

**PARTICIPATORY FOREST MANAGEMENT'S INFLUENCE ON RESOURCE USE  
CONFLICT RESOLUTION IN GOT RAMOGI FOREST RESERVE IN SIAYA  
COUNTY, KENYA**

**CARREN ATIENO KOWENJE**

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Award of Degree of Masters of Arts in Geography of Jaramogi Oginga Odinga University  
of Science and Technology.**

**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Sign: ..... Date: .....

Carren Atieno Kowenje,

Z451/4042/2015A

Declaration by Academic Supervisors:

This thesis has been submitted with our approval as the university supervisors.

Sign: ..... Date: .....

Dr. Otieno A. Charles (PhD)

Department of Social Studies,

School of Education, Humanities and Social Sciences,

Jaramogi Oginga Odinga University of Science and Technology.

Sign: ..... Date: .....

Dr. Warkach K. Tonui (PhD)

Department of Social Studies,

School of Education, Humanities and Social Sciences,

Jaramogi Oginga Odinga University of Science and Technology.

## **DEDICATION**

I devote this thesis to my husband; Chrispin Kowenje and my children; Edna, Bob and Sandra for the support they gave me during the study period.

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I would like to specifically thank my supervisors, Dr. Otieno Charles and Dr. Tonui Warkach for their continued mentorship, guidance and wise counsel in the preparation of this Thesis. Their vast knowledge and feedback have been very valuable in presenting this research work. I also thank my lecturers, classmates and my fellow colleagues for their input, support and guidance.

## ABSTRACT

Forest resources play a significant role in supporting livelihoods of people and biodiversity all over the world leading to their over exploitation. This over exploitation leads to depletion and conflicts over the resource utilization. The neighbouring communities generally benefit from the forests and at the same time are affected by policies and regulations from the government in terms of the resource utilization and access. Consequently, many governments have introduced decentralization of forest management to resolve conflicts on forest resource utilization. The study sought to determine the Participatory Forest Management's Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya. The study objectives were to: evaluate the level of community participation in decision-making in Got Ramogi Forest Reserve as a strategy for resource use conflict resolution, establish the benefits shared by the community from participatory forest management in Got Ramogi Forest Reserve and assess the community perception on conflict resolution strategies adopted for resource use in Got Ramogi Forest Reserve. The study was based on the managerial citizen involvement model. A cross-sectional research design was used. A sample size of 274 households was selected from target population of 950 households in the study area. The study used systematic, purposive and snowballing techniques in selection of respondents. Primary data was collected through structured questionnaires and key informant interviews. Secondary data was collected from published and non-published literature. Chi-square and Cost-Benefit Analysis were used to analyze quantitative data while qualitative data was analyzed thematically. The study showed that the community was slightly involved (mean of 2.06) in decision-making of participatory forest management's influence on resource use conflict resolution in Got Ramogi Forest Reserve. The study further recorded a Pearson Chi-Square value of 2.711 at a p-value of 0.854 indicating that there was no statistically significant association between level of involvement and conflict resolution for resource utilization. A cost-benefit of 66.67% was obtained thus showing existence of remarkable benefits. The study further established that the benefits shared by the community from participatory forest management as a strategy for forest resource use conflict resolution in Got Ramogi Forest Reserve included clay for making jikos (mean of 4.12), grazing land (mean of 4.09), water (mean of 4.07), firewood (mean of 3.93), worship area (mean of 3.88), timber as a building material (mean of 3.57) and herbal plants (mean of 3.53). The study concluded that the community perception on the conflict resolution strategies adopted for resource use in Got Ramogi Forest Reserve included use of negotiations that have been effective in managing livelihood-related wrangles on forest resource (mean of 3.68), adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest (mean of 4.01), protests have been effective in expressing dissatisfaction with general management of the forest resource (mean of 3.68), dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land (mean of 3.64), arbitration strategies have helped in solving conflicts related to resource use within the forest (mean of 3.58) and clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest (mean of 3.52). The study advises activating participatory forest management programs by both National and County governments. It proposes a Kenya Forest Service and Community partnership at Got Ramogi Forest Reserve for sustainable resource utilization. Additionally, increased government funding is recommended for digital demarcation, stakeholder mobilization and conservation training in Forest Reserves.

## TABLE OF CONTENTS

|  |             |
|--|-------------|
| <b>CONTENTS DECLARATION .....</b>  | <b>ii</b>   |
| <b>DEDICATION.....</b>   | <b>iii</b>  |
| <b>ACKNOWLEDGEMENT.....</b>  | <b>iv</b>   |
| <b>ABSTRACT.....</b>   | <b>v</b>    |
| <b>ABBREVIATIONS AND ACRONYMS .....</b>  | <b>x</b>    |
| <b>LIST OF TABLES .....</b>  | <b>xi</b>   |
| <b>LIST OF FIGURES .....</b>   | <b>xii</b>  |
| <b>LIST OF PLATES .....</b>  | <b>xiii</b> |
| <b>CHAPTER ONE .....</b>   | <b>1</b>    |
| <b>INTRODUCTION.....</b>   | <b>1</b>    |
| 1.1 Background of the Study .....  | 1           |
| 1.2 Statement of the Problem.....  | 6           |
| 1.3 General Objective of the Study.....  | 7           |
| 1.3.1 Specific Objectives.....   | 7           |
| 1.4 Research Questions.....  | 7           |
| 1.5 Significance of the Study .....  | 8           |
| 1.6 Justification of the Investigation.....  | 8           |
| 1.7 Scope and Limitation of the Study.....   | 9           |
| 1.8 Definition of the Operational Terms.....   | 10          |
| <b>CHAPTER TWO .....</b>   | <b>11</b>   |
| <b>LITERATURE REVIEW.....</b>  | <b>11</b>   |
| 2.1 Introduction.....  | 11          |
| 2.2 Participatory Forest Management’s Influence on Resource Use Conflict Resolut.....    | 11          |
| 2.3 Benefit Sharing in Participatory Forest Management and Forest Resources Use Conflict |             |

|   |           |
|---|-----------|
| Resolution .....  | 18        |
| 2.4 Local Community Perceptions on Conflict Resolution Strategies Adopted by Participatory Forest Management..... | 22        |
| 2.5 Theoretical Framework.....  | 28        |
| 2.6 Conceptual Framework.....   | 29        |
| <b>CHAPTER THREE .....</b>  | <b>31</b> |
| <b>RESEARCH METHODOLOGY .....</b>   | <b>31</b> |
| 3.1 Introduction.....   | 31        |
| 3.2 Research Design.....  | 31        |
| 3.3 Study Area.....   | 31        |
| 3.4 Target Population.....  | 33        |
| 3.5 Sample Size and Sampling Procedure .....  | 33        |
| 3.6 Sources, Types and Methods of Data Collection.....  | 36        |
| 3.6.1 Pre-testing .....   | 37        |
| 3.6.2 Validity of the Instruments .....   | 37        |
| 3.6.3 Reliability of Instruments.....   | 37        |
| 3.7 Data Analysis and Presentation.....   | 37        |
| 3.9 Ethical Considerations .....  | 39        |
| <b>CHAPTER FOUR.....</b>  | <b>41</b> |
| <b>RESULTS AND DISCUSSIONS .....</b>  | <b>41</b> |
| 4.1 Introduction.....   | 41        |
| 4.2 Response Rate.....  | 41        |
| 4.3 Reliability and Validity of the Instruments.....  | 42        |
| 4.4 Demographic Characteristics .....   | 43        |
| 4.4.1 Distribution of Respondents by Gender.....  | 43        |
| 4.4.2 Distribution of Respondents by Age.....   | 44        |

|   |           |
|---|-----------|
| 4.4.3 Distribution of Respondents by Level of Education .....   | 44        |
| 4.4.4 Distribution of Respondents by Marital Status .....   | 45        |
| 4.4.5 Distribution of Respondents by Number of Dependents .....   | 45        |
| 4.4.6 Distribution of Respondents by Occupation .....   | 46        |
| 4.4.7 Distribution of Respondents by Village of Residence .....   | 46        |
| 4.4.8 Distribution of Respondents by Duration of Stay .....   | 47        |
| 4.5 Community Involvement in Decision Making of Participatory Forest Management as a strategy for Resource Use Conflict Resolution..... | 48        |
| 4.5.1 Involvement in Specific Forest Management Activities and Forest Resources Use Conflict Resolution .....                           | 53        |
| 4.6 Benefits Shared by the Community from Participatory Forest Management for Resource Use Conflict Resolution.....                     | 54        |
| 4.6.1 Cost Benefit Analysis .....   | 58        |
| 4.6.2 Challenges Faced in Accessing Forest Resources .....  | 58        |
| 4.7 Community Perception on the Conflict Resolution Strategies Adopted for forest Resources Use.....                                    | 60        |
| <b>CHAPTER FIVE .....</b>   | <b>62</b> |
| <b>SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....</b>  | <b>62</b> |
| 5.1 Introduction.....   | 62        |
| 5.2 Summary of Findings.....  | 62        |
| 5.3 Conclusion .....  | 64        |
| 5.4 Recommendations of the Study .....  | 65        |
| 5.5 Suggestions for Further Research .....  | 65        |
| <b>REFERENCES.....</b>  | <b>66</b> |
| <b>APPENDICES .....</b>   | <b>73</b> |
| Appendix I: Consent Form .....  | 73        |

|  |    |
|--|----|
| Appendix II: Approval Letter .....         | 74 |
| Appendix III: Research Permit .....        | 75 |
| Appendix IV: Questionnaire .....           | 76 |
| Appendix V: Interview Schedule.....        | 82 |
| Appendix VI: Observation Checklist.....    | 83 |
| Appendix V: Krejcie and Morgan Table ..... | 84 |

## ABBREVIATIONS AND ACRONYMS

|               |   |
|---------------|---|
| ASFM          | Arabuko Sokoke Forest Management  |
| CF            | Community Forestry  |
| CFAs          | Community Forest Associations   |
| CFM           | Collaborative Forest Management   |
| CI            | Complexity Index  |
| CSR           | Corporate Social Responsibility   |
| CVI           | Construct Validity Index  |
| FAO           | Food and Agriculture Organisation   |
| FGDs          | Focus Group Discussions   |
| FLEGT-<br>VPA | Forest Law Enforcement, Governance and Trade-Voluntary Partnership<br>Agreement |
| FMA           | Forest Management Agreements  |
| FRA           | Forest Resource Assessment  |
| FUG           | Forest User Group   |
| GFGR          | Global Forest Goals Report  |
| Gok           | Government of Kenya   |
| IK            | Indigenous knowledge  |
| KIIs          | Key Informant Interviews  |
| KNBS          | Kenya National Bureau of Statistics   |
| M&E           | Monitoring and Evaluation   |
| NACOSTI       | National Commission for Science Technology and Innovation                       |
| NFRA          | National Forest Resources Assessment  |
| NGOs          | Non- Governmental Organisations   |
| NTFPs         | Non-Timber Forest Products  |
| PELIS         | Plantation Establishment Livelihood Improvement Schemes                         |
| PFM           | Participatory Forest Management   |
| PI            | Participation Index   |
| SDG           | Sustainable Development Goals   |
| SFM           | Sustainable Forest Management   |
| SPSS          | Statistical Package for Social Science  |
| UERC          | University Ethical Review Committee   |
| UNEP          | United Nations Environment Program  |

## LIST OF TABLES

|  |    |
|--|----|
| Table 3.1: Sampling Matrix .....   | 35 |
| Table 3.2: Summary of Data Analysis Techniques.....  | 39 |
| Table 4.1: Targeted Versus Achieved Response.....  | 41 |
| Table 4.2: Cronbach’s Alpha .....  | 42 |
| Table 4.3: Construct Validity Index.....   | 43 |
| Table 4.4: Distribution of the Respondents by Gender.....  | 43 |
| Table 4.5: Distribution of the Respondents by Age.....   | 44 |
| Table 4.6: Distribution of the Respondents by Level of Education .....   | 44 |
| Table 4.7: Distribution of the Respondents by Marital Status .....   | 45 |
| Table 4.8: Distribution of the Respondents by Number of Dependents .....   | 45 |
| Table 4.9: Distribution of the Respondents by Occupation .....   | 46 |
| Table 4.8: Distribution of the Respondents by Village of Residence .....   | 47 |
| Table 4.11: Distribution of the Respondents by Duration of Stay in Got Ramogi .....  | 47 |
| Table 4.12: Level of Community Involvement in Decision Making in Got Ramogi Forest Reserve<br>for Resources Use and Conflict Resolution .....    | 48 |
| Table 4.13: Level of Involvement in the Forest Management Activities for Decision Making ...   | 52 |
| Table 4.14: Chi-Square Test for level of Involvement .....   | 53 |
| Table 4.15: Strength of the Association.....   | 53 |
| Table 4.16: Benefit Sharing from Participatory Forest Management and Resources Utilization in<br>Got Ramogi Forest Reserve .....                 | 54 |
| Table 4.17: Benefits Derived from Participatory Forest Management of Got Ramogi Forest<br>Reserve.....   | 56 |
| Table 4.18: Cost Benefit Calculation for Participatory Forest Management in the Last Two Years<br>.....  | 58 |
| Table 4.19: Challenges Faced in Accessing Forest Resources .....   | 59 |
| Table 4.20: Perception of the Community on Conflict Resolution Strategies Adopted for Resources<br>Utilization in Got Ramogi Forest Reserve..... | 60 |

## LIST OF FIGURES

|   |    |
|---|----|
| Figure 2.1: Conceptual framework showing the relationship between participatory forest management and conflict resolutions..... | 30 |
| Figure 3.1: Ramogi Hill forest, the surrounding lakes and settlement.....   | 32 |
| Figure 4.1: Challenges Faced in Accessing Forest Resources .....  | 59 |

## LIST OF PLATES

|  |    |
|--|----|
| Plate 4.1: A Place Set Aside For Worship Purposes within the Forest..... | 57 |
| Plate 4.2: Herbal Plant Used To Treat Measles .....                      | 57 |

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Forests are of paramount importance, sustaining approximately 1.6 billion people, which accounts for a quarter of the global population, who heavily rely on them for their subsistence needs, employment, income and various livelihoods (The Global Forest Goals Report, 2021). Unfortunately, despite their significance, deforestation and forest degradation persist at alarming rates, leading to severe repercussions on the lives and well-being of forest-dependent communities (The Global Forest Goals Report, 2021). The main culprit behind this predicament is the continuous expansion of agriculture, which serves as the primary driver of deforestation and the fragmentation of forested areas (FAO and UNEP, 2020). Moreover, the issue is compounded by the expropriation of forests by governments, classifying them as state property reserves, consequently causing a progressive degradation of the remaining forest resources (Ebissa et al., 2023). Such a scenario has perpetuated conflicts as local communities assert their traditional rights to forests while the state exercises strict control over forest management, leading to contentious situations that hinder the sustainable use and conservation of these invaluable natural resources (Girma et al., 2023). The prevailing centralized and top-down decision-making approaches have proven to be inadequate in effectively addressing local-level natural resource governance issues and the diverse needs of various communities. To ensure efficient nature conservation, particularly in countries marked by vast ethnic and environmental diversities, there is a pressing need for locally specific conservation management strategies (Nzau et al., 2022).

Conflicts are common phenomena in many regions of the world; especially in dry lands that are endowed with scarce natural resource (Daniela and Blas, 2022).The scholars explain that Global environmental change coupled with population increases has led to unprecedented demand for resource leading to resource utilization conflicts. This is in line with the observation made by Frischmann et al. (2019) that rapid population growth puts 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 resource 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.

Participatory forest management (PFM) an approach to forest governance that involves the active participation of local communities, private stakeholders, and the public sector in making decisions related to the management and conservation of forest resources (Mbeche et al., 2021). PFM has increased conservation awareness, promoted a sense of ownership among forest-adjacent communities and fostered trust among private partners involved in forest governance (Chisika & Yeon, 2021).

