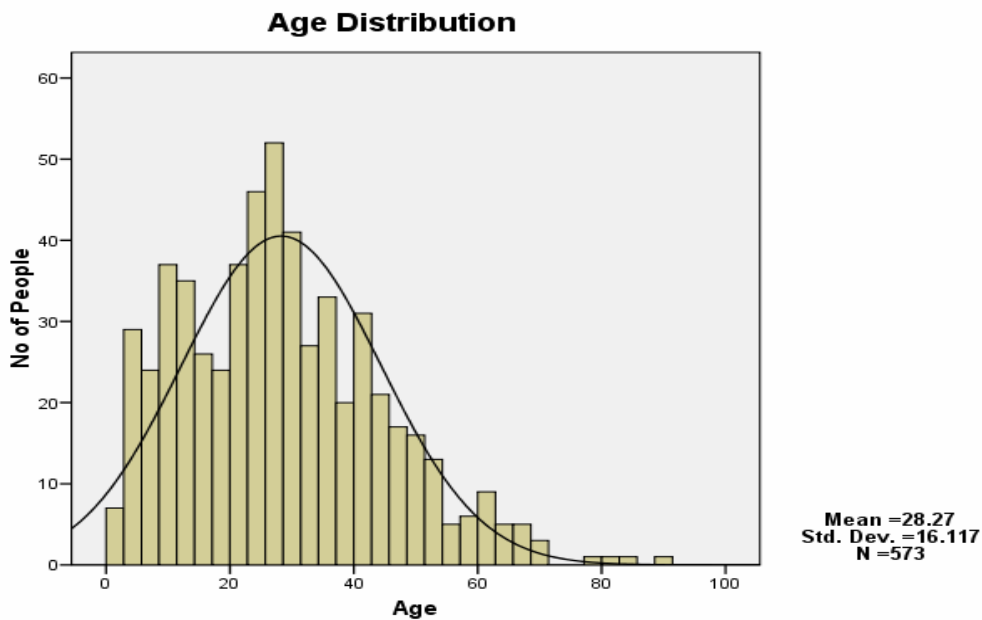
### 3.0 Survey findings

#### 3.1.1 Household characteristics

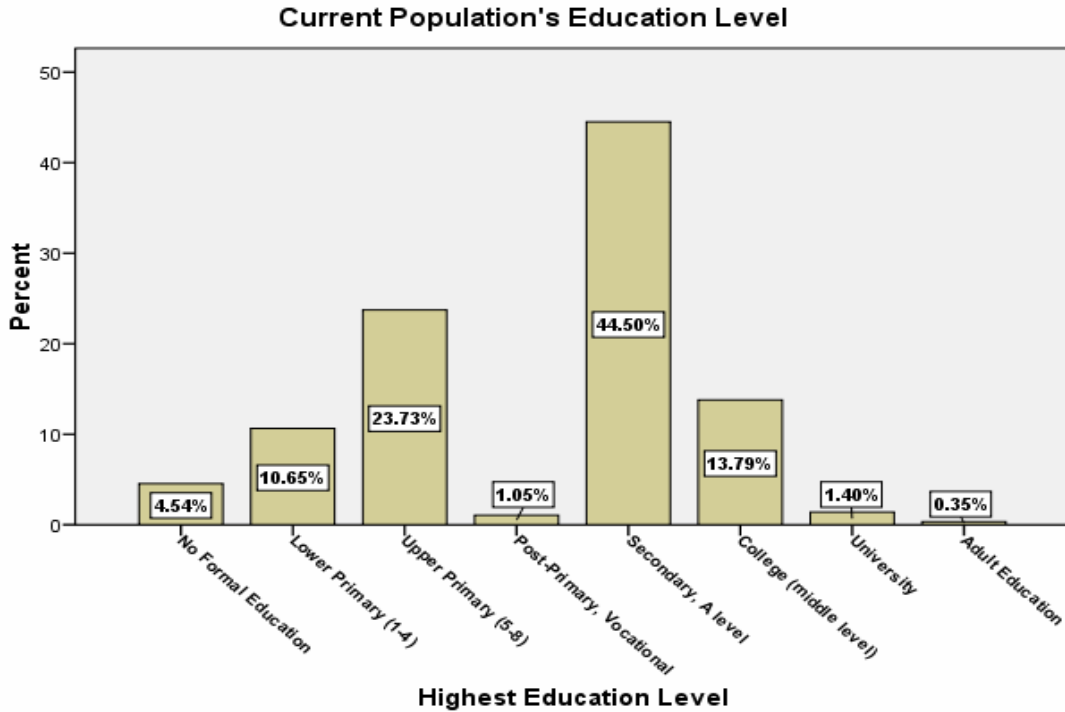
The mean household size is 4 people per household with an equal gender distribution of males and females with 49.7% and 50.3% respectively.



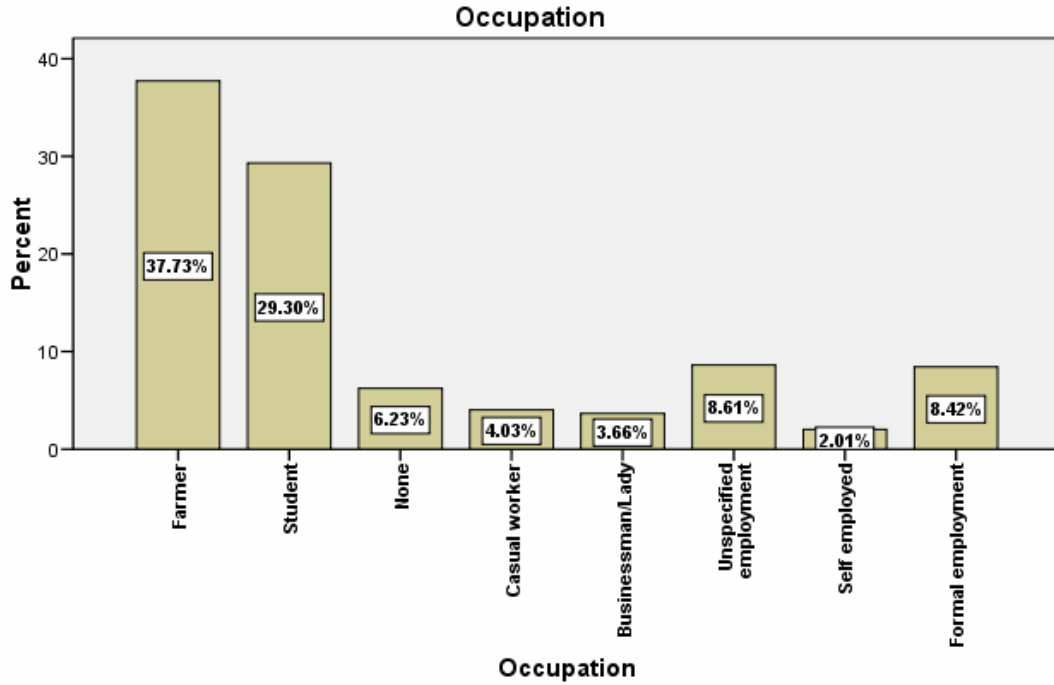
The average age of the population in the target area is 28 to 27 years with the majority being between 20 and 35 years, followed by children and teenagers between ages 5-19 years. The elderly make up a small part of the population as shown in the histogram below where the normal curve is slightly skewed to the left showing the population concentration is on the younger ages.



The current education level of the majority of the people in the community is Secondary and A-Level comprising 44.5%, followed by Upper Primary (23.7%) and College (13.5%). About 4.5% of the population have no formal education, and only 1.4% have university education.

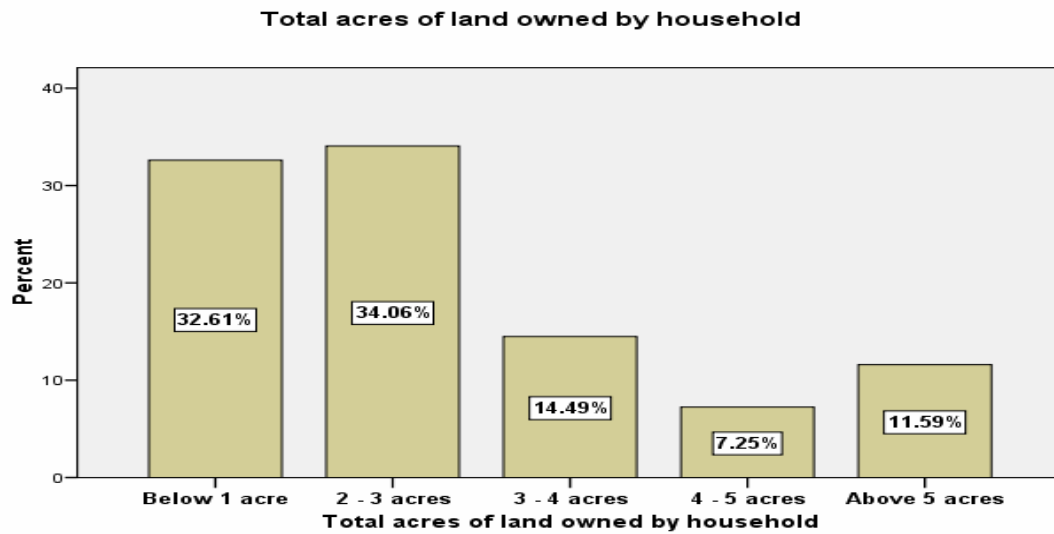


The majority of the population are farmers comprising 37.7 % of the sampled households while 29.3% are students. Other occupations include running businesses (3.7%), formal employment (8.4%) and self-employment (2.0%). Casual labour (mechanics, tea pickers, masons, tailors etc) make up 4% while 6.2% are unemployed. About 8.6% did not specify their employment status.

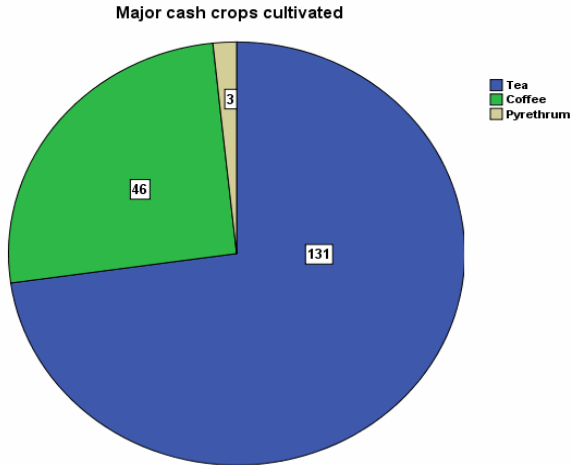


### 3.1.2 Household income/assets

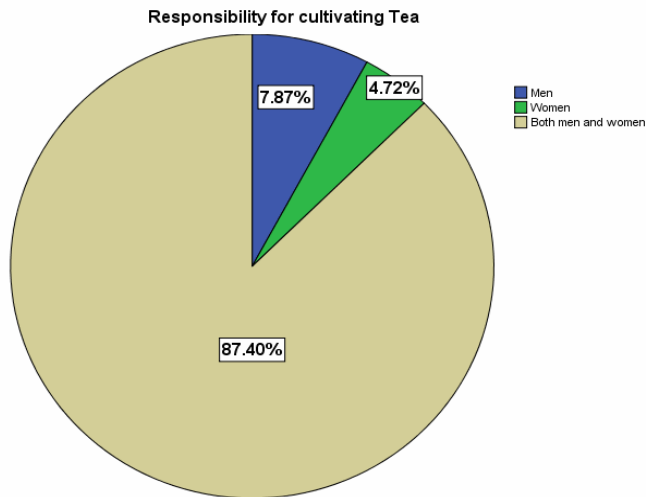
The average acreage of land owned by each household is 2.75 acres, with the maximum of 17 acres and a minimum of 0.25 acres. 32.6% of the households sampled own less than 1 acre of land; 34.1% owning between 2-3 acres; 14.5% owning 3-4 acres; 7.2% owning 4-5 acres and 11.6% owning above 5 acres.



The major cash crops cultivated by the members of the households sampled are tea, coffee and pyrethrum. Tea farming is the dominant cash crop with 131 out of the 142 households cultivating. 46 households cultivate coffee and only 3 households cultivate pyrethrum.



The average acreage of land under tea is 1.4 acres; the largest acreage under tea is 6 acres, while the minimum is 0.25 of an acre. The majority comprising 40% cultivate 1 acre. Tea cultivation is a collective responsibility for both women and men most of the times (87.4%), while in a few instances only men cultivate (7.9%) and women alone (4.7%).

