

## **Traditional Controls of Harvesting and Conserving Medicinal Plants in Keiyo South Sub-County, Kenya**

**Kurui C. Monica (Dr.)**

Department of Applied Environmental Social Science  
University of Eldoret  
P.O. Box 33-30107  
Moi University, Kenya

**Kiptui Mark (Dr.)**

Department of Applied Environmental Social Science  
University of Eldoret  
P.O. BOX 1125-30100  
Eldoret, Kenya

**Chelang'a James Kiprop (Dr.)**

Department of Natural Resources  
P.O. Box 33-30107  
Moi University, Kenya

**Omondi Paul (Prof.)**

Department of Geography  
Moi University  
P.O. Box 3900-30100  
Eldoret, Kenya

### **Abstract**

*This study investigated the traditional measures of harvesting and conservation of medicinal plants in Keiyo South Sub-County in Kenya. Garret Hardin's Tragedy of the Commons theory guided the study. Primary data was collected from 171 respondents comprising 120 household heads, 33 traditional herbalists, 15 herb vendors, and 3 Kenya Forest Service staff using a semi-structured interview schedule, observations and photograph. Secondary data was collected from books, journals and theses after which all data were analyzed qualitatively. Descriptive statistics were used to highlight some characteristics of the respondents. The study found that traditional measures of harvesting and conservation of medicinal plants include restricted gathering by mature people and herbalists guided by social controls and taboos. The study recommends that the community and government should protect traditional sacred sites and establish a research institute to support sustainable harvesting and conservation of medicinal plants.*

**Key words:** Traditional, harvesting, medicinal plants, herbs, conservation, environment

### **1. Background to the study**

Since time immemorial, all communities have conserved their local medicinal plants using measures that restricted the amount harvested at a time, control on the harvesters and use of taboos to regulate the harvest of plants. This ensured that their health care needs were protected through all generations. The growing demand for traditional medicines has also seen the international awareness about the declining medicinal plants globally as a result of over harvesting for commercial purposes, destructive harvesting practices, loss of habitat due to deforestation and agricultural practices (Roberson 2008). Research indicates the western world is now seeking plant based medicines away from synthetic chemical based medicines with minimum harmful effects on human health (Pamplona-Roger, 2013).

This has led to increased commercial exploitation of medicinal plants from the wild to meet the rising demand and this has contributed to the over-exploitation of useful species and use of destructive harvesting methods leading to decline in medicinal plants (Cunningham, 1993; Hamilton, 2004).

Consequently, there is a global concern on loss of plants and the urgent need to conserve traditional medicinal plants that can be used in the development of modern plant based pharmaceuticals. Further, research indicates that the challenges to conservation of medicinal plants and shrubs in Eastern Africa include increased population that has led to higher demand for traditional medicine in rural and urban areas; loss of habitat due to human settlements and clearing of vegetation for agriculture. The decline in the natural habitat has led to over harvesting of the available medicinal plants to meet the increasing local demand and for sale to the urban population (Owuor, *et al* 2006). African communities have a history of conserving the bio-diversity in medicinal plants which reflect traditional practices surrounding their use, local knowledge, and wisdom. Herbalists have preserved traditional knowledge and practices of herbal medicine used to prevent and treat common ailments as secrets within families (Hamilton, 2004). However, most traditional medical knowledge is still transferred orally in many communities and this has contributed to loss of some important uses of some medicinal plants. Traditional medicine in Africa was the only source of health care before the introduction of western medicine by missionaries and colonialists in the 19<sup>th</sup> century. During colonization in Africa, local people were encouraged to use western medicines to treat their ailments as part of the colonization mission.

Missionaries discouraged African Christian converts from using traditional medicines as the Christian Church associated traditional medicine with witchcraft and animism. This led to secretive use of traditional medicines generally in rural areas especially with the enactment in colonial Kenya of the Witchcraft Act Cap 67 of 1925 (Bussmann *et al*, 2006). The new law restricted the use of traditional medicine by imposing a penalty of imprisonment in Kenya. After independence, the Kenya medical practitioners, like in other African countries trained by the colonialists, continued to discourage the use of traditional medicine. A study by Mukiyama (2005) noted that in Kenya specific steps were taken to ensure that from policy perspective, traditional medicine became marginalized. In 1978, however, the World Health Organization (WHO) encouraged member countries to use traditional systems of medicine for primary health care. The Alma Ata Declaration of 1978 therefore recognized traditional medicine as one of the ways of achieving total health care (Owuor, *et al* 2006; Addeh-Mensa, 1992).