Globally, deforestation has led to a reduction in forest cover as the world continues to lose around 13 million hectares of forests annually, including six million hectares of primary forests (Nousiainen & Mola-Yudego, 2022; Thompson et al., 2013; Pahari & Murai, 1999). This has been driven by population increase and the need for land for agriculture, settlements and development (Newton and Agrawal, 2013). An analysis done in Europe by Nousiainen and Mola-Yudego (2022) established that effective communication, transparency of the planning process and involvement of all stakeholders are essential actions to prevent harmful high-intensity forest conflicts. An exploration in Indonesia by Golar et al. (2021) reported that community involvement is significant in every stage of conflict resolution alongside factors such as clear boundaries between community-owned land, villages and forest areas. Deforestation is evident in various countries, such as South America and Indonesia (Food and Agriculture Organization of the United Nations, 2015). In India, Nagahama et al. (2022) identified three distinct phases of involvement among local communities in forest management: firstly, engagement in practical activities; secondly, participation in the decision-making process; and finally, active involvement in the development of management plans.

Resource utilization conflicts have also been a pressing issue in Africa, evidenced by forced evictions, unfair land resettlement, mass transfers and genocides (Regan, 2016). Africa, has been witnessing substantial net forest loss, as reported in the Global Forest Resource Assessment (FRA) report (FRA, 2020). Africa has experienced significant forest destruction due to subsistence activities, leading to resource utilization conflicts (Gumoshabe et al., 2023). Kimengsi et al. (2022) systematically reviewed over three decades of scientific literature on forest use and management institutions, analyzing 100 empirical articles involving 374 case studies. They found that forest-linked institutions are often conceptualized as dynamic processes rather than rigid structures, and the determinants of institutional compliance vary across sub-regions in sub-Saharan Africa, with economic, demographic and political factors being more dominant in Central Africa

Participatory Forest Management (PFM) has been implemented deliberately to involve forest-adjacent communities and other stakeholders in forest management, contributing to community livelihoods (East Africa Natural History Society, 2020). In Tanzania, Luswaga and Nuppenau's (2020) investigated community involvement in the participatory forest program, revealing notable disparities in participation levels and intensity between villages neighbouring state-managed and community-managed forests. The research indicated that the effectiveness of participatory programs in achieving their intended goals was moderate, with more favourable outcomes observed in state forests that had collaborative management with the local community. A study done in Uganda by Gumoshabe et al. (2023) explored the provisioning services obtained from the Mpanga central forest reserve (CFR), assessed the contribution of the CFR to the surrounding communities and explored the challenges faced while obtaining these services from the forest reserve. The study established that 76.5% of the variability in cash income from the CFR was significantly explained by age of respondents, period of stay and education level.

Kenya's forest cover has suffered significant declines due to deforestation, though it currently stands at around 7.4% of the total land area, falling below the expected global percentage of 10% (Republic of Kenya, 2018a). The case study of the Arabuko Sokoke Forest Management (ASFM) Team in Kenya, conducted by Mbuvi et al. (2020), demonstrated successful forest management, community livelihood improvement and overall rural development through participatory approaches. However, conflicts arise when different stakeholders have conflicting values, rights, needs and interests related to resource use (Food and Agriculture Organization, 2020). Scholars in Europe have reported limited success in participatory management if conflict resolution strategies do not address resource-sharing rules and regulations among stakeholders (Alfonso and Castro, 2001; Nguyen, 2012).

In Kenya, conflicts over resource utilization persist in many forest reserves due to reluctance by the government to transfer lucrative revenue sources from joint forest management to local levels (Kairu et al., 2020). Consequently, communities living adjacent to the forests are demotivated to invest in sustainable forest management, as they perceive minimal benefits from forest resources (Mbeche et al., 2021). Despite agreements on forest access, illegal activities such as tree harvesting, charcoal burning and game hunting continue to be reported (Maina and Nzengya, 2021). Forests are of paramount importance, sustaining approximately 1.6 billion people, which accounts for a quarter of the global population, who heavily rely on them for their subsistence needs, employment, income and

various livelihoods (The Global Forest Goals Report, 2021). Unfortunately, despite their significance, deforestation and forest degradation persist at alarming rates, leading to severe repercussions on the lives and well-being of forest-dependent communities (The Global Forest Goals Report, 2021).

The primary factor responsible for both deforestation and the fragmentation of forested regions in Kenya is the ongoing expansion of agriculture (FAO, 2020). Moreover, the issue is compounded by the expropriation of forests by governments, classifying them as state property reserves, consequently causing a progressive degradation of the remaining forest resources (Girma et al., 2023). Such a scenario has perpetuated conflicts as local communities assert their traditional rights to forests while the state exercises strict control over forest management, leading to contentious situations that hinder the sustainable use and conservation of these invaluable natural resources (Girma et al., 2023).

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Even though community members had a stake in the forest resource 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 ineffective 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; Kenya included, 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 resource 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 conflicts on forest resource utilization experienced (Rotich et al., 2020). 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 resource 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 conflicts on forest resource utilization in Kenya and especially in Got Ramogi.

Got Ramogi forest has experienced severe degradation over the last two decades and several sacred sites have been destroyed threatening important plant and animals with extinction (Otuoma & Odera, 2008). The situation according to the scholars is due to failures of previous forest management interventions to incorporate conservation and livelihood needs of the community adjoining the forest. The scholars therefore proposed a sustainable resource utilization that will lead to the conservation of the resource. Kairu et al. (2020) reports a decline in Got Ramogi forest due to population increase that demands more land for settlement, cultivation and other purposes. As a result, the writer observed that

the needs of the community must be met for sustainable forest management to succeed without many conflicts.

In Got Ramogi Forest Reserve, participatory forest management has been implemented (Kairu et al., 2020). However, a significant challenge has emerged from the on-going conflicts related to forest resource utilization. The primary issue lies in the limited involvement of all stakeholders, particularly the local community, which hinders the effectiveness of management efforts. Despite the introduction of participatory approaches, the lack of comprehensive engagement with all concerned parties has resulted in setbacks in achieving sustainable and harmonious forest management practices (Kairu et al., 2020). Osumba (2011) adds that minimal benefit-sharing of resource in Got Ramogi has made the community reluctant to support the conservation policies proposed by Participatory Management and this may have contributed to the resource utilization conflicts experienced in the forest. Therefore, this study was undertaken to assess the effectiveness of participatory management for forest resource utilization through the adoption of conflict resolution strategy in Got Ramogi Forest Reserve. The study contributes to the growing PFM literature by recommending solutions to conflicts on forest resource utilization.

## **1.2 Statement of the Problem**

Despite the government introduction of participatory forest management policy, institutions and by-laws safeguarding forest resource utilization in Kenya, conflicts over utilization of the forest resources persisted in many forest Reserves (Ongugo, 2007; Ribot et al., 2010). Conflicts over resource utilization get worse when the population increases and poverty levels rise. Consequently, the high demand for cultivation and pasture land had also increased. Got Ramogi too had experienced continued encroachment in forest land in form of settlement and illegal use of forest resource like grazing, logging, firewood collection among others (Ongugo et al., 2008). The increased demand for housing units using traditional materials and dependence on traditional energy sources had increased the forest destruction. Although the Kenya Forest Service together with the Community Forest Association had been given mandate on forest Reserves to include the community living adjacent to the forest in major decision-making and control over benefits from the forest Reserves, conflicts were common over forest resource utilization. The communities therefore felt left out of forest management and did not enjoy their participation right in the forest resource management (Ayiemba et al., 2014).

Despite the concerted efforts by the government to save the forest resource, unlawful exploitation was still on going and threatened efforts of forest resource utilization conflict resolution. The information on the level of involvement in decision-making and benefit-sharing by the community living adjacent to Got Ramogi and their perception on the conflict resolution strategies adopted over resource utilization by PFM was limited hence the need to be investigated. Forest resource utilization conflict resolution efforts in the forest Reserves were therefore dictated by participatory management strategies used. This therefore meant that better conflict resolution strategies were realized to justify further utilization of the forest resource. The researcher believed that if effective participatory forest management was done in Got Ramogi, the conflicts on forest resource utilization would be resolved.

### **1.3 General Objective of the Study**

The study sought to determine the Participatory Forest Management's Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya.

#### **1.3.1 Specific Objectives**

The specific objectives were:

- i. To evaluate the level of community involvement in decision-making of participatory forest management as a strategy for resource use conflict resolution in Got Ramogi forest Reserve.
- ii. To establish the benefits shared by the community from participatory forest management as a strategy for resource use conflict resolution in Got Ramogi Forest Reserve.
- iii. To assess the community perception on the conflict resolution strategies adopted for resource use in Got Ramogi Forest Reserve.

### **1.4 Research Questions**

This exploration was guided by the following research questions:

- i. What is the level of community involvement in the decisions of participatory management as a strategy for resource use conflict resolution in Got Ramogi?

- ii. What are the benefits of participatory forest management to the community in Got Ramogi Forest Reserve?
- iii. What is the community perception on the conflict resolution strategies adopted for the resource use conflict resolution in Got Ramogi Forest Reserve?

### **1.5 Significance of the Study**

The study findings can be beneficial to the forest officers working with the Kenya Forest Services in highlighting, following up and developing interventions that could aid in curbing conflicts over forest resource utilization, deforestation and other hazardous practices that could lead to diminishing forest cover. Consequently, the exploration findings could inform policy makers within the national (GoK) government of Kenya on environmental protection and conservation.

Furthermore, the study findings can be beneficial to the community living around Got Ramogi and other forest Reserves in Kenya by providing relevant knowledge that would empower their capacity in conflict resolution strategies to be adopted for managing forest resource. Accordingly, the study findings could be co-opted by politicians and other community representatives in forming structures that could enable easy and effective participation of the forest inhabitants and nearby residents in the protection and management of forest Reserves.

The NGOs and other non-state organizations fascinated by forest conservation and conflict resolution programs for forest resource utilization may adopt the findings of this exploration to help set realistic goals and thus run effective interventions. Lastly, the study findings could be adopted by scholars for further review, research gap exploration and other scholarly works.

### **1.6 Justification of the Study**

This study focused on Siaya County because the recent report from the National Forest Resources Assessment (2021) indicated that the County's tree cover was 5.2 % thereby being enumerated among the last five counties with the least tree cover in Kenya. In addition, the report listed Siaya as the County with the smallest forest cover of 0.2 % in Kenya (NFRA, 2021). This exploration specifically focused on Got Ramogi because it is the largest forest Reserve within Siaya County and therefore contributes to its larger share of the forest cover. Participatory forest management aligns with SDG 15 as it emphasizes the involvement and active participation of local communities and stakeholders

in the sustainable management of forests. Got Ramogi formed an attractive natural resource for the ever-increasing population in an arid area with limited livelihood opportunities. The forest Reserve therefore had become vulnerable to destruction by the community living adjacent to it; compromising its conservation and further leading to many conflicts over resource utilization between the Forest Department and the community. Moreover, Got Ramogi was not only a forest Reserve but also served as a cultural shrine where the community gathered in for prayers and performed other rituals.

### **1.7 Scope and Limitation of the Study**

The exploration focused on assessing the effectiveness of participatory forest management for forest resource utilization through the adoption of conflict resolution strategies in Got Ramogi Forest Reserve. The geographical scope of the study was limited to the Got Ramogi Forest Reserve area. The study strictly focused on three thematic areas: the level of community involvement in decision-making, benefit-sharing and the community's perception of conflict resolution strategies adopted by participatory management for resource utilization in Got Ramogi Forest Reserve.

Data collection limitations in the field were encountered during the exploration. Some challenges included difficult terrain and limited accessibility to certain areas within the forest reserve, which affected the ability to gather data from all desired locations. Additionally, the response rate of some respondents to questionnaires and interviews varied, which may have influenced the representativeness of the data.

The time scope of the study was limited to a specific period during which data was collected and analyzed. Due to time constraints, it may not have been possible to capture long-term trends or changes in forest management practices beyond the study's duration. However, the study aimed to provide valuable insights into the current state of participatory forest management in the study area during the specified time frame.

## **1.8 Definition of the Operational Terms**

**Community:** A group of people living in a particular local area and usually sharing a common ancestor. In this exploration, the community will be the people living adjacent to Got Ramogi.

**Forest Management:** Is the process of planning and implementing practices for the stewardship and use of the forest Reserve aimed at achieving specific environmental, economic, social - cultural goals.

**Forest Resource Use Conflict:** The existence of multiple and competing interest by various groups over the use of forest resource. This exploration will focus on Got Ramogi Forest Resources.

**Forest resource:** All products underlined under the Forest Act,cap385, which include, timber, fruits, charcoal, firewood, trees, grass, leaves, seeds and any other declared by the Forest Department.

**Forest:** The type of ecosystem dominated by trees and undergrowth covering a vast area of land.

**Participation:** Active involvement of the people living adjacent to Got Ramogi in the management of the forest Reserve that directly affect their lives to achieve the shared objectives.

**Stakeholder:** A person with legitimate interest in participatory management in Got Ramogi forest Reserve.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter describes the literature that was relevant to the study. The review was discussed in line with the objectives of the exploration. The review looked at the following areas: community involvement in the decisions of participatory forest management, benefit-sharing of forest resource and the community perception on the conflict resolution strategies adopted by participatory management in Forest Reserves.

#### **2.2 Participatory Forest Management's Influence on Resource Use Conflict Resolution**

Studies on participation and participatory processes have been significant in two main areas: the political sciences, which delve into discussions about democracy and citizenship, particularly within the context of regional and local planning and the theory of development, especially concerning sustainable land use in forested areas (Odhiambo and Opiyo, 2017). Involving the community in the decision-making of any development project like forest management increased their level of trust and encouraged willing contribution (Mwiru, 2015). Reed et al. (2009) argued that successful participation involved stakeholders who had active engagement in the project through regular negotiations and decision-making that occurred at various stages and with the groups that were affected by the resolutions. To realize this, the researchers added that different stakeholders involved were consulted especially in decision-making, however putting this into practice had been a major challenge in most participatory processes leading to unresolved conflicts.

The success of PFM depends on discovering the interrelations and recognizing power inequalities and prominent players especially in decision-making (Tadesse, Woldetsadik and Senbeta, 2017). However, FAO (2012) noted that participation allowed stakeholders influence on policy formulation, investment choices, control over development initiatives and management of decisions so as to create the necessary sense of ownership among the local community and reduce resource utilization conflicts. However, limited documentation had been done on stakeholders influence in decision-making processes in participatory forest management. Arnstein (1969) posits that people's participation included; consultation, partnership, delegated power and citizen control through decision-making for successful project management. The Participatory Management Policy in Got Ramogi was silent on

the engagement of the community in decision-making and hence a possible cause of resource's utilization conflicts.

According to Chisika and Yeom (2020), the success of participation in common resource depended on the consideration of stakeholders' decisions at different levels in management of the resource like organization, implementation and supervision, control, benefit-sharing and financing. According to Opanga (2009), when the resource is largely controlled by external entities such as investors and professionals, the participation of local communities in critical decision-making stages diminishes, consequently resulting in an increase in resource utilization conflicts.

Globally, decision-making as a strategy in participatory forest management was gaining importance and each region had adopted a suitable level of engaging the stakeholders in management. In England for example, the community living adjacent to the forests were highly engaged in decision-making in participatory management, resulting to a great improvement in the country's community forestry (Thammanu et al., 2021). The involvement of the stakeholders led to planting of several hectares of new woodlands, brought more acreage of existing woodland under participatory management, increased the non-farmer landowners in addition to opening up considerable aesthetic green space (Miyagawa et al., 2018). There was need for more emphasis on inclusive decision-making in Got Ramogi participatory forest management and how successful it had been in resource utilization conflict resolution.

The realization of people's participation in community forests, as posited by Tabot et al. (2019), hinged on the existence of collaboration and continuous follow-up, supported by relevant government sectors in the decision-making process. This was in line with Ayiamba et al. (2014) argument that when the decision of the community living adjacent to the forest is ignored in making rules and regulations of forest management, the forests are highly degraded and many resource utilization conflicts arise. Involving the community in active decision-making and giving them responsibilities in the forest resource management brought a win-win solution for the Government, the people and the environment (Kristina, Bajrachanya & Sitaula, 2009). This led to minimal resource utilization Conflicts when the government policies were implemented successfully and the community made decisions in the major resource development and conservation processes.

Participation, as defined by Luswaga and Nuppenau (2020), involves stakeholders influencing and sharing control over priority setting, policy-making, resource allocations and access to public goods and services. Meanwhile, Walpole et al. (2003) characterized participation as active involvement and attentive listening to stakeholders in all decisions concerning the project's objectives. The primary purpose of participation in forest management was to encourage community self-determination and thus foster sustainable forest development. Some scholars supported the opinion however; they had observed that participation became an important element in any change process if it enhanced equity, effectiveness and long-term management capacity of the stakeholders through participating actively in decision-making processes (Alcorn, 2014).