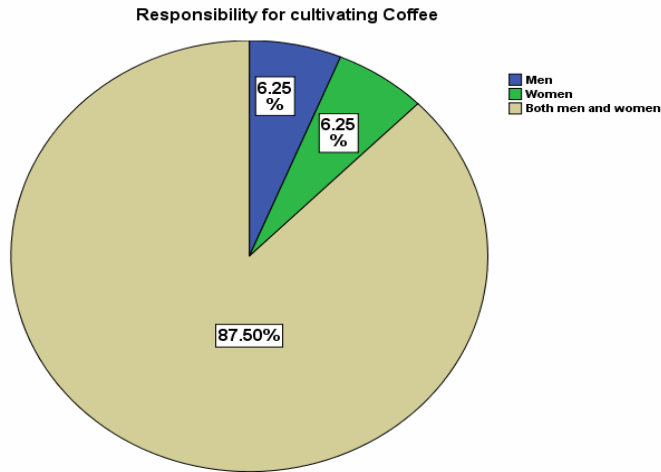


**Average acreage under major cash crops**

	N	Minimum	Maximum	Mean
Tea acreage	55	0.25	6.00	1.4091
Coffee acreage	24	0.25	2.00	0.5417

The average acreage under coffee is 0.54 acres; the largest acreage is 2 acres while the minimum is 0.25 acres. The majority of the households comprising 66.7% cultivate 0.50 acres. Coffee cultivation is also a collective

responsibility involving both women and men with 87.5% with men only cultivating (6.3%) and women alone cultivate (6.3%).



Pyrethrum cultivation in the area is negligible but done by both women and men. In a nutshell, cash crop cultivation is done by both women and men.

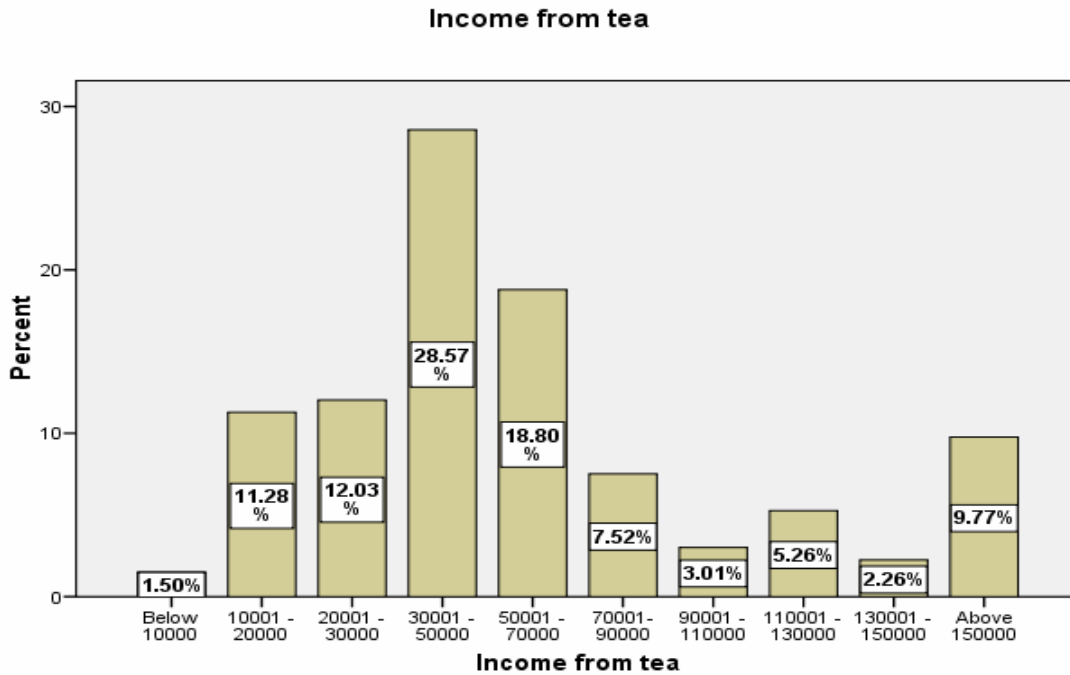
### 3.1.3 Cash crop income

Tea contributes an average of Kshs. 70,000/= per year for the sampled households and a minimum of Kshs. 5000/= per year. The highest earnings from tea are up to Kshs. 421,000/= per year.

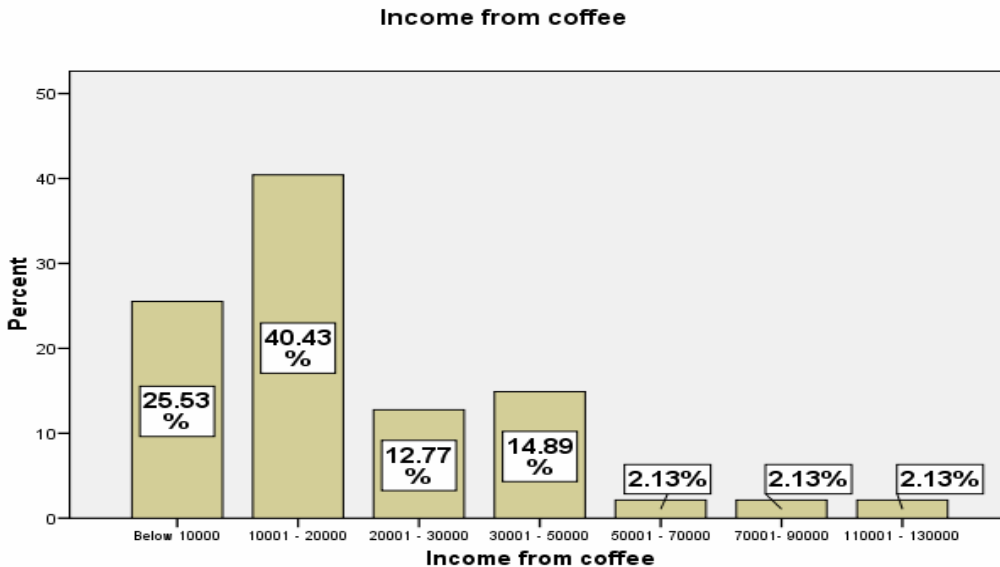
#### Average yearly income from cash crops

Cash crop	No. of HH	Minimum Kshs	Maximum Kshs	Average Kshs
Average annual household income from tea	133	5000	421000	70070.68
Average annual household income from coffee	47	1500	120000	23444.68

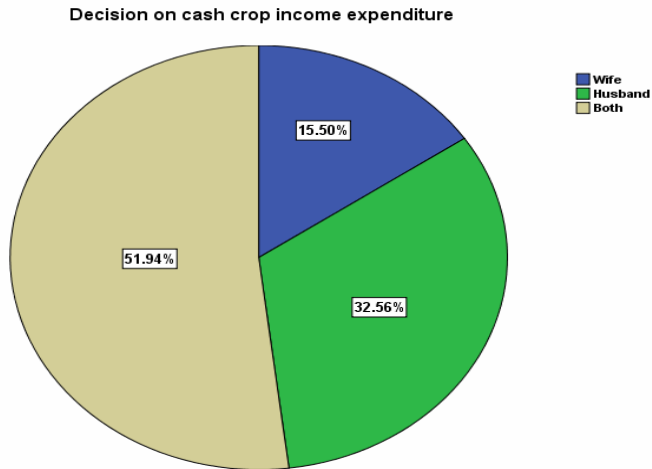
9.8% of the households sampled earn above Kshs. 150,000/= annually; 2.3% earn between Kshs. 130,000/= and Kshs. 150,000/=; 8.3% earn between Kshs. 90,000/= and Kshs. 130,000/=; 7.5% earn between Kshs. 70,000/= and Kshs. 90,000/=; 18.8% earn between Kshs. 50,000/= and Kshs. 70,000/=; 28.6% earn between Kshs. 30,000/= and Kshs. 50,000/=; and 24.8% earn below Kshs. 30,000/=.



Coffee contributes an average of Kshs. 23,500/= per year to the households sampled and a minimum of Kshs. 1500/= per year. The highest earnings from coffee are up to Kshs. 120,000/= per year. 2.1% earn above Kshs. 150,000/=; 4.3% earn between Kshs. 50,000/= and Kshs. 90,000/=; 27.7% earn between Kshs. 20,000/= and 50,000/=. The majority (40.4%) earn between Kshs. 10,000 and 20,000/= while 25.5% earn below Kshs. 10,000/=.



Decision making on how to use income from cash crops is most of the times made by both husband and wife (51.9%). In 32.6% and 15.5% the decisions are made by husband and wife respectively.



### 3.1.4 Food crops

Major food crops cultivated by the members of the households sampled are maize, beans, potatoes, cabbages, bananas, yams, carrots, tomatoes and passion fruits. Others include *sukumawiki*, French beans, onions, pumpkins, cassava, sugarcane, arrowroots, avocados, sorghum, millet and sweet potatoes.

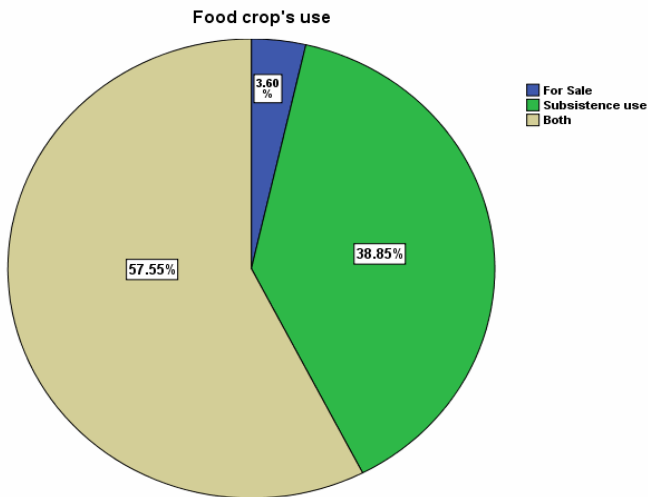
Maize is the main cash crop cultivated by the majority of the respondents (127 households out of the total 142 sampled), followed closely by beans cultivated by 91 households and potatoes (80 households, bananas and cabbages (56 households).

Both men and women are involved in the cultivation of most food crops such as maize, bananas, potatoes and cabbages, tomatoes and carrots. A larger percentage of women are however more involved in cultivation of beans, arrowroots sweet potatoes, pumpkin, millet, *sukumawiki*, onions and carrots. Men are more involved in cultivation of sugarcane and yams.

**Food crops grown**

Crop	Frequency	Total	Percent %
Maize	127	142	89.4
Bananas	56	142	39.4
Beans	91	142	64
Arrow roots	20	142	14
Passion fruits	21	142	14.8
Avocadoes	3	142	2.11
Potatoes	80	142	56
Sugarcanes	8	142	5.6
Yams	38	142	26.8
Pineapples	1	142	0.70
Cassava	8	142	5.6
Sweet potatoes	4	142	2.8
Pumpkins	2	142	1.4
Cabbages	56	142	39.4
Millet	1	142	0.70
<i>Sukumawiki</i>	10	142	7.0
Carrots	33	142	23
Onions	2	142	1.4
Tomatoes	21	142	14.8
Sorghum	3	142	2.11
French beans	4	142	2.8

In most cases, food crops are grown for both subsistence and sale (57.6%). 38% of the crops are grown purely for subsistence while those grown purely for sale are only 3.6%.



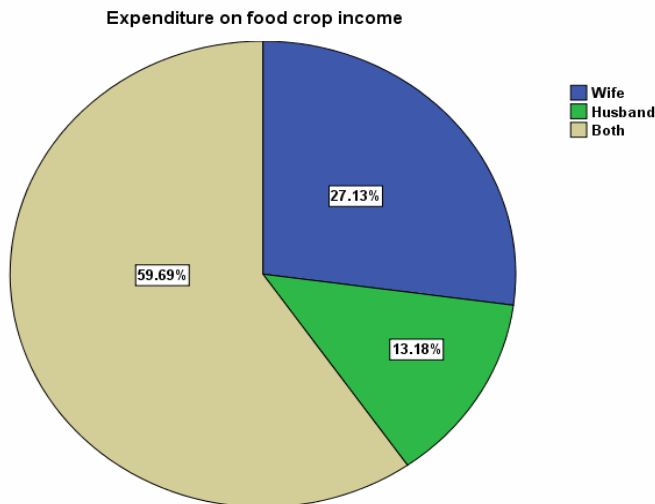
### 3.1.5 Incomes from major food crops

Average annual earnings for the 80 households who grow maize for sale or both sale and subsistence is Kshs. 15,700/=; 61 households who grow beans - Kshs. 11,600/=; 51 households growing potatoes - Kshs. 15,500/=; 46 households growing bananas - Kshs. 17,200/=; 42 households growing cabbages - Kshs. 15,000/=. More details are provided in the table below.

Average annual household income from food crops (in Ksh.)

