

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

*Socio-economic status of households and
utilization of public areas: Baseline
survey of Mt. Elgon ecosystem*



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



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Cover Photograph: Shows a landscape of Mt. Elgon ecosystem. **Photograph by Roxventa Othim.**

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Executive Summary

Kenya's Water Tower Protection and Climate Change Mitigation and Adaptation (WaTER) Programme objectively focuses to contribute to poverty reduction and sustainable livelihoods by applying scientific principles to inform design of community level actions and national policy decisions on rehabilitation and conservation in Mt. Elgon water towers. Mt. Elgon water towers provide ecosystem services crucial to forest proximate communities. More so, these communities depend on goods derived from forests for their livelihoods. These include timber, firewood, fodder for their livestock, and other non-timber forest products. However, the ecosystems have been degraded reducing their capability to provide those goods and services in the long term. Worse still, the most degraded areas in the water catchment areas also referred as “hotspots” or the “vulnerable areas” threaten the provision of key ecosystem services to communities living downstream who also rely on those services.

Understanding the socio-economic status of inhabitants living close to forested areas is important for decision makers who will make informed decisions on target actions for improving their livelihoods, and at the same time address factors that lead to degradation of the ecosystems. The purpose of this survey was to obtain baseline socio-economic data on households; data on utilization of public areas; and, information on demographic and economic status of “hotspots” and vulnerable areas on public and community land in the project area.

The following information was provided by this baseline survey;

In terms of household level analysis: the household size was an average of 8 family; the male headed households were higher than female headed households; about 71 % of the households had settled in Mt. Elgon area for less than 30 years; the settlement was characterized by more immigrants coming from other settlements for various reasons such as fertile land access to resources amongst others. While more female than male had no formal education (18% and 11%) respectively, the transition for both male and female from primary was lowest at secondary and tertiary levels.

For land ownership; almost all forest land was owned by the state whereas agricultural land in the settlement was owned privately. About 69% of households owned less than 1.1ha of land in the settlement whereas 6% had over 5ha. Most of the land had been put under agricultural production, where maize and beans were the major crops. A higher percentage of

the land was owned by male household heads, and in few households, female were the household heads.

As far as their living standards and conditions were concerned; majority of the households (97%) lived in their own houses, while some rented the houses or lived with other households. Most houses (85%) were mud walled followed by brick-walled houses (11%) and very few wooden walls and iron sheet walls. Majority of the houses (87%) had iron-sheet roofing with a few grass thatched roofs, however, in Kalongeni village, all the houses were grass thatched. Over 60% of households owned phones, radios and furniture whereas few households owned assets such as tractors, cars/trucks, motorcycles, stoves, water-pumps and chainsaws. Villages with highest mean value of assets were Cherongos farm (Ksh 215,080) and Kibosit (Ksh 184,532) and the lowest mean value of assets of less than Ksh 5000 was recorded in 17 out of the 47 villages. Almost all households (95%) had savings of less than Ksh. 50,000; however, 92% of the households had liabilities of less than Ksh. 20,000. Most of these debts accrued from table banking, agricultural inputs, financial loans and dowry. The households had formal and informal savings cash irrespective of the level of education.

On survey of the forest resource: the mean distance of household's home to the edge of the forest was 2.2 km, with majority of the households collecting firewood from the forest live between 0-2 km from their homes. Additionally, 39 out of 47 villages were found within 3 km to the forest edge. The average time spent in collecting firewood was 3.4 hours a week, with the households adjacent to the forest spending more time in firewood collection. Majority of the households indicated that they spent more time now collecting firewood, compared to 5 years ago and this was due to the fact that firewood availability has declined. This information was confirmed by 92% of the households who indicated that firewood availability had declined. The coping strategy in response to the decline in firewood was use of agricultural residues, purchase of fuel wood and planting of woodlots on-farm mainly for firewood and domestic. In terms of the forest user groups, about 59% of the households were not members of user groups, due to lack of information (28%) or non-existence of user groups (23%) in the settlement. The main motivation for joining the user groups was increased access of firewood, cultivation and grazing. Majority of the FUG members (92%) attended FUG meetings with 58% of the meetings attended by the husbands.

Infrastructure in Mt Elgon was still weak: 95% of the households did not have access to electricity; 61% of the households didn't have access to piped water in the settlement whereas

the district market where major consumption goods, and agricultural products were sold were far from the villages (over 10km from the center of the village). Most households (61%) did not have access to a health center within their villages except Kibuk, Habitat, Sikirwa and Cherubai villages where households accessed health centers from within. Motor cycles were the main mode of transport used, with vehicles, foot, donkey and bicycles also used.

In terms of crisis and unexpected expenditures; the respondents in Mt Elgon indicated that they experienced crises in paying school fees, serious crop failure, and serious illness in the family in the last 12 months; however, land loss was not considered a crisis. The coping strategies adopted by the households were sale of assets, extra casual labor work, reducing household spending, and borrowing against future assets.

For welfare perceptions and social capital in the past 12 months; 49% of the households were very unsatisfied with life in the settlement. On the other hand, 4% very satisfied with life in the settlement; 26% of the households were satisfied with life in the settlement whereas 21% were indifferent with life in the settlement. In terms of food sufficiency, 53% and 14% of the households indicated that food production and income was reasonably sufficient or sufficient to cover household needs respectively. About 34% of the households' production and income were not sufficient to cover the households' needs. Comparing household wellbeing level to 5 years ago; 66% of households were about average, with 19% indicating they were worse off and 15% mentioning that they were better off than the other households in the village. The reasons for being worse off were low prices for agricultural produce, increased cost of living, illness, and increase in school fees while reasons for being better off included improved land holdings, gain of material assets and increased knowledge. Majority of the households (78%) considered their village as a good place to live; 12% indicated the village as partly good while 10% percent indicated the village as not a good place for the household to live in.

Utilization of public areas: the main public areas within the ecosystem were gazetted forests, communal land, markets and schools. The public areas were either owned communally or by the state. The establishment of gazetted forests and market centers was by *de jure* rights, except for schools which were under *de facto* rights. The public areas were mostly used as sources of wood, food and animal feeds. Most communal land was used as religious and trading grounds as well as for barazas while schools offered space for education, employment and for religious meetings. The gazetted forests provided indirect benefits such as water catchment and soil fertility improvement. Varied technologies were used to access tangible

products such as animal/crop husbandry, fertilizers/pesticides, bee hives, piped water, Mpesa and mobile banking. The main products of economic benefits were firewood, maize, beans and posts for subsistence and commercial use. Rules governing access to public areas were set by the government and administered through KFS, county government, local and school administration. The penalties on users breaking the set rules were fines, exclusion from group, prosecution in court and arrests leading to imprisonment. Due to increased access, products from the public areas such as firewood, fodder, posts and honey have declined in the past 15 years. Increase in food production is associated by allocation of more land for PELIS, improved technology in beekeeping and harvesting. The decline was due to increased harvesting of trees due to population increase.

During the village analysis; the following were recorded – in terms of the forest resource base, the most important products from the ecosystem were food, firewood and grazing as well as medicinal plants and withies. The village elders noted that availability of poles/posts; firewood and water had decreased in the past 5 years, while food availability had increased. The villages had access to formal and informal credit facilities. The roads within the villages were earth roads which were not accessible during all season. The nearest road usable during all seasons was 15km away. The village elders confirmed that the forest was managed by KFS together with the CFAs; they indicated that the CFAs were formed from government initiatives.

The above findings will form good background information on socioeconomic factors relevant to project planning and implementation of water tower project activities.

1 INTRODUCTION

Kenya has several water towers with the main ones being, the Aberdares, Cherengany Hills, Mau Complex, Mt. Elgon and Mt. Kenya. The water towers are important for provision of goods and ecological services that have economic and social value and livelihood. The various services provided by the water towers include; local climate regulation, habitat for flora and fauna, water flow regulation and purification, carbon sinks, improving soil fertility, and reducing soil erosion and sediment loads in river waters. Communities adjacent to the water towers depend on goods derived from forests ecosystems for their livelihoods. The main goods include; timber, firewood, fodder for livestock, and other non-timber forest products.

However, these water towers are threatened by degradation caused mainly by over-exploitation, deforestation and poor resource use, which has necessitated urgent rehabilitation, restoration and sustainable management actions. Conservation of the water towers is a flagship project under Vision 2030, Kenya's long-term planning blueprint. Given the importance of Kenya's water towers in terms of the economic, social and ecosystem services they provide, the government is implementing several initiatives towards their restoration. One such initiative is the 'Kenya's Water Tower Protection and Climate Change Mitigation and Adaptation (WaTER) Programme being under taken in Mt. Elgon and Cherangany Hills water towers.' (Government of Kenya, Vision 2030)

Mt. Elgon Forest Ecosystem plays an important role in the provision of ecological, social and economic services that support livelihoods of many local communities within Lake Victoria and Lake Turkana basins. In particular the Mt. Elgon water tower is an important, water catchment for the Nzoia River, which flows to Lake Victoria, and for the Turkwel River which flows into Lake Turkana (CIFOR, 2015).

Mount Elgon is the fourth highest mountain in Africa with a peak of 4320 m.a.s.l. It is located on the North Western Kenya and Eastern Uganda international boundaries. It covers two administrative districts and provinces; Mt. Elgon district in Western province and Trans Nzoia district in Rift Valley province. It is a large extinct volcano of tertiary origin with an altitudinal range of between 2030 and 4320 m.a.s.l. It lies at latitude 1°08' N and 34°45'E. Mount Elgon Forest covers 107,821 ha, composed of Mount Elgon National Park (34,116 ha) and Chepkitale and Mount Elgon Forest Reserves (73,705 ha) Mt. Elgon receives an annual

precipitation of 1280 mm and minimum and maximum temperatures of 9°C and 22°C respectively (CIFOR, 2015). Most of the soils in the ecosystem are poorly drained dark peaty loams, ranging from reddish brown to black in colour. The soils above 3000 m.a.s.l are shallow with rock outcrops. However on the mountain footsteps the soils are well-drained humid friable clay with dark red subsoil derived from volcanic rocks.

Mt. Elgon vegetation can be zoned into; open woodland, tropical moist forest, bamboo and afro-alpine. *Juniperus procera*, *Hagenia abyssinica*, *Olea welwitschii*, *O.hochstetteri*, *Prunus africana*, *Podocarpus falcatus* and *P. latifolius* dominate the tropical moist forest. Moorlands, swamps and rocks form a major part of the afro-alpine zone. Mount Elgon forest was gazetted as a government forest reserve in 1932 (Howard, 1991). It currently covers an area of about 49,382.9 ha. The forest is divided into three management units namely the natural forest reserve, the commercial exotic plantations and the national park. The density of the vegetation and the species diversity of the Mt. Elgon forest are about normal for this ecological zone.

However, the commercial and the subsistence values of the forest are regarded as below normal. Over the past 5 years, the densities of trees have decreased due to clearing and selective over-exploitation of species. Forest fires have also destroyed some trees, causing overgrowth of non-palatable species. The destruction caused on trees by medicine harvesters, and big animals have also contributed to decrease in tree species diversity and density (Van Heist, 1994).

Part of Mt. Elgon covering an area of 16900 ha was gazetted as a national park in 1968. The most commonly sighted mammal species on the mountain are the black and white colobus monkeys (*Colobus guereza*) and blue monkeys (*Cercopithecus mitis*), hyrax (*Heterohyrax brucei*), antelope and duiker (*Sylvicapra grimmia*) (Katende et al. 1990; Howard, 1991; van Heist, 1994). Other animals found in the park include elephants, bushbuck, spotted red tailed monkey, buffaloes and Leopards

Mount Elgon forest ecosystem holds a high percentage of resources, crucial to local community' livelihoods, supporting its huge population (van Heist, 1994). Key economic activities in Mount Elgon forest Ecosystem are hosted within 11 major land uses. Mt. Elgon ecosystem land use is dominated by agriculture (Figure 1). The main agricultural activity is growing of maize and beans. Beside agriculture as the major activity, forest product access is also important as a source of community livelihoods and income.