In line with Monsi's (2014) findings on African governments' decentralization of forest management decision-making, major decisions imposed by top-level representatives on the forest users led to disagreements and resource utilization conflicts in several African countries. These conflicts were attributed to the decisions made at the top, causing let-downs in natural resource management. Monsi (2014) highlights a pertinent issue in African forest management, where decentralization efforts have not fully translated into effective decision-making at the local level. The fact that major decisions are still enforced by top-level representatives onto forest users is concerning. This centralized approach may contribute to disagreements and conflicts, hindering sustainable natural resource management in the region. However, we must be cautious not to generalize this situation, as different African countries may have varying degrees of success in their decentralization efforts.

In contrast, Alcorn (2014) observed that resource use conflicts were considerably reduced in cases where communities were empowered to participate in decision-making at all levels of participatory management. This suggests that empowering communities in the decision-making process fosters better natural resource management and reduces conflicts related to resource utilization. Alcorn (2014) observed that involving the communities in decision-making leads to fewer resource use conflicts is a promising finding. This suggests that participatory approaches where local communities have a say in forest management decisions, could be instrumental in promoting conflict resolution and fostering more sustainable resource utilization.

In East Africa, participatory forest management had been embraced for improved forest cover and reduction of excess carbon dioxide in the atmosphere which was a factor in positive climate change worldwide (Bong, Felker and Maryudi, 2016). This had been observed where the communities had been involved in decisions of Participatory Carbon Assessment in the forests which led to the success of such projects and reduced the conflicts that could have occurred over the forest resource utilization. Luswaga and Nuppenau (2020) delved into community engagement within the participatory forest program, uncovering significant variations in both the extent and enthusiasm of participation among villages adjacent to state-run and community-run forests. Their study suggested that the success of participatory initiatives in realizing their objectives was of a moderate nature, with more positive results evident in state-managed forests that practiced collaborative management with the local community.

Participatory forest management, as argued by Chisika and Yeom (2020), involves deliberately engaging the local community and stakeholders in decision-making related to forest management. This approach is believed to be effective in reducing resource utilization conflicts, but it should be carried out within a framework that contributes to the community's livelihoods. Scholars in agreement with this perspective also emphasized the importance of respecting authority within participatory processes. Decision-making on aspects like improving seedlings, security patrols, forest access, harvesting and operational costs should involve the stakeholders to encourage improved forest cover while minimizing resource utilization conflicts (Shelton et al., 1997). However, despite the recognized benefits of participatory approaches, forestry agencies were often reluctant to relinquish their control over forest resources to the communities. This unwillingness to guarantee authority to the communities in decision-making led to conflicts over resource utilization (Opanga, 2009).

The level of participation in a development process or plan was frequently assessed in terms of power and roles assigned to different participants in decision-making. Denying stakeholders their rightful power in these processes may lead to conflicts arising from feelings of marginalization or exclusion. While the literature presents strong arguments in favour of participatory forest management, it also highlights some critical issues. The challenge of ensuring genuine authority and decision-making power for communities remains a significant barrier in implementing participatory approaches

effectively. Addressing this challenge is crucial for promoting successful conflict resolution and sustainable forest management.

Community forest management that involves stakeholders at all levels, from villages to top officials through Community Forest Associations (CFA), has been associated with limited resource use conflicts (Wambugu et al., 2017). The involvement of the community living adjacent to the forest is deemed essential as they possess valuable insights due to their regular interactions with the forests. However, Roy (1999) raised concerns about the formation of CFA members by external forces. Excluding community members from decision-making processes might hinder the effectiveness of the CFA and lead to heightened resource utilization conflicts. Challenges during CFA meetings include discrimination based on income levels, dominance of decisions by powerful individuals and unequal access to benefits, all of which contribute to conflicts (Ongugo, 2007). Despite the CFA's role as community representatives in decision-making, they have not been successful in curbing forest destruction. This situation necessitates a stronger focus on developing effective conflict resolution strategies to address the on-going challenges.

Effective PFM implementation required social interactions in management of conflicts on forest resource utilization like empowerment, involvement, negotiation and collective decision-making by all stakeholders (Ayiemba et al., 2014). However, Blas, (2011) asserted that local governance over forest resource was still very poor and the local community members had not received significant decision-making powers because the government authorities still had an upper hand in decision-making concerning harvesting of timber and other forest products. This had been a major source of discontent in PFM. Elsewhere, scholars had also observed that the local community representatives usually act as observers in decision-making meetings in the management which were mostly chaired by the higher authority or their representatives (Tadesse, Woldetsadik and Senbeta, 2017). As a result, the community felt side-lined in the forest management decisions hence did not support the resolutions adopted for solving resource utilization conflicts.

Participatory management had been criticized when it came to power balancing between stakeholders involved especially in decision-making (Nzau et al, 2020). For instance, the scholar argued that major decision-making like finances, ownership and, objectives of the project were the preserve of the powerful stakeholder while other actors were excluded; furthermore, there were possibility of the

local elite capturing the matters concerning decision-making because of their position in the society. This had always left the community disappointed by the management of forest resource. The same opinion had been supported by (Turyahabwe et al., 2012) that in reality the governments did lead and only included other stakeholders in consultation which was not collaborative in manner. However, power balancing remained a major concern in most participatory forest management and was a cause of resource utilization conflicts. Ongugo et al. (2008) noted that efforts of PFM were demoralized by conflicts on forest resource utilization and if no proper resolution methods were adopted, forest degradation would result into advanced reduction of forest cover as well as greater conflicts on forest resource utilization.

In their study, Chisika and Yeom (2020) set out to examine the procedural and distributive equity effects of the two Forest Management Agreements (FMAs). The researchers conducted a comparative analysis of the processes involved in recognizing the agreements, as well as the income and cost-sharing aspects. Additionally, they investigated the challenges experienced by the state in implementing these FMAs. The study also sought to determine whether FMA implementation was yielding equity outcomes or not. The study used literature review and 19 key informant interviews, results from Gathiuru and Karima forests to substantiate that FMA is a reasonably robust, multi-objective-win-win tool that promoted equity in PFM. However, the research established that implementation process had been slow. The study proposed complementing the current Participatory Forest Management (PFM) framework with explicit provisions for Corporate Social Responsibility (CSR). However, the study was comparative in nature, a methodological divergence from the current study.

Tabot et al. (2019) sought to examine how participatory project initiation influenced sustainable forest management in Saboti forest in Trans-Nzoia County, Kenya. The study was guided by Participatory Development theory. The study adopted the explanatory research design. The study had a target population of 2600 community forest association (CFA) members and 15 Kenya Forest Officers. Further, the exploration used Census sampling in the sampling of Kenya forest Officers and simple random sampling to select community forest management members. The sample size was 347 community forest management members and 15 Kenya forest Officers. The study collected data using questionnaires and interview guides. The exploration also analysed collected data using descriptive and inferential statistics. The study carried out presentation of the findings using tables. The study

had a significant influence of participatory project initiation on sustainable forest management (SFM). The findings implied that an increase in participatory project initiation improved sustainable forest management in Saboti. Participatory project initiation had a significant influence on sustainable forest management. Moreover, the study found out that the community participation in initiation had a significant influence on sustainable forest management. Therefore, the study recommended the need for forest management to involve the community members during the initiation stage of the projects to achieve sustainable forest management.

Cheruiyot et al. (2020) sought to establish the extent to which Participatory Forest Planning influences conservation of Mau forest program. The study was guided by descriptive survey and correlational research designs. The study drew a sample size of 364 respondents from a target population of 4100 people using Yamane's Formula. The research established that since  $r = 0.087$ , then there was a weak positive linear correlation between Participatory Forest Planning and Conservation of Mau Forest program. The study concluded that with a  $p\text{-value} = 0.132$ , the null hypothesis was not rejected. Therefore, the study recommended that trust between the state actors and local communities can be built up if the local institutions were empowered and given authority in the context of participatory forest management system.

In Tanzania, Lokina (2020) examined the impact of participatory forest management on tree planting. The exploration focused on tree planting on private land – an important yet understudied response. The exploration combined a conceptual spatial landscape model with primary data. Further, the study demonstrated that villagers do plant trees in response to increased forest protection, but only when there were no unprotected forests within their landscape to which they can displace their extraction activities. The study also highlighted how tricky it was methodologically to isolate the response in Tanzania. Therefore, the study concluded that both tree planting and the siting of forests under increased protection following the introduction of participatory forest management are responses to forest degradation.

The study conducted by Kairu et al. (2020) aimed to evaluate the effects of implementing Participatory Forest Management (PFM) on the structure and regeneration of mangroves in Gazi Bay, Kenya. The study collected forest data along belt transects perpendicular to waterline in both community and state managed blocks. The exploration found out that basal area and standing density

were significantly higher in the co-managed forests (16 m<sup>2</sup> ha<sup>-1</sup> and 4,341 tree ha<sup>-1</sup>) as compared to the state managed forests (eastern block 10.3 m<sup>2</sup> ha<sup>-1</sup> and 2,673 trees ha<sup>-1</sup>; western block 6.2 m<sup>2</sup> ha<sup>-1</sup> and 2,436 trees ha<sup>-1</sup>). The exploration also found out that there were significantly higher ( $p = 0.0068$ ) densities of quality class poles in co-managed forest block as compared to state-managed eastern and western blocks. Further, the exploration considered natural regeneration values of 38,822 juveniles' ha<sup>-1</sup> in the co-managed central block and 23,556 and 35,061 juveniles ha<sup>-1</sup> in the state managed eastern and western blocks respectively were adequate to support recovery of the forest. The exploration recorded a higher complexity index (CI) in the co-managed mangrove forest compared to the state managed eastern and western blocks was particularly due to improved stand density, tree height and biomass resulting from increased surveillance and protection by the community. The results of the study had wide implications in the management of mangroves for community and biodiversity benefits and climate change mitigation. Therefore, the study supported community participation for improved management of mangrove forests and were in conformity with sectoral policies on natural resource management in Kenya.

### **2.3 Benefit Sharing in Participatory Forest Management and Forest Resources Use Conflict Resolution**

Benefit-sharing in this case referred to a particular form of social responsibility to proportionately direct earnings from exploitation of forest resource, be they economic or non-economic to the local communities (Thammanu et al., 2021). The scholar explained that in many parts of the world, the forest community usually welcomed logging operations without conflicts if they could secure part of the benefits either as cash or in kind. According to Alcorn (2014), Participatory Forest Management succeeded where the benefit-sharing schemes had been used to compensate the local communities whose land had been used for forest conservation like in Latin America. This was supported by Mariki (2015) who argued that Participation in forest management should include material benefit-sharing to the participants such as income, services or public goods to the community and personal benefits like leadership. In such scenarios conflicts arising from sharing forest resource were minimal. However, the extent to which the benefits from Got Ramogi forest Reserve were shared was not documented hence it became a subject of this study.

African countries like Tanzania and Ethiopia indicated high level of benefit-sharing from Participatory Forest Management in terms of both forest products and NTFPs like firewood, poles, timber, animal's feeds, traditional medicine, wild coffee and livestock fodder (Lemenih and Bekele, 2008). However, the study argued that PFM that only concentrated on improving the forest coverage and ignored other benefits that the forest could offer to livelihood of the forest community like firewood, fruits and herbs among others.

An investigation of Bonga forest in Ethiopia had observed high level of benefit-sharing by the community through earning incomes from forest products and acquiring household assets apart from reduced over dependence on the forest (Gobeze et al., 2009). This level of benefit-sharing from the forest encouraged the forest conservation and protection thus reducing conflicts over resource's utilization. However, according to Ongungo (2007), the community living adjacent to Got Ramogi was yet to enjoy benefit-sharing from participatory forest management hence the need for further research on benefit-sharing in Got Ramogi and a record on such evidence.

Participatory arrangement in resource worldwide had been considered not only as a conservation tool, but also as a resource base contributing to poverty reduction in many developing countries (Farouque, Fuyuki and Takashino, 2017). Different actors like international conservation groups, development partners and African governments had recognized local participation in forest management as an important component in their programs; however, their approaches and perception on what really constituted participation and its role in benefit-sharing of forest resource was not stated (Mariki, 2015). This was a loophole leading to resource utilization conflicts that had remained unresolved in many participatory management like in Got Ramogi Forest Reserve.

Studies across West Bengal region of India had reported successful community forestry and became a famous example by adapting rapidly to local circumstances through sharing of forest resource like fuel wood (Nagahama et al., 2022). As the forestry project evolved, the community gained supplies of bamboo, timber, fodder, fruits, oilseeds and other minor products raising their living standards hence conflicts over resource utilization were reduced. However, in Sub Saharan Africa the scenario was different with key stakeholders as donors, political organizations and NGOs being active in participatory forest management programs with minimal benefits to the local communities since their rights were limited and the projects' control left to the state authorities (Ribot, Lund and Treue

2010). This limited livelihood benefits to the poor communities living adjacent to the forests had been a source of resource utilization conflicts and Got Ramogi was not be left out.

Many studies in East Africa on participatory arrangements had shown successful benefit-sharing with the local communities leading to reduced conflicts over resource utilization. For instance, Uganda as an example, had 20 % of the income generated from community forestry entry fees directed to local people (Turyahabwe et al., 2012). In Tanzania, about 7.5 % of the parks operational budget was used to support local community development projects (Mariki, 2015). The studies had also reported good use of revenue from community forestry to improve livelihood of the forest community indirectly through construction of health clinics, roads, schools, bridges among others. This study aimed at documentation of records of benefit-sharing if any at Got Ramogi from earnings generated by participatory forest management.

The performance of participatory approaches varied depending on benefits generated from the forest products and transparency within the management when it came to sharing of benefits (Cavanagh and Freeman, 2017). However, successful Forest Conservation in Kenya was only realized when community livelihood requirements such as provision of firewood, building poles, herbal medicine, fruits ,mushrooms and fodder for their animals were considered (Kajembe, Nduubungu and Luoga 2006). The same sentiments had been echoed by some scholars who argued that community forestry was seen as beneficial when it provided sustainable forest management through reduced deforestation, maintaining biodiversity and poverty alleviation (Bowler et al., 2012). The scholars added that this was only realized if benefit-sharing had been designed as a strategy to encourage conservation of the forest and not a source of conflict. This became a concern of this research to establish benefits management from the forest Reserve among the stakeholders at Got Ramogi.

Rotich et al. (2020) sought to assess local community' forest resource use and their perception towards forest status, use and management of Kapolet Forest Reserve in Kenya. The study collected data through household surveys using semi-structured questionnaires, participant observation, Key Informant Interviews (KII) and Focus Group Discussions (FGD). The study randomly sampled a total of 112 respondents from three adjacent villages within 5 km from the forest boundary for the household survey. The study also used descriptive statistics for data analysis. The study reported that most (94.6%) of the households used products from forests. The products formed an integral part of

the households' energy needs, construction materials, medicine, income generation and daily dietary needs. Further, the exploration found out that firewood was the most collected product from the forest (76.4%) whereas bush meat was the least (4.7%). The exploration recorded mixed views on the forest management with more than half (54.5%) expressing dissatisfaction with the current management regime citing insecure land tenure system, inadequate integration of the community in forest management and corruption. Moreover, the exploration also found out that there was perceived forest degradation due to illegal logging, illegal grazing, forest fires, climate change and encroachment for farming. Therefore, the exploration recommended the need for incorporating Indigenous knowledge (IK) in forest management plans and putting in place grievance address mechanisms to cater for the needs of local communities when designing forest policies and implementing forest restoration programs.

