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Participatory Management for Forest Resources' Conflict Resolution in Got Ramogi Forest Reserve, Siaya County, Kenya

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ABSTRACT

Forest resources play a significant role in supporting livelihood of people and biodiversity all over the world leading to over exploitation. This over exploitation leads to depletion and conflicts over the resources utilization as is the case in Got Ramogi. The purpose of this study was to evaluate the community participation in decision making in Got Ramogi forest reserve as a strategy for resources utilization conflict resolution. The study was based on the managerial citizen involvement model. A cross-sectional research design was used in collecting information on participatory forest management as a strategy for forest resource utilization conflict resolution in Got Ramogi forest reserve. A sample size of 274 households was selected from target population of 950 households in the study area with 3903 people. The research used systematic, purposive and snowballing techniques of both probability and non-probability sampling design in selection of informants. Secondary and primary sources of data were used. Primary data was collected through structured questionnaires, interview of key informants, focus group discussions and observation of forest destruction. Secondary data was collected from published and non-published literature on conflict resolutions in forest resource management. Chi-square and Cost-Benefit Analysis were used to analyze quantitative data collected in Got Ramogi Forest Reserve. Qualitative data collected from got Ramogi Forest reserve was analyzed by using a descriptive master sheet where data was cleaned, edited and coded then presented thematically. Maps were used showing the study area. The results found that; a mean of 4.76 was obtained denoting strongly agree. The interpretation of this finding is that the respondents strongly agreed that major decisions in the participatory forest management are made by the Government Authority thus affecting community involvement.The study contributed to the body of knowledge on management strategies that would prevent forest resources utilization conflicts and advice stake holders on the best practices for forest policy formulation in participatory processes. The study concluded that the community was slightly involved in decision making of participatory forest management as a strategy for resources utilization and conflict resolution in Got Ramogi forest reserve.

KeyWords: Forest Resources, Biodiversity, Management, Got Ramogi, Kenya.

INTRODUCTION

Over the years, there has been widespread deforestation which has reduced forest cover worldwide Thompson, Guariguata, Okabe et al., 2013). This has been prompted by population increase and need for more farming land, settlement and other developments Newton and Agrawal, 2013). As a result, conflicts have often occurred among the stakeholders over forest resource utilization. Pahari and Murai (1999), report that 13 million hectares of world forests are still lost each year, including six million hectares of primary forests. These Worldwide forest losses have been observed in many countries like South America, Indonesia, Nigeria, and Sudan among others Food and Agriculture Organsiation of the United Nations (2015). According to McFarland (2018), Africa has suffered great forest destruction and lost large forested areas due to subsistence activities leading to resource utilization conflicts between stake holders. Nonetheless, Tabot *et al.* (2019) posit that there is need for forest management to involve the community members during the initiation stage of the projects in order to achieve sustainable forest management and prevent conflicts.

According the global forest resources assessment (FRA) report, Africa had the largest annual rate of net forest loss in 2010–2020 at 3.9 million ha, followed by South America at 2.6 million ha (FRA, 2020).This is supported by Republic of Kenya (2018a), that the forest cover in Kenya has suffered a great loss due to deforestation though it is about 7.4 percent of total land area which is below the expected percentage of 10% worldwide. For example, [6] Mbuvi *et al.* (2020) reviewed the 25-year-old Arabuko Sokoke Forest Management (ASF) Team in Kenya; using the Influence and Importance tool and established that influence and importance factors affected forest management either positively or negatively. Moreover, the study in Arabuko Sokoke forest, had achieved enviable success in forest management, community livelihoods, organizational development and rural development; which are essential elements for forest citizenship.

Conflict arise from human relations when individuals have different values, rights, obligations, needs and interests that are supposed to be met from a particular resource (FAO, 2020). Elsewhere, scholars have reported very little success in participatory management through conflict resolutions when the strategies adopted do not negotiate rules and regulations for sharing resources by all stakeholders (Alfonso and Castro, 2001; Nguyen, 2012). Participatory Forest Management (PFM) deliberately involves forest-adjacent communities and other stakeholders in the management of forests within a structure that contributes to the communities' livelihoods (East Africa Natural History Society, 2020). PFM has contributed to increased conservation awareness leading to better conservation of forests. It has also inculcated a sense of ownership among forest-adjacent communities and built trust and confidence amongst private partners involved in the governance of public natural forests (Chisika & Yeon, 2021).