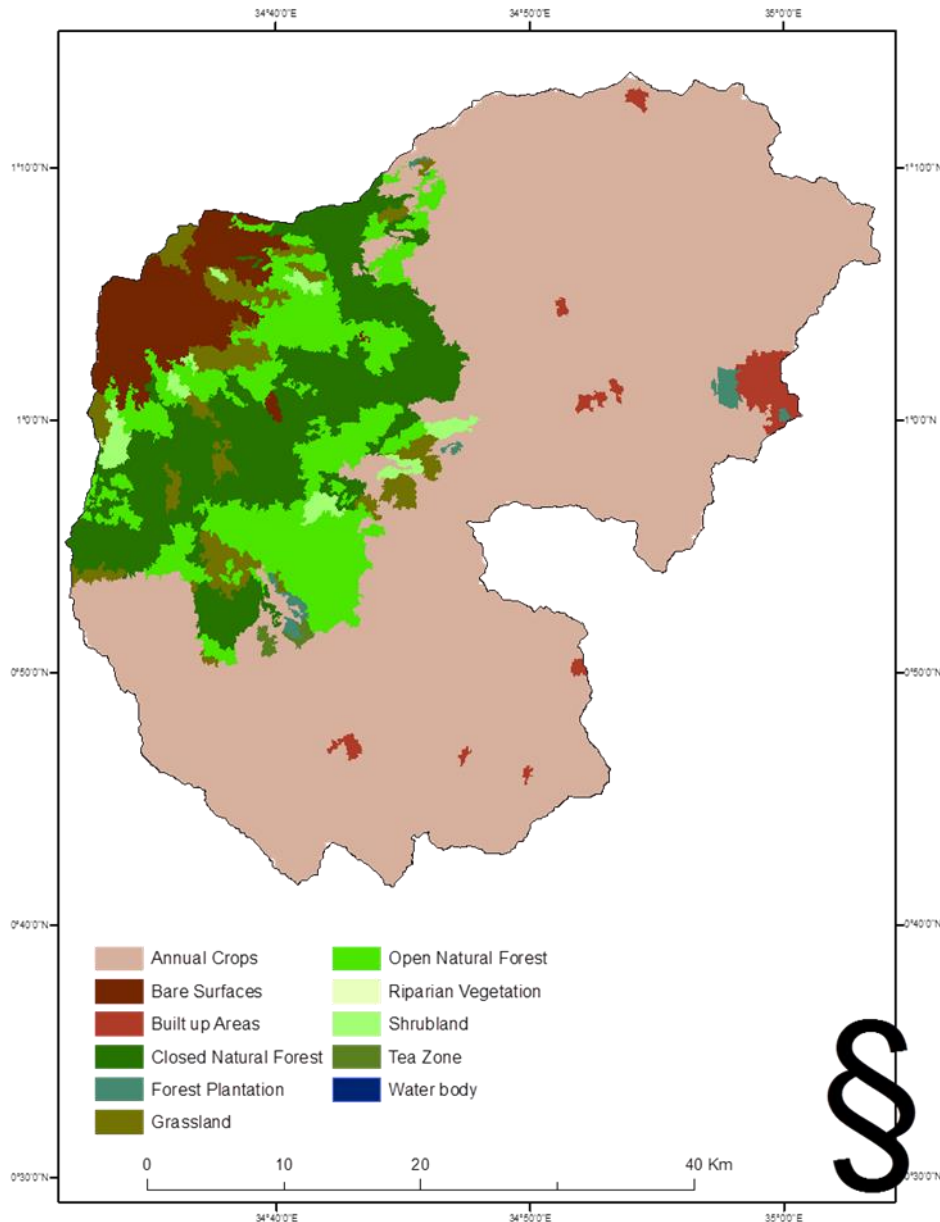


Figure 1 Land use land cover map for Mt. Elgon forest ecosystem

The increasing human population and their uncontrolled settlement in some fragile areas of the ecosystem have exerted enormous pressure, resulting in over-exploitation and degradation of resources in the ecosystem. Rehabilitation and conservation of the water tower is therefore a priority to restore its capacity to sustainably provide goods and services not only for adjacent communities but also within its catchment.

The WaTER Programme intervention aim at contributing to poverty reduction and sustainable livelihoods by applying scientific principles to inform national policy decisions and design of community level actions on rehabilitation and conservation in Mt. Elgon water

tower. To track on the impact of the interventions on the livelihood status of inhabitants living close to forested areas, a baseline survey was undertaken to provide information on the actual situation of socio-economic aspects within Mt. Elgon ecosystem to provide a basis against which the performance of the programme will be measured, reported and verified.

The objective of the survey was to obtain baseline socio-economic data on; households and villages relying on ecosystem services from Mt. Elgon. The survey also documented utilization by adjacent communities of public areas including: gazetted forests, and community lands.

The specific objectives were to:

- Assess the socio-economic status of households relying on ecosystem services;
- Assess the socio-economic status of villages relying on ecosystem services;
- Conduct a survey on utilization of public areas which include: gazetted forests, community lands and other public areas with the two ecosystems.

2 METHODOLOGY

2.1 Sampling for data collection

Study site selection was based on area maps generated during ground truthing activity, in which the hot spot areas were identified. The hot spot areas covered 11 major land uses within the ecosystem.

The target population within Mt. Elgon ecosystem were communities adjacent to the following forest blocks (0-5 km); Cheptais, Kaberwa, Kaboiywo, Kimothon, Kiptogot, Suam, Saboti and Sosio. Village elders were identified to help in participatory mapping of the forest block and villages. Focus Group Discussions (FGDs) with community elders were held in each of the sites to provide information on the village through participatory mapping and further identify and list the households in which the questionnaires would be administered. It is from these lists that the 10 households were randomly selected for the study.

A maximum of 7 villages were selected randomly per forest block in consultation with the village elders. The selected villages were picked to represent villages close to the forest edge, in the middle and the far edge. However, due to household to household proximity, terrain, weather effects amongst other challenges, 47 villages were sampled in the ecosystem.

From the selected villages two elders were used to provide household names where a maximum of ten households were randomly selected for the household interviews.

2.2 Data Collection

Quantitative and qualitative data was collected using semi-structured questionnaires and from secondary data. Three different questionnaires were administered to collect data on household, village and utilization of public areas respectively. A total of 259 households were interviewed. Data collected at household level included household composition, land ownership, assets and savings, forest resource base, forest user groups, forest services, forest clearing, infrastructure, crisis and expected expenditures, welfare perceptions and social capital. A total of 30 village questionnaires were administered. Data collected at village level included; village demography, infrastructure, forest and land cover/use, forest resource base, forest institutions, and forest user groups. A total of 30 questionnaires on utilization of public areas were administered to the elders at the village level. Data collected on utilization of public areas included; categorization of public areas, legal status of the public areas, size,

uses, economic benefits, rules governing access and resource status over time. Secondary data included information on public land such as size, dates of gazettment and ownership.



Photo 1 Participatory mapping activity in Suam settlement



Photo 2 Household identification and listing in Kiptogot Settlement



Photo 3 Participatory map of villages in Kiptogot Forest block



Photo 4 Data collection at the village level in Kaberwa forest station

2.3 Questionnaires and data sets

A combination of village, household and utilization of public area questionnaires derived from Poverty Environment Network (PEN) and International Forestry Resource and Institutions (IFRI) were used in the study (Table 1).

Table 1 Description of questionnaires used in the study

Questionnaire	Description	Outputs
Village	Assess the socio-economic status of villages relying on ecosystem services.	Socio-demographics, infrastructure, forest and land cover use, forest resource base, forest institutions, risks, wages and prices, forest services
Household	Assess the socio-economic status of households relying on ecosystem services.	Household composition, land ownership, assets and savings, forest resource base, forest user groups, forest services, forest clearing, infrastructure, crisis and expected expenditures, welfare perceptions and social capital.
Utilization of public areas	Conduct a survey on utilization of public areas which include: gazetted forests, community lands and other public areas with the two ecosystems	Demographics, type and description of public areas, direct and indirect uses of public areas, benefit and rules to access of public areas

2.4 Data management and analysis

Collected data was cleaned, coded and then entered and analysed using Statistical Package for Social Sciences (SPSS V.21).

3 FINDINGS OF THE SURVEY

Household analysis

This section presents results collected on the social, economic and demographic status in the Mt.Elgon ecosystem at household level.

3.1.1 Household composition

Household characteristics are important in analysis as they are a pointer of the social and economic well-being of the members of the household. In many cases, large household size may lead to constrained financial resources and therefore lack of basic necessities. The mean number of persons per household in the study area in Mt. Elgon was 8 members; of the villages sampled, 77% of the households had on average five to eight members while families with nine to fourteen persons constituted 23%. Taboo, Kimothon A and Labot villages had the highest mean number of persons per household at 14, 12 and 12 respectively. Gitwamba, Kahuho and Kaptarakwa villages had a mean of 5 members each. The male headed household was higher (94.6%) than female headed households (5.4%). A higher percentage of all households heads were married and living together as shown in (Figure 2). In terms of education level, there were more female respondents with no formal education (19%); 62% at primary level and 18% at secondary level. There were more male with secondary education (26%) than female (18%), however at tertiary level, the number of male and female was relatively similar (Figure 3).

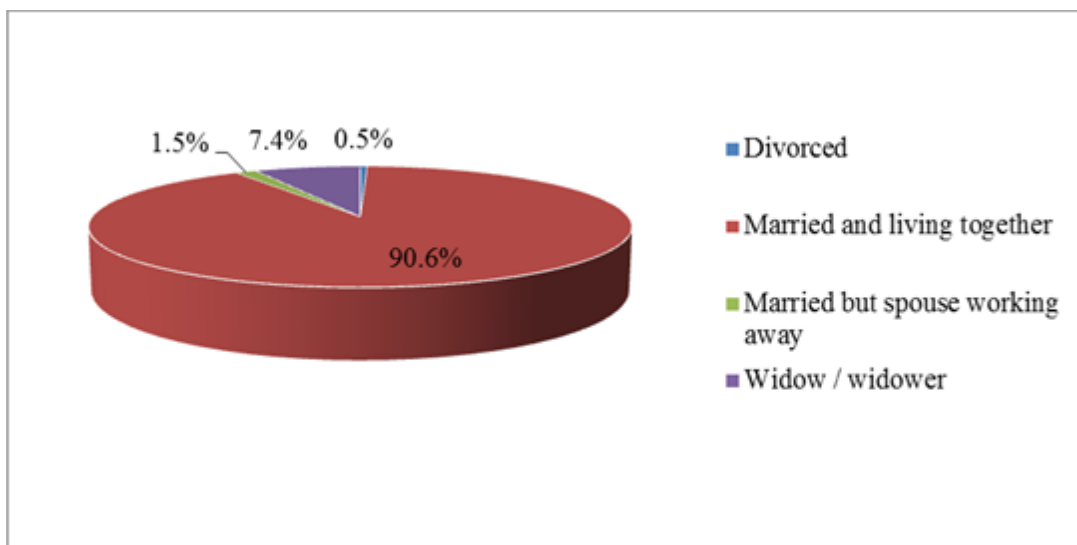


Figure 2 Marital status of households in Mt Elgon

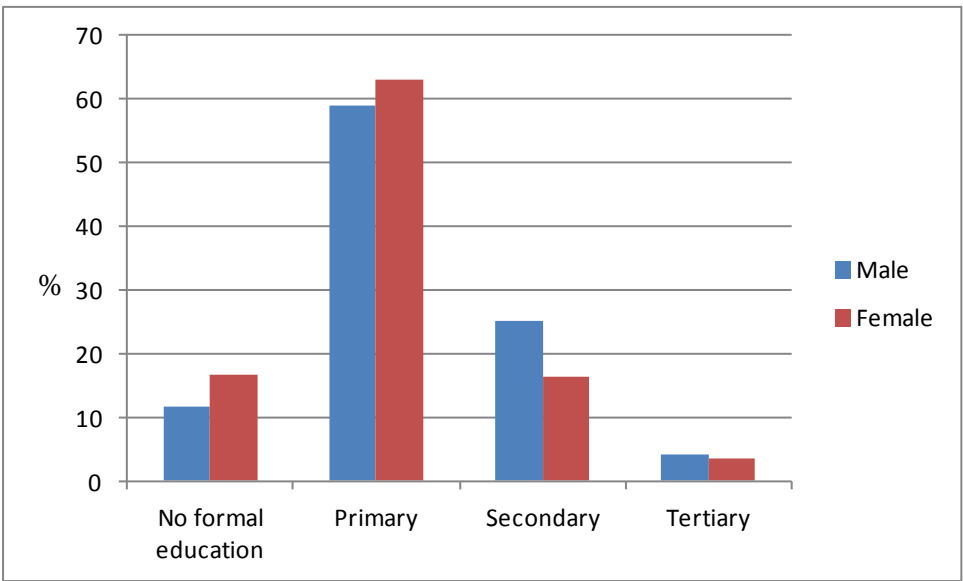


Figure 3 Household head gender education level

3.1.1.1 Household existence

Majority of the households (71.2%) in Mt. Elgon study area have existed for less than 30 years, whereas 18.8% have existed for over 30 years (Figure 4).