As a result of the general acceptance of traditional medicine, local communities have increased their use. With increased population and urbanization, traditional medicinal plant parts are now sold in the urban areas to meet the needs of the urban population. This has motivated traditional medical practitioners to move to urban areas to provide these services. The medicinal plant species sold in the urban areas are harvested in the wild and this has led to over harvesting and this has threatened some plant species with extinction (Cunningham, 1993 and Bodeker, 2005). The commoditization of traditional medicinal plants led to destructive harvesting of medicinal plants and unsustainable collection of required parts.

Before the influence of western culture in Kenya, natural resources were protected using cultural controls and regulations guided by community elders in various community settings. The change in economic activities has impacted on the ways of harvesting and the amount which may lead to extinction of certain plant species before documentation of the uses and conservation measures are put in place. This study therefore investigated the current traditional conservation measures of medicinal plants by the Keiyo in Keiyo South Sub-County. This will add to the knowledge on traditional measures of conservation of medicinal plants and will further help in the development of policies on cultural ways resource conservation. These issues are addressed in the study objectives. The general objective of the study was to assess the conservation of traditional medicinal plants used by the Keiyo people of Kenya. The specific objective was to establish the traditional measures employed to conserve medicinal plants in Keiyo South Sub County in Kenya.

## **2. Review of Literature**

This chapter reviews literature on traditional conservation of medicinal plants and was guided by the study objective. Specifically, it examines the customary conservation measures adopted for sustainable use of medicinal plants.

### **2.1 Traditional Conservation of Medicinal Plants**

Over time, the use of herbal medicines has been on the increase because of the belief that herbal remedies are safe, cheap, and affordable to the local communities in developing countries.

While interacting with the environment, local people have accumulated important traditional knowledge on medicinal plants regarding their use. The demand for medicinal plants has also been increasing because of increased use and economic value of some plants. Past studies have shown that almost one third of medicinal plant species could become extinct, in China, India, Kenya, Nepal, Tanzania, Uganda (Hamilton, 2004; Njoroge *et al*, 2010). This is because medicinal plants are widely used by every community in Africa to treat ailments leading to increased exploitation. Traditionally sustainable use of medicinal plants was regulated by management practices such as taboos, seasonal and social restrictions on harvesting of medicinal plants which served to limit medicinal plant harvesting. Wooden tools such as pointed sticks were used to harvest before metal tools were widely used helped to regulate quantity of bark or roots collected at ago (Cunningham 1993). This in turn minimized the damage on the whole plant or the parts targeted for extraction. Cunningham (1993) shows that other factors that limited pressure on species from being over- exploited include:

- a) Use of taboos in South Africa and Swaziland which restricted menstruating women from collecting medicinal plants. This was believed would avoid reduction in the healing power of the medicine.
- b) Women in South Africa tended to practice as diviners while men practiced as herbalists, which limited the number of resource users.
- c) Traditional control of tools used to remove barks of some plants to wooden sticks and not metal implements.

A study by Mavi and Shava (1997) in Zimbabwe revealed that traditional methods of collecting medicinal plants used by herbalists ensured that plants were harvested in a sustainable manner using the following guidelines:

- i). Restricted removal of the bark of a tree for medicinal purposes from the east and west facing parts of the trunk. The north and south facing sides were believed to be ineffective for curative purposes.
- ii). Collection of roots for medicinal use was done sparingly so that some roots remained to ensure the plant does not die otherwise it was believed that the patient would also die.
- iii). Taboos to regulate over-harvesting were used so that a plant which had already been collected from or that showed signs of having been collected from by another traditional healer was prohibited.