According to Maclellan and Duinker (2012), allowing both private and the public sector in forest management decisions has reduced resource utilization conflicts in forests and maximum benefits have been guaranteed with long term ecological sustainability. Conflicts usually arise when some party's interests are not considered or are not aware of the other party's measures affecting their use of the forest (Daniela & Blas, 2022). As a result of increasing demand for forest products and expanding bio-economy uses, the relevance of forest conflicts is increasing in most countries.

Issues like forceful ejection of people from their land, unfair land resettlement, mass transfer of people and genocides are evidences of unresolved land resource use related conflicts in Africa affecting participatory processes, Achankeng (2013) and Regan (2016). Kenya shares a similar background of resource use conflicts traced back from the colonial rule when the land policy isolated the indigenous Kenyans from their fertile lands like forests leading to tenure insecurity, land shortages with many unresolved land grievances (Veit, 2007). As a result, the need for the adoption of resource utilization conflict resolution strategy in participatory management cannot be underscored and Got Ramogi is not left out being a valuable resource.

Conflicts over resource utilization have been reported in many forest reserves in Kenya since the government has been hesitant to transfer lucrative sources of revenue earned from joint forest management to the local levels (Kairu *et al*., 2020). As a result, the communities living adjacent to the forests have been demotivated and in most cases have remained reluctant to invest their time and resources in sustainable forest management after realizing that the forest resource benefits are minimal to them (Mbeche, *et al.*, 2021). According to Maina and Nzengya (2021) some forested areas in Kenya still experience illegal tree harvesting, charcoal burning and game hunting despite signing of agreement on the access of the forests. Mwaniki (2016) adds that forced ejection of some Kenyan communities from forest land and restriction of cultural and religious rites from the trees and forests after the gazettement and declaration by Forest Act of 2005 has increased the illegal activities and negative attitudes towards conservation initiatives.

According to Mbuvi, Musyoki and Ndalilo (2020) forests in Kenya still face illegal tree felling for building houses, charcoal burning and wood carving since the poor communities have limited options to livelihood. The

situation has worsened due to high population growth leading to constrains in forest conservation efforts and frequent resources utilization conflicts. However, Matiku (2013) reports inclusive participatory management in Arabuko –Sokoke where benefits from the forest are used in education of children from poor families. The community is positive with the conservation measures undertaken by the management and resource utilization conflict cases have declined.

Even though community members had a stake in the forest resources use in Kenya, they were inadequately involved in its management resulting to conflicts (Rotich, Makindi & Esilaba, 2020). The Centralized system of forest management was later realized to be in effective and the need to involve the communities for effective management became necessary (Republic of Kenya, 2014). A further development made in Kenya to reduce forest resource use conflicts was the introduction of a new forest policy and law of 2005. This new development began with the Tropical Forests Action Plans encouraging many countries to develop new devices for improved forestry governance and reduced forest degradation mainly in the tropics Republic of Kenya (2009). This policy focused on conservation and management of forest resources on government land. However, the policy failed to adequately recognize community participation, rights and responsibility, and livelihood improvement in most forests resulting to the many forest resource utilization conflicts experienced as observed by Mathu (2007). This emphasizes the need to address the problem of forest resource utilization conflict resolutions in Kenya for the improvement of forest cover including Got Ramogi.