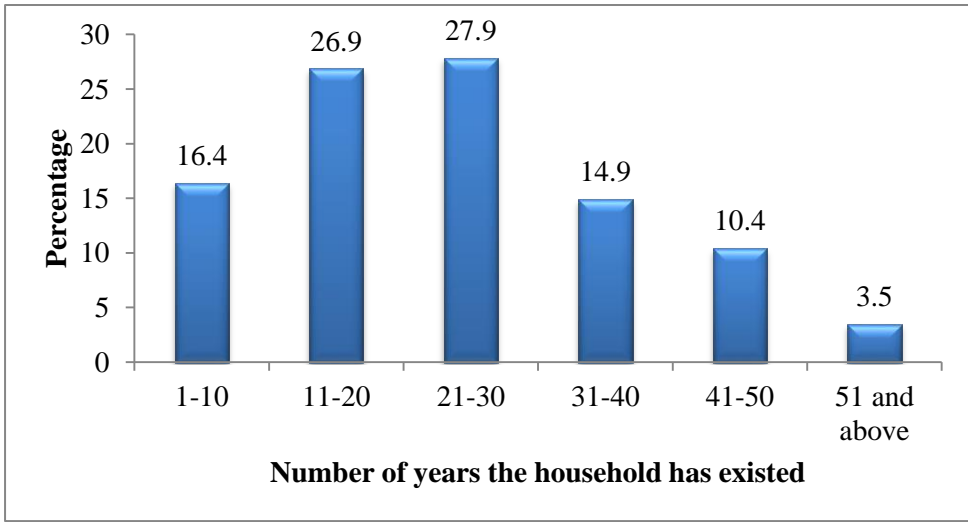


Figure 4 Number of years the household has existed

Household heads born in the village were 60.4 % while, 39.6% of the household heads were born in other villages and settled as immigrants. Of the household heads not born in the village, 79.4 % have been in the village for less than 30 years while 19.6% for over 30 years (Figure 5).

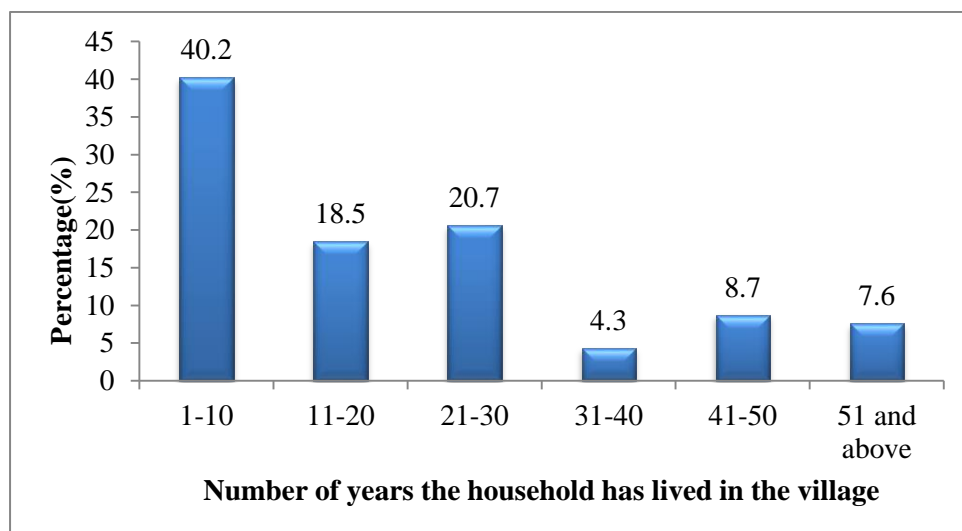


Figure 5 Number of years the household has lived in the village

Land ownership

Most of the land under natural, plantation, and managed forests are state owned, while cropland, residential and agro-forestry are mainly found in individual owned lands (Table 2). About 69% of households owned less than 1.1ha of land in the settlement, 1.2 – 2.3ha (18%) whereas 6% had over 5ha (Figure 6).

Table 2: Land ownership categories

Category	Ownership(tenure), %		N
	State	Individual	
Cropland	2.5	97.5	238
Residential	2.1	97.9	141
Plantations	83.7	16.3	86
Agro-forestry	0.0	100.0	67
Pasture (natural or planted)	0.0	100.0	25
Managed forests	57.9	42.1	19
Fallow	0.0	100.0	16
Silvipasture	0.0	100.0	15
Natural forest	100.0	0.0	14

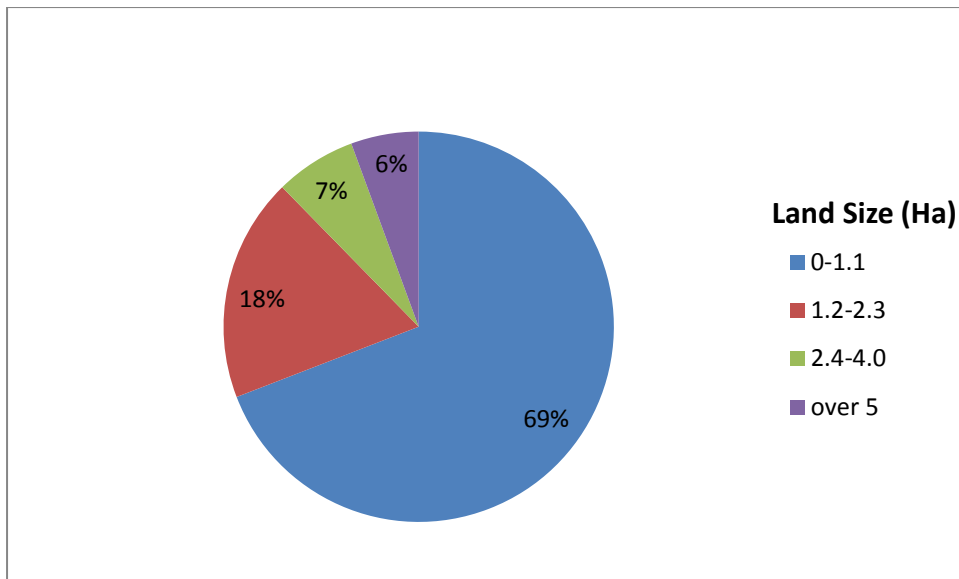


Figure 6 Land size in households within Mt Elgon ecosystem

3.1.2 Housing characteristics, ownership, structure and size

3.1.2.1 Housing ownership

About 96.5% (n =193) of households owned their own houses while 0.5% owned the houses with other households, while 1% did not own houses, 1.5% rented the houses alone while 0.5% rented the houses with other households. There is no significant difference at the village level in house ownership.

3.1.2.2 Wall and roof characteristics

Most of the houses had mud walls (85.9%), brick walls (11.6%) whereas those that had wooden walls were 2%. Only (0.5%) of houses had iron sheets walls (0.5%) (Table 3). The roofs were predominantly made of iron sheets (89.4%) and (10.6%) grass thatched houses (Table 3).

Table 3 Wall and roof materials used in villages within Mt. Elgon

Structure characteristics		
	Frequency	Valid Percent
Wall materials		
Mud/soil	171	85.9
Wooden (boards, trunks)	4	2
Iron (or other metal) sheets	1	0.5
Bricks or concrete	23	11.6
Roof materials		
Thatch	21	10.6
Iron or other metal sheets	177	89.4

3.1.2.3 Size of the house (M²)

Most houses (89.3%) were smaller than 9 m² while 5.4% of the houses were between 30 to 60 m². Wangahu village had the highest percentage of the bigger houses of 30 to 60m² (60%).

3.1.3 Household assets

Majority of the households in Mt. Elgon possessed phones (23.7%), radios (18.7%) and furniture (19.7%) as the main assets (Table 4).

Table 4 Household assets

Item	Frequency (n)	%
Phone	170	23.9
Radio	134	18.8
Furniture	140	19.7
Plough	56	7.9
Bicycle	36	5.1
Solar panel	36	5.1
Motorcycle	22	3.1
TV	22	3.1
Wooden cart or wheelbarrow	26	3.7
Stove for cooking (gas or electricity)	16	2.2
Water pump	14	2.0
Chainsaw	13	1.8
Tractor	10	1.4
Car/truck	9	1.3
Refrigerator/freezer	4	0.6
Shotgun/rifle	4	0.6
Total	712	100

Cherongos farm and Kibosit villages had the highest mean total value of household assets (Ksh. 215,080.00 and Ksh. 184,532.00 respectively), whereas, Kambi Waya and Chemondi North had the least total value of household items (Ksh. 1,624.75 and Ksh. 1,442.86 respectively) indicating that there is a big variation in income (Table 5).

Table 5 Mean Income (KShs) in villages within Mt. Elgon Ecosystem

Village name	Mean	Std. Deviation	Village name	Mean	Std. Deviation
Cherongos farm	215080	627871	nabeki(lower)	6567	7143
Kibosit	184532	617663	Kipsasa	6215	6540
Kimama east	36558	96590	Tumuk	6188	6590
Taboo/Kararani	32000	42154	Nasianda	6125	7674
Kiptichor	25000	.	Corner farm	5645	8940
namtukholo	19460	20823	Kapchepkui	5491	4610
Kapsegisio	18885	33420	Chepsanja	5403	5165
Total	18501	147829	Tilibey	4950	3512
tall tree	16867	28695	Wangahu	4692	5926
Top farm	13050	27824	kipyeto	4583	4684
Chepchelon	12840	16477	kapkrongwa	4120	2415
Kaibei	11683	24829	Chepkoyaa	4094	4552
Gamba	10977	13795	Massopoi	4081	3761
Sikirwa	10061	24222	Chesekeli	4057	4508
Salama	10031	22229	Amani farm	3766	5059
Habitat	9388	31240	Labot	3350	1851
Kipkama	8930	12061	Sikinwa	2950	2223
carlifonia	8774	11547	Kapkures	2833	2021
Cheptumbelio	8500	6062	Cheptobot	2825	1362
Kalongeni	8000	4000	Musembe	2720	2783
Kimama North	7700	10198	Saboti	2600	2352
Cherubai	7186	17806	Kongit	2182	1661
Kahuho	7167	7320	Kambi Waya	1625	1109
Kibuk	7075	6054	Chemondi North	1443	1179

3.1.3.1 Household savings in banks, credit associations/saving clubs and non-productive assets

In the study area, 95.1% of households had savings of less than Ksh. 50,000; Ksh. 50,000-100,000 (2.8%) while 2.1% had savings of more than Ksh. 150,000. Irrespective of the level of education, most households had savings of less than Ksh. 50,000. Household heads with no formal education (16.7%) had a saving of between Ksh. 50,000 to Ksh. 100,000. Household heads who attained secondary and tertiary education had saving of less than Ksh. 150,000 at 2.1% and 25% respectively (Figure 7).

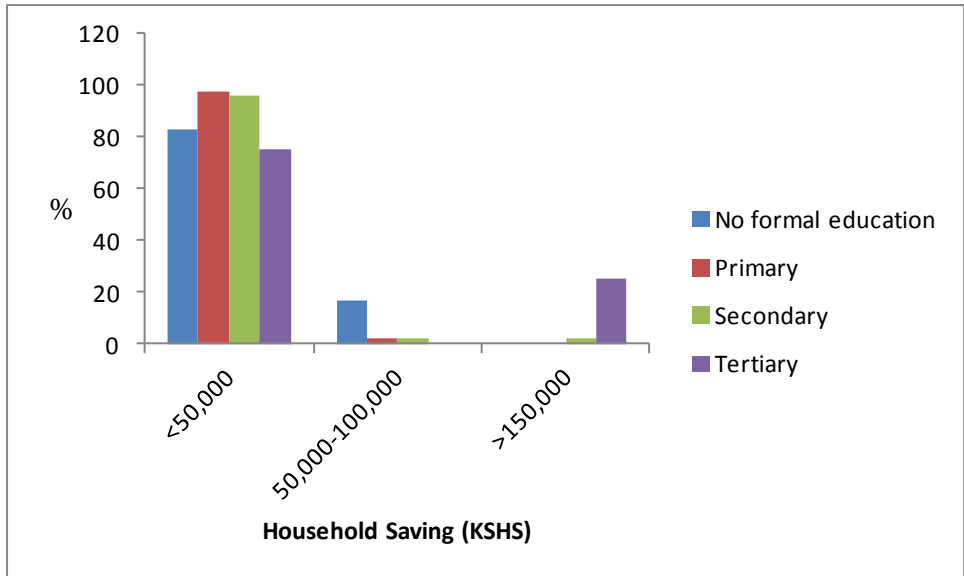


Figure 7 Household saving against level of education

The number of male and female headed households with a savings of less than Ksh.50, 000 was relatively similar; however, there were more female headed households than male headed households with savings of Ksh. 50,000-100,000. The female headed households did not save more than Ksh.150,000 (Figure 8).