The foregoing among other methods of plant protection ensured that the environment and medicinal plants found therein was conserved. Despite this, some of these cultures have ceased due to migration of people and urbanization which have resulted in erosion of local people's knowledge of their traditional beliefs and practices. The pressure exerted on medicinal plant resources has however, remained low in remote areas and in countries where commercial trade in traditional medicines has not developed due to the small number and size of urban centres (Dold and Cocks, 2002). In Tanzania trade in herbal medicine and deforestation are the major factors threatening medicinal plants. The important role that medicinal plants play in people's health together with the increasing threat of extinction facing them requires immediate conservation measures. Therefore, the revival of traditional management practices based on cultural norms and religious beliefs is the basis for sustainable use and conservation of biodiversity.

According to Msuya and Kideghesho (2009), the social organization that controlled access to resources within the community, coupled with customary norms and procedures for control, acquisition, maintenance, transfer of resources and traditional utilization were key features used in the traditional natural resources and management practices. Traditional practices are additional management conservation strategies that can complement contemporary conservation and sustainable utilization of natural resources.

Similarly, in Kenya, traditional herbalists' collected herbal medicine guided by taboos and this protected the plants from over harvesting. They had a way of living with the rich biodiversity without destroying it, but using it in a protective way. They knew plant propagation, growth, and potential for plants which the present generation knows very little about, leading to destructive harvesting of vulnerable medicinal plants. In addition, traditional knowledge about biodiversity is inadequately protected and information is lost as traditional healers die without revealing their knowledge (Owuor *et al*, 2006). Literature reviewed showed traditional conservation measures of medicinal plants have not been well documented among local communities in Kenya. This is due to the secretive nature of herbalists' knowledge.

Traditional controls on harvesting herbal medicine ensured that medicinal plants were not destroyed. For instance, before colonization of Africa, young people were socialized on local plants and their uses in human health, which enabled members of the community to be informed on use and care of plants in the locality. These members of the community were guided by the elders on the protection of resources that provide food and medicine.

However, the advent of western culture, introduction of cash economy and government controls led to decline of traditional cultural practices and controls. This has created an environment where people are individualistic and destruction of the available natural resources has been on the increase. This has contributed to loss of indigenous plants, a source of traditional herbal medicine due to unregulated human activities. Based on the foregoing, it can be argued that traditional measures used traditionally to protect medicinal plants can be useful in establishing appropriate measures in the present day where individual and capitalistic interests are pursued.

## **2.2 Theoretical Framework**

The theory of the tragedy of the commons states that when a resource is collectively owned by a group of people, each exploits the resource for his or her own benefit and thus eventually destroying the resource. Hardin (1968) posits that resources that are open to unregulated exploitation are eventually depleted. According to this scenario, a public resource such as pasture that is collectively owned and is unregulated for grazing each person increases the number of his animals. This eventually leads to overgrazing and finally causes the destruction of the commons as each herder adds his stock to maximize on the profits. Accordingly, sustainability requires that common pool resources be maintained so as to continue to yield benefits, not only for the present but also for future generations. Thus lack of management of common pool resources leads to a tragedy for all (Osemeobo, 1991).

Among African communities, there were traditional controls that regulated individuals on the use of natural resources such as herbal plants for the good of all. These regulations protected and conserved the resources for the good of all under the direction of the elders. However, during and after establishment of colonial rule, traditional administrative systems were ignored and western systems that were introduced were individualistic and adopted commercial approach in the economy. This gradually led to the loss of cultural values and hence a tragedy to the indigenous ways of protection of resources including medicinal plants. Medicinal plants were traditionally gathered by herbalists for use by the local community with a smaller population. At present the increasing population, high demand for herbal medicine and commercial harvest for profit without clear regulations may eventually lead to depletion of the resource.

Land in Keiyo escarpment and Kerio valley is communally owned by clans who obtain resources guided by cultural regulation of the elders. In addition, the local people allowed members of the community to gather medicinal plants without restriction. At present, high demand for herbal medicine to supply the increasing rural and urban population for sale has led to a decline in the use of traditional guidelines when harvesting medicinal plant parts.

The secondary data together with this theoretical foundation informs the research methods used in the study to obtain primary data. They include the study area, research design, the target population and sample, methods of sampling and sample size, data collection procedures, and data analysis methods and presentation techniques.