Most communities in Kenya have embraced PFM as a suitable strategy to address forest destruction although the management of resources use conflict is still a tall order (Mbuvi, Musyoki & Ndalilo, 2020). Methods to prevent forest destruction adopted by the management like paying fines, laws and policies enforcement have not fully resolved the forest resource use conflicts in Kenya, Kemunto (2016).It has also been reported that incentives like Plantation Establishment Livelihood Improvement Schemes (PELIS), participation in harvesting of forest products among others have also failed to offer resolutions to the conflicts over the forests (Okumu and Muchapondwa, 2017). This has necessitated the need for further research on the attitude of the communities on the conflict resolutions that have been adopted for forest resources utilization conflicts in Kenya and especially in Got Ramogi.

Conflicts are common phenomena in many regions of the world, especially in dry lands, that are endowed with scarce natural resources (Daniela & Blas, 2022).The scholar explains that Global environmental change coupled with population increases has led to unprecedented demand for resources leading to resource utilization conflicts. This is in line with the observation made by Frischmann, Marciano, Ramello *et al*., (2019) that rapid population growth would put a lot of pressure on the common environmental resources .The scholars report that the consequences have been struggle over control of and access to the inadequate resources which in turn generate conflicts and therefore the need for effective allocation of access and user rights which will result to operative resource management over a long period. Got Ramogi finds itself as a common pool resource where it is difficult and costly to ignore potential users in the management strategy as observed by Ostrom (2008).

According to Kairu *et al*. (2020) participatory forest management has been adopted in Got Ramogi forest reserve, however, the major challenge has been the continued forest resource utilization conflicts experienced due to limited involvement of all stakeholders especially the community hence a setback to effective management. Osumba (2011) adds that minimal benefit sharing of resources in Got Ramogi has made the community reluctant to support the conservation strategies proposed by Participatory Management and this may have contributed to the resource utilization conflicts experienced in the forest.

Although participatory forest management and policy has gained popularity in Kenya since the early 2000, the adoption of forest resources utilization conflict resolution in participatory management has not been much investigated. This study therefore will be undertaken to assess the effectiveness of participatory management for forest resources utilization through the adoption of conflict resolution strategy in Got Ramogi Forest Reserve. The study will contribute to the growing PFM literature by recommending solutions to forest resources utilization conflicts.

RESEARCH METHODOLOGY

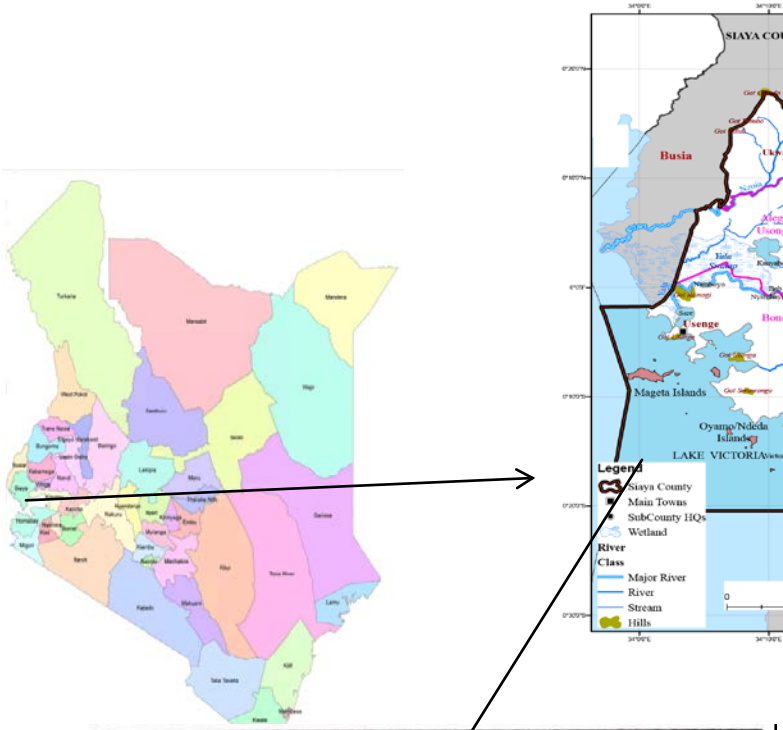
Research Design

The study applied cross-sectional research design whereby qualitative and quantitative data collection methods was used (Silvia, 2017). Qualitative method was used to collect data that was not be subjected to statistical test like forest destruction and people's opinion while quantitative method on the other hand was used to collect numerical data that was analysed statistically.