In their study, Thammanu et al. (2021) investigated the utilization of non-timber forest products (NTFPs) under community forest management in Northern Thailand. The study was conducted at the Ban Mae Chiang Rai Lum Community Forest located in Pa Mae Phrik National Forest Reserve in Thailand's northern province of Lampang. Interviews of 159 household heads and/or other household representatives were conducted using a designed questionnaire. The questionnaire focused on information regarding the households' NTFP utilization habits and engagement in CFM processes. A forest survey was conducted which found that there were 197 plant species, 144 genera and 62 families in the community forest. Of these, 160 plant species were classified as having medicinal uses, 89 were used as food, 37 as extractives, 32 for firewood and 12 for fibres. The study also revealed that unmonitored over-exploitation of NTFPs might negatively impact forest biodiversity. As surveyed, 68.55% of households depended on NTFPs. The value of the harvested NTFPs was 6.35% of the total community income. A positive correlation between NTFP income and CFM suggested that utilization of NTFPs combined with CFM can create income opportunities and promote participation in CFM. In addition, income earned from NTFPs and participation in CFM was directly related to the socio-economics of identifiable groups in this community. Labourers, merchants and low-income families utilized NTFPs to a lesser degree. Further, the study implied that the harvesting of NTFPs should not go unchecked, especially of species that are threatened or likely to be threatened if over-harvested. Therefore, the exploration recommended that efforts to enhance lower income household utilization, to more equitably distribute the benefits and to incentivize

community involvement should be prioritized as doing so was crucial to maintaining a healthy supply of NTFPs and safeguarding the community forest biodiversity.

Corbera et al. (2020) sought to address this gap by analysing governance and livelihood changes in a PFM initiative in Tanzania. The exploration was based on qualitative governance analysis and quantitative livelihood panel data (2011–2014) that compared villages and households within and outside the project. Further, the study findings were positive regarding forest governance improvements but inconclusive regarding livelihood effects, which at least in the short term seemed to benefit more from agricultural intensification than forestry activities. In conclusion the study emphasized the need for moving towards longer term monitoring efforts, improving understandings of local dynamics of change, particularly at a regional rather than community level. The study also emphasized on defining the most appropriate outcome variables and cost-effective systems of data collection or optimization of existing datasets if the researcher were to better capture the complex impacts of PFM initiatives worldwide.

#### **2.4 Local Community Perceptions on Conflict Resolution Strategies Adopted by Participatory Forest Management**

Perception according to Oxford Dictionary denoted to the way something was viewed. After 1980, the conservation community worldwide understood that humans were important part of the ecosystem and for sustainability of the environment; the human aspect had to be addressed. Communities in most cases had high expectation of what ownership was to do to them in participatory forest management as they always regard the program as an opener to income flow and source of housing needs (Derkyi et al., 2021). In cases of non-fulfilment of their expectation, they were disappointed and their perception became negative towards the project as expressed by illegal activities like encroachment, harvesting of forest products like firewood without authorization (Ongugo et al., 2008). It was necessary to consider the expectation of the community living adjacent to Got Ramogi Forest Reserve as a possible cause of resource utilization conflicts.

Globally, local communities possessed substantial knowledge about their local environment and its importance. Consequently, if these communities held positive perceptions, they would be more likely to effectively conserve and manage natural resources (Mustalahti and Nathan, 2009). It is in line with this that the perception of local community should be considered for the success of participatory

forest management in any given area. Ribot, Lund and Treue (2010) asserted that devolved forest management might improve access to economic benefits aimed at improved rural livelihoods that fulfills the community expectations over the resource use. However, the extent to which Got Ramogi forest management handles the conflicts over the resource utilization and the community expectations remained unclear. Local people would not quickly become conservation minded or economically oriented forest managers if their legal rights over natural resource had been curtailed. This fact had affected conservation of most community forests in Kenya and Got Ramogi being one of them was not being left out.

For effective forest management and utilization of the resource, there should be stability between tree planting, harvest and forest protection with the aim of generating benefits for the poor forest community living adjacent (Mustalahti and Nathan, 2009). The writers further argued that more benefit-sharing normally had positive influence on the life of the community and in the long run change their negative attitude towards forest conservation. If the benefit management strategies were applied effectively, the community perception would be supportive of participatory forest management in most parts of the world (Bowler et al., 2010). In Kenya, however this information was yet to be disseminated to most participatory forest management and in particular, at Got Ramogi. People's attitude on forest resource use had so far changed from the concept of aesthetic to that of environmental, ecological and socio- economic (Food and Agricultural Organization of the United Nations, 2012). The study further asserted that most people had recognized that forest products could offer solutions to their problems of poverty, restoring climatic balance and improving micro- climate in many parts of the world. It was the interest of the researcher to investigate the perception of the community living adjacent to Got Ramogi towards the resource utilization conflict resolution strategies adopted by the management.

Attitude change had been often argued by scholars as the only tool available to conservationists for resource utilization conflict resolution when other approaches were ineffective (Mugambi et al., 2020). However, some studies had shown that positive attitudes alone might not directly translate into friendly conservation behaviour unless the community was involved in the various forms of management strategies (Jashimuddin and Inoue, 2012). Elsewhere studies had shown limited influence of the forest adjacent community on the forest management ideas (Mugambi et al., 2020). The study further explained that even if locals had some means to influence upon the management

processes, their possibilities to affect the resource conflict resolution strategies were limited making them to have low opinion about the forest conservation.

Occasional concealed resistance towards conservation of forests by the local communities had been expressed in Kenya as a result of fear that the developments made in the name of participation could help the local elites to take over the forest resource control (Himberg, 2011). This opinion had also been expressed by Derkyi et al. (2021) that participatory approaches which limited access to the forest resource had always resulted in negative relations with the community as they feel disadvantaged from getting their daily livelihood. This research would examine the community perception on the resource utilization conflict resolution strategies adopted by participatory management in the study area.

According to Wambugu et al. (2017) in his study of Aberdare forest, effective participation in forest management was influenced by the attitude and perception of the local community towards conservation strategies adopted because they were naturally connected with the forest in their daily needs. Farouque, Fuyuki and Takashino (2017) supported the argument and add that understanding the people perception and attitude is fundamental to development and implementation of forest conservation and management strategies which were both sustainable and sensitive to local needs. However, the scholars noted that a lot of restrictions on forest access without providing alternative livelihood sources to the community results to negative attitude and opposition to forest conservation strategies. An investigation of Western Kenya by Kipkemoi (2015) stated that involving the community in the forest management especially benefit-sharing and decision-making had enhanced positive conservation ideas and limited resource utilization conflicts.

Zartman (2001) reported a negative change of community attitudes on a given management strategy on realization that the motivations they were getting from the resource had become unsatisfactory or fresh opportunities had been discovered leading to uncertainty in support and disagreements. It was in this view that the research aimed at assessing the attitude of the community in Got Ramogi towards the conflicts on forest resource utilization resolution strategies adopted by the management or a discovery of a new opportunity of livelihood making the people to disagree with the forest management. Abuto (2014) argued that most communities in Kenya had minimal Knowledge on

forest conservation as an environmental good which had influenced their perception negatively on any resource utilization conflict resolution strategies. The scholar observed that most communities therefore did not understand the effect of forest degradation on their environment hence the continued exploitation leading to many conflicts over utilization of the resource. Positive perception on any activity meant to conserve the forest had been reported where there was economic and social benefits drawn from the forest (Nzau et al., 2020). Such benefit-sharing from the forests reduced conflicts over the utilization of the resource.

In their study, Mugambi et al. (2020) aimed to investigate whether the activities of Community Forest Associations (CFAs) contributed to improved forest cover in a leased forest in Kenya. The study adopted a descriptive survey design. The study issued sample size of 139 individuals with questionnaires and 5 key informants were interviewed. The study also used satellite imagery to quantify changes and trends in forest cover of Kibwezi forest for ten years. Further, the study established that infrastructural development had a great effect on destruction of forest cover in Kibwezi forest. The study also found out that there was significance relationship between community participation and improvement of forest since Chi-square results were ( $\chi^2 = 27.631$ ,  $df = 9$ ,  $0.001$ ). The study recommended that there should be deliberate action by stakeholders to give community forest association incentives to operate optimally.

The study by Mbeche et al. (2021) aimed to explore the factors that influenced the level of participation by forest-dependent communities in a Participatory Forest Management (PFM) program. The study ran a probit model to assess households' choice to join PFM and then compute a Participation Index (PI) for forest users' participation across different stages of the PFM program – planning, implementation and Monitoring and Evaluation (M&E). The exploration analysed determinants of participation using the fractional regression approach. The exploration showed that over half (52%) of the respondents participated in PFM. While vulnerability to shocks being in a farmers' group, a household's access to the forest within the previous 12 months and access to extension were associated with the likelihood of participating in PFM, the influence of the household head's age and education, access to credit and food insecurity had a negative influence. The exploration revealed PIs of 41%, 49% and 42% at the planning, implementation and M&E stages respectively, indicating a moderate participation level. The fractional regression model showed that transaction costs associated with access to markets, gender (being male), household expenditure and

expected forest benefits positively influence household participation in PFM, while the opportunity costs associated with off-farm income, distance to the forest and lack of extension have a negative influence on participation. Moreover, the exploration concluded that there was need to take the household context (gender, education, household expenditure and vulnerability) into consideration during planning and implementation of the forestry programs. Therefore, the exploration recommended that forest authorities should not only identify and implement mechanisms to enhance benefits from forests but also reduce costs of participation, especially for women.

An investigation was conducted by Derkyi et al. (2021) to determine the factors influencing the participation of local communities in the implementation and monitoring of Forest Law Enforcement, Governance, and Trade-Voluntary Partnership Agreement (FLEGT-VPA) activities in Ghana. The exploration was conducted in three communities in Goaso Forest District in the Ahafo Region of Ghana. Based on a cross-sectional design, 105 (n = 105) community members were interviewed using a semi-structured questionnaire. Further, the exploration performed Logistic regression analysis to identify socio-demographic and cultural factors that influence people's participation in FLEGT-VPA activities. Friedman and Wilcoxon signed-rank tests were conducted to analyse the influence of the environmental role of the forest and participation in FLEGT-VPA activities. Moreover, the exploration found a significant association between the leadership status of respondents' local customs/taboo days and participation in both implementation and monitoring activities. At the same time, a significant association was found between respondents' participation in previous training programs and FLEGT-VPA monitoring activities. Therefore, the exploration identified significant socio-demographic and environmental factors contributing to participatory forest conservation modules such as FLEGT-VPA that guided future forest conservation initiatives that were inclusive of stakeholders' interests/concerns.

Ekanayake et al. (2021) sought to examine rural Sri Lankans' participation intention in community forestry (CF) program by using the probit regression model. Randomly selected 300 individuals representing both CF members and non-CF members were interviewed for the exploration. The study results indicated that rural residents' intention in future CF program negatively correlated with the participation status (CF membership) of individuals. Moreover, the exploration findings also revealed the knowledge gap on the purpose of the CF program and CF policy design. Hence immediate attention was required to improve awareness among the people. Consequently, failure to raise local people's participation

intention in CF might indicate inadequate or ineffective government policies. Therefore, the Department of Forest Conservation should take sound measures to ensure that community-based forest management policies were consistently implemented at different administrative levels across the country and its rightness should be evaluated strictly.

The study conducted by Lusambo et al. (2021) aimed to investigate the effects of Participatory Forest Management on the livelihoods of communities living adjacent to forests in Redd+ pilot areas of Mufindi, Iringa rural, and Mbozi districts. The objectives of this exploration were to analyse socio-economic characteristic of respondents in the study area, assess forest products accessed by the communities living adjacent to the forests, analyse the local communities' perception on the importance of forests under PFM to their livelihoods and analyse socio-economic factors influencing the households' perception on the importance of PFM. The study used household survey, direct observations, key informant interviews and focus group discussions as methods of data collection. Data analysis was done using chi-square analysis and binary logistic regression. Further, the study findings revealed that  $\chi^2$  test on the importance of PFM forests (compared to non-PFM forests) were statistically significant. Binary logistic regression analysis revealed that household size was a statistically significant factor influencing the household's perception on the importance of PFM forests on livelihoods. In conclusion, according to the study PFM forests were perceived to have had positive effects on their livelihoods.

Maina and Nzengya (2021) did an investigation to investigate perceptions of smallholder farmers towards ban on livestock grazing in the Mount Kenya West Protected Forest, Kenya. The study conducted Interviews with a sample of 234 smallholder farmers in Chehe, Hombe and Kahurura forest blocks and data was transcribed then translated into English. Both deductive and inductive coding was used for analysis. Five themes emerged, with the most frequently mentioned theme as the reduction on land available for livestock keeping. Others included reduced family cash flows, disruptions of income for paying fees for children, coping strategies and seeking alternative sources of pasture without reducing cattle numbers. Moreover, coping strategies highlighted two segments of the population; those who had the ability to cope with restrictions to forest access for livestock grazing and those who would be vulnerable to such policy actions. Therefore, the study recommended that sustainability of livelihoods was thus a major consideration in any intervention measures.

## 2.5 Theoretical Framework

This study adopted the ideology of **managerial citizen involvement approach** which was developed by Habermas in 1996. According to this theory, citizen participation in environmental decision-making contributes to reflexive deliberations, communication, effective representation and consensus building in the public sphere. According to this theory, citizen participation in environmental decision-making contributes to reflexive deliberations, effective communication, representation and consensus-building in the public sphere (Rosenfeld & Andrew, 1998). However, the theory also acknowledges potential weaknesses, stating that action strategies may be influenced by ideological commitments, leading to selective decision-making.

In the context of this exploration, the Habermas managerial approach is utilized to assess the effectiveness of participatory forest management as a strategy for resolving resource utilization conflicts in Got Ramogi Forest Reserve. The approach emphasizes the presence of environmental managers at all levels, significant stakeholder identification and public involvement with the aim of reaching compromise and consensus (Rosenfeld & Andrew, 1998). While the Habermas managerial citizen involvement approach aligns with the principles of participatory democracy and the ideals of fairness and inclusiveness in policy-making, it is essential to consider its potential limitations. These limitations may include the risk of biased decision-making based on ideological perspectives and the challenges in achieving genuine consensus among stakeholders with diverse interests.

By applying this theoretical approach, the study aims to critically evaluate the extent to which participatory forest management in Got Ramogi Forest Reserve adheres to the principles of inclusive decision-making and consensus-building. It also seeks to identify any weaknesses in the approach and explore how these challenges might impact the resolution of conflicts related to resource utilization in the forest Reserve. Ultimately, this theoretical framework provides a basis for understanding the dynamics of participatory forest management and its implications for conflict resolution in the studied context.

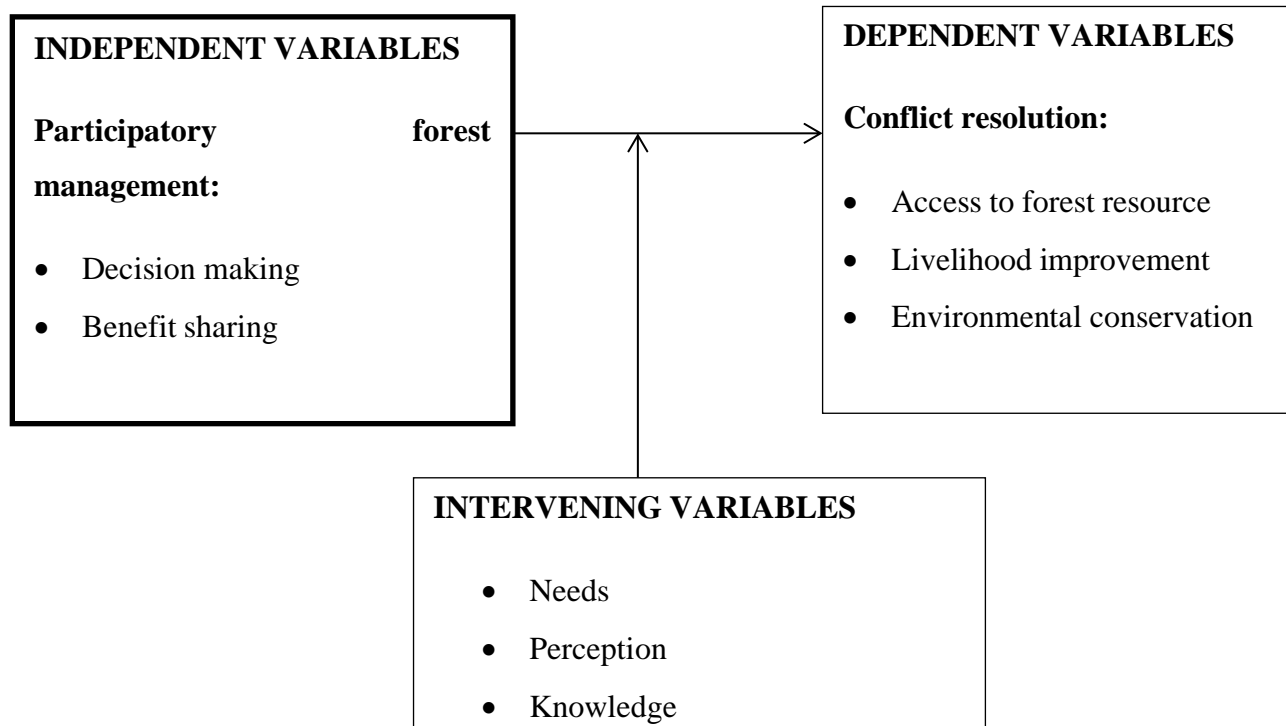
The weakness of Haberman's managerial citizen approach is that it acknowledges the possibility of citizen action strategies being influenced by ideological commitments, which can result in selective decision-making. In other words, when citizens participate in environmental decision-making, their actions and decisions may be biased or driven by personal beliefs or interests, potentially leading to

outcomes that do not fully reflect the broader public's interests or needs. This weakness raises concerns about the objectivity and fairness of the decision-making process and the potential for certain groups or interests to dominate the public sphere.