Food crop	No of HH	Minimum (Kshs)	Maximum (Kshs)	Average (Kshs)
Maize	80	1000	80000	15730.50
Bananas	46	400	108000	17195.65
Beans	61	400	50000	11590.66
Arrowroots	11	700	25000	11700.00
Passion fruits	18	1000	60000	18111.11
Avocadoes	3	5400	30000	18466.67
Potatoes	51	800	50000	15545.10
Sugarcanes	5	3000	40000	16040.00
Yams	17	200	84000	7176.47
Pineapples	3	3000	40000	19166.67
Cassava	4	800	10000	5700.00
Sweet potatoes	1	1500	1500	1500.00
Cabbages	42	1200	50000	15040.48
Sukuma wiki	4	1500	11000	4465.00
Carrots	25	1000	20000	6696.00
Onions	1	3000	3000	3000.00
Tomatoes	17	4000	16000	8470.59
Sorghum	3	8000	30000	16000.00
French peas	4	3000	50000	32000.00

Decisions on how income from food crops is spent are mainly made by both husband and wife comprising 59.7%. Wives alone however make decisions more often than men alone (27.1% and 13.2% respectively).



**3.1.6 Livestock incomes**

The major livestock types reared are cattle, poultry, sheep and goats. Others reared at a lower scale include pigs and rabbits. 90.8% of the households sampled keep cattle. The main livestock products mentioned are milk (82.7%) manure (13.7%), and meat- (3.6%). The average number of cattle per household is 2 animals, with the highest being 14 animals and the lowest 1 animal.

Poultry rearing is practiced by 83.8% with the main products mentioned being eggs (81.7%), meat (17.4%), and manure (0.9%). The average number of poultry per household is 10 chickens with the maximum being 50 chickens and the minimum 1 chicken.

Sheep rearing is practiced by 51.4% of the households sampled with the main products being meat (92.2%), manure (3.9%), wool (2%) and milk (2%).The average number of sheep per household is 4 sheep with the highest number being 30 and the lowest 1 sheep.

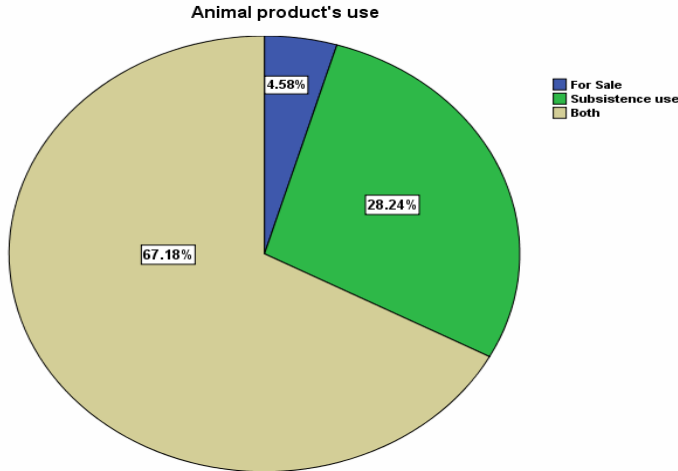
39.4% of the households are involved in goat rearing with the main products being meat (67.6%), milk (29.4%), and manure (2.9%). The average number of goats per household is 4 with the highest number being 12 goats and the lowest 1 goat.

Only 7 households rear pigs with the average being 3, the maximum 4 and minimum 1 pig. Products from pig rearing include pork.

**Average number of animals per household**

	No of HH	Minimum No.	Maximum No.	Average No.
Cattle	124	1	14	2
Sheep	69	1	30	4
Goats	53	1	12	4
Poultry	110	1	50	10
Donkeys	2	1	2	2
Rabbits	6	1	12	5
Pigs	7	1	4	3

The animal products are mainly used for both subsistence and sale (67.2%); subsistence only (28.2%), sale only (4.6%)

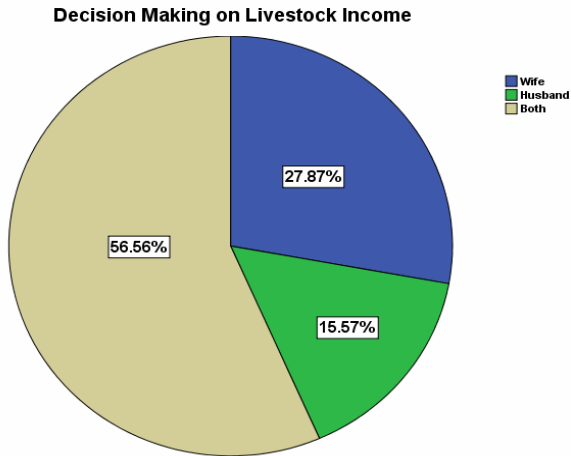


The average earnings for 104 households from cattle is Kshs. 25,500/=, the lowest being Kshs. 1000/= and the highest Kshs. 145,000/=. Average earnings for 67 households from poultry is Kshs 16,235= with a minimum of Kshs. 1000/= and a maximum of Kshs.130, 000/=. 49 households earn an average of Kshs. 12,700/= from sheep with the minimum being Kshs. 1000/= and the maximum being Kshs. 53.000/=. Average earnings for 23 households from goats is Kshs 16,200/= with a minimum of Kshs. 1000/= and a maximum of Kshs.75, 000/=

**Average Income from sale of livestock and products**

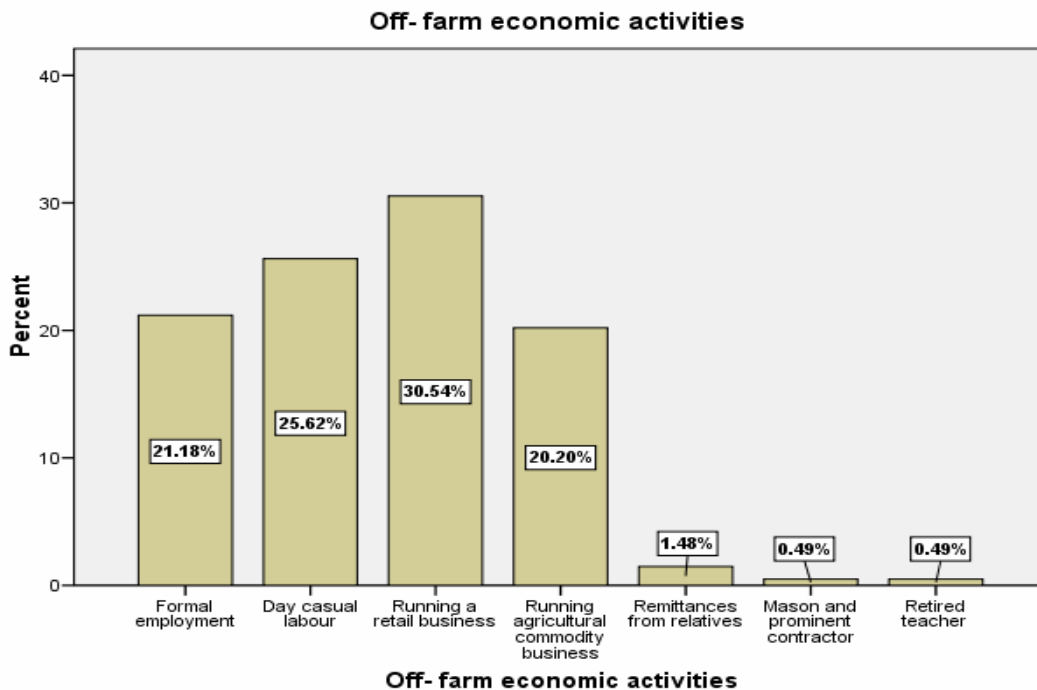
Livestock/products	No. of HHs	Minimum (Kshs)	Maximum (Kshs)	Average (Kshs)
Cattle/ products	104	1000	145000	25,526.44
Sheep/ products	49	1000	75000	12,732.65
Goats/ products	23	1000	53000	16,168.26
Poultry/ products	67	1000	130000	16,235
Donkeys	2	9000	11000	10,000.00
Rabbits	1	5000	5000	5,000.00
Pigs/ products	8	12000	45000	27,125.00
Sale of manure	2	18000	204000	111,000.00

Decisions on how income from livestock is spent are made by both husband and wife (56.6%); wife only (27.9%); husband only (15.6%).



### 3.1.7 Off-farm economic activities

In addition to farming, most of the members the households sampled engage in various other economic activities ranging from running retail businesses (30.5%); day casual labour (25,6%); formal employment (21.2%); running agricultural commodity businesses (20.2%); and remittances from relatives (1,5%). A few others include a Mason and a retired Teacher.

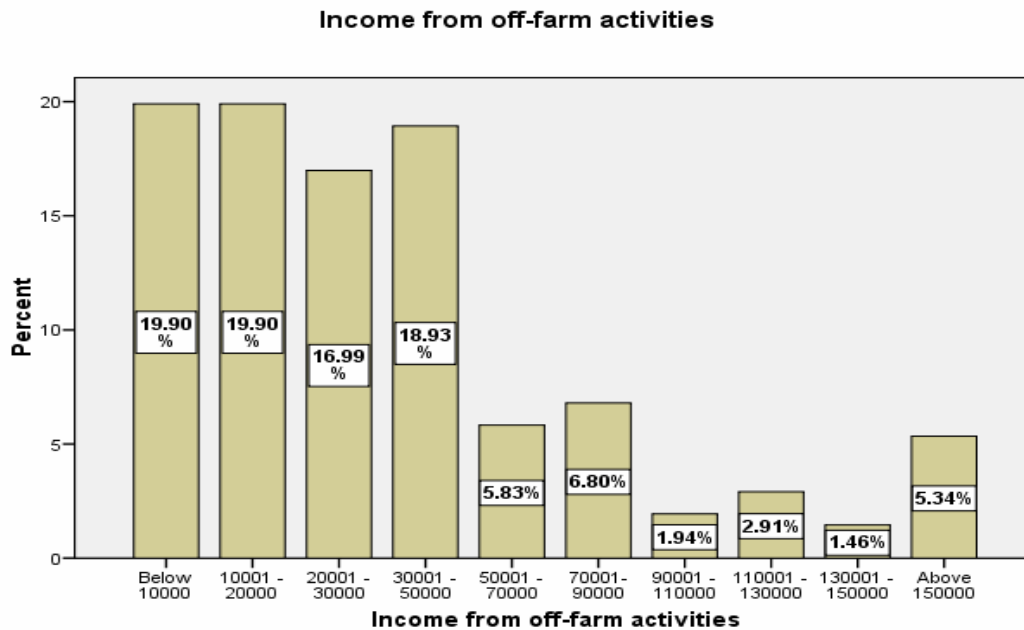


Average earnings per year are Kshs. 49,085/=, with minimum of Kshs. 2000/= and a maximum of Kshs. 600,000/=

**Average annual income from off- farm economic activities**

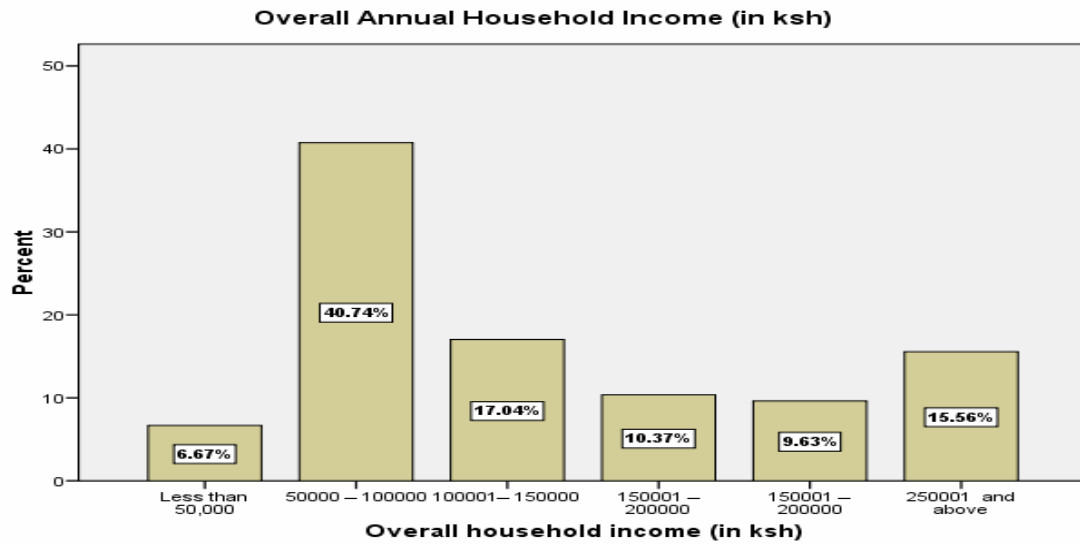
	No of HH	Minimum (Kshs)	Maximum (Kshs)	Average (Kshs)
Average annual income from off-farm economic activities	205	2000	600000	49085.85

Majority of the households interviewed earn below Kshs. 20,000/= (39.8%); between Kshs. 30,000/= and 50,000/= (34.8%); between Kshs.50, 000/= and 90,000/= (12.6%); above Kshs. 90,000/= (11.7%); More details can be seen in the graph below.



**3.1.8 Overall Household Income**

40.7% of the sampled households earn an average annual income of between Kshs. 50,000/= and Kshs. 100,000/=; followed by 17.0% earning between Kshs. 100,001/= and Kshs. 150,000/=; 15.6% earning Kshs. 250,000/= and above. More details are shown in the graph below.