3.3: Study Area

Got Ramogi is in central Yimbo location, Usigu division of Bondo Sub County, Siaya County (Figure 2.1). Got

Ramogi comprises of two hills, Minyengira (200 hectares) and Nyaidi (83 hectares) and bordered by heavily populated settlements of Oraro, Usigu and Jusa. It lies between latitude O˚26″N and O˚90″S, and between longitude 33˚ 58″ E and 34˚ 04”E (Kenya National Bureau of statistics., 2013). Got Ramogi area has warm dry and humid climate with mean annual rainfall of between 800-1600mm, while Temperatures do vary with annual mean of 22.5ºC annually (Republic of Kenya, 2018b).



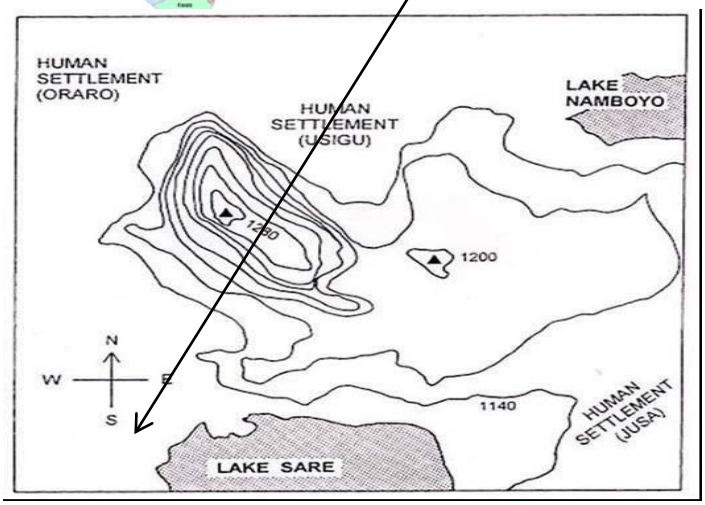


Figure 3.1: Ramogi Hill forest, the surrounding lakes and settlement

Source: Siaya County Annual Development Plan 2019-2020.

The vegetation of Got Ramogi was composed of thickets, natural forests, some exotic trees and grass spread over the region while swampy vegetation dominate Yala (Bagine,1998). The tree species include: Eucalyptus camaldulensis, Eucalyptus maculate, Gmelina Arborea, Terminalia swamp Brownii, Tamarindus Indica, Acacia species and Senna Siamea.

Target Population

The target population of 950 households were drawn from Got Ramogi sub location with a total population of 3903 people (KNBS, 2013). This included the household units especially the people who had stayed in the area for more than ten years, the forest department officials like forest officers and community forest Association leaders. Other people like herders, hunters in the area, charcoal burners and herbalists were also contacted to get important data for this study.

Sample Size and Sampling Procedure

The researcher used a sampling size of 274 households out of 950 target population as obtained using Krejcie and Morgan's formula. The sample size was justified by Krejcie and Morgan table and graph of determining sample size from a given population and sample size vis-à-vis total population respectively as follows;

$$S = \frac{x^2 NP\ (1-P)}{d^2(N-1) + x^2 p\ (1-p)} \quad (1)$$

$$Where;$$
$$S\ =\ required\ sample\ size$$
$$X^2\ =\ Table\ value\ of\ chi-square\ for\ 1\ degree\ of\ freedom\ at\ the\ confidence\ level, which\ is\ 3.841\ I.e.\ 1.96\ x\ 1.96$$
$$N\ =\ population\ size$$
$$P\ =\ proportion\ assumed\ to\ be\ 0.5$$
$$d\ =\ degree\ of\ accuracy\ expressed\ as\ a\ proportion\ which\ is\ 0.05.$$