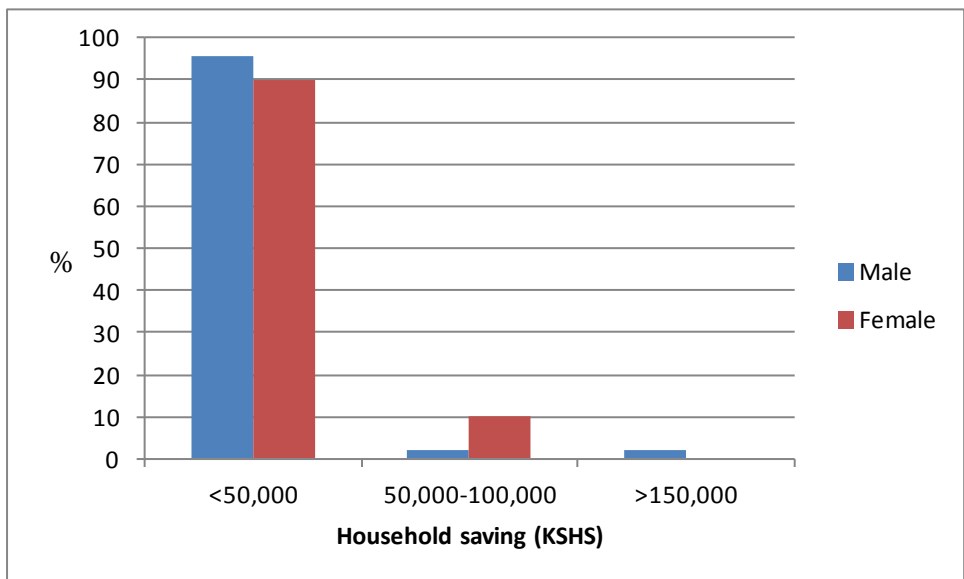


Figure 8 Household head savings by gender

3.1.3.2 Debts

Majority (91.2%) of the households had debts of less than Ksh. 20,000. Kibuk village had households with larger debts of between Ksh. 80,000 -100, 000. The debts included those from table banking, agricultural inputs, financial loans and dowry.

3.1.4 Forest resource base

3.1.4.1 Distance from the forest edge

The average distance to the nearest forest edge for all sampled households was 2.2 km. Many of the sampled villages were found between 0.3-1.0 km (31.9%) from the forest edge, few villages were over 3 km with the furthest village (Kimama East) being 6.3 km from forest edge. About 76% of households collected firewood from Mt. Elgon forest, while 24% did not have access to the forest for firewood. Of those that collected their firewood from Mt. Elgon, 68.3% of them were between 0–2 km from the edge of the forest as shown in (Figure 9). This shows that if a different survey is to be carried out on forest resources, those closer to the forest would be more resourceful

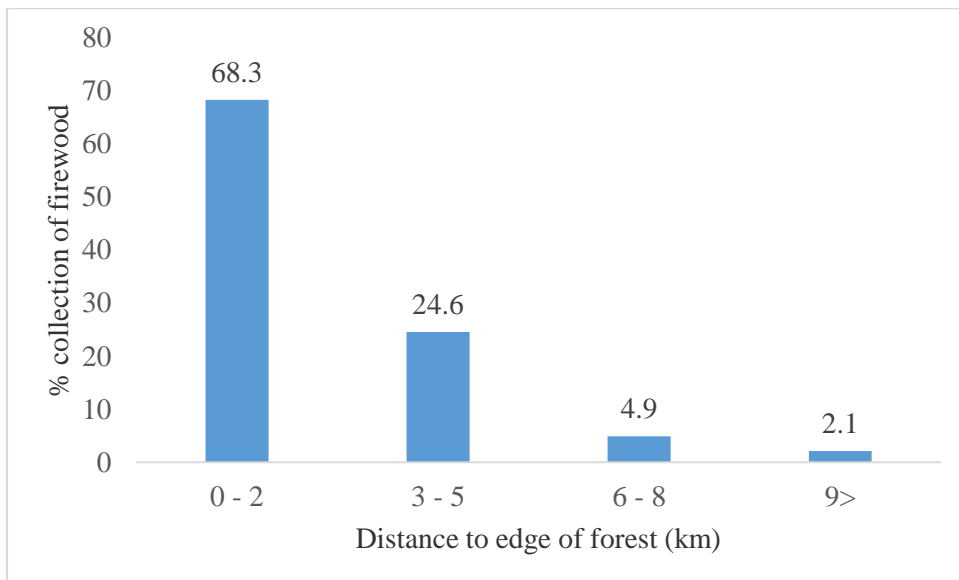


Figure 9 Firewood collection in relation to distance of the household to the edge of the forest
The villages that depended less on the forest for firewood were Kaibei and Kimama East (100% and 80% respectively). This could be due to the fact that Kaibei is a shopping center and household could have had access to alternative fuels while Kimama East is further away (6.3 km) from the forest edge.

3.1.4.2 Time spent in collecting firewood

The average time per week spent on collecting firewood was 3.5 hours. The villages living in close proximity to the forest edge spent more time collecting larger head loads of firewood. This could be attributed to ease of making several trips to the forest. For example, Kongit village which is 0.6 km from the forest edge had most households spending an average of

14.7 hours per week on firewood collection. The households in the villages which were far from the forest edge spent less time per week in collecting firewood, probably due to the long distance, and lack of ease to carrying large head loads of firewood. For example Kimama North village which is 5.4 km from the edge of the forest households spent on average 1.7 hours per week in firewood collection.

3.1.4.3 Time spent collecting firewood 5 years ago.

About 78% of households in Mt Elgon spent more time collecting firewood now than they did 5 years ago (Figure 10). Households from Corner farm village indicated that they spent less time now (66.7%) than 5 years ago, due to availability of firewood from alternative sources of fuelwood such as woodlots on their farms. All the respondents from Top farm village indicated that they spent the same time collecting firewood now as they did 5 years ago.

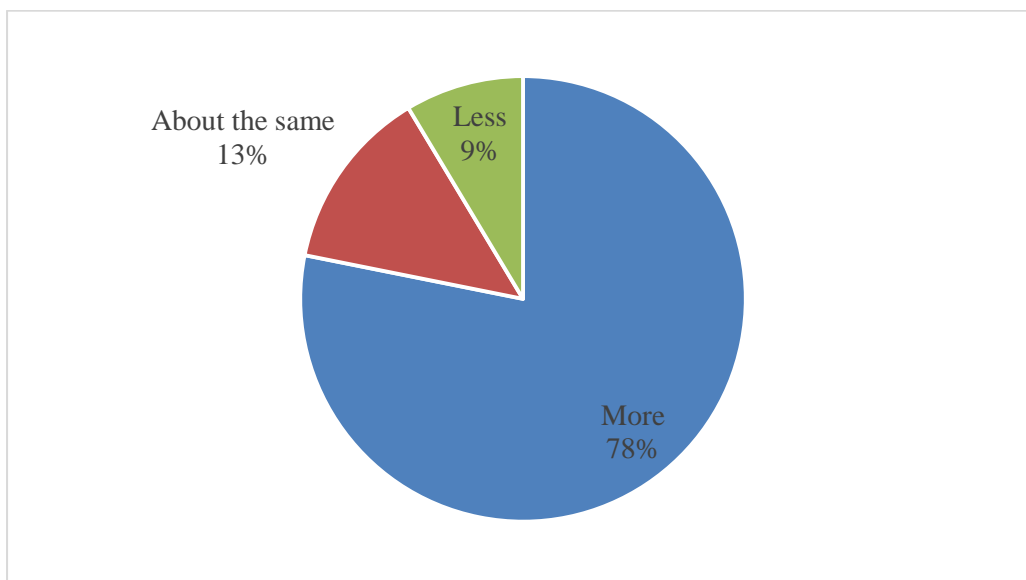


Figure 10 Time spent in collecting firewood now, compared to 5 years ago

3.1.4.4 Trends in firewood availability

About 92% of households indicated that availability of firewood had declined while 4.46% indicated that the availability of firewood remained the same whereas 3.62% indicated that availability of firewood had increased.

A higher percentage of the households (30.3%) indicated that they had responded to decline of firewood availability by increasing the use of agricultural residues, buying more fuel wood (15%) and planting woodlots on farm (12%) (

Table 6)

Table 6 Response to decline in firewood availability

Response	Frequency(n)	%
Increased use of agricultural residues as fuel	97	30.3
Increased collection time	91	28.4
Buying more fuel wood and/or charcoal	50	15.6
Planting of trees on private land	41	12.8
Restricting access/use to own forest	16	5.0
Making charcoal	9	2.8
Increased use of non-wood wild products	6	1.9
More conservative use of fuel wood for cooking and heating	5	1.6
Buying more commercial fuels	3	.9
Reduced the need for use of fuels, such as using improved stove	1	.3
Conserving standing trees for future	1	.3
Total	320	100.0

3.1.4.5 Establishment of woodlots

Majority of the household (74.4%) indicated that they had established woodlots. The woodlots were established mainly for firewood for domestic use (35.1%), timber and poles for own use (22.9%) as shown in (Table 7).

Table 7 Main reasons for establishing woodlots

Purpose	Frequency (n)	%
Firewood for domestic use	135	35.1
Timber/poles for own use	88	22.9
Other environmental services	56	14.5
Timber/poles for sale	33	8.6
Other domestic uses	28	7.3
Land demarcation	23	6.0
Firewood for sale	9	2.3
Fodder for own use	6	1.6
Fodder for sale	2	.5
To increase the value of my land	2	.5
Other products for sale	1	.3

Carbon sequestration	1	.3
To allow my children/grand children to see these trees	1	.3
Total	385	100.0

3.1.5 Forest User Groups

Majority of households in Mt. Elgon (58.8%) were not members of any Forest User Groups (FUG). About 28% indicated lack of adequate information and non-existence of FUGs in their villages (22.9%) among other reasons (Table 8).

Table 8 Reasons for not participating in FUG

Reason	Frequency (n)	% frequency
Inadequate information	40	27.8
No FUG exists in the village	33	22.9
Constraint on time	20	13.9
Not interested in FUGs activities	13	9.0
Corruption in FUG	10	6.9
High subscription fees	7	4.9
Forest authorities	7	4.9
Competition from other community groups	5	3.5
Lack of trust in FUGS	5	3.5
New in the village	3	2.1
FUG exists in village, but household unaware of its presence	1	.7
Total	144	100.0

About 28% of households joined FUGs for increased access to forest products such as firewood, and cultivation in the forest (Plantation Establishment for Livelihood Improvement Scheme- PELIS) as well as for grazing livestock among others (Table 9).

Table 9 Reasons for joining FUG

Reason	Frequency (n)	%
Increased access to forest products	55	28.2
Social aspect	33	16.9
Access to other benefits	31	15.9
Better forest management and benefits in future	23	11.8
Learn new skills/information	19	9.7
Makes harvest of forest products more efficient	9	4.6

More secure land title	9	4.6
My duty to protect the forest	6	3.1
Better quality of forest products	4	2.1
To be respected and regarded as responsible	2	1.0
Forced by government /chiefs/neighbours	1	0.5
Higher price for forest products	1	0.5
Know forest resource better	1	0.5
Reduce conflicts over resources	1	0.5
Total	195	100.0

3.1.5.1 Attendance of FUG meetings, time spent in meetings and monetary issues related to FUG

In Mt Elgon, 91.8% of the members attended meetings; and in most cases (57.7%), it was the husbands attended the meetings suggesting domination of the males in decision making in that area (Table 10).

Table 10 Attendance of Forest User Group meetings

Attendance of FUG meetings	Frequency (n)	%
Only the husband	45	57.7
Both, but mainly the husband	16	20.5
Only the wife	9	11.5
Mainly son(s)	3	3.8
Both, but mainly the wife	2	2.6
Both participate about equally	1	1.3
Mainly daughter(s)	1	1.3
Mainly wife and daughter(s)	1	1.3
Total	78	100.0

During the last 12 months, majority of the members (51.3%) spent about 10 working days in FUG meetings which was approximately one meeting per month (Figure 11).