### 3.1.9 Housing

The average number of houses per homestead of the sampled households is 3 houses with a minimum of 1 house and a maximum of 10 houses. The average number of rooms per household is 9 rooms with the lowest being 1 room and the highest being 20 rooms.

Average number of houses and rooms in the homestead

	N	Minimum	Maximum	Mean
No. of houses in a homestead	139	1	10	3
No. rooms in the houses	139	1	20	8

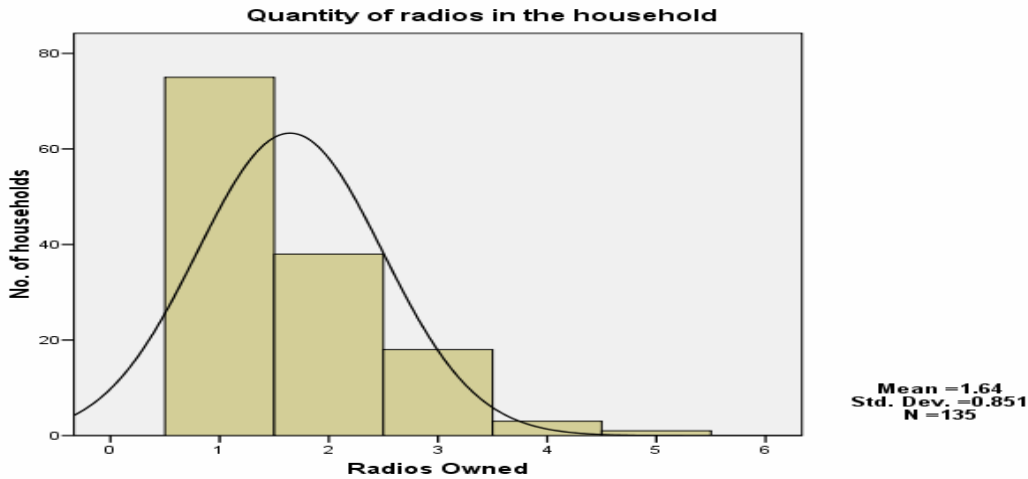
Out of the 142 households interviewed, the walls are constructed with wood (136 households), stones (97 households), iron sheets (8 households), and mud (13 households).

All the 142 households sampled have houses that are roofed with iron sheets; 31 households have houses roofed with *makuti*/grass; 2 households have houses roofed with bricks.

### 3.1.10 Ownership of electrical equipment

The most common electrical appliance owned by the sampled household members is a radio which was found in 95.1% of the households. The average number of radios per household is 2 radios, a minimum of 1 and a maximum of five. In 59.2% of the households radios were bought by men; 13.1% were bought jointly by

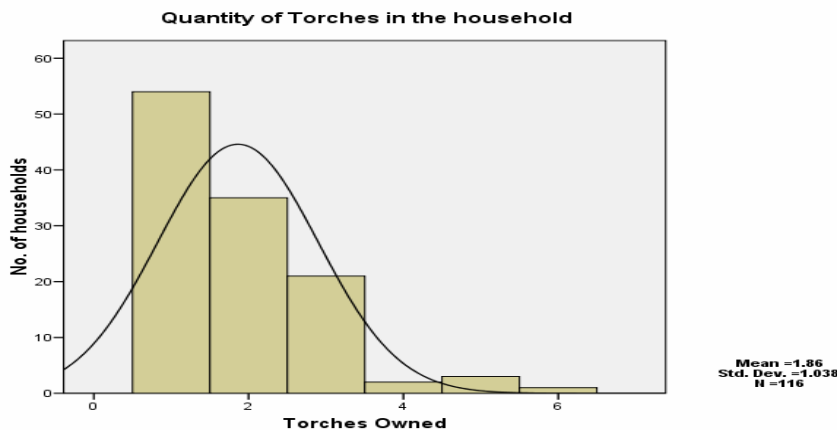
husband and wife. In 12.3% of the households, all family members were consulted in purchasing the radio, while in 8.5% of the households, men and boys made the decision to buy the radio. Only in 4.6% of the households the radio was bought by women.



The radio is mostly used by all family members comprising 74.0% in the sampled households; men only-7.6%; men and women- 7.6%; men and boys-3.1%; boys alone- 3.1%; women alone - 2.3% and women and girls – 2.3%. Girls alone do not use radios.

The radio is located in the sitting room in 50% of the households; in 23.7% of the households the radio is located in any room and 11.9% in the bedroom.

81.7% of the households own a torch with the average number being 2 torches; the minimum being 1 torch and the maximum being 6 torches.

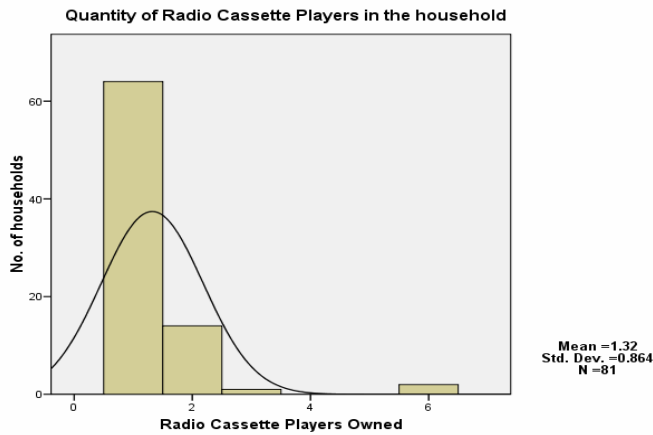


In most cases, torches are bought by men comprising 44.7%; both husband and wife – 21.9%; all family members- 13.2%; women alone- 9.6%; boys and men- 7%, women and girls – 2.6% and boys alone- 0.9%.

Torches are mostly used by all household members comprising 75.5% of the households; husbands and wives- 6.4%; boys alone- 5.5%, men alone-4.5%; women alone-4.5%; women and girls-1.8%; boys and men 0.9% and girls alone- 0.9%.

Torches are located in all rooms in 42% of the households; 28.4% - sitting room; 24.2% - bedroom; and only 2.1% in the kitchen.

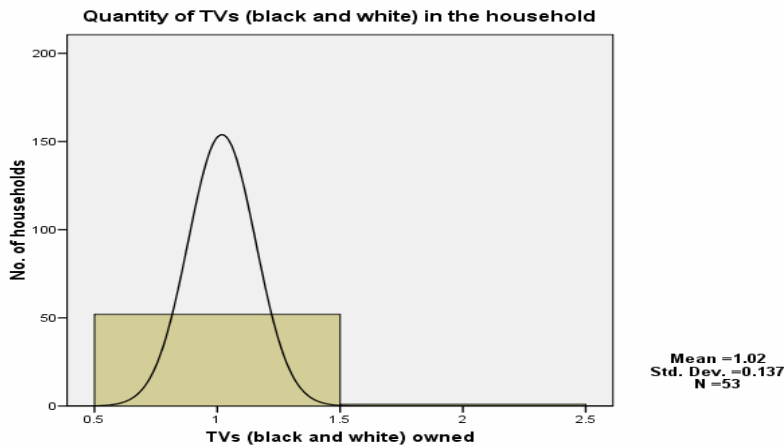
57% of the households sampled own a radio cassette player with the average number being 1 per household, the minimum -1 and maximum 6 cassette players.



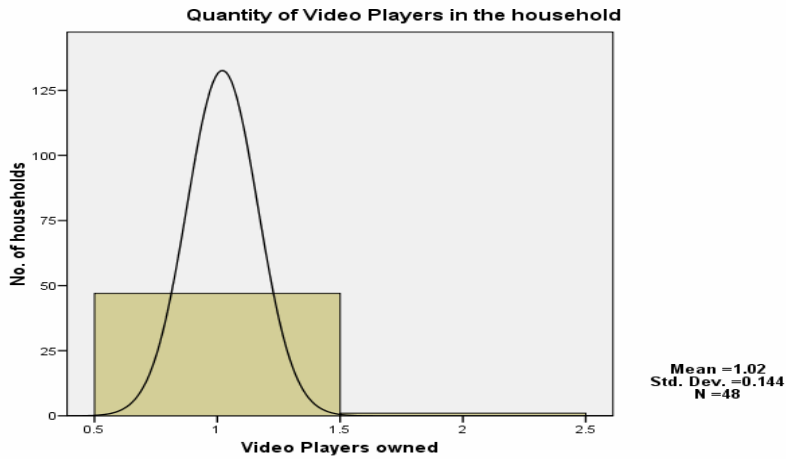
Radio cassette players are bought by men in most households comprising 63.8%; followed by both husband and wife- 12.5%; all family members- 10%; men and boys -6.3%; boys alone- 3.8% and women alone -3.8%.

In majority of the households sampled, the radio cassette is used by all family members comprising 74.4%; followed by husbands and wives- 8.5%; girls and boys- 7.3%; men and boys -4.9%; men alone -3.7%; boys alone -1.2%; women and girls alone do not use radio cassette players. The radio cassette player is mainly located in the sitting room in 67.1% of the sampled households; 11% in all rooms; and Cupboard- 11%; bedroom- 6.8%; kitchen -2.7% and corridor-1.4%.

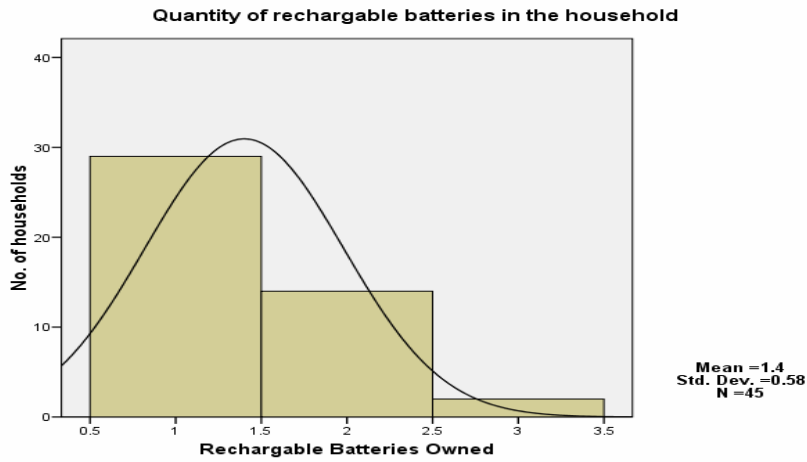
37.3% of the households own black and white television with an average of 1 TV, a minimum of 1 and a maximum of 2 TVs.



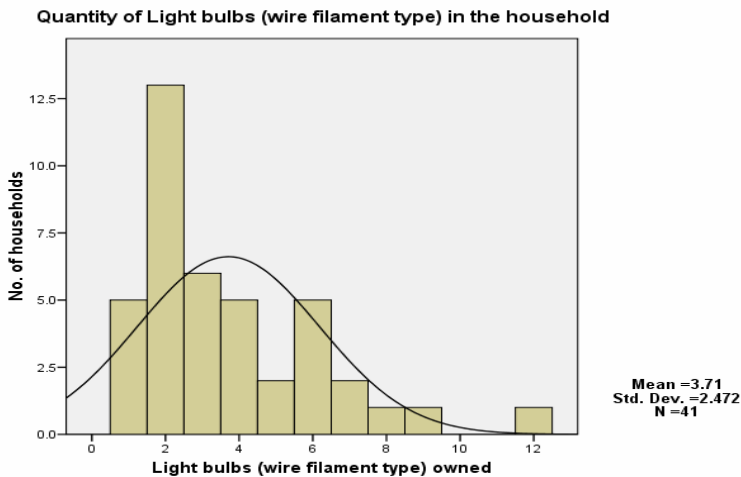
With regard to other electrical appliances (video player, rechargeable batteries, TV black and white and coloured, light bulbs, electric iron and cookers), men are mostly involved in their purchase. However women are also involved to a large extent in the purchase of kitchen appliances such as electric cooker and irons. 33.8% of households own a video player with the maximum of 2, a minimum of 1 and an average of 1.



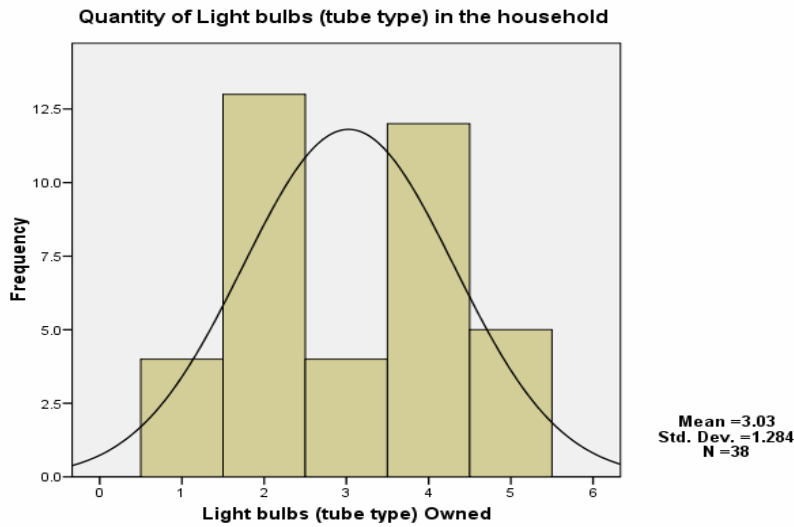
31.7% of the sampled households own rechargeable batteries with an average of 1 battery per household, a minimum of 1 and a maximum of 3.