## **3. Methodology**

The study was conducted in Keiyo South Sub-County, one of the two sub- counties occupied by the Keiyo community in Elgeyo-Marakwet County, one of the forty seven Counties in Kenya. The County is inhabited by two main communities namely the Keiyo who occupy the southern and central parts and the Marakwet who occupy the Northern part (Gachati, 1992). Keiyo South Sub- County lies between latitude 0° 20” to 0° 30” North and 35° 20” and 35° 45” East. It borders Keiyo North Sub-County to the North, Baringo County to the east and south, and Uasin-Gishu County to the west. The Sub-County has a total area of 899.7sq.km, with a total population of 109,160 (Republic of Kenya, 2012).

The population of Keiyo South is greatly influenced by the climatic conditions and productivity of the land. The Sub-County has a population growth rate of 2.8 percent and the population of the community varies according to the topography. The highlands are densely populated and settlements at the Kerio Valley floor are concentrated near the road and the gentle areas on the escarpment. The total population of the sub county was 109, 160 (Republic of Kenya 2005; Republic of Kenya, 2012). The population according to IEBC records is as shown in table 1.

**Table 1: Population of Keiyo South Sub-County per Ward**

	County Assembly Ward	Population (2009 national census)
1	Kaptarakwa	19,069
2	Chepkorio	23,349
3	Soy South	20,370
4	Soy North	14,457
5	Kabimmit	18,970
6	Metkei	12,945

**Source: Independent Electoral and Boundaries Commission (IEBC), 2012**

Due to rapid population growth there is increased unemployment and high demand for agricultural land and high poverty level. The poor, who live in absolute poverty, include squatters, the aged, orphaned, handicapped, female household heads, small holder agricultural and livestock farmers. As a result of rapid population growth in the Sub-County, there is encroachment into forest land, over-utilization of forest products, which has led to ecological imbalances. However, those who live in the highlands and the escarpment generally have higher incomes than those in the valley because of higher agricultural productivity in the region (Republic of Kenya, 2005).

### 3.1 Target population and sampling procedures

The target population for the study comprised 22,400 household heads, and an estimate of 110 herbalists and herb vendors in Keiyo South Sub-County. Household heads were the target population for this study because traditionally, in the Keiyo community, when a member of the family was sick one was first treated within the family. If the treatment provided was not effective the person was taken to a traditional herbalist (medicine man/woman) in the village recommended by the household head. The Keiyo South Sub-County was purposively selected for this study because it covers the high altitude highlands of Metkei (2,700m ASL), the steep escarpment and gentle plateaus on the escarpment and the semi-arid valley all occupied by the Keiyo people. This enabled the researchers obtain data from residents in the three topographical zones occupied by the Keiyo South was also selected because, unlike Keiyo North which has a more cosmopolitan population, it is generally occupied by indigenous Keiyo. Besides, the Keiyo South unlike Keiyo North had less western influence compared to Keiyo North which had the colonial administrative offices in Tambach as well as the only modern hospital. It was not until independence that health centres and dispensaries were built in other parts of Keiyo (Chebet and Dietz 2000).

According to the 2009 population census statistics, Keiyo South had a total population of 109, 160 and 22,400 households (Republic of Kenya, 2012). The confidence level used was 95%, and a confidence interval of 9. These were used to calculate a sample size of 118 respondents. This figure was subsequently adjusted upwards to 120 household heads to allow two interviewees who were referred to us as important respondents. The initial 118 household heads however were chosen through systematic random sampling from their respective Administrative Wards. Snowballing sampling techniques was used to choose 33 traditional herbalists and 15 herb vendors from all parts of Keiyo South Sub County who provided key information on the objectives of the study. In addition, three (3) Kenya Forest Service Staff purposely and interviewed at their work station at Kaptagat and Kipkwen Kenya Forest Offices.