$$S = \frac{3.841x950x0.5x0.5}{0.05^2(950-1) + 3.841x0.5x0.5} = 274$$

The researcher then used systematic random sampling and stratified purposive sampling techniques in selecting respondents because everybody was conversant with participatory forest management in the study area (Suri, 2011). The sampling technique also helped the researcher to collect data from the targeted population within the expected period (Kothari,1990). The above sampling techniques used to get the sample size of 274 informants. The sample size for each group was calculated using proportionate stratified sampling method by Creswell (2013). The design was chosen since it was effective and ideal when the cost of choosing an item was the same for each stratum, no difference was found within the stratum variances and the aim of sampling happened to be approximation of the population value of some characteristics, as follows;

$$n = \frac{n_i xP}{N} \quad (2)$$

Where; n is the cluster sample,
n_i is the cluster population,
N is the target population and
P is the probability of that specific cluster as illustrated by the calculation below:

Table 3.1: Sampling Matrix

Cluster	Target Household	Sample for The clusters	Proportion representation of Target Household
A. Kakumu village	94	27	0.10
B. Kalaka village	138	40	0.14
C. Ureje village	91	26	0.10
D. Unyejira village	109	31	0.11
E. Kanyagol village	87	25	0.10
F. Ywacha/Masiwo village	141	41	0.15
G. Somroo village	68	20	0.07
H. Mgane village	108	31	0.11
I. Nyadheho village	114	33	0.12
TOTAL	950	274	1.00

Source: Researcher (2020)

Types and Methods of Data Collection

Primary and secondary sources of data were used by the researcher to achieve the objectives of the study. Primary data was obtained by using questionnaires, key informant interviews and direct observation while secondary data would be attained from journals, dissertations, theses, published books, internet and reports.

Both qualitative and quantitative data were collected (Hussein, 2015). Quantitative data dealt with figures and quantities which were used to find out level of community involvement in decision making and benefit sharing. Qualitative data on the other hand would deal with data that was not in figures or quantities like the community perceptions or views on participatory forest management and observation of the forest destruction.
Interview guide and questionnaire schedule were tools for data collection from the households while direct observation and taking photographs helped to collect data on forest destruction. Quantitative data was collected by interviewing the respondents using interview guide and filling in questionnaire using a questionnaire schedule consisting of both open ended and closed questions administered to selected respondents for primary data. Questionnaire was used because it covered a big sample of respondents within a short time and saved the cost of travelling. Questionnaires were also comprehensive in data collection (Creswell, 2013). Key informants were interviewed using interview guide to collect primary data. The respondents included the forest department officials and members of the community who had stayed long in the study area. They were chosen purposively. According to (Ebrahim, 2018) key informant interview helped to get intimate and sensitive information that could not be shared in an open forum.
Qualitative data was collected from the focus group discussions by using interview guide and through observing the activities and features like tree stumps in the forest, encroachment, grazing among others. This was complimented by taking photographs and writing short notes. Observation would help the researcher to get any information which might not be extracted from the local people. The researcher also used snow balling to get the responses needed from other forest users. This helped the researcher to get specific information that might be useful for this study. Upon booking an appointment, Key informants were visited at their area of work while focus group discussions were conducted to selected people like charcoal burners, subsistence farmers, herders, traditional medicine men and women from the community through the assistance of the local authority like village elders and the area chief.

Piloting and Test Run

This was performed by involving a selected number of interviewees so that questionnaires and data manipulations was verified, well understood and rationalized. The sample intended to be used for piloting would constitute about 10% (25) of the households sampled at Got Ramogi. Piloting assisted the researcher to establish the suitability of the questions in the questionnaire for generating responses which were aligned to the research objectives (Bannigan and Watson, 2009). The opinions given by respondents during the piloting will be used to improve the research quality.

Validity of the instruments

Hussein (2015) described the validity of the instruments as the extent to which the tools were able to capture what they were supposed to measure. This had also been supported by (Bannigan and Watson, 2009) that validity was the concept of how the instruments gave accurate and predictable measurements. Inquiries from experts and supervisors were done to check inaccuracies in the research tools like questionnaires and interview guides. Their recommendations helped to improve the research questions.