The theory explained that when conflict over resource allocation arose, managers specified the problem and devised an action strategy to be taken but warned that the action must be taken selectively that it was dependent on their ideological commitment. This research assessed participatory approach for management of resource in Got Ramogi Forest Reserve that had been adopted by the policy makers (the government of Kenya) as a strategy to resolve resource utilization conflicts. In the theory, the environmental managers were present at all levels; stakeholder identification was significant in addition to public involvement with a goal of compromise and consensus. This theoretical approach was relevant to the study since it was consistent with the ideals of participatory democracy where conflicts were resolved by Principles of fairness and inclusiveness in policy making as indicated in the Kenya Forest Policy of 2005.

## **2.6 Conceptual Framework**

This study was conceptualized as a model (Figure 2.1) that describes relationship between the action strategies selected which was participatory management style (Decision making and Benefit sharing) as the independent variables while the ideological commitment (conflict resolution) which was a factor of access to forest resource, livelihood improvement and forest conservation as dependent variables in Got Ramogi.



*Figure 2.1: Conceptual framework showing the relationship between participatory forest management and conflict resolutions.*

Source: Researcher's Conceptualization (2023).

The conceptual model of this study assumed that when the local community was included in decision-making and sharing of benefits of the forest resource in Got Ramogi very well, it led to access to forest resource, improve the community livelihood and forest conservation. Involving the community in management was important since they were the direct users of the resource and know exactly what their problems and needs were. The framework conceptualizes that there was correlation between forest resource management and forest resource utilization conflict resolutions. The resource utilization conflict resolution was dependent on knowledge of the community about forest conservation and access, perception of the community and their needs. Therefore, the managers should consider involving the community in the management of the forest through decision-making and benefit-sharing for effective resource utilization conflict resolutions.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter mainly discussed the methods of data collection to be used in the research. It looked at research design, the study area, target population, sampling procedures, sample size, types of data collected, and sources of data and collection methods, data analysis, data presentation techniques and piloting.

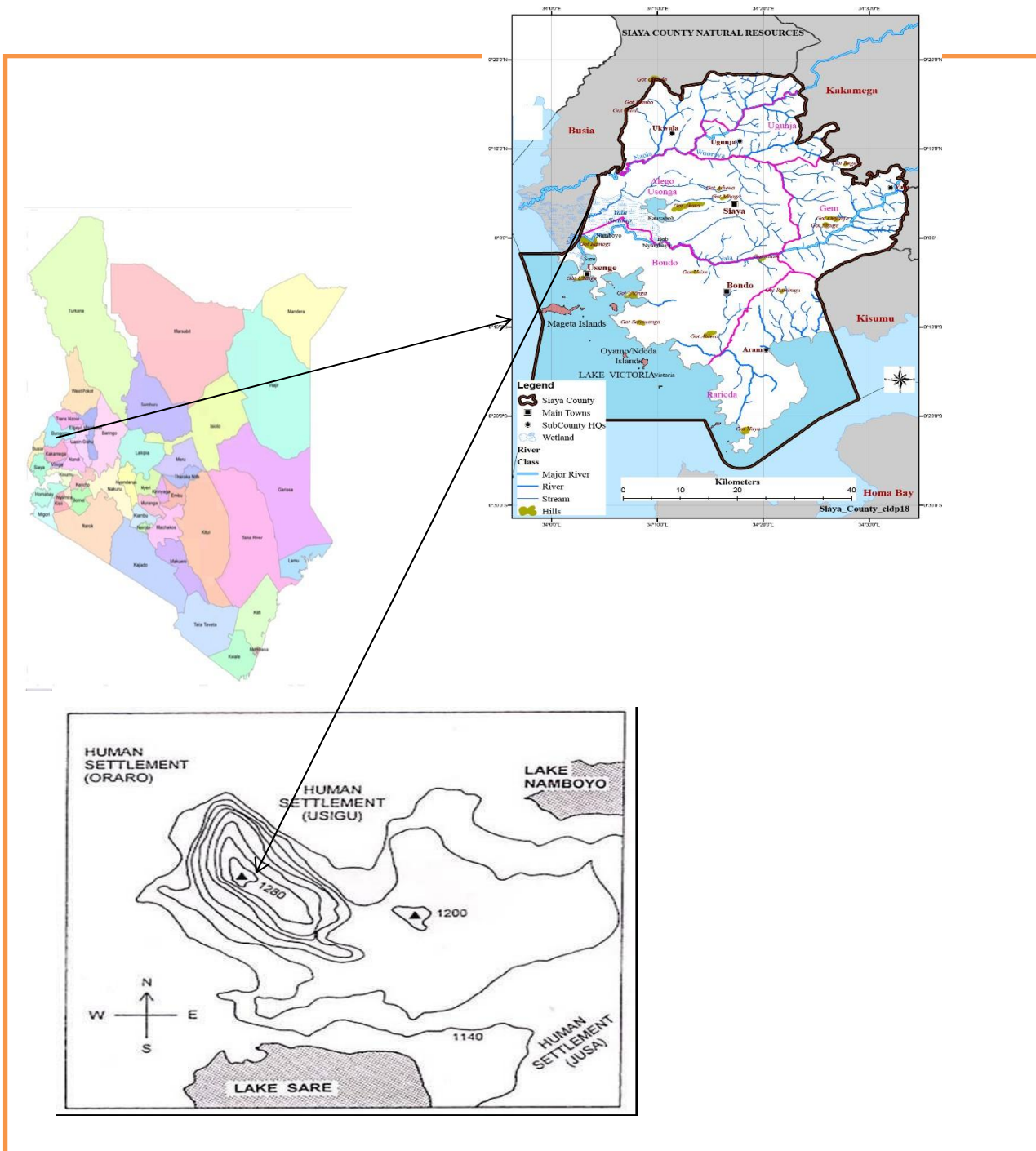
#### 3.2 Research Design

The study applied a cross-sectional research design whereby qualitative and quantitative data collection methods were used. A qualitative approach was employed for gathering data not suitable for statistical testing, such as forest destruction and people's opinions. Conversely, a quantitative method was utilized to gather numerical data that underwent statistical analysis. The researcher chose the design since it was non-intrusive as supported by Arias Valencia (2022) and did not disrupt participants' lives or routines in collection of information.

#### 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 is located at latitude  $00^{\circ} 06'23'S$  and longitude  $034^{\circ} 04'10'E$ . The hill lies at an altitude of 1240 m above sea level. 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  $22.5^{\circ}C$  annually (Republic of Kenya, 2018b). This little rainfall discouraged farming hence the already poor community resort to forest exploitation as source of livelihood (Njora & Yilmaz, 2022). The area has varied soil types ranging between black-cotton, sandy loams and laterites including red volcanic soil. Got Ramogi was chosen for the study due to its diverse ecosystem and ecological significance, which had implications for resource management and conflict resolution; as well as the existence of limited previous studies or on-going research in the area thus sparking interest in further investigating the effectiveness of PFM in

resolving conflicts. Moreover, Got Ramogi was selected because of its accessibility, making it easier for the researcher to conduct fieldwork and gather data to be able to easily answer research questions.



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

Source: Siaya County Annual Development Plan 2019-2020.

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

### 3.4 Target Population

The target population of 950 households was drawn from Got Ramogi sub-location with a total population of 3903 people (KNBS, 2019). 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.

### 3.5 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  $\chi^2$

– square for 1 degree of freedom at the confidence level, which is

3.841 I.e.  $1.96 \times 1.96$

$N =$  population size

$P =$  proportion assumed to be 0.5

$d =$  degree of accuracy expressed as a proportion which is 0.05.

$$S = \frac{3.841 \times 950 \times 0.5 \times 0.5}{0.05^2(950 - 1) + 3.841 \times 0.5 \times 0.5} = 274$$

The researcher then used simple random sampling and 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 stratum was calculated using proportionate stratified sampling method. 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;

$$n_i = \frac{n_i x P}{N} \quad (2)$$

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:

Sample size for the clusters:

Stratum N1 = 94 probability,  $p = 94/950 = 0.099$

Hence  $n_1 = n.P_1 = 274 (0.099) = 27.12 = 27$

Stratum N2 = 138 probability,  $p = 138/950 = 0.145$

Hence  $n_2 = n.P_2 = 274(0.145) = 39.73 = 40$

Stratum N3 = 91 probability,  $p = 91/950 = 0.095$

Hence  $n_3 = n.P_3 = 274 (0.095) = 26.03 = 26$

Stratum N4 = 109 probability,  $p = 109/950 = 0.114$

Hence  $n_4 = n.P_4 = 274 (0.114) = 31.23 = 31$

Stratum N5 = 87 probability,  $p = 87/950 = 0.091$

Hence  $n_5 = n.P_5 = 274 (0.091) = 24.93 = 25$

Stratum N6 = 141 probability,  $p = 141/950 = 0.148$

Hence  $n_6 = n.P_6 = 274 (0.148) = 40.55 = 41$

Stratum N7 = 68 probability,  $p = 68/950 = 0.071$

Hence  $n_7 = n.P_7 = 274 (0.071) = 19.45 = 20$

Stratum N8 = 108 probability,  $p = 108/950 = 0.113$

Hence  $n_8 = n.P_8 = 274 (0.113) = 30.96 = 31$

Stratum N9 = 114 probability,  $p = 114/950 = 0.12$

Hence  $n_9 = n.P_9 = 274 (0.12) = 32.88 = 33$

**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                     | Krejcie & Morgan (1970)                       |

Source: Researcher (2023)

### **3.6 Sources, Types and Methods of Data Collection**

Primary and secondary 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 was attained from journals, dissertations, theses, published books, internet and reports.

Both qualitative and quantitative data were collected. Quantitative data dealt with figures which were used to find out level of community involvement in decision-making and benefit-sharing. Qualitative data on the other hand dealt 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 were tools for data collection from the households while direct observation and taking photographs helped to collect data on forest destruction. Qualitative data was collected by interviewing the respondents using interview guide and filling in questionnaire using a questionnaire consisting of both open ended and closed questions administered to selected respondents for primary data. Questionnaire was used because it enabled collection of relevant and solicited data within short durations. Questionnaires were also comprehensive in data collection (Creswell, 2013). Kenya forest staff and government officials 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.

Qualitative data was also collected through observing the activities and features like tree stumps in the forest, encroachment and grazing among others. This was complimented by taking photographs and writing short notes. Observation helped the researcher to get additional information which was 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 was useful for this exploration. Upon booking an appointment, key informants were visited in their area of work.

### **3.6.1 Pre-testing**

The researcher conducted a pre-testing study in Got Ramogi on a sample size consisting of about 10% of the sampled respondents. However, those included in the pre-testing study were not counted among the 274 sampled for the actual study. The aim of the pre-testing survey was to test whether the design of the questions was logical; if the questions were clear and easily understood; whether the stated responses were exhaustive and how long it would take to complete the questionnaire (Bannigan and Watson, 2009). The views given by the respondents during the pre-testing study were used to improve the research quality before the actual collection of data.

### **3.6.2 Validity of the Instruments**

Arias Valencia (2022) described the validity of the instruments as the extent to which the tools are 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.

### **3.6.3 Reliability of Instruments**

Reliability is the accuracy to which the research instruments were able to give consistent and equivalent feedback or data after repeated trials (Bannigan and Watson, 2009). The study analyzed the internal consistency of the tools using the split-halves technique. Thereafter, Cronbach's alpha was adopted in ensuring that the internal consistency was achieved. The researcher considered Cronbach's alpha values of below 0.7 as unreliable.

## **3.7 Data Analysis and Presentation**

The collected data was cleaned and prepared for analysis. This involved checking for errors, missing data and outliers. The feedback obtained from the interview guides was carefully analyzed using qualitative methods. To achieve meaningful insights, the data was itemized and categorized according to the key thematic areas outlined. Through this process, the qualitative data was organized to highlight magnitudes applicable to each thematic area. The findings were then conveyed using vividly descriptive accounts, offering a comprehensive understanding of the participants' perspectives and experiences.

In addition to the qualitative analysis, the exploration adopted quantitative data analysis to provide a more comprehensive understanding of the research outcomes. The collected quantitative data was cleaned and verified before further analysis. The fundamental descriptive statistics, including frequency, percentage, mean, ratio (cost-benefit analysis) and standard deviation were used to summarize the quantitative data. These statistics offered a clear overview of the distribution and variability of responses. Moreover, inferential statistics such as Chi-square were applied to draw meaningful conclusions from the data. The outcomes were displayed using frequency tables, percentages and means, providing a concise presentation of the quantitative findings.

Objective one found out the relationship between involvement of the community in decision-making of participatory forest management and resource 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 established by using Chi-square in equation (1);

$$X^2 = \sum \frac{(f_o - f_e)^2}{f_e} \quad (1)$$

Where;

$f_o$  = Observed frequency on involvement of the community in decision-making of PFM

$f_e$  = the expected frequency if no relationship exist between the variables

A greater computed 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 resource 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, and then the benefits accrued during a given period (Saez, 2007). According to Rus de Gines (2010) Cost Benefit Analysis might be worked out as shown in equation (2);

$$NPV = \sum \frac{Bt - Ct}{(1+r)^t} \quad (2)$$

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 resource 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 research questionnaires were coded and checked for any errors or omissions (Creswell, 2013), then analyzed using Statistical Package for Social Science (SPSS, Version22). The collected qualitative data from the key informant interviews were organized, thematically analyzed and presented precisely as narratives. The summary of data analysis techniques is presented in Table 3.2

**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<br>-Frequency distribution and percentages<br>-Thematic Analysis and narration |
| 2  | Establish the benefit shared by the community from participatory forest management in Got Ramogi Forest Reserve.   | -Cost Benefit Analysis<br>-Thematic analysis and narrations   |
| 3  | Assess the community perception on conflict resolution strategies adopted for forest resource utilization in Got Ramogi Forest Reserve.                                | -Frequency distribution and percentages<br>-Thematic analysis and narrations                        |

Source: Researcher (2023)

### 3.9 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; as shown in the appendix), 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 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. Finally, the researcher presented what was observed or collected from the respondents.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

The results of the study findings are presented and discussed under thematic subsections in line with the study objectives. The study sought to determine the Participatory Forest Management's Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya. The specific objectives were: To evaluate the level of community involvement in decision-making of participatory forest management as a strategy for resource use conflict resolution in Got Ramogi forest Reserve; To establish the benefits shared by the community from participatory forest management as a strategy for resource use conflict resolution in Got Ramogi Forest Reserve; To assess the community perception on the conflict resolution strategies adopted for resource use by participatory management in Got Ramogi Forest Reserve.

#### 4.2 Response Rate

The study displays the response rates in Table 4.1.

**Table 4.1: Targeted Versus Achieved Response**

| <b>Respondents</b> | <b>Targeted respondents</b> | <b>Achieved respondents</b> | <b>Response rate</b> |
|--------------------|-----------------------------|-----------------------------|----------------------|
| Questionnaires     | 274                         | 268                         | 97.81%               |
| <b>Total</b>       | <b>274</b>                  | <b>268</b>                  |                      |

Source: Field Data (2023)

The study targeted a population of 274 respondents. However, only 268 questionnaires were obtained. This implied that a response rate of 97.81% was obtained from the data collected. Weigold, Weigold and Natera (2018) determined that a response rate of 80% was highly acceptable for paper-and-pencil surveys. Moreover, Hendra and Hill (2019) concur that it is ideal to have a small but random sample with an 80% or higher response rate than a low response rate from a large sample.