According to the *Final Draft* National policy on Traditional medicine (Republic of Kenya, 2005) of Kenya, the ratio of Traditional Medical Practitioners to the patient was 1: 987. Based on the national ratio of traditional medical practitioners to patient, the number of traditional medical practitioners in the Sub-County was calculated as follows  $109,160/987 = 110$ . From this figure, it was inferred that the traditional medical practitioners based on the national ratio is one hundred and ten (110). Thus purposive and snowball sampling techniques was used to select traditional herbalists who provided key information on the objectives of the study. According to Mugenda and Mugenda (2003) purposive sampling allows the researcher to use cases that have the required information for the study. According to Bailey (2007) when selecting individuals to be interviewed a good starting point is 20, then continue to interview till five new cases do not add any new information to the study. In this study, thirty three (33) out of one hundred and ten (110) traditional herbalists interviewed in this study met this requirement as the responses to the interview schedule questions became similar as the point data saturation was reached. Systematic random sampling was used to sample the household heads and purposive sampling and snowballing was used to select herbalists and herb vendors for an in depth interview on the study.

A total number of 171 respondents who were interviewed were distributed as follows; 120 household heads, 33 traditional herbalists, 15 herb vendors and three KWS staff. The herb vendors based in local market centers were selected for interview through snowballing. The researchers interviewed one or two vendors per centre on a market day. In addition, three (3) Kenya Forest Service Staff purposely sampled for interview. They were interviewed at their work station at Kaptagat and Kipkwen Kenya Forest Offices. The researchers used a semi structured interview schedules and responses written in English. There after data collected was summarized according to themes as discussed in the results in the section that follows.

#### 4. Results and Discussions

This section focuses on the findings of the study guided by the objective of assessing traditional harvesting and conservation measures of medicinal plants. Prior to this, the socio- demographic and economic characteristics of the respondents are presented.

##### 4.1 Socio-Demographic and Socio-Economic characteristics of the respondents

The respondents' gender was noted on the interview schedule for every respondent. The data recorded and analyzed is shown on table 2.

**Table 2: Demographic Characteristics of Respondents**

Characteristics of Respondents	Frequency	Percentage	
<b>Gender</b>	Male	79	46.2
	Female	92	53.8
	<b>Total</b>	<b>171</b>	<b>100</b>
<b>Age range</b>	Below 35	15	8.8
	36-55	60	35.1
	56-75	86	50.3
	76 and above	10	5.8
	<b>Total</b>	<b>171</b>	<b>100</b>
<b>Ward</b>	Metkei	24	14
	Kabiemit	23	13.5
	Chepkorio	28	16.4
	Kaptarakwa	33	19.3
	Soy South	31	18.1
	Soy North	32	18.7
	<b>Total</b>	<b>171</b>	<b>100</b>
<b>Percentage Income from Herbal Medicine</b>	0-25%	102	59.6
	26-50%	37	21.6
	51-75%	15	8.8
	76-95%	15	8.8
	over 96%	2	1.2
	<b>Total</b>	<b>171</b>	<b>100.0</b>

**Source: Authors field data, 2015**

Table 2 indicates that the number of respondents interviewed were 171, out of which 79 were males, while 92 were female. The males interviewed represented 46.2 percent while the female were 53.8 percent. These included the household heads, herbalists, herb vendors, and a forester. The results depict the important role played by the women in providing herbal medicine. This finding agrees with that of Kipkorir and Welbourn (1973) and Kipkorir and Ssenyonga (1984), who noted that among the Marakwet, most of the herbalists are women.

The respondents were asked to give their age and since most respondents did not give the actual age, the age range was used and tabulated as shown on table 2. The respondents aged below 35 years were 8.8 percent and those aged between 36-55 years were 35.1 percent comprised mainly of household heads, while those aged bracket of 56-75 years 50.3 percent were the practicing herbalists' and vendors. Those who were above 75 years were 10 (5.8 percent) and constituted mainly the elderly household heads knowledgeable in medicinal plants and herbalists based in their homes.

From the age categorization it was clear that majority of the herbalists were elderly people within the age of 56-75 years. This is consistent with literature which indicates that old men and women practiced herbal medicine and passed the skill to their first born or favorite children (Kokwaro, 1993).