Reliability of instruments

Reliability was the accuracy to which the research instruments were able to give consistent and equivalent feedback or data after repeated trials (Bannigan and Watson, 2009) .To ensure the reliability of the instruments, the questionnaires were pre- tested on 10% of respondents randomly selected rather than those in the study (Creswell, 2013). The quality of the research instruments improved through the pre testing.

Data Analysis and Presentation

Data analysis was described as an orderly, consistent technique for condensing a wide range of data into fewer content categories based on clear rules of coding (Stemler and Colors, 2001). The data was summarized into patterns by the help of statistical methods. Objective one found out the relationship between involvement of the community in decision making of participatory forest management and resources utilization conflict resolution. This was done using Chi square which was a quantitative data analysis method. Chi square was ideal because it showed relationship between two or more variables and easier to compute compared to other statistical methods (Kothari, 1990). The results were presented on frequency tables, as percentages and on graphs and analyzed into themes and narrations. The relationship between the independent variable and dependent variable was estab-

lished by using Chi square as follows;

$$X^2 = \sum \frac{(f_0 - f_e)^2}{f_e} \quad (3)$$

Where;

$\mathbf{f_o}$ = Observed frequency on involvement of the community in decision making of PFM

$\mathbf{f_e}$ = The expected frequency if no relationship exist between the variables

A greater value than the chi table (< 0.05) showed a strong relationship between the variables while a value less than the chi table (> 0.05) shows no relationship between the variables.

Objective two was to establish the benefit sharing from participatory forest management for resources use conflict resolution in Got Ramogi forest reserve. Cost Benefit Analysis was used to establish the benefits of participatory forest management in the study area by considering the objectives of the PFM management, accounting for the total income and expenditure, then the benefits accrued during a given period (Saez, 2007). According to Rus de Gines (2010) Cost Benefit Analysis might be worked out as follows;

$$\text{NPV} = \sum \frac{Bt - Ct}{(1+r)t} \quad (4)$$

Where;

C = cost, B= Benefits, r = discount rate t= year

Objective three was to assess the perception of the community on conflict resolution strategies adopted for resources utilization in Got Ramogi Forest Reserve. The data was analyzed using themes and narrations because qualitative data was collected. The Qualitative data that was collected was categorized into themes and narrations and presented in form of percentages and frequencies on frequency distribution tables. Maps were used to show location of the study area.

The study questionnaires were coded and checked for any error omission (Creswell, 2013), then analyzed using Statistical Package for Social Science (SPSS, Version22). The collected qualitative data from the questionnaires and key informant interviews were organized, thematically analyzed and presented precisely as narratives (Creswell, 2013).

Table 3.2: Summary of Data Analysis Techniques

No	Objectives	Statistical analysis technique
1	Find out the level of community involvement in decision making of participatory forest management as a strategy for conflict resolutions in Got Ramogi Forest reserve.	-Chi square analysis -Frequency distribution and percentages -Thematic Analysis and Narration
2	Establish the benefit shared by the community from participatory forest management in Got Ramogi Forest Reserve.	-Cost Benefit Analysis -Thematic analysis and narrations
3	Assess the community perception on conflict resolution strategies adopted for forest resources utilization in Got Ramogi Forest Reserve.	-Frequency distribution and percentages -Thematic analysis and narrations

Source: Researcher (2022)

Ethical Considerations

Upon approval from the School of Graduate studies, the researcher sought clearance from the University Ethical Review Committee (UERC) and from National Commission for Science Technology and Innovation (NACOSTI), before embarking on the research. To access the area of study, the researcher got an official permission from the area chief to reach various respondents within his/her location. To access the forest reserve area, the permission of the regional Forest officer in charge was sought. Thereafter the researcher informed the respondents on the nature and purpose of the study and the information needed in order to get informed consent of the respondents before the actual data collection. The researcher assured the respondents on the confidentiality of their responses and the privacy of the source of any data provided; maintain the objectivity of the research as well as ensure no personal bias and opinion got into the research; and all sides were given fair considerations (Farrimond, 2006). Finally the researcher presented what was observed or collected from the respondents.