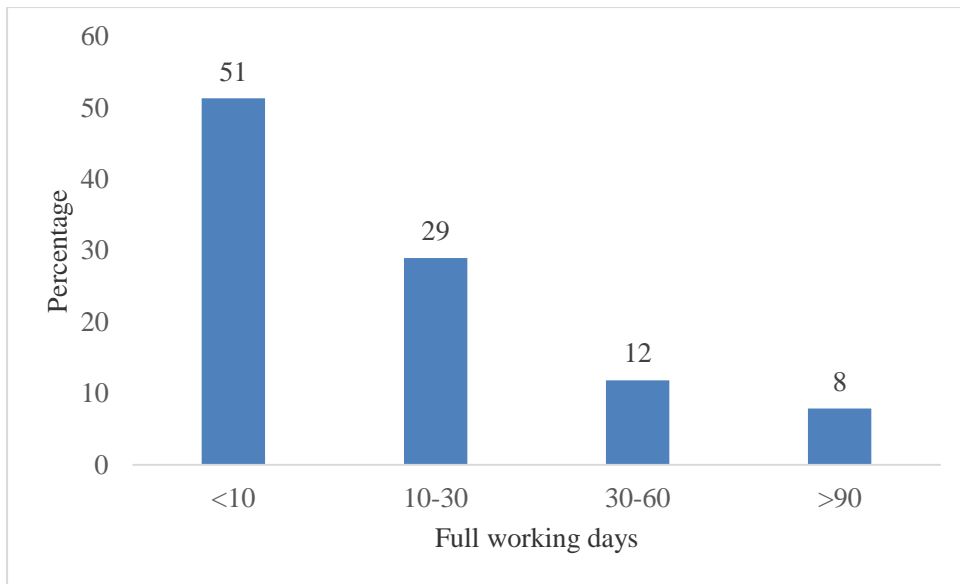


Figure 11 Number of days members of FUG spent attending meetings per annum

Majority (92.7%) of members contributed subscription fees to the FUG. The annual contribution for most of the members (78.7%) was between Ksh. 1,000 and 5,000 (Figure 12). However, majority of the households (91.4%) indicated that they had not received any cash payment from the FUGs. Those who received money got between Ksh 5,000 and 10,000 annually.

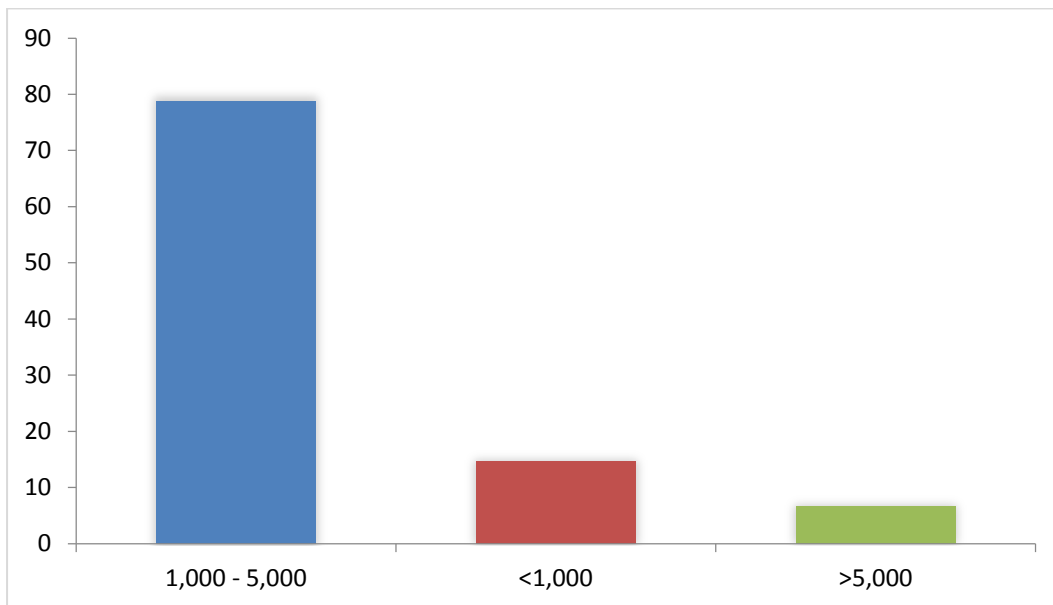


Figure 12 Subscription fee (Ksh.) to FUG per annum

The households indicated that FUGs had large (45.4%) and small (44.3%) positive effect on their livelihoods whereas, 8.6% indicated that there was no effect on their livelihoods. About 0.8 % of the households indicated that FUGs had both large and small negative effect.

3.1.6 Forest services

Majority of the households had not received forest service benefits in villages within Mt Elgon region. The households which received benefits included; timber concessions (7.3%), tree planting (3.8%) and carbon projects (1.9%) and biodiversity conservation (1.9%) (Table 11). The forest service beneficiaries were both members and non-members of forest user groups.

Table 11 Benefits from forest services

Principal purpose	Have received (%)		n
	No	Yes	
Tourism	100.0	0.0	53
Carbon projects	98.1	1.9	54
Water catchment projects	100.0	0.0	53
Biodiversity conservation	98.1	1.9	53
Tree planting	96.2	3.8	53
Timber concession	92.7	7.3	55

3.1.6.1 Forest clearing

Almost all households (97.3%) had not cleared any part of the forest in the past 12 months, indicating that they were concerned with the conservation of the forest. However, 2.7% of the population in Sikirwa village cleared a total of 4 ha of forest within 5 km from the edge of the forest, for cropping (80%) and non-agricultural purposes (20%). About 96.5% of the households had not engaged in any forest clearing over the last 5 years. However, Sikirwa and Kapchepkui villages had cleared 5.7 and 1.4 ha respectively over the past 5 years. Although most forest clearing was done for agricultural purposes, some cleared forest areas were abandoned due to unknown reasons and fear of being arrested. The villages which abandoned large areas of cleared land were Kibosit (4.0ha), Kimama East (3.2ha), and Sikirwa (2.8ha) (Figure 13).

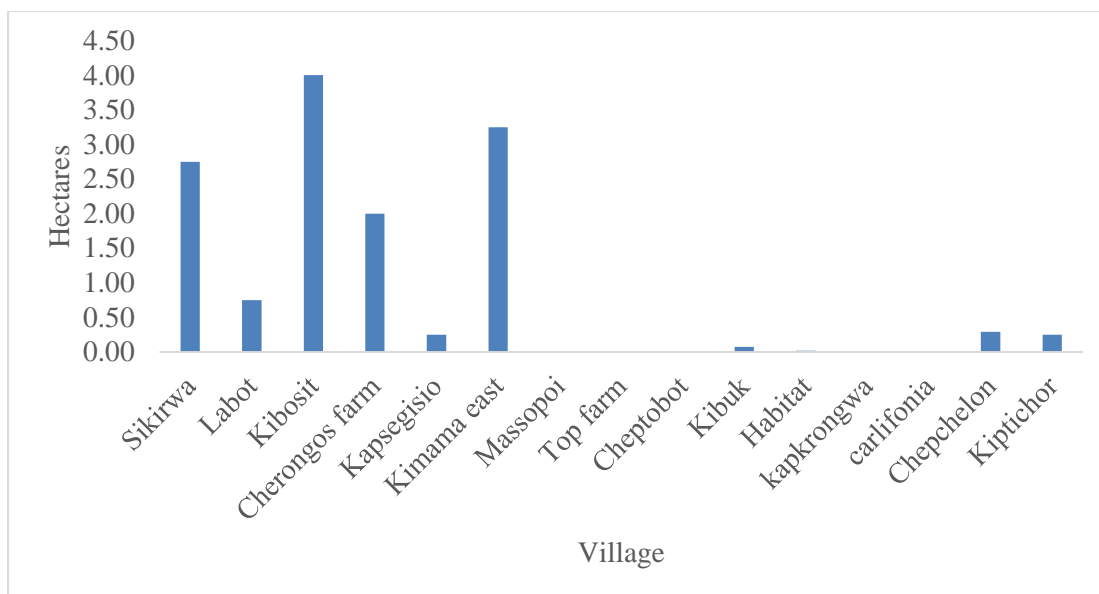


Figure 13 Land abandoned by households after forest clearing over the past 5 years

3.1.7 Infrastructure

3.1.7.1 Access to electricity and piped water

Almost all the households (95%) did not have access to electricity. The percentage of households in the villages that had access to electricity was Cherongos farm (25%), Kimama East (40%) and Musembe (25%). Similarly, most of the households (61%) had no access to piped water. The reason for villages having no piped water may be due to delay in implementing County development plans thus forcing the majority of households (76.6%) to rely water from rivers crossing the village. The mean distance travelled by households to the nearest river was 1.66 km. Households in Kimama North and Kapkures had the furthest mean distance to the nearest river at 8 km and 4 km respectively.

3.1.7.2 Access to health centre

Most households 61.0% had no access to a health centre within the village except all the households in Kibuk, Habitat, Sikirwa, and Cherubai. The mean distance travelled by household to the nearest health centre was 6.26 km. The households in Top Farm, Amani Farm and Kona Farm villages experienced more difficulties since they were very far from health facilities i.e. 25.63 km, 14.17 km and 13.57 km respectively.

3.1.7.3 Distance from the village centre to the nearest market facility

The average distance to the nearest district market was 14 km, while the average distance to market for major consumption of goods and agricultural products was 10 km. The distance to market where the forest products are sold was 9 km (Figure 14). The fact that markets for different products exist imply that trade in different products can readily be improved in the region.

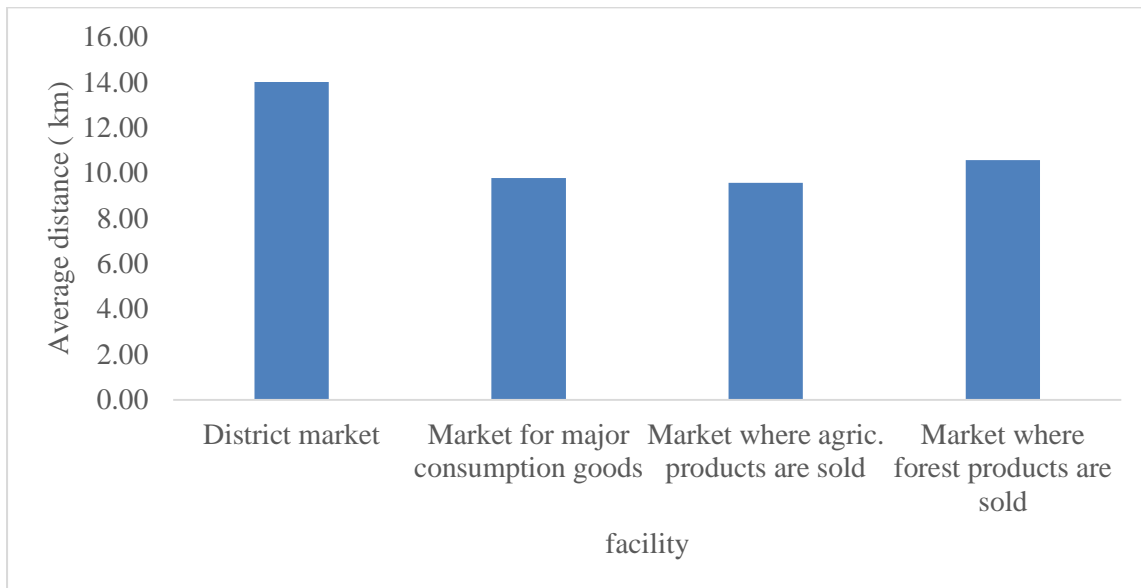


Figure 14 Distance from village center to the nearest market for different products

3.1.7.4 Mode of transport used to the markets

Motor cycles were the most preferred mode of transport to all the markets. Other major modes of transport included; use of public/private vehicles and walking. Donkeys and donkey carts were also used for transport, but for short distances. On a limited scale, bicycles were used to transport products to the district markets (Figure 15).

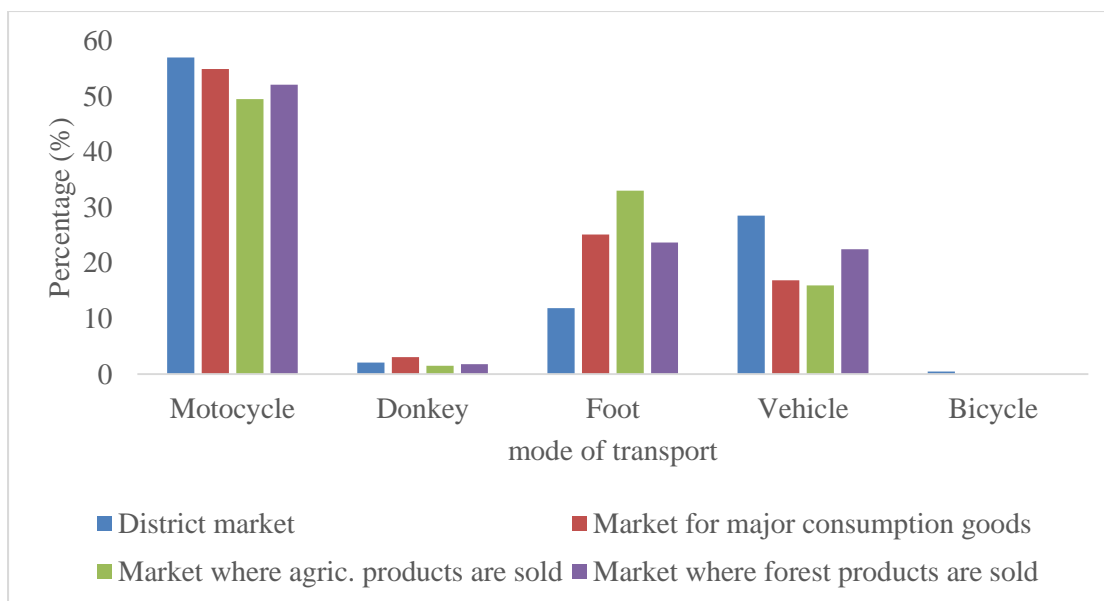


Figure 15 Mode of transport to nearest markets

3.1.8 Crisis and unexpected expenditures

3.1.8.1 Severity of events

During the last 12 months; households that had not experienced any crisis were 67.4%, those who experienced severe crisis (17.8%) while 14.8% had experienced moderate crisis. The severe crises faced were on difficulty in paying school fees (81.8%), serious crop failure (47.7%) and serious illnesses in the family (44.5%). The moderate crises were mentioned as financial constraints (42.9%), livestock loss (38.2%), serious illness in family (33.6%) and serious crop failure (36.3%).