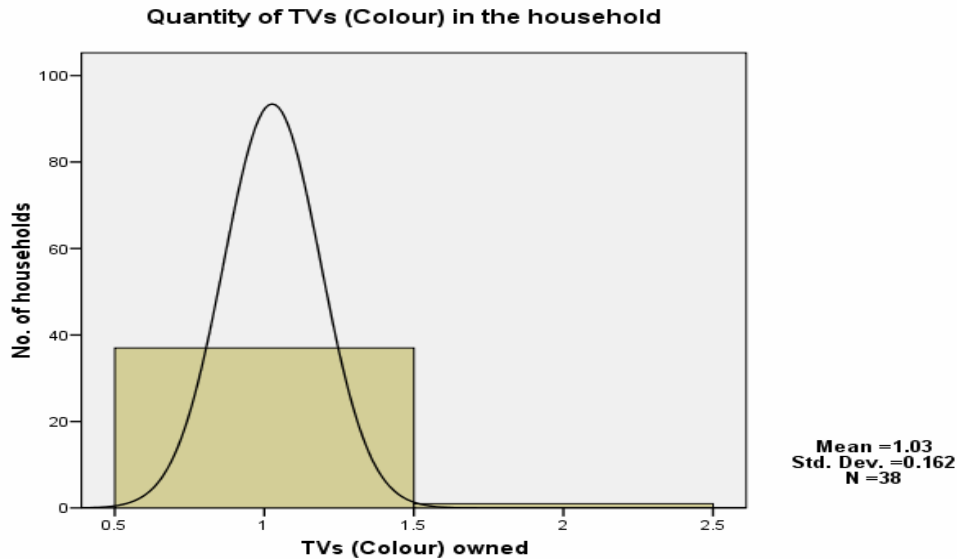
28.9% of the sampled households own light bulbs (filament type) with the average being 4, minimum of 1 and maximum of 12.



26.8% of the sampled households own light bulb tube type (fluorescent); the average being 3, minimum of 1 and maximum of 5.



26.8% of households own a colour TV, the average being 1 TV, minimum of 1 and a maximum of 2.



5.6% of the households own an electric iron with each household owning only one while 5.6% own an electric cooker /coil with an average of 1 and a minimum of 1 and a maximum of 2.

With regard to use of electrical appliances, all family members mostly have access to and use of all appliances with the exception of the electric cooker/coil which is predominantly used by women alone and women and girls. Men and boys tend to have higher access to all appliances compared to women and girls while girls alone seem not to be involved in purchase of appliances or use of all appliances with the exception of the electric cooker.

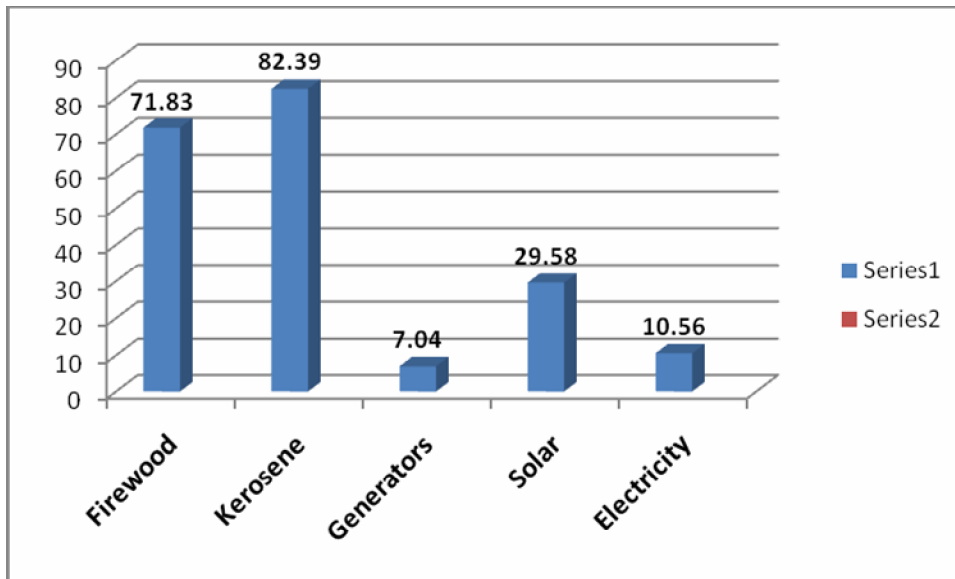
With regard to location of appliances, most are located in the sitting room in most households with the exception of the light bulbs and the torches which are located in all the rooms.

**3.1.11 Energy and energy services**

The main sources of energy used for lighting in the sampled households are kerosene which is used by 117 households comprising (82.4%); firewood -102 households (71.8%); solar 42 households-(29.6%); generators – 10 households (7.0%); electricity 15 households (10.6%).

**Main sources of energy for lighting**

Energy type	No. of HHs	Total HHs	Percent (%)
Firewood	102	142	71.83
Kerosene	117	142	82.39
Generators	10	142	7.04
Solar	42	142	29.58
Electricity	15	142	10.56



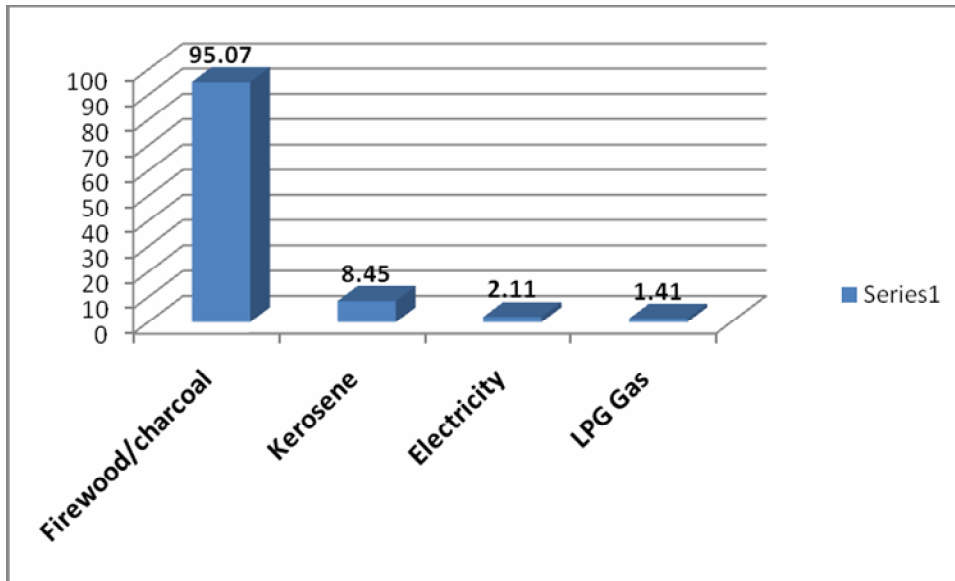
Decisions on the type of energy to use for lighting are mainly made by both husband and wife (46.0%); husband alone (33.3%); wife alone (20.6%).

The lighting is mainly located in the sitting room, bedroom and kitchen with 92.3%, 88% and 85.2% of households respectively. Others locations include outside security lights, corridor, and bathroom with negligible mention.

The main source of energy for cooking is fuelwood comprising 95.1% of the households; kerosene -8.5%; electricity – 2.1% and LPG -1.4%;

**Main source of energy for cooking**

Energy type	No. of HHs	Total HHs	Percent (%)
Firewood/charcoal	135	142	95.07
Kerosene	12	142	8.45
Electricity	3	142	2.11
LPG Gas	2	142	1.41

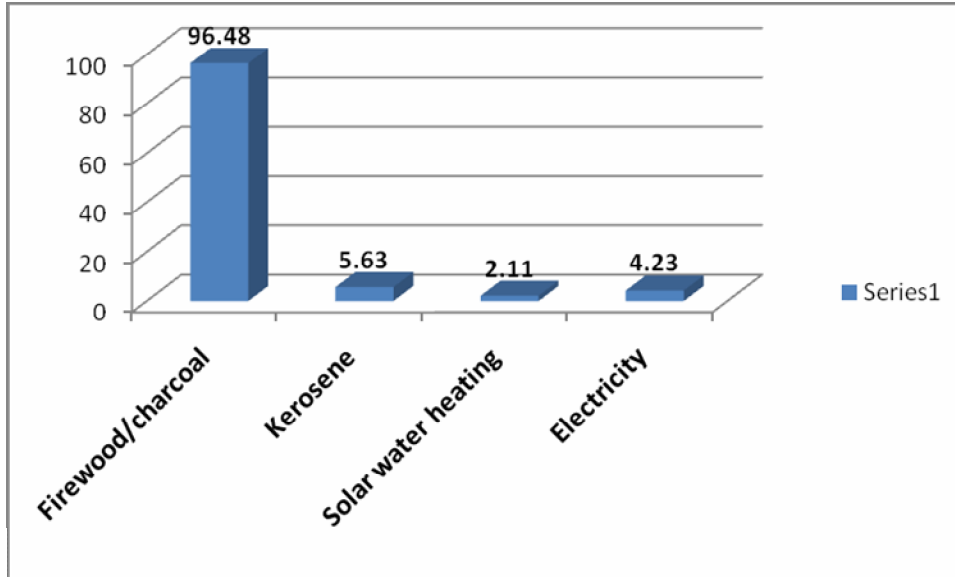


Decisions on appliances used for cooking are mainly made by wives (44.7%); husbands (29.5%); both husband and wife (25.8%).

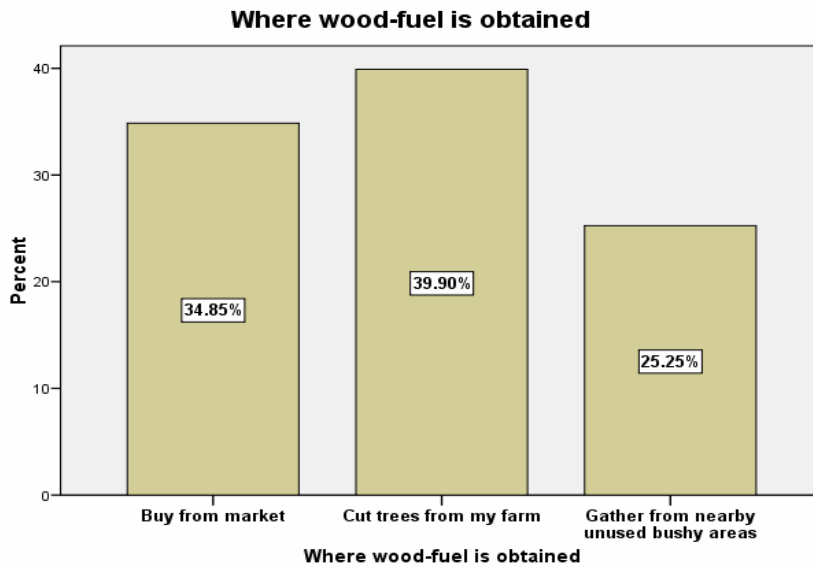
The main source of energy for space warming and water heating is firewood (96.5%); kerosene (5.6%). 2.1% of respondents use solar thermal for heating water; 4.2% use electricity.

**Main sources of energy for warming**

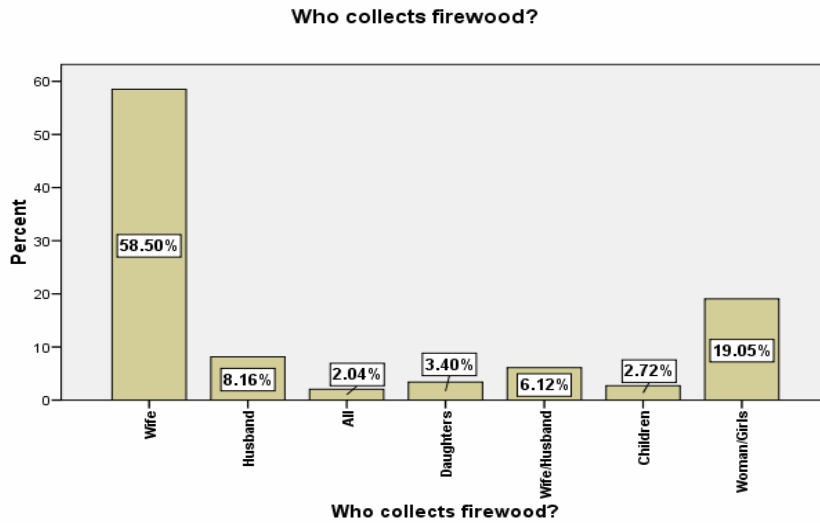
	Frequency	Total HHs	Percent (%)
Firewood/charcoal	137	142	96.48
Kerosene	8	142	5.63
Solar water heating	3	142	2.11
Electricity	6	142	4.23



Majority of respondents obtain wood fuel from trees in their own farms (39.9%); buying from the market (34.8%); gathering from nearby unused bushes (25.3%).