RESULTS AND DISCUSSIONS

Community Involvement in Decision Making of Participatory Forest Management as a Strategy for Resources Utilization and Conflict Resolution

The study sought to evaluate the community involvement in decision making of participatory forest management as a strategy for resources utilization and conflict resolution in Got Ramogi forest reserve. A five point likert scale was adopted such that; 5-Strongly Agree; 4- Agree; 3-Undecided; 2-Disagree and 1-Strongly Disagree. The feedback in shown in table 4.10.

Level of Community Involvement in Decision Making in Got Ramogi Forest Reserve for Resources Utilization and Conflict Resolution

Statements	N	Mean	SD
Major decisions in the participatory forest management are made by the Government Authority thus affecting community involvement	268	4.76	0.864
The community by law breakers are handled through arrest and charges thus affecting community involvement	268	4.56	0.924
Nominated members in any forest protecting committee were actively involved in forest management initiatives	268	3.74	0.982
The community participate in all the management processes through their representatives	268	3.71	1.034
Attendance rates for participatory forest management meetings has generally been high	268	3.69	1.034
Men are the majority in the forest user group	268	3.39	1.056
There is payment for registration as members of participatory forest management	268	2.82	1.769
There is involvement bias between the community and those who claim user rights	268	2.82	1.080
The community is involved in conflict resolution in the forest through different methods	268	2.78	1.176
The level of participation is affected by insecurity	268	2.61	1.005
Existing forest user group can run PFM effectively	268	2.39	0.899
Major decisions in the participatory forest management are made by the Forest User Group	268	2.23	0.772

Source: ***Researcher's Data*** (2022)

From Table it is clear that: when the respondents were asked whether major decisions in the participatory forest management are made by the Government Authority thus affecting community involvement; a mean of 4.76 was obtained denoting strongly agree. The interpretation of this finding is that the respondents strongly agreed that major decisions in the participatory forest management are made by the Government Authority thus affecting community involvement.

A question was presented on whether the community by law breakers are handled through arrest and charges thus affecting community involvement; a mean of 4.56 was obtained denoting strongly agree. The understanding of this finding is that the respondents strongly agreed that the community by law breakers are handled through arrest and charges thus affecting community involvement.

The respondents were asked whether nominated members in any forest protecting committee were actively involved in forest management initiatives; a mean of 3.74 was obtained, denoting agree. The construal of this finding is that the respondents agreed that nominated members in any forest protecting committee were actively

involved in forest management initiatives.
When the respondents were asked whether the community participated in all the management processes through their representatives; a mean of 3.71 was obtained, denoting agree. The understanding of this finding is that the respondents agreed that the community participated in all the management processes through their representatives.
When the respondents were asked whether attendance rates for participatory forest management meetings have generally been high; a mean of 3.69 was obtained, denoting agree. The construal of this finding is that the respondents agreed that attendance rates for participatory forest management meetings have generally been high.
When the respondents were asked whether men are the majority in the forest user group; a mean of 3.39 was obtained, denoting not sure. The interpretation of this finding is that the respondents were not sure that men are the majority in the forest user group.
The respondents were asked whether there was payment for registration as members of participatory forest management; a mean of 2.82 was obtained, denoting not sure. This finding implies that the respondents were not sure whether there was payment for registration as members of participatory forest management.
A question was presented on whether there was involvement bias between community and those who claim user rights; a mean of 2.82 was obtained, denoting not sure. This finding implies that the respondents were not sure whether were involvement bias between community and those who claim user rights.
The respondents were asked whether the community was involved in conflict resolution in the forest through different methods; a mean of 2.78 was obtained, denoting not sure. The construal of this finding is that the respondents were not sure whether the community was involved in conflict resolution in the forest through different methods.
A question was presented on whether the level of participation is affected by insecurity; a mean of 2.61 was obtained, denoting not sure. This finding implies that the respondents were not sure whether the level of participation is affected by insecurity.
The respondents were asked whether existing forest user group can run PFM effectively; a mean of 2.39 was obtained, denoting disagreement. The construal of this finding is that the respondents disagreed that the existing forest user group can run PFM effectively.
A question was presented on whether major decisions in the participatory forest management are made by the Forest User Group; a mean of 2.23 was obtained, denoting disagreement. The interpretation of this finding is that the respondents disagreed that major decisions in the participatory forest management are made by the Forest User Group.
The study further sought to analyze the level of involvement of community members in specific forest management activities. A five point-Likert scale was adopted such that: 5-Highly involved; 4- Just involved; 3-Not sure; 2-Slightly involved and 1-Not involved. Findings are presented in Table 4.11.