### 4.3 Reliability and Validity of the Instruments

The questionnaires used in this study were subjected to reliability test using Cronbach's alpha. The results were displayed as shown in Table 4.2

**Table 4.2: Cronbach's Alpha**

| Variable   | Mean scale | Scale variance | Corrected Correlation | Item | Cronbach Alpha |
|--|------------|----------------|-----------------------|------|----------------|
| Benefits shared by the community from PFM                  | 7.20       | 8.71           | .53                   |      | .853           |
| Community involvement in decision-making                   | 6.29       | 19.2           | .069                  |      | .79            |
| Community perception on the conflict resolution strategies | 6.63       | 20.71          | .039                  |      | .839           |
| Forest resource utilization conflict resolution            | 19.76      | 8.93           | .963                  |      | .723           |

Source: Researcher (2023)

From Table 4.2, the Cronbach's Alpha values for each variable are as follows: Benefits shared by the community from PFM (0.853), community involvement in decision-making (0.790), community perception on the conflict resolution strategies (0.839) and forest resource utilization conflict resolution (0.723).

Generally, Cronbach's Alpha values range from 0 to 1, with higher values indicating greater internal consistency and reliability of the tool. In this case, all the Cronbach's Alpha values obtained for the independent variables in the study were within the acceptable threshold of 0.7, suggesting that the questionnaires used were reliable and consistent in measuring the variables under study.

Therefore, the researcher was confident that the results obtained from the study were dependable and valid, as the data collected was consistent. The high Cronbach's Alpha values also indicate that the questionnaire items were measuring the intended variables consistently. To sum it up, the findings suggest that the instruments used in the study were appropriate for data collection and yielded reliable results. Consequently, validity was checked as shown in Table 4.3

**Table 4.3: Construct Validity Index**

| <b>Variable</b>  | <b>Construct Validity Index (CVI)</b> |
|--|---------------------------------------|
| Benefits shared by the community from PFM                  | 0.89                                  |
| Community involvement in decision-making                   | 0.83                                  |
| Community perception on the conflict resolution strategies | 0.91                                  |
| Community involvement in decision-making                   | 0.95                                  |

Note: Sample size = 25.

Source: Researcher (2023)

Table 4.3 shows the construct validity index (CVI) for each variable in the study, with a high value indicating a strong relationship between the measure and the construct it is intended to measure. All variables in Table 4.3 have a high CVI, indicating that the measures used in the study are reliable and valid indicators of their respective constructs.

#### **4.4 Demographic Characteristics**

This section describes the demographic characteristics of the respondents in the study. Such a description was essential in providing a clear account of the respondents included in the study.

##### **4.4.1 Distribution of Respondents by Gender**

The study aimed to determine the gender distribution of the respondents. The results are shown in Table 4.4.

**Table 4.4: Distribution of the Respondents by Gender**

| <b>Gender</b> | <b>Frequency</b> | <b>Percent</b> |
|---------------|------------------|----------------|
| Male          | 162              | 60.4           |
| Female        | 106              | 39.6           |
| <b>Total</b>  | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The research established that 60.4% of the respondents were male while 39.6% were female. This implied that majority of the respondents were male while minority of the respondents were female. The finding implies that more men were available for the interviews as compared to the women within and about Got Ramogi. This was not pre-planned, but occurred randomly. However, the difference between the men and women interviewed is not big enough to create a research bias.

#### 4.4.2 Distribution of Respondents by Age

The study sought to establish the distribution of the respondents by age. The results are shown in Table 4.5.

**Table 4.5: Distribution of the Respondents by Age**

| <b>Age</b>   | <b>Frequency</b> | <b>Percent</b> |
|--------------|------------------|----------------|
| 18-35        | 76               | 28.4           |
| 36-64        | 131              | 48.9           |
| A64          | 61               | 22.8           |
| <b>Total</b> | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The study established that majority of the respondents; 48.9% were aged 36-64 years. This was followed by 28.4% of the respondents who were aged 18-35 years; then 22.8%, who were aged above 64 years. The finding implies that most of the respondents interviewed were mature enough and therefore had the best experience; thus, enhancing the feedback obtained. Moreover, the results imply that the age trend observed around Got Ramogi depicts an increase in an ageing population; probably because the young populace is out and far into urban centres in pursuit of education and job opportunities.

#### 4.4.3 Distribution of Respondents by Level of Education

The study sought to establish the distribution of the respondents by level of education. The results are shown in Table 4.6.

**Table 4.6: Distribution of the Respondents by Level of Education**

| <b>Level of education</b> | <b>Frequency</b> | <b>Percent</b> |
|---------------------------|------------------|----------------|
| None                      | 8                | 3.0            |
| Primary                   | 93               | 34.7           |
| Secondary                 | 115              | 42.9           |
| Post-Secondary            | 52               | 19.4           |
| <b>Total</b>              | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The study found out that 42.9% of the respondents' highest level of education was secondary level; 34.7% had reached the primary level while 19.4% of the respondents had attained post-graduate level

of education. The study also found out that 3% of the respondents had no level of education. This implied that a majority of the respondents' highest level of education was secondary while a minority of the respondents had no level of education.

#### 4.4.4 Distribution of Respondents by Marital Status

The study sought to establish the distribution of the respondents by marital status. The results are shown in Table 4.7.

**Table 4.7: Distribution of the Respondents by Marital Status**

| <b>Marital status</b> | <b>Frequency</b> | <b>Percent</b> |
|-----------------------|------------------|----------------|
| Married               | 218              | 81.3           |
| Single                | 47               | 17.5           |
| Widowed               | 2                | 0.7            |
| Divorced/Separated    | 1                | 0.4            |
| <b>Total</b>          | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The study found out that 81.3% of the respondents were married; 17.5% of the respondents were single; 0.7% of the respondents were widowed while 0.4% of the respondents were divorced or separated. This implied that majority of the respondents were married while the minority were either divorced or separated. The finding implies that majority of the respondents were married and therefore had responsibilities which relate directly to deriving resource from the forest to fend for the families.

#### 4.4.5 Distribution of Respondents by Number of Dependents

The study sought to establish the distribution of the respondents by number of dependents. The results are shown in Table 4.8.

**Table 4.8: Distribution of the Respondents by Number of Dependents**

| <b>Number of dependents</b> | <b>Frequency</b> | <b>Percent</b> |
|-----------------------------|------------------|----------------|
| 0-5                         | 178              | 66.4           |
| 6-10                        | 75               | 28.0           |
| 11-15                       | 15               | 5.6            |
| <b>Total</b>                | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The study found out that 66.4% of the respondents had 0-5 dependents; 28% of the respondents had 6-10 dependents; while 5.6% of the respondents had 11-15 dependents. This finding implies that majority of the respondents had dependents and were therefore likely to derive resource from the forest Reserve in a bid to put food on the table.

#### 4.4.6 Distribution of Respondents by Occupation

The study sought to establish the distribution of the respondents by occupation. The results are shown in Table 4.9.

**Table 4.9: Distribution of the Respondents by Occupation**

| <b>Main occupation</b> | <b>Frequency</b> | <b>Percent</b> |
|------------------------|------------------|----------------|
| Farming                | 108              | 40.3           |
| Business               | 71               | 26.5           |
| Civil servant          | 43               | 16.0           |
| Others                 | 28               | 10.4           |
| Fishing                | 18               | 6.7            |
| <b>Total</b>           | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The study found out that 40.3% of the respondents were into farming as an occupation. 26.5% of the respondents were into business while 16% of the respondents were civil servants. 10.4% of the respondents had other occupations while 6.7% of the respondents were into fishing. The finding implies that majority of the respondents were into farming and business; two activities related to utilization of forest resource; a very critical element in this study.

#### 4.4.7 Distribution of Respondents by Village of Residence

The study sought to establish the distribution of the respondents by village of residence. The results are shown in Table 4.10.

**Table 4.8: Distribution of the Respondents by Village of Residence**

| <b>Name of village</b> | <b>Frequency</b> | <b>Percent</b> |
|------------------------|------------------|----------------|
| Ureje                  | 41               | 15.3           |
| Others                 | 37               | 13.8           |
| Unyejra                | 36               | 13.4           |
| Kalaka                 | 31               | 11.6           |
| Kakumu                 | 30               | 11.2           |
| Mgane                  | 29               | 10.8           |
| Kanyagol               | 24               | 9.0            |
| Masiwo                 | 23               | 8.6            |
| Nyadheho               | 10               | 3.7            |
| Somroo                 | 7                | 2.6            |
| <b>Total</b>           | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The research established that 15.3% of the respondents were from Ureje village; 13.8% were from other villages; 13.4% were from Unyejra village; 11.6% were from Kalaka village; 11.2% were from Kakumu village; 10.8% were from Kanyagol village; 8.6% were from Masiwo village; 3.7% were from Nyadheho village while 2.6% of the respondents were from Somroo village. This implied that the majority of the respondents were from Ureje village while minority was from Somroo village. However, this did not generate into any form of bias that could affect the study findings.

#### **4.4.8 Distribution of Respondents by Duration of Stay**

The study sought to establish the distribution of the respondents by duration of stay. The results are shown in Table 4.11.

**Table 4.11: Distribution of the Respondents by Duration of Stay in Got Ramogi**

| <b>Duration of stay in Got Ramogi</b> | <b>Frequency</b> | <b>Percent</b> |
|---------------------------------------|------------------|----------------|
| 10-15                                 | 12               | 4.5            |
| 15-20                                 | 33               | 12.3           |
| 20-25                                 | 6                | 2.2            |
| A25                                   | 217              | 81.0           |
| <b>Total</b>                          | <b>268</b>       | <b>100.0</b>   |

Source: Field Data (2023)

The study found out that 81% of the respondents had stayed in got Ramogi for duration above 25 years. 12.3% of the respondents had stayed in got Ramogi for 15-25 years. 4.5% of the respondents had stayed in got Ramogi for 10-15 years while 2.2% of the respondents had stayed in got Ramogi

for 20-25 years. This finding implies that majority of the respondents had lived long enough around Got Ramogi Forest Reserve; thus, their feedback and inclusion in this study was an added advantage.

#### **4.5 Community Involvement in Decision Making of Participatory Forest Management as a strategy for Resources Use Conflict Resolution**

The study sought to evaluate the community involvement in decision-making of participatory forest management as a strategy for resource utilization 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 is shown in Table 4.12.

**Table 4.12: Level of Community Involvement in Decision Making in Got Ramogi Forest Reserve for Resources Use and Conflict Resolution**

| <b>Statements</b>  | <b>Mean</b> | <b>SD</b> |
|--|-------------|-----------|
| Major decisions in PFM are made by the government thus affecting community involvement                       | 4.76        | 0.864     |
| The lawbreakers are handled through arrest and charges thus affecting community involvement                  | 4.56        | 0.924     |
| Nominated members in any forest protecting committee were actively involved in forest management initiatives | 3.74        | 0.982     |
| The community participate in all the management processes through their representatives                      | 3.71        | 1.034     |
| Attendance rates for PFM meetings has generally been high  | 3.69        | 1.034     |
| Men are the majority in the forest user group  | 3.39        | 1.056     |
| There is payment for registration as members of participatory forest management                              | 2.82        | 1.769     |
| There is involvement bias between the community and those who claim user rights                              | 2.82        | 1.080     |
| The community is involved in conflict resolution in the forest through different methods                     | 2.78        | 1.176     |
| The level of participation is affected by insecurity   | 2.61        | 1.005     |
| Existing forest user group can run PFM effectively   | 2.39        | 0.899     |
| Major decisions in participatory forest management are made by the forest user group                         | 2.23        | 0.772     |
| Composite Mean   | 3.29        |           |

Source: Field Data (2023)

From Table 4.12, it is clear that:

When the respondents were asked whether major decisions in participatory forest management were made by the Government Authority, 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 participatory forest management are made by the Government Authority thus affecting community involvement. This finding was supported by respondent X who said:

*“Yes, there is a demarcated boundary and recognised border at Got Ramogi forest. I am not comfortable with the community by law of forest management plan; this is because the by-laws implemented do not include the forest user group members in most of the decision-making. My responsibility includes implementation of the forest management activities; this involves organisation of the events that support the maintenance of the forest. Meetings are held monthly and haven’t missed any of the meetings. The major key players in decision-making process include the forest management staff and the government. Some of the members participate in the forest management activities and forest user group members, religious institutions and some community members decide on forest management.”*

A question was presented on whether the community by lawbreakers are handled through arrest and charges; 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 lawbreakers were 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. This finding was supported by respondent Y and respondent Z who said:

Respondent Y said:

*“Yes, there is a clear and recognised border at Got Ramogi forest and I am not comfortable with the community bylaws of forest management plan. My responsibility includes planning in participatory forest management. Meetings are carried out monthly and the key players include the government and forest management staffs. Community members participate in all forest management activities and the forest user group participate and decide on forest management.”*

Respondent Z said:

*“Got Ramogi forest has a clear and recognised border and I am not happy with the community by laws of the forest management plan. I am responsible for the evaluation of forest management activities where I evaluate all the activities involved. Meeting is conducted monthly and the forest*

*management staff and the government make the decisions in the meetings. All members participate in all forest management activities and the religious institutions and forest user group members participate and decide on forest management.*”

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 agrees. The understanding of this finding is that the respondents agreed that the community participated in all the management processes through their representatives. This finding was supported by respondent A and respondent B who said:

Respondent A said:

*“My responsibility in forest management is decision-making in the forest management activities where I chair in making important decisions concerning the activities. Meeting is held monthly and some members participate in forest management activities. All members participate in all forest management activities and the religious institutions and forest user group members participate and decide on forest management.”*

Respondent B said:

*“I attend the forest meetings once a month and the forest management staff and the government are the key players in decision-making. Yes, the forest has a clear and recognised border. I am uneasy with the community by law of forest plan. My main job is to implement the forest management activities. Most members participate in management activities while the forest user group and religious institutions participate and make decisions in forest management.”*

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 agrees. 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 there was 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 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 participatory forest management are made by the Forest User Group. This finding was supported by respondent C and respondent D who said:

Respondent C said:

*“Forest boundary is well known to us. I am comfortable with the community by laws of forest management plan. I am also responsible for planning the forest management activities. The meetings are held monthly and I never miss one. Most members participate in all forest management activities.*

*The community members, the forest user groups and the religious institutions participate and make decisions in forest management.”*

Respondent D said:

*“I don’t know the exact forest boundary, but I think it’s the area protected by the guards. I attend forest participatory meetings once a month with the government and forest management staff being the key players in decision-making process in the meetings. However, I am not at ease with the community by laws of forest management plan. My responsibility includes implementation in forest management activities. Most members participate in all forest management activities while the religious institutions and forest participate and decide on forest management.”*

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 4.13.

**Table 4.13: Level of Involvement in the Forest Management Activities for Decision Making**

| <b>Forest management activity</b> | <b>Mean</b> | <b>Std. Deviation</b> |
|-----------------------------------|-------------|-----------------------|
| Implementation                    | 3.52        | 1.794                 |
| Decision making                   | 1.96        | 1.488                 |
| Evaluation                        | 1.88        | 1.429                 |
| Planning                          | 1.76        | 1.263                 |
| Others (specify)                  | 1.21        | 0.708                 |
| Composite mean                    | 2.06        |                       |
| <b>Valid N (listwise)</b>         |             |                       |

Source: Field Data (2023)

From Table 4.13, 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 one of the 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 the 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, including advisory and conservation as forest management activities 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.

In summary, a composite mean of 2.06 denoting slight involvement was recorded. This implies that the community was slightly involved in forest management activities for decision-making in Resources Utilization and Conflict Resolution in Got Ramogi Forest Reserve.

**4.5.1 Involvement in Specific Forest Management Activities and Forest Resources use Conflict Resolution**

The study sought to evaluate the community involvement in decision-making of participatory forest management as a strategy for resource 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 resource utilization conflict resolution using Chi-square test. Results are displayed in Table 4.14.

**Table 4.14: Chi-Square Test for level of Involvement**

|                              | Value              | df | Asymp. Sig. (2-sided) |
|------------------------------|--------------------|----|-----------------------|
| Pearson Chi-Square           | 2.711 <sup>a</sup> | 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: Field Data (2023)

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.

**Table 4.15: 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: Field Data (2023)

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.