Women are mainly involved in collecting firewood (58.8%); followed by women and girls (19.0%); men (8.2%); both wife and husband (6.1%); girls (3.4%); children (2.7%); all family members (2%).



The average time spent collecting firewood is 1.5 hrs with a minimum of 0.25hrs and a maximum of 3hrs.

**Average time spent collecting firewood**

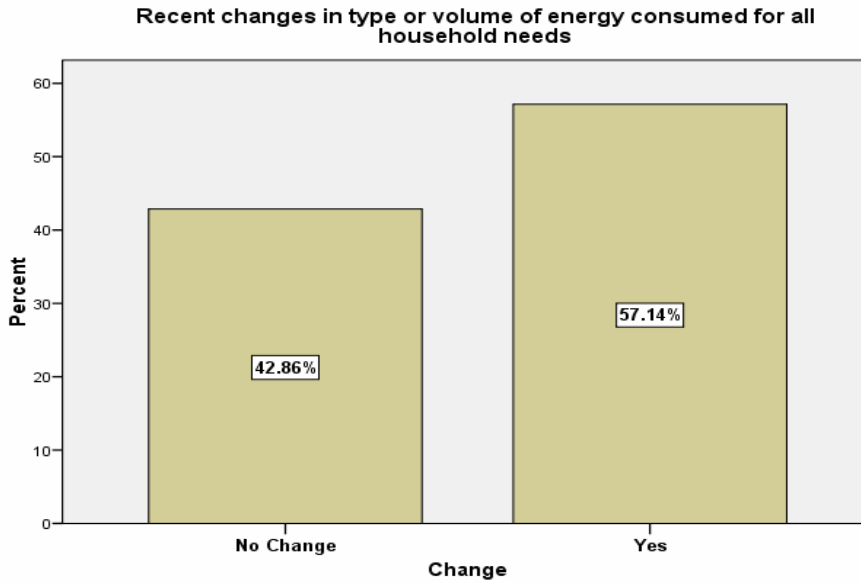
Time	No. of HH	Minimum (hrs)	Maximum (hrs)	Average (hrs)
Time spent collecting firewood	129	0.25	3.00	1.50

For respondents who do not have access to electricity, the approximate average distance from the nearest electricity line is 1.8km, with a minimum of 0.01km and a maximum of 8km. 74.4% of the respondents are less than 2km from the electricity line.

**Approximately average distance from the nearest electricity line in kilometres**

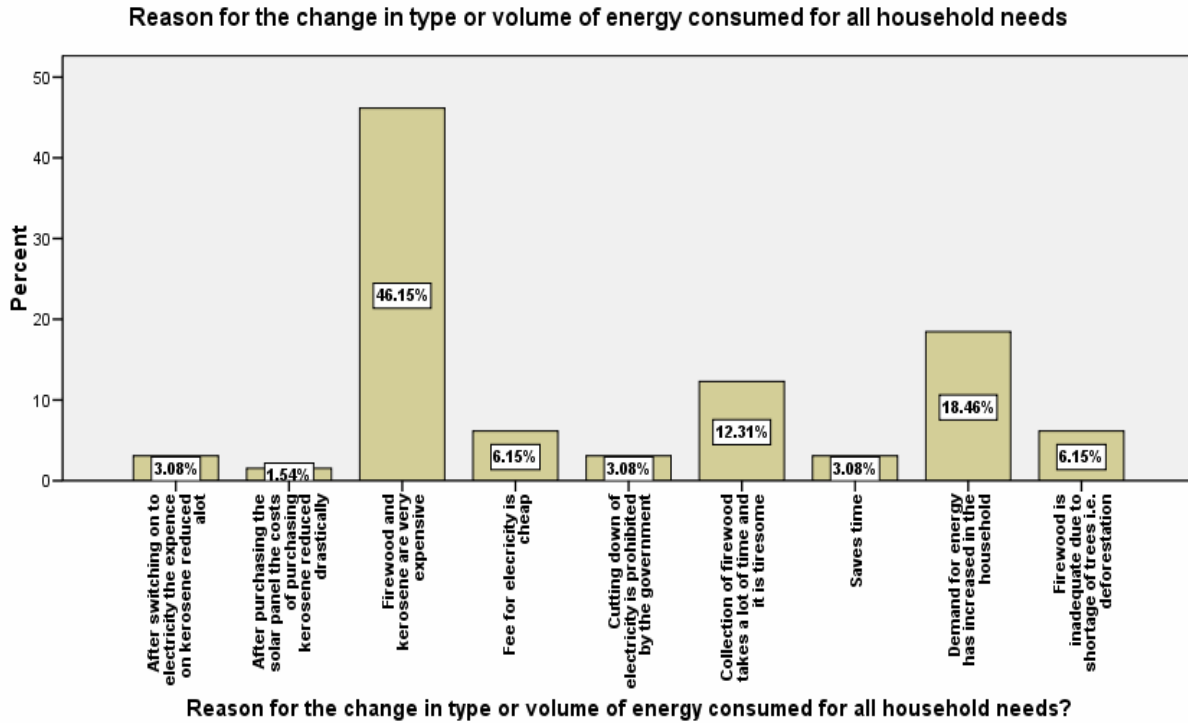
Distance	N0.of HH	Minimum (Km)	Maximum (Km)	Average (Km)
Approximately distance from the nearest electricity line	117	0.01	8.00	1.8

Majority of households (57.1%) have noticed change in the type and volume of energy they consume in relation to their family needs, while 42.9% have not noticed any change.

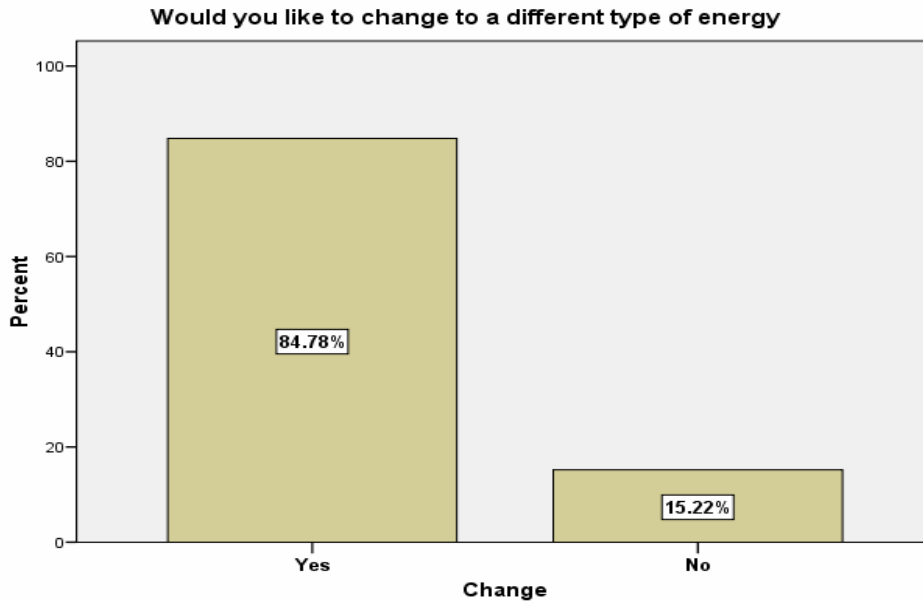


Reasons given for the change include:

- Firewood and kerosene are very expensive (46.2%)
- Demand for energy has increased in the household (18.5%)
- Collection of firewood takes a lot of time and is tiresome (12.3%)
- Firewood is inadequate due to shortage of trees (6.2%)
- Fee for electricity is cheap (6.2%)
- Cutting down of trees is prohibited by the government (3.1%)
- Expenses in kerosene reduced after switching to electricity (3.1%)
- Cost of purchasing kerosene reduced drastically after purchasing a Solar Home System (1.5%)



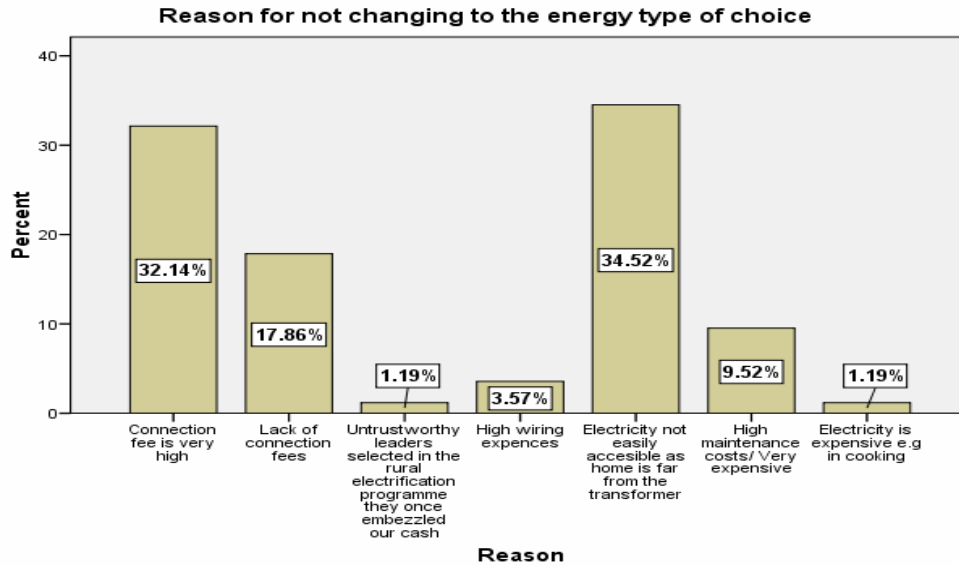
84.8% of the respondents said they would like to change to a different form of energy while 15.2% said they are satisfied with the kind of energy they are using comprising those already using electricity and some with Solar Home Systems.



Reasons given for not changing to energy type of choice are:

- Electricity connection fee is too high (32.14%)
- Lack of electricity connection fees (17.9%)
- Electricity is not accessible/ home is far from the transformers (34.52%)

- Untrustworthy leaders selected in rural electrification programme- once embezzled cash (1.2%)
- High maintenance cost/very expensive (9.52%)
- High wiring expenses (3.57%)
- Electricity is expensive especially in cooking (1.2%)



### 3.1.12 Monthly energy expenditure

The average monthly expenditure on electricity for those using is Kshs. 319/= with the minimum being Kshs. 100/= and the maximum Kshs. 600/=. The majority of households spend between Kshs. 200/= and Kshs 350/=.

The average monthly expenditure on rechargeable batteries for the households using is Kshs. 134/= with a minimum of Kshs. 35/= and a maximum of Kshs. 500/=. The majority of households spend between Kshs. 100/= and Kshs 250/=.

Expenditure on firewood for households using is Kshs. 1550/= with the minimum being Kshs. 50/= and the maximum being Kshs. 5000/=. Majority of households spend between Kshs. 500/= and Kshs. 1500/= on firewood.

Average monthly expenditure on kerosene is Kshs. 438/= with a minimum of Kshs. 40/= and a maximum of Kshs. 1200/=. Majority of households spend between Kshs. 150/= and Kshs. 600/=.

**Household expenditure on energy**

Energy type	No. of HHs	Minimum (Kshs)	Maximum (Kshs)	Average (Kshs)
Electricity	15	100	600	319.33
Battery Charging	60	35	500	134.08
Firewood	103	50	5000	1551.36
Kerosene	121	40	1200	437.98
Dry cells	91	40	1500	214.34
Gas	8	100	1000	537.50
Charcoal	59	80	2000	385.25
Candle	11	30	300	122.27
Solar PV	4	40	4500	1660.00
Generators	1	4000	4000	4000.00

Expenditure on dry cells on the average is Kshs. 214/= with a minimum of Kshs. 40/= and a maximum of Kshs. 1500/=. Majority spend between Kshs. 50/= and Kshs. 250/=.

Average monthly expenditure on LPG is Kshs. 538/= with a minimum of Kshs. 100/= and a maximum of Kshs. 1000/=. Majority of households spend between Kshs. 600/= and Kshs. 1000/=. Average monthly expenditure on charcoal is Kshs. 357/= with a minimum of Kshs. 80/= and a maximum of Kshs. 700/=. Majority of households spend between Kshs. 50/= and Kshs. 250/=.