3.1.8.2 Coping strategy

The coping strategies adopted by the households included selling of assets (22.2%) and doing casual labour work (18.6%); the least mentioned coping strategies was reducing household spending and borrowing against future earnings(0.2%) and acquiring loans (0.9%).

3.1.8.3 Welfare perceptions and social capital

3.1.8.3.1 Household satisfaction with life over the past 12 months

During the last 12 months, the households that were not satisfied with their life were 38.7% while 4% were very satisfied with their life (Figure 16).

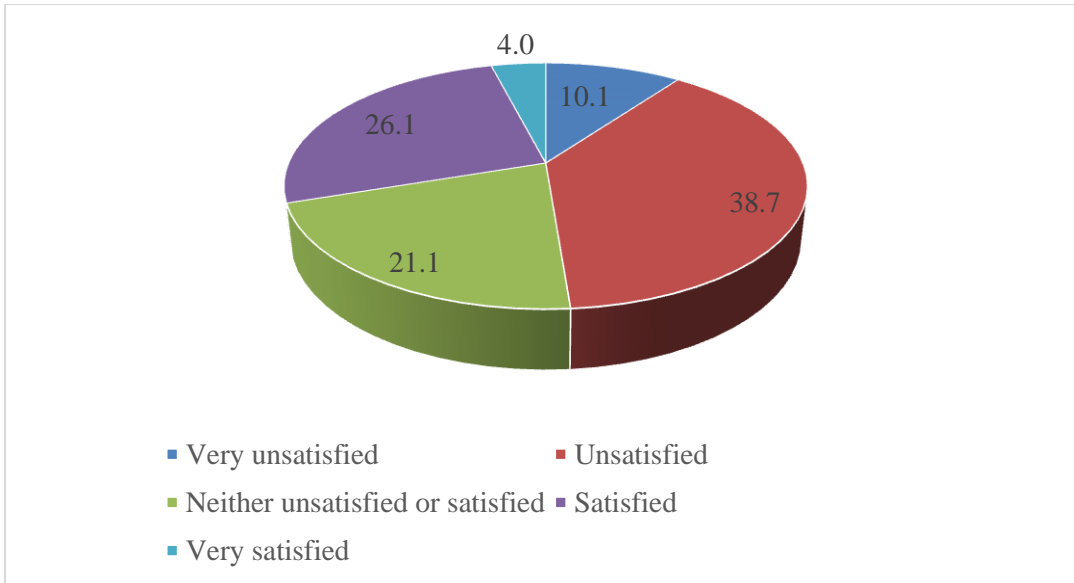


Figure 16 Household satisfaction with life over the past 12 months

3.1.8.4 Sufficiency of food production and income over the past 12 months

About 53% of the households' had relatively sufficient food production and income; for 33.5%, food production and income was not sufficient while for 13.5% of the households; food production and income was sufficient to cover the households needs (Figure 17)..

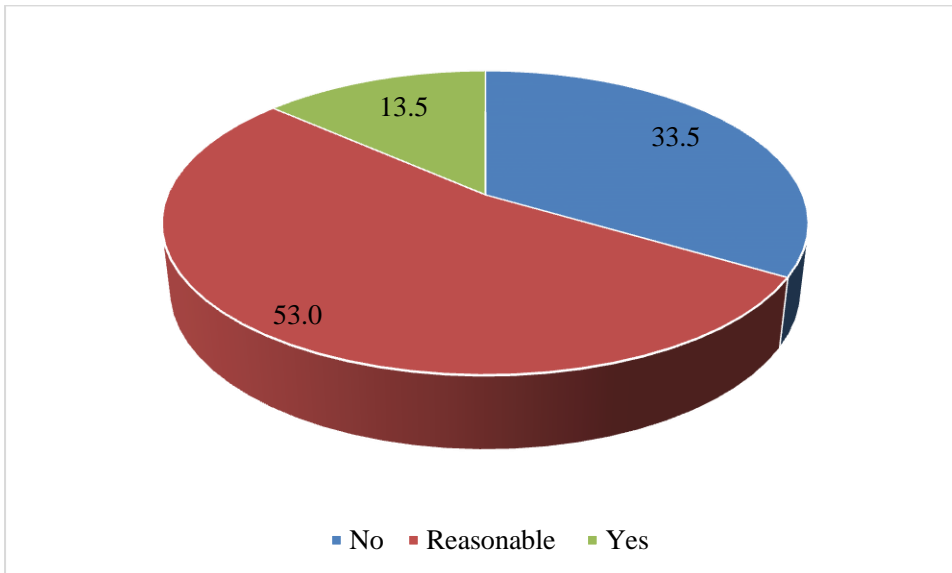


Figure 17 Household food sufficiency in households within Mt Elgon.

3.1.8.5 Household wellbeing compared to other households now and 5 years ago

When the current households level of well-being was compared to 5 years ago; 66% of the households stated that there was no change in their well-being, 19% stated they were worse off, while 15% mentioned they were better off. The villages where households stated that they were currently worse off were Cherongos Farm (75%), Chepkoyaa (66.7%) and Cherubai villages (87.1%) whereas in Kapsegisio, 66.7% of households perceived that they were better off. The main reasons households attributed to being less well-off now compared to five years ago included low prices of agricultural produce (64.3%), increased cost of living (95.5%), illness (87.5%), and increase in school fees for dependents reported by 61.5%. Contrary to the above, the major reasons for being better-off now than 5 years ago included; improved land holdings (77.3%), gain of material assets such as housing (90%), and better education and increase in knowledge attributed to 38.5% of the households.

3.1.8.6 Household perception on the suitability of the village as a place to live in

Majority of the households (78%) considered their village as a good place to live in; partly a good to live in (12%) and (10%) as a place not good for the household to live in. In, Chesekei village, 50% of the household indicated that they were not happy to stay in their village while in Kongit and Kapchepkui villages, 50% of the households were partly happy to live in their villages. The households who considered the village as a good place to live in owned on average 2.2 acres of land; while those who considered it as partly good to live in owned on average 0.8 acres. Those who did not consider it a good place to live in owned on average 0.8 acres.

The households who did not consider the village as a good place to live, lived at an average of 2.2 km from the edge of the forest; those who considered the village as partly good lived on average 2.3 km from the forest edge while those who lived at an average of 1.8 km from the forest edge considered the village a good place to live in.

3.2 Village analysis

This section presents results on the social, economic and demographic status in the Mt.Elgon ecosystem at village level.

3.2.1 Demographics

The average household size in the sampled villages was 6. Out of the existing population (2477) in the sampled villages, an average of 4.5% people had moved in and 1.8% had left the village in the previous 10 years, implying many people were settling in than those leaving the villages (Table 12).

Table 12 Population dynamics

Statistics	Number of households in the village	Current population of the village	Number of persons living in the village that moved in the previous 10 years	Number of persons who had left the village in the previous 10 years
N	30	29	30	30
Mean	394	2477	112	44
Std. Deviation	520	2728	196	93
Minimum	40	300	0	0
Maximum	2000	10000	1000	400

3.2.2 Forest resource base

The five most important products from Mt Elgon ecosystem were: food from the forest (28.1%) firewood (24.7%) and grazing (19.1%). Others were medicinal plants and withies (fito) (Figure 18). Food was derived from the forest through the PELIS program, which is implemented through the Community Forest Association and Kenya Forest Service.

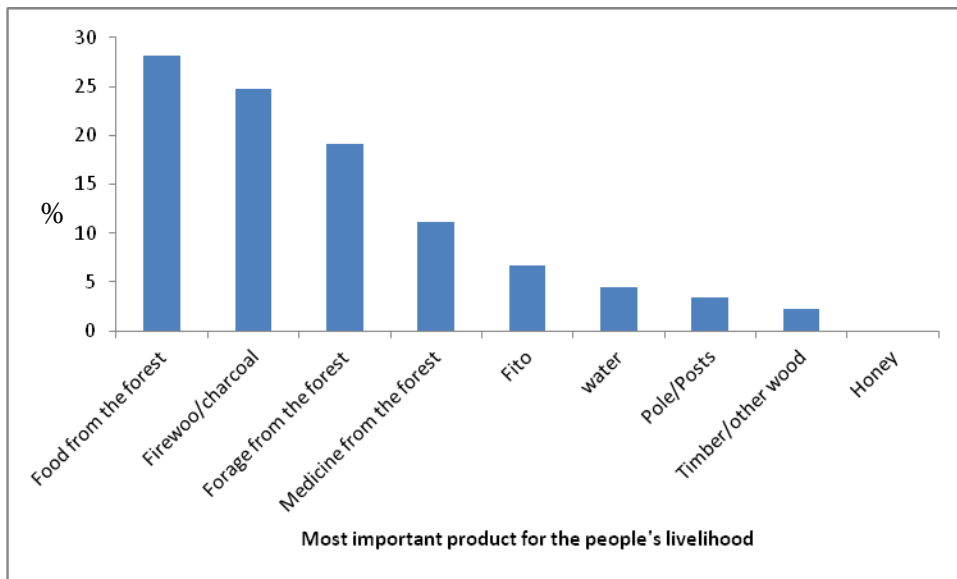


Figure 18 Most important products derived from Mt. Elgon Ecosystem

Most respondents indicated that the availability of the following products had decreased in the last 5 years: Posts/poles (85.7%), firewood (75.8%) and water (66.7%) whereas the availability of food had increased (66.7%) (Table 13). The reasons for decline of firewood were; reduced forest area due to small scale forest clearing (24.1%) and the local people collecting more due to population increase (Table 14). In cases where food decline was reported, climate change, charcoal production and purchase of more land were the reasons for decline. Forage from the forest declined due to both small scale and large scale reduction of forest area.

Table 13 Dynamics of most important forest products in the last 5 years

Most important product for the people's livelihood	Change in the availability (%)			N
	Declined	About the same	Increased	
Firewood/charcoal	75.8	3.0	21.2	33
Food from the forest	24.2	9.1	66.7	33
Forage from the forest	50.0	5.0	45.0	20
posts/poles	85.7	0.0	14.3	14
Medicine from the forest	41.7	41.7	16.7	12
Timber/other wood	50.0	0.0	50.0	6
Fito	20.0	40.0	40.0	5
Water	66.7	33.3	0.0	3

The main reason for increase in food from the forest was due increase in access rights (Table 15) to the forest for non-residential cultivation (PELIS).

Table 14 Reasons for decline of most important forest product

Reasons for change (decline)	Most important product for the people's livelihood (%)		
	Firewood/charcoal	Food from the forest	Forage from the forest
Reduced forest area-small scale clearing.	24.1	0.0	50.0
Reduced forest area-large scale projects	17.2	11.1	25.0
Reduced forest area-people from outside buying land	3.4	22.2	0.0
More local (village) collecting more	20.7	11.1	0.0
More people from other villages collecting more	10.3	0.0	0.0
Climatic changes	10.3	22.2	12.5
Timber harvesting	6.9	0.0	0.0
Charcoal production	0.0	22.2	0.0
increased population	6.9	11.1	12.5
N	29	9	8

Table 15 Reasons for increase of most important forest product

reasons for change (increase)	Most important product for the people's livelihood (%)		
	Firewood/charcoal	Food from the forest	Forage from the forest
Less clearing of forests for agriculture	0.0	0.0	16.7
Fewer local (village) people collecting less	0.0	0.0	33.3
Climatic changes, e.g., more rainfall	0.0	17.6	16.7
Tree planting	66.7	5.9	0.0
Improved access rights to products	33.3	76.5	16.7
More secondary forest	0.0	0.0	16.7
N	3	17	6

3.2.2.1 Forest management practices by villages

Certain forest management practices were undertaken at the village level. Protecting forest areas for environmental services was most practiced (32.1%) while protecting desired trees in forest was the second most important activity (21.4%). Mapping of forest resource was none existent practice in Mt. Elgon ecosystem (Figure 19).