#### **4.6 Benefits Shared by the Community from Participatory Forest Management as a Strategy for Forest Resources Use and Conflict Resolution**

The study sought to establish the benefits shared by the community from participatory forest management as a strategy for forest resource 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 results are displayed in Table 4.16.

**Table 4.16: Benefit Sharing from Participatory Forest Management and Resources Use in Got Ramogi Forest Reserve**

|   | <b>Mean</b> | <b>SD</b> |
|---|-------------|-----------|
| The forest is very important to the forest user group                       | 3.96        | 1.525     |
| Members of FUG are normally eager to have committee responsibility          | 3.95        | 1.278     |
| Women equally participate in use of the forest                              | 3.79        | 1.022     |
| Members of the FUG often incur losses from wild animals                     | 3.73        | 1.525     |
| Participatory forest management contributes to environmental conservation   | 3.70        | .968      |
| There is support from outsiders in form of forest training & administration | 3.37        | 1.095     |
| The dependency on the forest by FUG create improved participation           | 3.19        | 1.077     |
| Members of the forest user group are rewarded for participation in FM       | 2.07        | 1.136     |

Source: Field Data (2023)

The respondents were asked whether the forest is very important to the forest user group; a mean of 3.96 was obtained denoting to a large extent. In summation, the respondents agreed to a large extent that the forest is very important to the forest user group. A question was asked whether members of FUG are normally eager to have responsibility in the committee; a mean of 3.95 was obtained denoting a large extent. Consequently, it can be concluded that the respondents agreed to a large extent that the members of FUG are normally eager to have responsibility in the committee.

The study asked the respondents whether women equally participate in use of the forest; a mean of 3.79 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that women equally participate in use of the forest. The respondents were asked whether members of the forest user group often incur losses from wild animals destroying crops and killing livestock; a

mean of 3.73 was obtained denoting a large extent. Consequently, it can be concluded that the respondents agreed to a large extent that members of the forest user group often incur losses from wild animals destroying crops and killing livestock.

A question was asked to the respondents whether participatory forest management contributes to environmental conservation; a mean of 3.70 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that participatory forest management contributes to environmental conservation. The study asked the respondents whether there was support from outsiders in form of training and administration of the forest; a mean of 3.37 as obtained denoting that some of the respondents were undecided on whether there was support from outsiders in form of training and administration of the forest. Therefore, it can be concluded that the respondents were undecided on whether there was support from outsiders in form of training and administration of the forest.

A question was asked on whether the dependency on the forest by FUG creates improved participation; a mean of 3.19 was obtained denoting that the respondents were undecided on the question asked. The interpretation of this finding is that the respondents were undecided on whether the dependency on the forest by FUG creates improved participation. The respondents were asked whether members of the forest user group are rewarded for participation in forest management; a mean of 2.07 was obtained denoting a disagreement with the question. The interpretation of this finding is that the respondents disagreed that members of the forest user group are rewarded for participation in forest management.

The study further sought to determine the specific benefits derived from Participatory Forest Management of 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 findings are displayed in Table 4.17.

**Table 4.17: Benefits Derived from Participatory Forest Management of Got Ramogi Forest Reserve**

|   | <b>Mean</b> | <b>SD</b> |
|---|-------------|-----------|
| Members of the forest user group benefit from clay for making jikos | 4.12        | 1.098     |
| Members of the forest user group benefit from grazing land          | 4.09        | 1.086     |
| Members of the forest user group benefit from water                 | 4.07        | 1.014     |
| Members of the forest user group benefit from firewood              | 3.93        | 1.510     |
| Members of the forest user group benefit from worship area          | 3.88        | 1.317     |
| Members of the FUG benefit from timber as a building material       | 3.57        | 1.387     |
| Members of the forest user group benefit from herbal plants         | 3.53        | 1.521     |
| Members of the forest user group benefit from bush meat             | 3.05        | 1.547     |
| Members of the forest user group benefit from charcoal burning      | 2.31        | 1.443     |
| <b>Valid N (listwise)</b>   |             |           |

Source: Field Data (2023)

The respondents were asked whether members of the forest user group benefit from clay for making jikos; a mean of 4.12 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the forest user group benefit from clay for making jikos. The study asked whether members of the forest user group benefit from grazing land; a mean of 4.09 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the forest user group benefit from grazing land.

A question was asked whether members of the forest user group benefit from water; a mean of 4.07 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the forest user group benefit from water. The respondents were asked whether members of the forest user group benefit from firewood; a mean of 3.93 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the forest user group benefit from firewood. The study asked whether members of the forest user group benefit from worship area; a mean of 3.88 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the forest user group benefit from worship area; as shown in the pictorial evidence in Plate 4.1.



***Plate 4.1: A Place Set Aside For Worship Purposes within the Forest***

A question was asked whether members of the FUG benefit from timber as a building material; a mean of 3.57 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the FUG benefit from timber as a building material. The respondents were asked whether members of the forest user group benefit from herbal plants; a mean of 3.53 was obtained denoting a large extent. In summation, the respondents agreed to a large extent that members of the forest user group benefit from herbal plants. For instance, a herbal plant used to treat measles was photographed as shown in Plate 4.2.



***Plate 4.2: Herbal Plant ('Indigofera Coerulea') Used To Treat Measles***

A question was asked whether members of the forest user group benefited from bush meat; a mean of 3.05 was obtained denoting that the respondents were undecided. In summation, the respondents were undecided on whether the members of the forest user group benefited from bush meat. The study asked the respondents whether members of the forest user group benefited from charcoal burning; a mean of 2.31 was obtained denoting a disagreement. In summation, the respondents disagreed that members of the forest user group benefited from charcoal burning.

#### 4.6.1 Cost Benefit Analysis

The study sought to establish the benefit shared by the community from participatory forest management in Got Ramogi Forest Reserve. Consequently, a cost-benefit analysis was performed and the results are shown in Table 4.16. The Cost Benefit Analysis was used to establish the benefits of participatory forest management in the study area. Results are presented in Table 4.18.

**Table 4.18: Cost Benefit Calculation for Participatory Forest Management in the Last Two Years**

| Description                 | Summation |
|-----------------------------|-----------|
| Benefits (B)                | 5         |
| Costs (C)                   | 3         |
| r                           | 0.5       |
| t                           | 2         |
| B-C                         | 2         |
| (1+r)t                      | 3         |
| NPV (Cost benefit analysis) | 0.666667  |

Source: Field Data (2023)

From Table 4.18, it is evident that a cost-benefit ratio of 0.666667 was recorded; denoting a cost-benefit of 66.67%; which is above 50% and therefore significant. This finding implies that indeed there existed some remarkable benefits derived from participatory forest management at Got Ramogi forest Reserve.

#### 4.6.2 Challenges Faced in Accessing Forest Resources

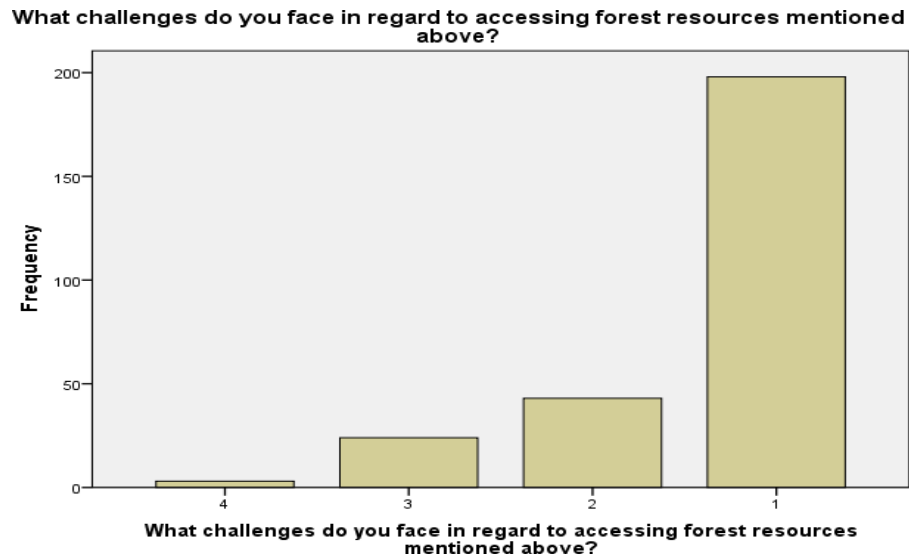
The study further sought to assess the specific challenges faced in accessing forest resource. A four-point scale was adopted such that: 1= Arrested by the forest authority for illegal use of the resource, 2= Denied access, 3= Pay fee, 4= others (specify). The results are shown in Table 4.18 while the distribution is shown in figure 4.19

**Table 4.19: Challenges Faced in Accessing Forest Resources**

|  | N          | Mean | Std. Deviation |
|--|------------|------|----------------|
| What challenges do you face regarding accessing forest resource mentioned above? | 268        | 1.37 | 0.694          |
| <b>Valid N (list wise)</b>   | <b>268</b> |      |                |

Source: Field Data (2023)

When the respondents were asked the challenges they faced regarding accessing forest resource mentioned above, a mean of 1.37 denoting arrested by the forest authority for illegal use of the resource. Therefore, it can be concluded that the main challenge faced by the community in Got Ramogi forest Reserve regarding accessing forest resource was being arrested by the forest authority for illegal use of the resource.



**Figure 4.1: Challenges Faced in Accessing Forest Resources**

Source: Field Data (2023)

Figure 4.1 shows confirms that the main challenge faced by the community in Got Ramogi forest Reserve regarding accessing forest resource was being arrested by the forest authority for illegal use of the resource; this was followed by being denied access , then fee payment. However, other challenges were considered least occurring.

#### 4.7 Community Perception on the Conflict Resolution Strategies Adopted for Resources Use

The study sought to assess the community perception on the conflict resolution strategies adopted for resource use 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. Results are shown in Table 4.20.

**Table 4.20: Perception of the Community on Conflict Resolution Strategies Adopted for Resources Use in Got Ramogi Forest Reserve**

| <b>Statement</b>  | <b>Mean SD</b> |       |
|---|----------------|-------|
| The use of negotiations has been effective in managing livelihood-related wrangles on forest resource                     | 4.01           | 0.727 |
| The adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest.            | 3.68           | 0.808 |
| Protests have been effective in expressing dissatisfaction with general management of the forest resource                 | 3.68           | 0.766 |
| Dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land               | 3.64           | 0.723 |
| Arbitration strategies have helped in solving conflicts related to resource use within the forest                         | 3.58           | 0.743 |
| Clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest | 3.52           | 0.721 |
| Government intervention has come in handy in resolving conflicts within the forest  | 2.43           | 0.705 |

Source: Field Data (2023)

A question was asked whether the use of negotiations has been effective in managing livelihood-related wrangles on forest resource; a mean of 3.68 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that use of negotiations has been effective in managing livelihood-related wrangles on forest resource.

The study asked whether the adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest; a mean of 3.68 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest.

The respondents were asked whether protests have been effective in expressing dissatisfaction with general management of the forest resource; a mean of 3.68 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that protests have been effective in expressing dissatisfaction with general management of the forest resource.

The study asked whether dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land; a mean of 3.64 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land.

A question was asked to the respondents whether arbitration strategies have helped in solving conflicts related to resource use within the forest; a mean of 3.58 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that arbitration strategies have helped in solving conflicts related to resource use within the forest.

A question was asked whether clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest; a mean of 3.52 was obtained denoting a large extent. The interpretation of this finding is that the respondents agreed to a large extent that clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest.

The respondents were asked whether government intervention has come in handy in resolving conflicts within the forest; a mean of 2.43 was obtained denoting disagreement. The interpretation of this finding is that the respondents disagreed that government intervention has come in handy in resolving conflicts within the forest.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter presents the summary, conclusions and recommendations of the study based on the research objectives. The study sought to determine the Participatory Forest Management's Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya.

#### 5.2 Summary of Findings

The specific objectives were: To evaluate the level of community participation in decision-making in Got Ramogi forest reserve as a strategy for resource use and conflict resolution; To establish the benefits shared by the community from participatory forest management in Got Ramogi Forest Reserve; To assess the community perception on the conflict resolution strategies adopted for resource use in Got Ramogi Forest Reserve.

The study sought to evaluate the level of community involvement in decision-making of participatory forest management in Got Ramogi forest Reserve. The respondents strongly agreed that major decisions in participatory forest management are made by the Government Authority thus affecting community involvement. Furthermore, the respondents strongly agreed that the community by lawbreakers were handled through arrest and charges thus affecting community involvement. Nonetheless, the respondents agreed that nominated members in any forest protecting committee were actively involved in forest management initiatives; the community participated in all the management processes through their representatives and attendance rates for participatory forest management meetings were generally high. Moreover, the study established that the community was just involved in implementation as a forest management activity; with a mean of 3.52 denoting just involved. The study also established that the community was slightly involved in decision-making (with a mean of 1.96 denoting slightly involved), evaluation (with a mean of 1.88 denoting slightly involved) and planning (with a mean of 1.76 denoting slightly involved) as forest management activities. In summary, the community was slightly involved in decision-making of participatory forest management's influence on resource use and conflict resolution in Got Ramogi forest Reserve.

The study sought to establish the benefits shared by the community from participatory forest management's influence on forest resource use conflict resolution in Got Ramogi Forest Reserve. The respondents agreed that to a large extent, the forest user group often incur losses from wild animals destroying crops and killing livestock; participatory forest management contributes to environmental conservation. However, the respondents disagreed that members of the forest user group are rewarded for participation in forest management. Moreover, the respondents were undecided on whether the members of the forest user group benefited from bush meat. The study further established that the respondents disagreed that they derived any benefit from charcoal burning. Specifically, the study established that the members of the forest user group benefit from clay for making jikos, grazing land, water, firewood, worship area, timber as a building material and herbal plants. In summary, the benefits shared by the community from participatory forest management's influence on forest resource use and conflict resolution in Got Ramogi Forest Reserve included clay for making jikos, grazing land, water, firewood, worship area, timber as a building material and herbal plants.

The study sought to assess the community perception on the conflict resolution strategies adopted for resource use by the participatory management in Got Ramogi Forest Reserve. A question was asked whether the use of negotiations has been effective in managing livelihood-related wrangles on forest resource; a mean of 3.68 was obtained denoting a large extent. The study asked whether the adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest; a mean of 4.01 was obtained denoting a large extent. The respondents were asked whether protests have been effective in expressing dissatisfaction with general management of the forest resource; a mean of 3.68 was obtained denoting a large extent. The study asked whether dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land; a mean of 3.64 was obtained denoting a large extent. A question was asked to the respondents whether arbitration strategies have helped in solving conflicts related to resource use within the forest; a mean of 3.58 was obtained denoting a large extent. A question was asked whether clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest; a mean of 3.52 was obtained denoting a large extent. The respondents were asked whether government intervention has come in handy in resolving conflicts within the forest; a mean of 2.43 was obtained denoting disagreement.

In summary, the community perception on the conflict resolution strategies adopted for resource utilization in Got Ramogi Forest Reserve include: use of negotiations has been effective in managing livelihood-related wrangles on forest resource; adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest; protests have been effective in expressing dissatisfaction with general management of the forest resource; dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land; arbitration strategies have helped in solving conflicts related to resource use within the forest and Clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest

### **5.3 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 resource use 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 resource use conflict resolution in Got Ramogi Forest Reserve included clay for making jikos, grazing land, water, firewood, worship area, timber as a building material and herbal plants. Finally, the study concluded that the community perception on the conflict resolution strategies adopted for resource use in Got Ramogi Forest Reserve included use of negotiations that has been effective in managing livelihood-related wrangles on forest resource, adoption of collaborative conflict resolution has helped in solving settlement wrangles around the forest, protests have been effective in expressing dissatisfaction with general management of the forest resource, dialogue and sensitization strategies have been effective in averting ownership wrangles of the forest land, arbitration strategies have helped in solving conflicts related to resource use within the forest and clear demarcation of forest land has been effective in managing wrangles related to commercial exploitation of the forest.

#### **5.4 Recommendations of the Study**

The study recommends that participatory forest management sensitization programs be activated by both National and County governments to emphasize the need for the community to remain actively involved in Forest Management Initiatives; especially targeting community around Got Ramogi forest Reserve. Furthermore, the study recommends that the National government and County governments organize regular joint public participation forums targeting the forest user groups to inculcate a sense of collaborative and responsive involvement attitude in the community on matters to do with forest management for resource utilization.