Average monthly expenditure on candles is Kshs. 122/= with a minimum of Kshs. 30/= and a maximum of Kshs. 300/=. Majority of households spend Kshs. 50/=. Only 3 people have expenditure on solar spending Kshs. 4500/=. Kshs. 1500/= and Kshs. 600/=. Expenditure on a generator had only one mention with an amount of Kshs. 4000/=.

The average number of rechargeable batteries bought by 76 households in the last five years is 2, with a minimum of 1 and a maximum of 8 batteries. The cost range was mainly between Kshs. 4001 to Kshs. 5000/= comprising 46.8%; Kshs. 3001 to Kshs. 4000/= (20.8%); Kshs. 2001 to Kshs.3000/= (15.6%); Kshs. 5000 and above (14.3%) and only 2.6% costing Kshs. 2000/= and below.

Most of the batteries were purchased new (62.8%) with the second hand ones (16.7%), those who mixed old and new (20.5%). The average distance to the nearest battery charging facility is 3.5 km, with a minimum of 1 and a maximum of 10km.

**3.1.13 Social and other amenities**

The average distance travelled to the nearest market place is 2.5Km, the minimum being 0.5Km and the maximum 5Km. Majority of households travel between 1-3Km to the nearest market place.

Average distance travelled to the nearest hospital is 10Km with the minimum of 1Km and a maximum of 60Km. Majority of households travel between 1- 15Km to the nearest hospital. Average distance to the Maternity facility is 13Km, minimum of 0.5Km and a maximum of 30Km. Majority of households travel 10Km to the nearest Maternity facility.

The average distance to the nearest Shopping Centre is 2.5Km, with a minimum of 0.5Km and a maximum of 8Km. Majority of households travel between 1-3Km to the nearest market.

The average distance to the nearest Health Centre/Dispensary is 2.6Km with a minimum of 0.5Km and a maximum of 12Km. Majority of households travel between 1-3Km to the nearest Health Centre/ Dispensary. The average distance to the nearest water point is 1 Km with a minimum of 0.003Km a maximum of 7Km.

Average distance to the grain mill is 2.7Km with the minimum of 0.3Km and a maximum of 10Km. The majority of households travel between 1 and 3Km to the nearest grain mill.

The average distance to the nearest Primary School is 2.1Km with a minimum of 0.2Km and a maximum of 17Km. Majority of households travel between 0.5Km and 2Km to the nearest Primary School. The average distance to the nearest Secondary School is 3.7Km, with the minimum being 0.5Km and the maximum of 25Km. Majority of households travel from 1-4Km to the nearest Secondary School.

The average distance to the nearest church is 1.7Km with the minimum 0.05Km and a maximum of 7Km. Majority of households travel between 0.5 - 2Km to the nearest Church.

**Average distance in kilometres from the nearest social amenity**

Social Amenity	No. of HH	Minimum (km)	Maximum (km)	Average (km)
Market place	100	0.50	5.00	2.5
Hospital	131	1.00	60.0	10.9
Maternity facility	124	0.50	30.0	12.9
Shopping centre	97	0.50	8.00	2.5
Health centre/ dispensary	97	0.50	12.0	2.6
Water point	83	0.003	7.00	1.07
Grain mill	95	0.30	10.0	2.7
Primary school	95	0.20	30.0	2.1
Secondary school	102	0.50	25.0	3.7
Church	81	0.05	7.00	1.7

Majority of households have access to piped water comprising 60.1%; rivers (23.5%), rain water (15.8%), boreholes/wells (0.5%). During the dry season 54.8% of households still rely on piped water, 35.6% rivers, 4.8% rain water, boreholes/wells (3.2%) and dams (1.1%). Only 5 respondents pay for water with an average monthly expenditure of Kshs. 340/=, a minimum of Kshs. 200/= and a maximum of Kshs.500/=.

**Average water bill per month**

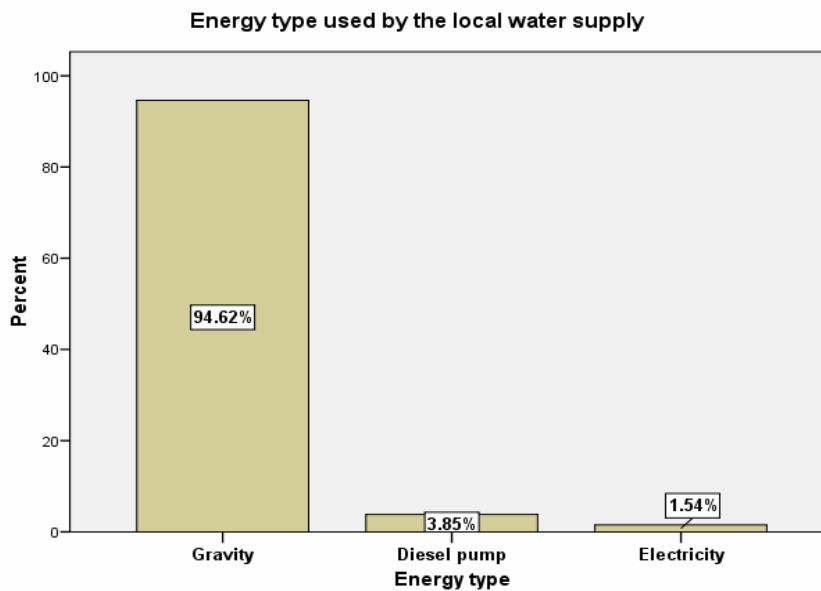
	N	Minimum (Kshs)	Maximum (Kshs)	Average (Kshs)
Average payment for water in a month	5	200	500	340

Responsibility for fetching water during the wet season falls on the women (31.3%) and girls (28.2%), boys (26.6%) and father (12.7%) and water vendors (1.3%). During the dry season, girls fetch water most of the times (29.5%), followed by women (28.5%), boys (28.1%), men (13.2%) and Water vendors (0.7%).

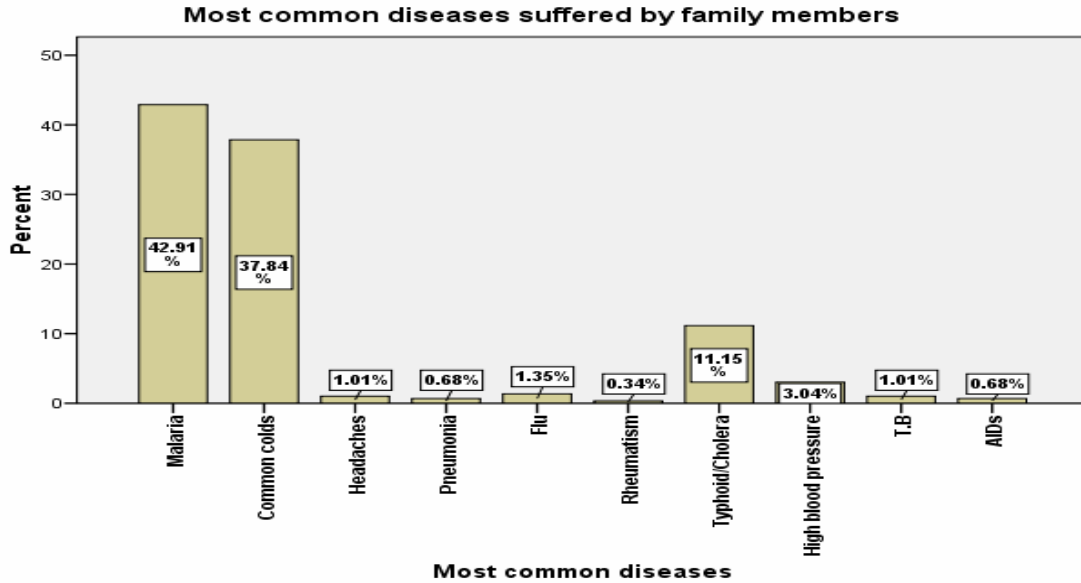
**Water fetching duties during the wet and dry season**

Responsible	Wet season		Dry season	
	Frequency	Percent	Frequency	Percent
Father	40	12.7	40	13.2
Mother	99	31.3	86	28.5
Boys	84	26.6	85	28.1
Girls	89	28.2	89	29.5
Water vendors	4	1.3	2	.7

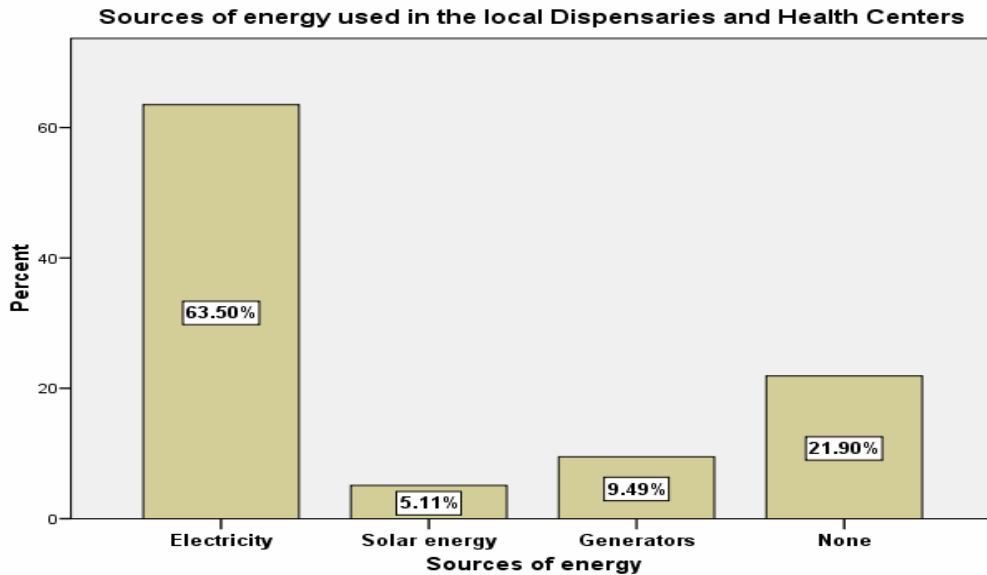
Water supply mainly runs by gravity (94.6%). Diesel pump (3.8%) and electricity (1.5%)



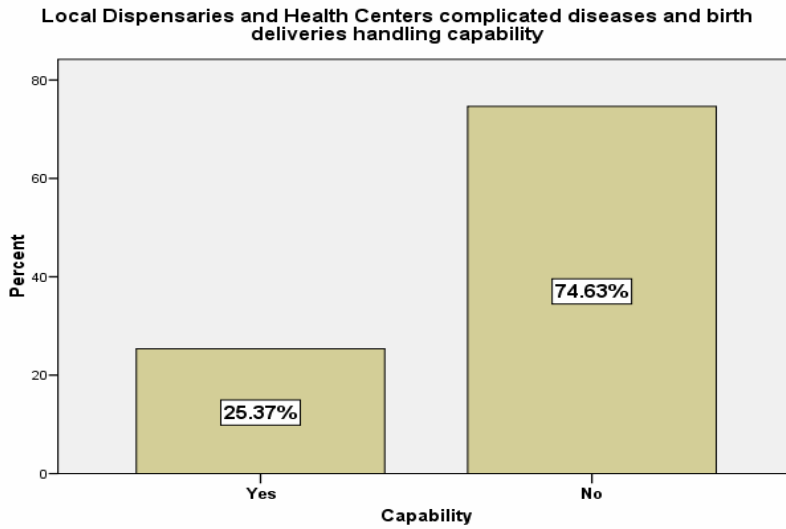
The most common diseases suffered by family members are malaria (42.9%), common cold (37.8%), Typhoid and Cholera (11.1%). Others with negligible mentions include headaches, pneumonia, flu, high blood pressure, TB, HIV AIDs and Rheumatism.



Sources of energy used in local Dispensaries and Health Centres include electricity (63.5%), while 21.9% of the Dispensaries and health Centres don't use any energy, 9.5% use generators and 5.1% use solar energy.