Results on income received by respondents from herbal medicine are tabulated in table 2. From the results, 102 respondents (59.6 percent) indicated that they earned less than 25 percent income from herbal medicine. The household heads however reported that they saved money by using herbs rather than spending on treatment in a modern health facility or to paying herbalists. The herbalists in the rural areas also reported that most people in the neighborhood were relatives and neighbours and payment was not immediate. They only gave small tokens whenever they had, and could eventually give a goat or sheep as payment for treatment received. It was noted that more than 50 percent of the respondents did not depend on the provision of herbal medicine as a source of livelihood but only serve the community. A minority group (21.6 percent) of the respondents indicated that they earned between 26-50 percent from herbal medicine. These were mostly herbalists based in their homes whose income from herbal medicine varied widely, based on the number and economic ability of the clients. This also varied widely due to accessibility of the herbalist residing in the rural areas. Those in inaccessible areas earned less than 25 percent while well-known herbalists (8.8 percent) who live in accessible areas near roads earned an income of between 51-75 percent from herbal medicine. Such herbalists were popularly known and were specialists in the treatment of cancer, reproductive health problems, and chronic ailments which modern medicine did not cure completely.

Popular herb vendors (8.8 percent) earned over 75 percent income from herbal medicine. Some herb vendors dedicated their time to treating people in market centres and selling herbs within the Sub County and in other areas such as Uasin- Gishu and Trans Nzoia Counties. In rare isolated cases, some herbalists received and treated clients/patients from distant Counties like Nairobi and Nyanza.

#### **4.2 Customary Controls on Harvesting and Conservation Medicinal Plants**

Traditional ways of gathering medicinal plants were guided by the need to protect the plant from drying up or being destroyed. Various measures were adopted to ensure that medicinal plants did not die due to harvesting of herbs. The harvesting methods included uprooting herbs, removing a few roots or bark, and/or removing some leaves from a shrub/ tree. These methods are discussed in the subsequent sections.

##### **4.2.1 Harvest of medicinal plant roots**

The study noted that the local community relied a great deal on medicinal plant roots which were removed using wooden/ simple tools. The roots were chewed on the spot to relieve some discomfort or were used at home with other herbs provided by the household head or herbalist.

##### **4.2.2 Uprooting of a medicinal plant**

According to the respondents, medicinal plants that are small and had few roots or one tuber could be uprooted. Once the roots or the tuber was removed, the plant was then replanted. This was demonstrated by a herbalist in Kerio valley as shown in figure/ plates 1 and 2



**Figure 1 and 2: Herbalist demonstrates harvesting by uprooting and replanting a medicinal plant for the tuber in Kerio Valley**

**Source: Authors field data, 2015**

Small shrubs with medicinal value were uprooted if they were plenty in an area, otherwise one would only remove few roots.



### 4.2.3 Removing of some roots

According to the respondents, harvesting roots of medicinal plants was mainly from trees and shrubs that have several roots. It was a practice to remove one or two roots and at most four. This meant that only what was required was gathered for use so as to preserve the plant. If one needed more roots then he/she identified another and removed it. Herbalists taught the young people never to remove the tap root- which they referred to as the 'heart' of the plant. The common words used were literally translated as "you only scratch out the roots of a medicinal plant but not digging out." The use of the term "scratching" meant avoiding digging with a hoe or "jembe" which may remove many roots at once. This traditional method ensured the continued survival of the medicinal plant. If a herbalist or a person sent to harvest a medicinal plant, found that it had been harvested recently, then he/she considered one of two options;

- (i) To remove two roots from the opposite side of the section where the roots/bark were recently gathered. This was done only if the medicinal plant was not easily available in the vicinity, or
- (ii) To leave the medicinal plant and look for another plant. It was believed that if one harvested herbs from the same plant causing it to dry, then the patient would never get well.

This practice is similar to the beliefs cited by Mavi and Shava (1997) who assert that in Zimbabwe collection of roots for medicinal use was done sparingly so that some roots remained to ensure survival of the plant.

### 4.2.4 Removal of the bark

When one required the bark of a certain tree, it was recommended that one removes a bark that is the size of the palm of one's hand. The estimated measurement was a maximum of nine (9") inches by four (4") inches from one side of a tree. This size ensured that the plant did not dry up or get stunted. This was demonstrated by one elderly household head as shown in figure/ plate 3.