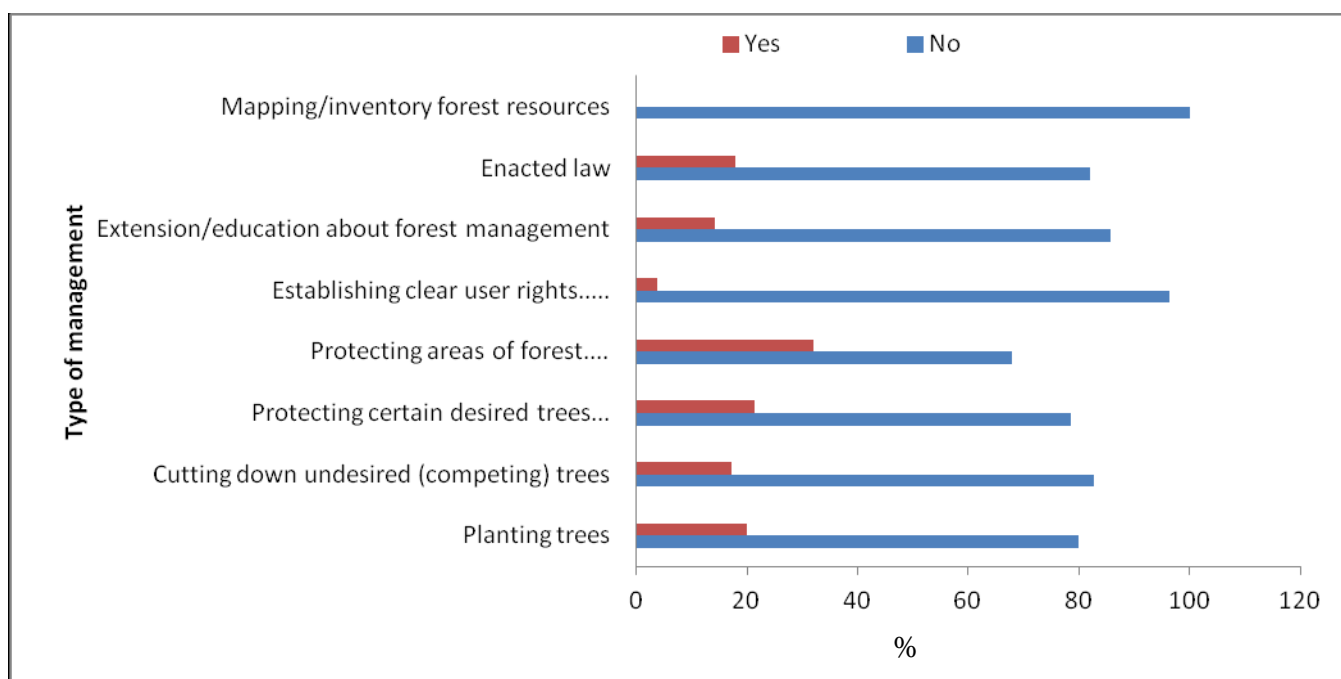


Figure 19 Percentage of villages engaged in respective forest management practices

3.2.3 Institutions involved in forest management

The study revealed that the forest blocks adjacent to the villages were all managed by the state-through KFS together with the CFAs.

There were clear customary rules regulating the use of various forest products (Table 16). KFS/CFA had clear rules for extraction of various products. However, there were no rules regulating harvesting of small poles/posts

Table 16 Existence of customary rules

Most important product for the people's livelihood	% of villages with customary rules regulating the use of various forest products			N
	None, very few	Yes, but vague/unclear	Yes, clear rules exist	
Food from the forest	41.7	4.2	54.2	24
Firewood/charcoal	50.0	15.0	35.0	20
Forage from the forest	37.5	0.0	62.5	16
Medicine from the forest	0.0	20.0	80.0	10
Fito/withes	66.7	0.0	33.3	6
water	25.0	0.0	75.0	4
Pole/Posts	100.0	0.0	0.0	3

Timber/other wood	50.0	50.0	0.0	2
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3.2.3.1 Forest User Groups

The study found twenty seven forest user groups in the villages interviewed. Most of the groups had been formed through government initiatives, while some emerged from local initiatives and two from influence of Non-governmental Organizations (NGO) as shown in (Table 17).

Table 17 Formation of forest user groups

Forest User Group	How the group was formed (%)			n
	Local initiative	Initiative from NGO	Initiative from government	
Bee keeping	33.3	0	66.7	6
Firewood	16.7	0	83.3	6
Fodder	0	0	100	1
Grazers	0	0	100	5
Grazing	0	0	100	5
Jerusalem	100	0	0	1
PELIS	0	10.5	89.5	19
Sinen Borowo	100	0	0	1
Honey CBU				
Sinen Central	100	0	0	1
Tree nurseries	100	0	0	1
Water	0	0	100	1
N	7	2	38	47

The FUGs were established to protect a specified area of the forest and to derive benefits from certain products such as honey and fodder (Figure 20). Being a member of PELIS was the most popular FUG in the ecosystem, which was reported to be most effective (100%), followed by Grazing user group, (80%) as shown in (Table 18).

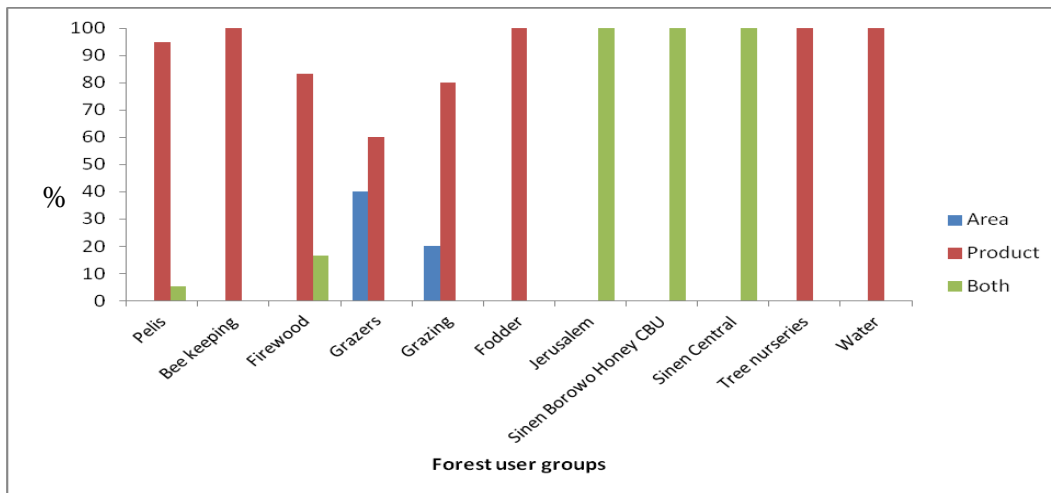


Figure 20 Purpose of forest user groups

Table 18 Effectiveness of forest user groups

Name of user group	% Effectiveness of Forest user Group in ensuring sustainable and equitable forest use		N	Mean score
	Most effective ³	effective ²		
Bee keeping	100.0	0.0	6	3
Firewood	100.0	0.0	4	3
Fodder	100.0	0.0	1	3
Grazers	66.7	33.3	3	3
Grazing	80.0	20.0	5	3
Jerusalem	100.0	0.0	1	3
Pelis	100.0	0.0	19	3
Sinen Borowo Honey CBU	100.0	0.0	1	3
Sinen Central	100.0	0.0	1	3
Tree nurseries	0.0	100.0	1	2
Water	100.0	0.0	1	3

The study found out that FUGs had certain rules and regulations that imposed penalties on law breakers. Of the FUGs recorded 51.7% of them chose to exclude offenders while 48.3% charge a specified fee to the offenders (Figure 21).

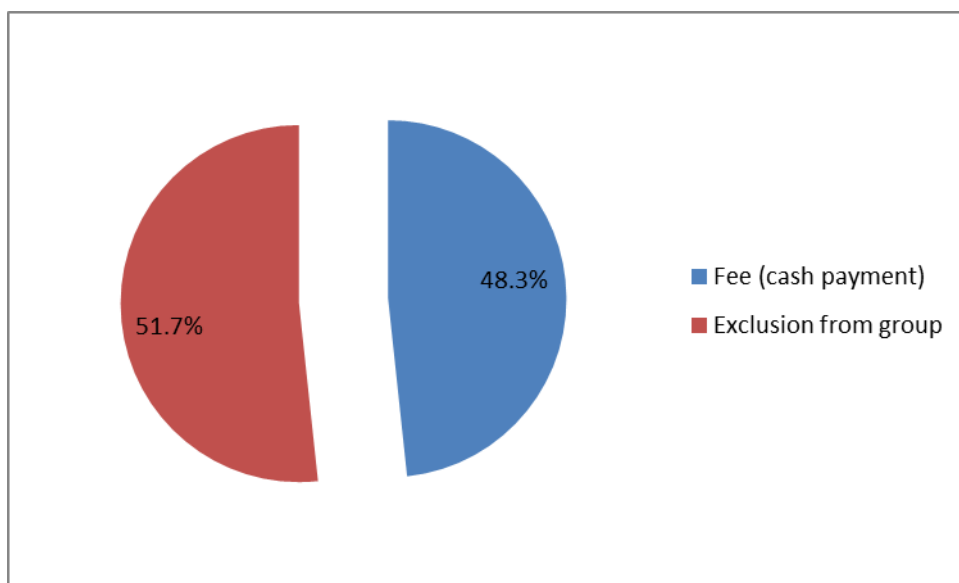


Figure 21 Penalties imposed on law breakers

3.2.4 Infrastructure

3.2.4.1 Number of households with access to electricity, piped water and formal credit

The village with the highest number of households having access to electricity was Nabiswa. However, Nabeki Lower, Cherubai and Musembe villages had no access to electricity, piped water or formal credit facility. Kipyeto is the only village sampled that all the households had access to formal credit facilities (100%). Out of 394 households, 43.7% had access to formal credit. Majority of households (56.4%), however, within the sampled villages had no access to formal credit facilities (Table 19). In Mt. Elgon; Nabiswa, Wanguhu, Kipyeto, Nasianda and Cheptumbelio villages did not have formal credit institutions present within their villages.

Table 19 Access to formal credit facilities

Statistics	Number of households with access to formal credit
N	10
Mean	172
Std. Deviation	143
Minimum	50
Maximum	520

3.2.4.2 Presence of a health centre, useable road, and river navigable during all seasons

Most of the villages did not have a health centre within the village except Nabiswa, Kongit, Kaboiwo, Habitat, Nabeki lower, Kona farm, Nasianda and Bugaa villages. Most of the villages sampled in Mt. Elgon did not have all weather roads except Tall tree, Nabiswa, Kaboiwo, Habitat and Kona farm villages. Musembe village was furthest (15km) to a useable (all weather road) whereas those closest to a useable road were Habitat, Takwei and Kapchepkui villages at 1km. Most of the villages sampled in Mt. Elgon had a river within its boundaries that was navigable all seasons apart from Kambi Waya, Kona Farm, Cherubai and Kapchepkui villages.

3.3 Utilization of public areas

This section presents results collected on the utilization of public areas which include gazetted forests, community lands and other public areas within the Mt.Elgon ecosystem.

3.3.1 Description of public areas

The land size of gazetted forest in Mount Elgon forest ecosystem was 32,034 acres, owned and managed by state. All public areas were under the state custody except communal land (Table 20).

Table 20 Mean land size of types of public areas and ownership status

Type of public area	Land size(Ha)	Ownership (%)			N
		State	Individual	Community	
Gazetted forest	32034	100	0	0	23
Communal land	2	0	0	100	2
Market	10.2	100	0	0	12
Schools	20.8	88	4	8	25

Establishment of the public areas; gazetted forests and market centers were by *de jure* rights (by rights as established by law). Public schools were also established under legal rights, except a few cases under *de facto* rights (as exists, not necessarily by legal establishment) as shown in (Table 21).

Table 21 Legal status of public areas

Type of public area	Legal status(%)		N
	De jure	De facto	
Gazetted forest	100	0	29
Market	100	0	11
Schools	96	4	24

3.3.2 Important direct uses of public areas

Gazetted forests were mostly used as sources of firewood/deadwood (25.9%), food (18.8%) and animal feeds (15.2%) by villages. Communal land was utilized as preaching grounds; market centers served as trading grounds as well as holding barazas and as venues community enlightenment. Schools offered employment opportunities, education and church halls (Table 22).