Level of Involvement in the Forest Management Activities

Forest management activity	N	Mean	Std. Deviation
Implementation	268	3.52	1.794
Decision making	268	1.96	1.488
Evaluation	268	1.88	1.429
Planning	268	1.76	1.263
Others (specify)	268	1.21	0.708
Valid N (listwise)	**268**		

Source: Researcher's Data (2022)

From Table 4.11, it is evident that:
Implementation as a forest management activity obtained a mean of 3.52, denoting just involved. Consequently, it can be concluded that the community was just involved in implementation as a forest management activity.
Decision making as a forest management activity obtained a mean of 1.96; denoting slightly involved. Consequently, it can be concluded that the community was slightly involved in decision making as a forest management activity.
Evaluation as a forest management activity obtained a mean of 1.88; denoting slightly involved. Consequently, it can be concluded that the community was slightly involved in evaluation as a forest management activity.
Planning as a forest management activity obtained a mean of 1.76; denoting slightly involved. Consequently, it can be concluded that the community was slightly involved in planning as a forest management activity. Others (specify) as a forest management activity obtained a mean of 1.21; denoting not involved. Consequently, it can be concluded that the community was not involved in other forest management activities.

Involvement in Specific Forest Management Activities and Forest Resources' Conflict Resolution

The study sought to evaluate the community involvement in decision making of participatory forest management as a strategy for resources utilization and conflict resolution in Got Ramogi forest reserve. Consequently, to establish the relationship between involvement of the community in decision making of participatory forest management and resources utilization conflict resolution using Chi square test. Results are displayed in Table.

Chi-Square Test for level of Involvement

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.711[a]	6	.854
Likelihood Ratio	2.928	6	.868
Linear-by-Linear Association	.140	1	.708
N of Valid Cases	268		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .03.

Source: Researcher's Data (2022)

The "Pearson Chi-Square" indicates a value of 2.711 at a p value of 0.854. This tells us that there is no statistically significant association between level of involvement and conflict resolution for resource utilization.

Strength of the Association

		Value	Approx. Sig.
Nominal by Nominal	Phi	.101	.844
	Cramer's V	.071	.844
N of Valid Cases		268	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Source: Researcher's Data (2022)

Phi and Cramer's V are both tests of the strength of association. We can see that the strength of association between the variables is very weak; thereby confirming that indeed level of involvement of the community was not significant in assessing the Forest Management Activities at Got Ramogi Forest reserve.

Conclusion

Based on findings discussed in the previous chapter, the study concluded that the community was slightly involved in decision making of participatory forest management as a strategy for resources utilization and conflict resolution in Got Ramogi forest reserve. The study further concluded that the benefits shared by the community from participatory forest management as a strategy for forest resources utilization and conflict resolution in Got Ramogi Forest Reserve include clay for making jikos, grazing land, water, firewood, worship area, timber as a building material and herbal plants.

The study recommends the creation of Kenya Forest Service and Community partnership program at Got Ramogi Forest Reserve to ensure adequate and sustainable utilization of forest resources in line with the conservation efforts worldwide. In addition, the study recommends community empowerment programs by the local NGOs and County Government sector players to initiate entrepreneurship programs that target the community in order to help in poverty alleviation that will eventually reduce the reliance on forest resources.

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