**Figure 3:** Respondent demonstrates size of bark Removed from medicinal tree

**Source: Author's field data, 2015**



**Figure 4:** Debarked portion of medicinal plant covered with soil

**Source: Author's field data, 2015**

After removing the bark, it was mandatory that one covered the exposed stem by rubbing the debarked portion of the tree with soil (Figure 4). It was believed that failure to do this would make the tree drop its sap and appear like the tree was "crying", which would be a curse on the gatherer. Rubbing or covering the debarked portion with soil was believed to help the plant to recover faster from the injury. The soil also was said to protect the gatherer from curses from other people who would see the plant "crying."

### 4.2.5 Taboos and social controls on harvesting of medicinal plants

Besides controls on harvesting, there were taboos that guided the social behavior of the people in the society with regard to harvesting of traditional medicinal plants. Elderly household heads and herbalists interviewed reported that there were social controls and prohibitions on who may harvest or handle medicinal plants. The taboos and myths protected and conserved medicinal plants. A woman in her reproductive age for instance, was not allowed to practice herbal medicine in the community. Mature women who were past menopause were allowed to practice herbal medicine in the community. However, child bearing mothers were only allowed to harvest medicinal plants parts for treating their own children. This restricted the people who harvested medicinal plants to only mature people who were considered responsible.



Despite this, young people, in some cases, were allowed to accompany an elder or a herbalist to the forest so as to assist them collect the herbs required. Their duty was to dig out the roots or remove the bark under the guidance of the elder or herbalist. This process helped the young person to identify the plant and the part used. A young person who was keen would gradually learn and could eventually be sent alone to harvest herbs for the elder, after a long period of apprenticeship. Traditionally, Keiyo women were mainly herbalists while some men were known to be diviners. The men were equally knowledgeable on traditional medicinal plants and would even guide their spouses on what to give to a sick child in the home. These practices tended to limit the number of those who gathered herbs and hence acted as a deterrent to overharvesting of medicinal plants. Another social control that regulated harvesting of medicinal plants was that a person who had just had sexual intercourse was not allowed to harvest or administer herbal medicine to a patient. It was believed that sexual intercourse destroyed the healing power of traditional medicine and could negatively affect the sick person. It was also a taboo to collect medicinal plants from sites where people were left to die or areas where epidemics affected or had wiped out families. Such areas were believed to be unclean and medicinal plants in these areas were not gathered for medicinal purpose.

Respondents reported that in the past every clan, in Keiyo South Sub County occupied land from the Kerio valley up to the escarpment. Each clan had a sacred site which was an area set aside for prayer and consulting their God. Some mature men who were set apart after undergoing several traditional ceremonies and considered “righteous” in the community would go to these sites, usually a hill, for a period of time to carry out their sacred activities. They performed special roles in cleansing, blessing and, in extreme situations to ‘curse’ if individuals never owned up for crimes committed. For example, the hill for Singore zone is Semo and the hill for Kapkee clan is Chepchonge (shown in figure/ plate 5).

**Figure 5: Sacred site (Chepchonge) below the cliff protects medicinal plants in Kaptarakwa**



**Source: Author's field data, 2015**

Sacred sites had very strict regulations regarding who may ascend this region and no one was allowed to cut a tree, graze animals or collect firewood. Traditional sacred sites in Keiyo include Kabarak and Simit. These areas were important for conservation of indigenous plants where medicinal plants would be well protected. These sites have however been neglected and greatly encroached, due to the influence of western culture and increasing effect of Christianity. At present, the community relies mainly on bushes near streams. This confirms the important role that traditional controls protected medicinal plants in the natural environment and promoted sustainable use. However, at present, the traditional controls are not used effectively and this may be a threat to the medicinal plants found in the study area.

## **5. Conclusion**

Since it is now locally and globally acknowledged that traditional medicine especially plant based medicine plays a key role in providing primary health care, it is important for communities to conserve locally available medicinal plants. This is also an important resource for research in plant based medicines that are affordable and have fewer or no side effects.

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