According to 72.8% of respondents, the local Dispensaries and health Centres are not well equipped to handle cases of complicated conditions and maternal deliveries. 26.1% of respondents said that the local Dispensaries and Health centres can handle complicated conditions and deliveries;



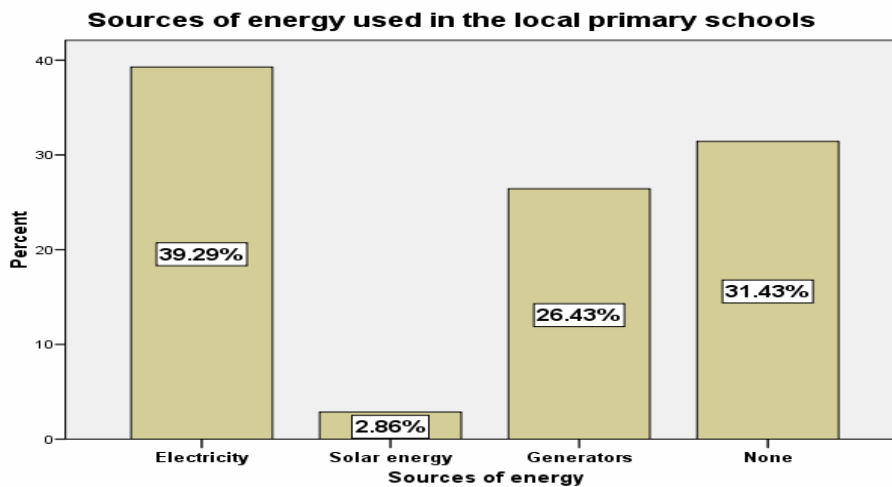
Reasons given to support inability of Dispensaries and Health Centres to handle complicated cases include:

- Not well equipped- lack of proper structures, equipment and facilities
- Lack of trained personnel to handle the cases
- Shortage of staff
- Poor transport

Reasons given to support ability of the facilities to handle complicated cases include:

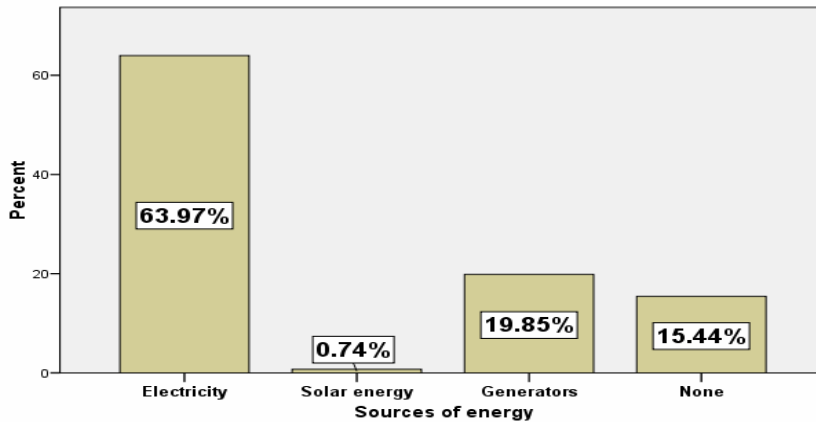
- They use electrical equipment for testing diseases
- Experienced Doctors and Nurses available in case of complicated cases
- No new diseases reported in the area

Sources of energy used by Local primary Schools include electricity (39.3%), solar energy (2.9%), generators (26.4%), with 31.4% of Primary Schools not using any energy type.



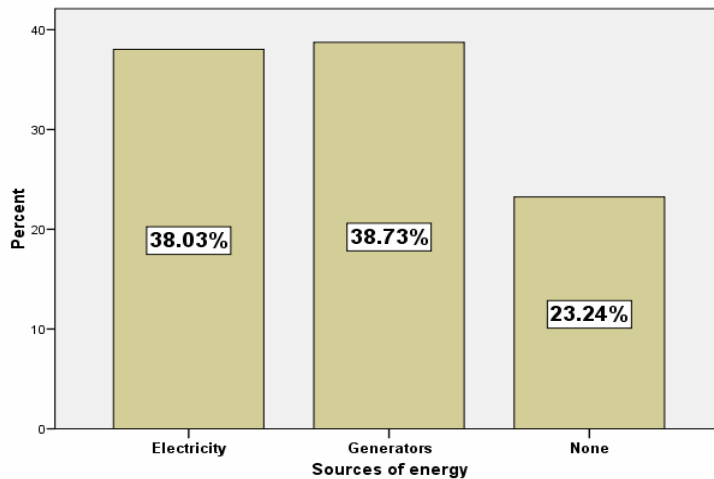
Local Secondary Schools mainly use electricity (64.0%); solar energy (0.7%); generators (19.9%); with 15.4% of Secondary Schools not using any energy type.

**Sources of energy used in the local Secondary Schools**



Sources of energy used by local churches include electricity (38.0%); generators (38.7%); with 23.2% of Churches do not use any energy type.

**Sources of energy used in the local Churches**



**3.1.14. Businesses operated at market centres**

The main businesses mentioned by respondents include butcheries (10.0 %) barber shops (9.5 %), hotels (11.9%), hair salons(10.8 %) , general shops (7.8 %), tailoring (6.4%), shoe making (5.0%), clubs/bars/pubs (5.7%), kiosks and canteens (4.4%), groceries (2.8%), banks (2.6%), carpentry (2.2%), computer services (3.1%), welding and panel beating (2.5%), electronics repair (1.9%), bakeries (1.8%), Mpesa (1.5%), grain selling (1.6%), grain milling (1%), computer colleges (0.9%). Others include open air markets for clothes, miraa dens, vehicle repair, maize roasting, video showing, masonry, driving school, hawking, photo studio, pool tables, garages, health clinics and chemists, hardware and driving schools.

**Female operated businesses/activities**

Majority of respondents (19.5%) mentioned salons as the main businesses run by women followed by hotels (16.5%), tailoring (13.8%) groceries (10.2%), and general shops (10.2%) Kiosks/ canteens (6.7%) of respondents, selling maize and beans (5.7%), open air market for clothes (5.1%), computer services (3.3%), clubs/pubs/bars (3.0%), Mpesa services (1.4%), grain milling (0.8%) .Others include health clinics and chemists, shoe making, cutlery selling.

### **Male operated Businesses/activities**

Majority of respondents (17.4%) mentioned butcheries as the main businesses run by men followed by hotels (13.4%), barber shops (11.8%), shoe repair (9.7%), clubs/bars/ pubs (6.5%), carpentry (5.3%), radio/TV repair (3.2%), pool tables (3.6%), welding and panel beating (3.8%), kiosks/canteens (3.1%), general shops (1.7%), Mpesa (1.3%), garages (2.1%), miraa sale (1.5%), grain milling (1.0%), computer services/typing(1.9%), health clinics and chemists(1.5%)

Others include open air market for second hand clothes, groceries, driving cars, video showing, electrical repair, selling tea baskets, selling food crops, mechanics and bakery.

### **3.1.15 Value of electricity to improvement of livelihoods**

The major ways that the respondent's think access to electricity will improve on the livelihoods of the people in their community include:

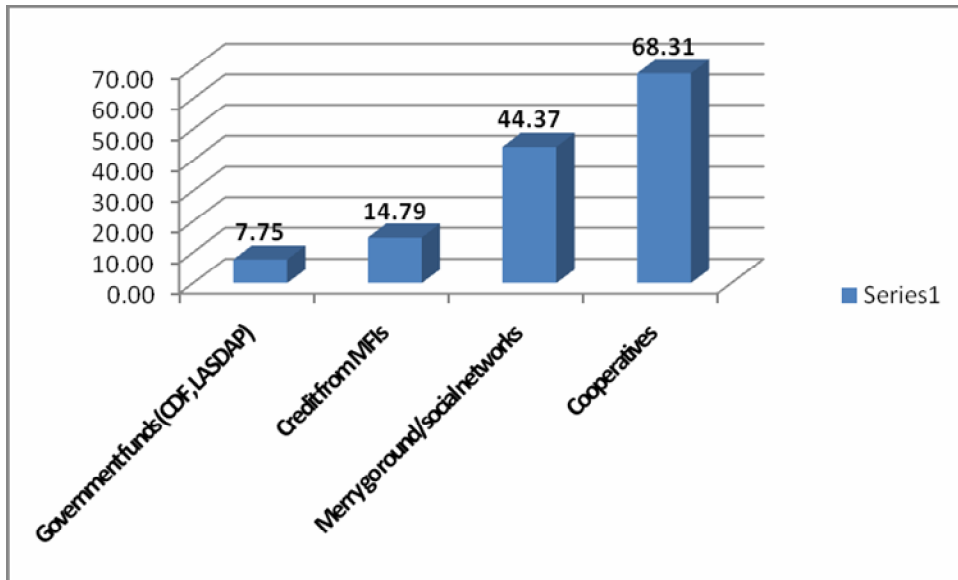
- Creating employment opportunities (19.7%)
- Improving on livestock (12.2%)
- Making work easier since most will be done by machines (9.8%)
- Hospital and dispensary improvement (6.8%)
- Reduces cost, time and energy spent on such services (6.4%)
- Markets improvement (6.1%)
- Increasing business opportunities (5.1%)
- Improving peoples overall economic base (5.1%)
- Improving lighting in homes (4.7%)
- Making people more enlightened e.g. by buying TV and Computers (4.4%)
- Improving security in homes and market centres (3.4%)
- Factory improvement (3.1%)
- School improvement (2.7%)
- Emergence of electrical services (2.7%)
- Improvement of agriculture (2.0%)
- Increasing working hours since people can work day and nights (1.4%)
- Environmental conservation/sanitation (1%)
- Improving *jua kali* sector (1%)

Others include reduction of stress due to listening to music

Reducing crime rate by opening business opportunities for the youth

### **3.1.16 Access to financial facilities**

68.3% of respondents said they have access to cooperatives as a financial facility while another 44.4% said they have access to merry go rounds and social networks; 14.8% have access to credit from MFIs; and only 7.8% have are aware of government funds such as CDF, and LASDAP.



#### **4.0 Conclusions and recommendations**

Only 15 households out of the 142 sampled use electricity for lighting, while only 3 households use electricity for cooking. One of the main reasons why most households are not connected to electricity although they would like to is because electricity is not accessible as their homes are far from the transformers. The approximate average distance from the nearest electricity line for households with no electricity is 1.8 km. 60.8% of the respondents are more than a kilometre away from the nearest electricity line which excludes them from benefiting from the rural electrification programme. This also implies that many households would be ready to get connected to electricity once the project is underway. The project will be of great benefit to the community in addressing their energy needs and improving their livelihoods.

Majority of respondents said that they would like to change to electricity but are not able to because of the initial high cost involved for connection and wiring, as well as distance from the transformers. Efforts should be made to come up with innovative financing mechanisms to address these barriers among others, during the implementation of the electrification project.

Majority of community members have a regular source of income from cash crops, food crops and other non farm activities and would therefore be able to pay for electricity if connected. Regarding household expenditure on energy for lighting, households using kerosene and firewood spend more than those using electricity and rechargeable batteries. This implies that access to electricity by most households would result in a reduction in household energy budgets in the long term. Electricity is also a cleaner energy compared to kerosene and firewood and also does not contribute to environmental degradation. There will be need to educate the households who believe that electricity connection fee is expensive that the initial costs in connection will be recovered quickly through savings from reduced kerosene use.

Most family members mostly have access to and use of all appliances with the exception of the electric cooker/coil which is predominantly used by women and girls. Men and boys tend to have higher access to all appliances compared to women while girls seem not to be involved in purchase of appliances or use of all appliances with the exception of the electric cooker. The project should aim at sensitizing the community to ensure that all family members participate in decision making regarding appliances to be purchased. Efforts should be made to ensure both men's and women's views are listened to during implementation in order to ensure all benefit from the electrification project.

Since use of torches in the kitchen is minimal, it is clear that providing electricity to homes and ensuring that there are light bulbs in all rooms including the kitchen would provide better working conditions for women who are responsible for cooking. Efforts should be made to ensure that each household has a light bulb in the kitchen. Further, considering that firewood is not only used for cooking by most households but also for lighting and heating, access to electricity will contribute to reduction of drudgery for women and girls. This will also allow more study time for girls.

There are enough incentives to make people switch from using kerosene to electricity. For example, majority of respondents said that firewood and kerosene are very expensive and that demand for energy has increased in the household. Collection of firewood also takes a lot of time, is tiresome and inadequate due to shortage of trees. Others said that expenses in kerosene reduced after switching to electricity or after purchasing a Solar Home Systems.

Almost all the sampled households own radios, over half own radio cassette players and coloured or black and white TVs. Access to electricity would provide an alternative and cheaper energy for powering the equipment and increase access to entertainment and information. Access to information may also lead to an increase in earnings from cash crops as well as food crops grown for sale through links to new markets.

Majority of respondents have access to financial facilities such as cooperatives, MFIs. Households could be encouraged to these could be used to finance connections to households. Some community members are even familiar with other financial sources such as CDF, and LASDAP which could be mobilised.

Over half of the households interviewed have been investing in rechargeable batteries. They travel an average distance 3.5 km to the nearest battery charging facility. This clearly demonstrates that people in this community are keen to acquire alternative energy options and would therefore be ready to invest in electricity connection.

Community members travel an average of 2Km to social amenities such as schools, health centres, markets, schools. Majority of respondents travel an average of 11 and 13km to the nearest Hospital or Maternity facility respectively. Majority feel that the local Dispensaries and Health Centres are not well equipped to handle cases of complicated conditions and maternal deliveries. Availing electricity to more health facilities will ensure better health services. Providing electricity in staff quarters will also attract qualified staff thereby ensuring quality health services for the community members.

Access to electricity in market centres will support the wide range of businesses being operated by both women and men such as salons, hotels, tailoring, carpentry, electrical shops etc. as well as create opportunity for new businesses to be established.

Most people are very aware of the wide range of benefits that electricity could bring to them, top among them, creation of employment opportunities, and improvement of social services as well as better working conditions in the home.