The study recommends the creation of Kenya Forest Service and Community partnership program in Got Ramogi Forest Reserve to ensure adequate and sustainable utilization of forest resource 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 to help in poverty alleviation that will eventually reduce the reliance on forest resource.

The study recommends increased government funding to forest Reserves in Kenya to help in digital demarcation, stakeholder mobilization and conservation training programs. Moreover, the study recommends stakeholder involvement and a bottom -up approach in designing conflict resolution policies for forest Reserves in Kenya.

#### **5.5 Suggestions for Further Research**

The study suggests that further research should be conducted in the following area:

The effects of Community Involvement on Sustainable Resource Exploitation in Got Ramogi forest Reserve, Bondo Sub-County, Kenya.

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**APPENDICES**

**Appendix I: Consent Form**

Carren Kowenje,  
P.O Box 192-40601,  
Bondo.

Dear respondent,

**RE: DATA COLLECTION FOR ACADEMIC RESEARCH**

I am a student at Jaramogi Oginga Odinga University of Science and Technology pursuing my master’s in Geography, in partial fulfilment of the degree. I am required to submit a thesis. I am currently carrying out my research on ‘Participatory Forest Management’s Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya’. You have been identified as a respondent in this study. The study will assist the county governments with strategies to adopt for solving conflicts on forest resource use, policymakers with the strategies for managing conflicts on forest resource use and offer alternative management strategies for resource use conflicts resolutions in related areas. It is in this line that I hereby request your assistance by participating in the filling of the questionnaires and or participating in key Informant face-to-face interviews in your best capacity. Participation in this research is voluntary and you are free to decline a question you are not contented with. The information you give is purely for academic purposes and your opinion will be treated with the greatest privacy. There shall be no monetary appreciation for participation in this exercise. Your cooperation will be highly appreciated and you are free to withdraw your participation without victimization.

If you consent to participate, please sign hereunder:

Consent by signing:

Name.....  
(Optional)

Signature.....

Thank you for accepting to take part in this research.

Yours sincerely,

Carren Kowenje, Adm. No .....

## Appendix II: Approval Letter



**JARAMOGI OGINGA ODINGA  
UNIVERSITY OF SCIENCE AND TECHNOLOGY  
DIVISION OF RESEARCH, INNOVATION AND OUTREACH  
JOOUST-ETHICS REVIEW OFFICE**

Tel. 057-2501804

Email: [erc@jooust.ac.ke](mailto:erc@jooust.ac.ke)

Website: [www.jooust.ac.ke](http://www.jooust.ac.ke)

P.O. BOX 210 - 40601  
BONDO

OUR REF: JOOUST/DVC-RIO/ERC/E3

19<sup>th</sup> May, 2021

Carren A. Kowenje  
Z451/4042/2015  
**JOOUST**

Dear Ms. Kowenje,

**RE: APPROVAL TO CONDUCT RESEARCH TITLED "PARTICIPATORY MANAGEMENT FOR FOREST RESOURCES USE CONFLICT RESOLUTION IN GOT RAMOGI FOREST RESERVE, SIAYA COUNTY, KENYA"**

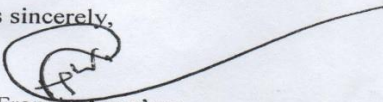
This is to inform you that JOOUST ERC has reviewed and approved your above research proposal. Your application approval number is **ERC/21/5/21-9**. The approval period is from 19<sup>th</sup> May, 2021 – 18<sup>th</sup> May, 2022.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations and violations) are submitted for review and approval by JOOUST IERC.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to NACOSTI IERC within 72 hours of notification.
- iv. Any changes, anticipated or otherwise that may increase the risks of affected safety or welfare of study participants and others or affect the integrity of the research must be reported to NACOSTI IERC within 72 hours.
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to JOOUST IERC.

Prior to commencing your study, you will be expected to obtain a research permit from National Commission for Science, Technology and Innovation (NACOSTI) <https://orin.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,

  
Prof. Francis Anga'wa



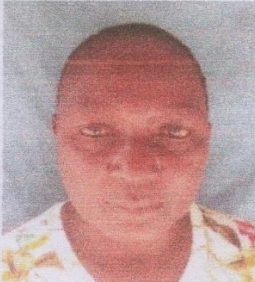


**Chairman, JOOUST ERC**

Copy to: Deputy Vice-Chancellor, RIO

Director, BPS

Dean, SEHSS

**Appendix III: Research Permit**

|  |   |
|--|---|
| <br>REPUBLIC OF KENYA   | <br>NATIONAL COMMISSION FOR<br>SCIENCE, TECHNOLOGY & INNOVATION                          |
| Ref No: 698604   | Date of Issue: 09/July/2021   |
| <b>RESEARCH LICENSE</b>  |   |
|   |   |
| <p>This is to Certify that Ms.. CAREN ATIENO KOWENJE of Jaramogi Oginga Odinga University of Science and Technology, has been licensed to conduct research in Siaya on the topic: PARTICIPATORY MANAGEMENT FOR FORES RESOURCES USE CONFLICT RESOLUTION IN GOT RAMOGI FOREST RESERVE,SIAYA COUNTY ,KENYA. for the period ending : 09/July/2022.</p> |   |
| License No: NACOSTI/P/21/11635   |   |
| 698604<br>Applicant Identification Number  | <br>Director General<br>NATIONAL COMMISSION FOR<br>SCIENCE, TECHNOLOGY &<br>INNOVATION |
|  | Verification QR Code  |
|  |    |
| <p>NOTE: This is a computer generated License. To verify the authenticity of this document,<br/>Scan the QR Code using QR scanner application.</p>   |   |

**Appendix IV: Questionnaire**

Dear Respondent,

I am conducting a study on ‘**Participatory Forest Management’s Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya;**’ as part of the fulfilment of the requirement of a degree of master. You have been identified as a respondent in this study. The information you give will be purely for academic research purposes and will not be used for any other purpose.

**Instructions**

Please answer the following questions by putting a tick (√) in the correct box or by writing your answer in the spaces provided.

**Level I: Information from Forest User Group**

- 1. Name of respondent (optional).....
- 2. Gender: (tick as appropriate)

| No | GENDER | RESPONSE √ |
|----|--------|------------|
| a  | Male   |            |
| b  | Female |            |

- 3. Age: .....
- 4. Name of village: .....
- 5. What is your household size? (Indicate in numbers) .....
- 6. What is your Marital Status? (tick as appropriate)

| No | MARITAL STATUS | RESPONSE √ |
|----|----------------|------------|
| a  | Single         |            |
| b  | Married        |            |
| c  | Divorced       |            |
| d  | Separated      |            |

6. What is your highest level of education? (Tick as appropriate)

| No | LEVEL OF EDUCATION | RESPONSE $\checkmark$ |
|----|--------------------|-----------------------|
| a  | No schooling       |                       |
| b  | Primary.           |                       |
| c  | Secondary          |                       |
| d  | College            |                       |
| e  | University         |                       |
| f  | Others.(specify)   |                       |

7. What is your main occupation? Tick as appropriate. If others, specify.

| No | OCCUPATION      | RESPONSE $\checkmark$ |
|----|-----------------|-----------------------|
| a  | Farming         |                       |
| b  | Fishing         |                       |
| c  | Teaching        |                       |
| d  | Business person |                       |
| e  | Others(specify) |                       |

8. How much do you earn from your main source of occupation? Indicate as appropriate.

| No | MAIN SOURCE OF INCOME     | RESPONSE (Kshs) |
|----|---------------------------|-----------------|
| a  | Farming                   |                 |
| b  | Small business enterprise |                 |
| c  | Fishing                   |                 |
| d  | Others.(specify)          |                 |

9. What is your approximate monthly expenditure? Give the amount in Kshs.....

10. What are the economic uses of land in Got Ramogi?

- a) Livestock farming (specify the type of livestock) .....
- b) Crop farming (specify which crops) .....
- c) Others (specify).....

**Level II: The level of community involvement in decision-making in Got Ramogi Forest Reserve.**

Below are questions related to the level of involvement in decision-making in forest management.

Please respond to them by putting a tick (√)

10. Do people pay for registration as members of participatory forest management? Please put a tick.

- A. Yes ( ) B. No ( )

11. How often do you come to meetings? Please put a tick

| NO | FREQUENCY   | RESPONSE √ |
|----|-------------|------------|
| a  | Weekly      |            |
| b  | Fortnightly |            |
| c  | Monthly     |            |
| d  | Yearly      |            |

12. What is the forest management activity you are involved in? Please put a tick

| NO | ACTIVITY        | RESPONSE √ |
|----|-----------------|------------|
| a  | Planning        |            |
| b  | Implementation  |            |
| c  | Decision-making |            |
| d  | Evaluation      |            |

13. Who makes major decisions in the participatory forest management? Please put a tick (√)

- A. Government Authority ( ) B. (Forest User Group ( )

14. How is the community by law breakers handled? Please put a tick (√)

- A. Arrested and charged ( ) B. Mediation and warning ( )

15. Please choose the responses by putting a tick (√) as follows: SA-Strongly Agree; A- Agree; D- Disagree and SD-Strongly Disagree.

| No | Question  | SA | A | D | SD |
|----|---|----|---|---|----|
| 1. | Existing forest user group can run PFM effectively                                      |    |   |   |    |
| 2. | The forest user group make the major decisions in management                            |    |   |   |    |
| 3. | The level of participation is affected by insecurity                                    |    |   |   |    |
| 4. | There are common conflicts between user groups and those who claim user rights          |    |   |   |    |
| 5. | The forest experience threats from the surrounding community                            |    |   |   |    |
| 6. | Nominated members in any forest protecting committee face challenges                    |    |   |   |    |
| 7. | The community participate in all the management processes through their representatives |    |   |   |    |
| 8. | Men are the majority in the forest user group   |    |   |   |    |

**Level III: Benefit sharing from participatory forest management in Got Ramogi for resource utilization conflict resolution**

16. Below are statements related to benefit sharing in Got Ramogi Forest Reserve. Please put a tick (✓) as follows: SA- Strongly Agree; A- Agree; D- Disagree and SD- Strongly Disagree.

| NO. | Statements   | SA | A | D | SD |
|-----|--|----|---|---|----|
| 1   | Members of the forest user group are rewarded for participation in forest management |    |   |   |    |
| 2   | The community access products of non-timber like firewood from the forest            |    |   |   |    |
| 3   | There is support from outsiders in form of training and administration of the forest |    |   |   |    |
| 4   | Women equally participate in the use and control of the forest                       |    |   |   |    |
| 5   | The dependency on the forest by the FUG group creates improved participation         |    |   |   |    |
| 6   | Participatory forest management contributes to environmental conservation            |    |   |   |    |

17. Do members of the Forest User Group incur losses? Tick (✓) where appropriate

Yes ( ) No ( )

18. To what extent is the Forest important to the User Group? Please put a tick

| NO | IMPORTANCE         | RESPONSE <sup>√</sup> |
|----|--------------------|-----------------------|
| a  | Very important     |                       |
| b  | Important          |                       |
| c  | Slightly important |                       |
| d  | Not important      |                       |

19. Members of FUG are eager to have a responsibility in the committee. Please put a tick (√)

Yes ( ) No ( )

20. What can you say are the benefits you derive from the PFM of Got Ramogi? Tick appropriately and explain.

| Item               | Tick | Comment |
|--------------------|------|---------|
| Firewood           |      |         |
| Grazing            |      |         |
| Building materials |      |         |
| Worship            |      |         |
| Charcoal burning   |      |         |
| Bush Meat          |      |         |
| Water              |      |         |
| Herbal plants      |      |         |
| Other (Specify)    |      |         |

21. How much (approximately) can you categorize the cost associated with forest maintenance and conservation?

22. How much (approximately) can you categorize the benefits associated with forest maintenance and conservation?

23. What challenges do you face regarding accessing forest resources?

a) Arrested by the forest authority for illegal use of the resources ( )

b) Denied access ( )

c) Others (specify) .....

**Level VI: The perception of the community on conflict resolution strategies adopted for resource utilization in Got Ramogi Forest Reserve.**

Below are statements related to the community’s perception of conflict resolution strategies adopted for resource utilization in Got Ramogi Forest Reserve. Please respond by putting a tick (√) as follows: SA- Strongly Agree; A- Agree; D- Disagree and SD- Strongly Disagree.

| No | Statements   | SA | A | D | SD |
|----|--|----|---|---|----|
| 1  | There is a sense of insecurity in ownership of the forest among the community    |    |   |   |    |
| 2  | There is a clear boundary between the forest and community land                  |    |   |   |    |
| 3  | Strong solidarity and cohesion exist between the members of PFM.                 |    |   |   |    |
| 4  | Forest User Group are comfortable with the by-laws of the forest management plan |    |   |   |    |
| 5  | Does the higher authority interfere with forest management?                      |    |   |   |    |
| 6  | Participatory forest management is important for livelihood improvement          |    |   |   |    |
| 7  | Participatory forest management has a bright future in the area.                 |    |   |   |    |

## **Appendix V: Interview Schedule**

Dear Respondent,

I am conducting a study on ‘**Participatory Forest Management’s Influence on Resource Use Conflict Resolution in Got Ramogi Forest Reserve in Siaya County, Kenya;**’ as part of the requirement of the degree of masters. You have been identified as a respondent in this study. The information you give will be purely for academic research purposes.

### **A: Benefits shared by the community from PFM**

1. How do you come to be a member of the forest user group? Which areas of forest management activities do you participate in?
2. Who in the local community participates and decides on forest management?
3. How do you access the products of non-timber forest products such as firewood, grasses, herbs etc.?

### **B: Community involvement in decision-making**

4. What is the extent of decision-making power and the democratic nature of FPC? How do you evaluate the extent and condition of external support (training, legal administration)?
5. How often do you come for meetings and who are the key players in the decision-making process in meetings?

### **C: Community perception on the conflict resolution strategies**

6. Why do you think the FUG members are eager to have responsibilities as FPC or reluctant to be one of them? How does this help with conflict resolution?
7. What do you think are some of the challenges of Got Ramogi participatory forest management in terms of the conflict resolution strategies?



## Appendix V: Krejcie and Morgan Table

| <i>N</i> | <i>S</i> | <i>N</i> | <i>S</i> | <i>N</i> | <i>S</i> |
|----------|----------|----------|----------|----------|----------|
| 10       | 10       | 220      | 140      | 1200     | 291      |
| 15       | 14       | 230      | 144      | 1300     | 297      |
| 20       | 19       | 240      | 148      | 1400     | 302      |
| 25       | 24       | 250      | 152      | 1500     | 306      |
| 30       | 28       | 260      | 155      | 1600     | 310      |
| 35       | 32       | 270      | 159      | 1700     | 313      |
| 40       | 36       | 280      | 162      | 1800     | 317      |
| 45       | 40       | 290      | 165      | 1900     | 320      |
| 50       | 44       | 300      | 169      | 2000     | 322      |
| 55       | 48       | 320      | 175      | 2200     | 327      |
| 60       | 52       | 340      | 181      | 2400     | 331      |
| 65       | 56       | 360      | 186      | 2600     | 335      |
| 70       | 59       | 380      | 191      | 2800     | 338      |
| 75       | 63       | 400      | 196      | 3000     | 341      |
| 80       | 66       | 420      | 201      | 3500     | 346      |
| 85       | 70       | 440      | 205      | 4000     | 351      |
| 90       | 73       | 460      | 210      | 4500     | 354      |
| 95       | 76       | 480      | 214      | 5000     | 357      |
| 100      | 80       | 500      | 217      | 6000     | 361      |
| 110      | 86       | 550      | 226      | 7000     | 364      |
| 120      | 92       | 600      | 234      | 8000     | 367      |
| 130      | 97       | 650      | 242      | 9000     | 368      |
| 140      | 103      | 700      | 248      | 10000    | 370      |
| 150      | 108      | 750      | 254      | 15000    | 375      |
| 160      | 113      | 800      | 260      | 20000    | 377      |
| 170      | 118      | 850      | 265      | 30000    | 379      |
| 180      | 123      | 900      | 269      | 40000    | 380      |
| 190      | 127      | 950      | 274      | 50000    | 381      |
| 200      | 132      | 1000     | 278      | 75000    | 382      |
| 210      | 136      | 1100     | 285      | 100000   | 384      |

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970