Table 22 Most important direct uses to these public areas

	Type of public area (%)					n
	Gazetted forest	Communal land	Market	Schools	Playing ground	
Firewood/dead logs	100	0	0	0	0	29
Education	0	0	0	100	0	23
Employment	0	0	0	100	0	23
Food	100	0	0	0	0	21
Grazing	100	0	0	0	0	17
Meeting/baraza	0	0	6.7	93.3	0	15
Selling points	0	0	100	0	0	12
Buying points	0	0	100	0	0	12
Water sources	100	0	0	0	0	9
Poles/posts	100	0	0	0	0	9
Medicinal	100	0	0	0	0	9
Information	0	0	100	0	0	7
Fodder/forage	100	0	0	0	0	6
PELIS	100	0	0	0	0	6
Withies	100	0	0	0	0	5
Church hall	0	0	0	100	0	5
Honey source	100	0	0	0	0	1
Preaching	0	100	0	0	0	1
Exercise	0	0	0	0	100.0	1
n	112	1	32	65	1	211

3.3.3 Most Important indirect uses to public areas

All respondents indicated that the indirect benefits from the forest were derived from gazetted forests. The most important indirect benefits were soil fertility improvement and water catchment (Figure 22).

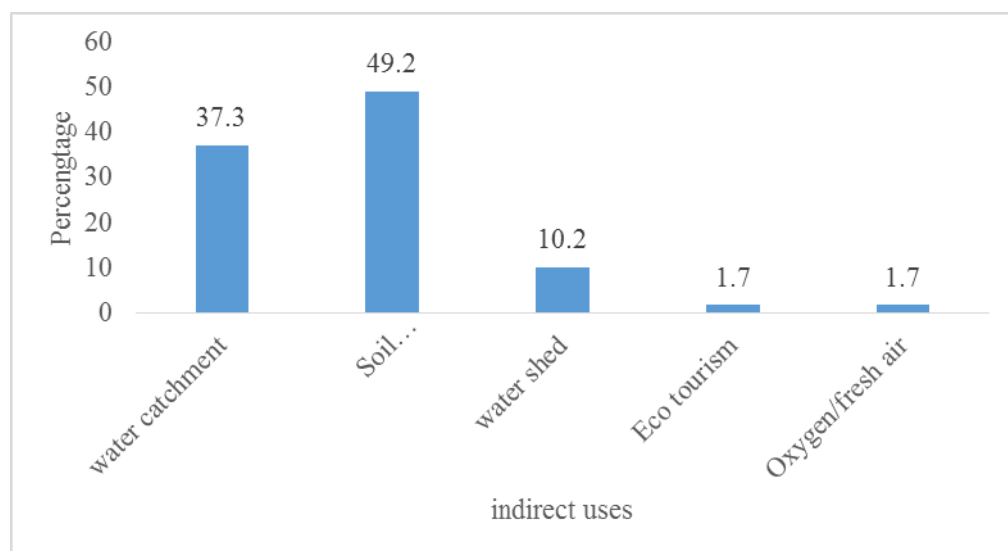


Figure 22 Indirect uses to the public areas

3.3.4 Technology to access tangible products

Different tangible products from public areas were accessed using different technologies (Table 23).

Table 23 Technologies for accessing tangible products

Type of public area	Tangible products	Technology (%)								N
		Animal/crop husbandry	fertilizer/pesticides	Bee hives	Piped water	Mpesa	Mbanking	electricity	Public addresses	
Gazetted forest	Food	94	6	0	0	0	0	0	0	16
	Honey	0	0	100	0	0	0	0	0	4
	Water	0	0	0	100	0	0	0	0	4
	Buying	100	0	0	0	0	0	0	0	1
Market	Selling	100	0	0	0	0	0	0	0	2
	Buying	0	0	0	0	88	13	0	0	8
	Selling	0	0	0	0	80	20	0	0	5
Schools	Light	0	0	0	0	0	0	100	0	1
	Grazing	100	0	0	0	0	0	0	0	1
	Light*	0	0	0	0	0	0	100	0	8
	Church hall	0	0	0	0	0	0	0	100	1

Light*- cannot be perceived by the sense of touch

3.3.5 Economic benefits (subsistence and commercial)

The main products of economic value derived from public areas were fuelwood, maize, beans and posts for both subsistence and commercial uses, whereas fodder was mainly for subsistence (Table 24).

Table 24 Products accessed from public areas

Product	(%) villages for respective use			N
	Subsistence	Commercial	Both subsistence and commercial	
Firewood	4	0	96	25
Maize	0	0	100	19
Beans	0	0	100	14
Foliage/fodder	92	0	8	12
Posts	46	0	55	11

Potatoes	0	0	100	9
Honey	13	0	88	8
medicinal products	50	0	50	8
Vegetables	0	0	100	7
Withies	50	17	33	6
Finger millet	0	0	100	2
timber	0	0	100	1

3.3.6 Rules governing access to public areas

All the villages indicated that there were rules that govern access and use of public areas. The rules governing access to gazetted forests were mainly set by Kenya Forest Service (KFS) and Community Forest Associations (CFA). Markets rules were set by the community/county government, whereas playing grounds and schools rules were set by the government (Figure 23).

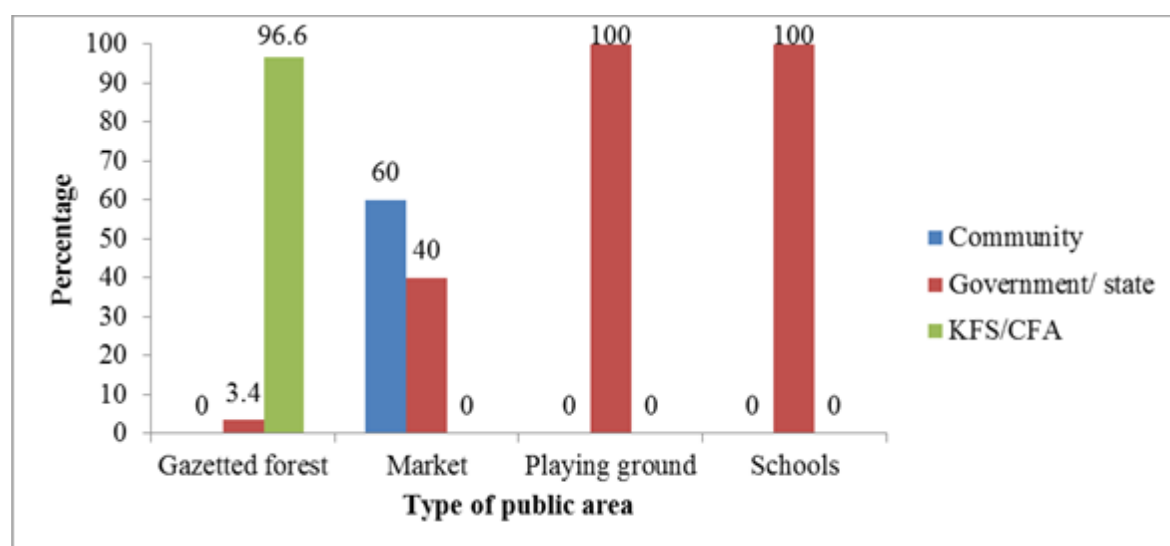


Figure 23 Type of public area and institutions setting

3.3.6.1 Restrictions on accessing, harvesting or selling tangible products from gazetted forests and communal land

Most of the villages (95.5%) indicated that there were restrictions to access, harvest, process or sell tangible products from gazetted forests. To access the products, permits issued by KFS was required. Monthly permits are required for harvesting/collection of fuelwood, fodder and posts. Cultivation through PELIS required an annual permit (Table 25).

Table 25 Permits to access tangible products from gazetted forests

Product	Restriction (%)				N
	Annual permit	Monthly permit	Harvesting as needed	Pay royalties	
PELIS	100.0	0.0	0.0	0.0	26
firewood	0.0	95.7	0.0	4.3	23
Foliage/fodder	0.0	100.0	0.0	0.0	8
Posts	0.0	100.0	0.0	0.0	7
Withies	0.0	25.0	75.0	0.0	4

3.3.6.2 Penalties

The villages were aware of different penalties imposed on users who broke the rules in accessing tangible forest products in public areas. These included; fines, exclusion from groups and court prosecution among others, (Figure 24).

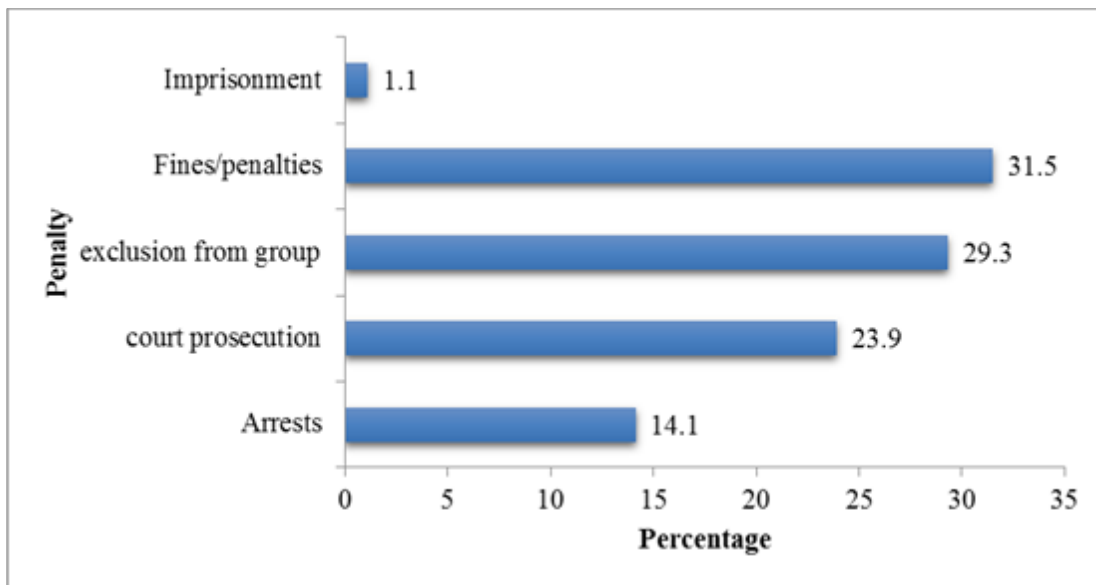


Figure 24 Awareness of penalties imposed on users who broke rules on access to public areas

3.3.6.3 Change in availability of tangible products

Products whose availability had decreased in the past 15 years from gazetted forests included; firewood and posts, whereas water availability increased (Table 26).

Table 26 Change in availability of tangible products

Product	% of villages reporting respective change in availability of tangible products from gazetted forest			Frequency (n)
	Increased	Declined	Remained the same	
Firewood	23.1	76.9	0	26
Water	71.4	21.4	7.1	14
Foliage/fodder	46.2	46.2	7.7	13
Maize	50	50	0	12
Posts	11.1	77.8	11.1	9
Medicinal products	0	33.3	66.7	6
Withies	0	100	0	3
Potatoes	0	0	100	2
Honey	50	50	0	2

3.3.6.4 Reasons for changes

The main reasons given by villages for increase in tangible products from gazetted forests were; food production was allocation of more land for PELIS, and honey production increased due to introduction of improved technology i.e. modern bee hives and efficient honey harvesting techniques. Those who reported a decline in availability of respective products attributed it to; increased cutting down of trees for medicinal products, honey and posts, over harvesting of juvenile trees for posts and population increase leading to overexploitation of fuel wood and withies.

3.4 Conclusion

The survey in Mt. Elgon looked at the overall socio-economic status of the households living adjacent to the ecosystem. The area is dominated by farmers who plant maize, beans and potatoes as the main crop for commercial and subsistence purposes. Results show that the households were mainly male headed, majority living in their own houses (mainly made of mud walls). Land ownership in the area was mainly private and majority owned 1.1 ha. However, due to land sub-division for agriculture, housing and grazing, most households

perceived the land not to be sufficient for agricultural production, hence substituting agricultural income through monitored and unmonitored forest based income.

The education levels were characterized by low transition of male and female household heads attaining secondary and tertiary education from primary level. This is attributed to few education facilities and poverty.

Overall, the availability of important forest products have declined due to increased access. Although both customary and National forest laws (Forest Conservation and Management Act 2016) exist, the illegal forest activities still occur.

While participation in forest conservation through CFAs membership has been encouraged through PFM, membership is low. However, PELIS and grazing groups were the most preferred.

The sources of income are highly varied (formal and informal employment), the living standards were low, based on household savings, asset ownership, type of housing. Further to this, some households considered the village not to be a good place to live in due to lack of infrastructure such as access to all-weather roads, electricity, health center, piped water, financial institutions and markets.

The main public areas within the ecosystem were gazetted forests, communal land, markets and schools. These areas were either owned communally or by the state. The gazetted forests provided indirect benefits such as water catchment and soil fertility improvement. These forests need to be conserved because most of the livelihood of the communities is derived from there. In terms of the forest resource base, the most important products from the ecosystem were food, firewood and grazing as well as medicinal plants and withies. KFS, County government and communities need to work together towards the conservation of the ecosystem as it is a very important resource to the adjacent communities and the country.

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