

APPROACHES AND CONSTRAINTS FOR COMMUNITY PARTICIPATION IN WILDLIFE CONSERVATION: A CASE OF RUNGWA GAME RESERVE IN MANYONI DISTRICT.

ABSTRACT

The study was tailored to assess the community participation in wildlife conservation in Rungwa Game Reserve particularly in Rungwa and Mwamagembe villages in Manyoni District. Specifically, the study focused on the approaches used for community participation and constraints facing communities that participate in wildlife conservation. A sample size of 98 respondents was involved in the study. Data were collected using questionnaires survey, key informant interviews, field observations, focus group discussion and document review. Data were analyzed with Statistical Product Service Solution (IBM-SPSS20). The results were produced in form of tables, mean/averages, frequencies, plates/photographs, figures. The community participation observations in wildlife conservation revealed that publicity and community based conservation were the main approaches used in the studied area. However, local community argued that conservation education was inadequately provided by Rungwa Game Reserves to adjacent villages. The failure of the game reserve to allow meaningful local participation and equitable sharing of the benefits with affected local people is leading to hatred, resentment, and illegal harvest of natural resources from the game reserve, resulting in poor wildlife conservation.

Key words: Wildlife, community participation, protected area, conservation approaches, conservation education.

1. INTRODUCTION

27 Protected areas worldwide are viewed as a refuge for wildlife and other forms of biodiversity,
28 most of which are currently threatened due to anthropogenic activities and other factors
29 (Kiria *et al.*, 2014). Throughout the world, managing protected areas involves people and
30 organizations in widely differing roles (Borrini-Feyerabend *et al.*, 2004). Law enforcement of
31 protected areas often forms significant portions of the protected area management budgets
32 (Plumptre *et al.*, 2014). Field managers, whether working for an agency or for a community,
33 deal with concrete problems and responsibilities on a daily basis and directly enjoy the
34 rewards that only wildlife and culture at their best are able to provide (Borrini-Feyerabend *et*
35 *al.*, 2004).

36 Wildlife conservation is aimed at preserving nature for the provision of spiritual, scientific,
37 educational, recreational, and visitor opportunities, all of which must be environmentally and
38 culturally compatible and livelihood improvement for the benefits of society (Muhumuza and
39 Balkwill, 2013; Owusu-Ansah, 2016). Such protected areas vary greatly from strictly
40 protected areas with no human settlement to areas that have resident communities where
41 multiple uses of wildlife are permitted (Lindsey *et al.*, 2014). Over the years, the level of
42 protection, distance from human settlements, and reserve boundaries all have been identified
43 as important predictors of encroachment and hunting pressure in Africa (Brashares *et al.*,
44 2004; Masanja, 2014). These problems are pronounced where human settlement is permitted
45 or tolerated inside protected areas, as occurs in parts of Ethiopia, Mozambique, Tanzania, and
46 Zambia (Nelson *et al.*, 2013; Lindsey *et al.*, and 2014). In order to protect the natural
47 resources in protected areas, strict protection measures that include stringent legislation,
48 regulations, and use of armed guards to keep people out often are used to ensure sustainable
49 resource conservation (Madulu, 2001). The law enforcement through patrols attempt to
50 control illegal activities; however, the benefits to the poachers are far greater than the costs
51 associated with a low probability of arrest and punitive fines (Gandiwa, 2011). Thus, illegal

52 activities are a persistent, widespread problem and governments find it difficult to fund
53 protected area and are facing severe threats from poaching and encroachment (Lindsey *et al.*,
54 2013).

55 Recently, there is a paradigm shift from exclusion to participatory approaches in wildlife
56 management which necessitate involvement of people who live and work in and around
57 protected areas in decision-making processes is paramount for the long-term success of a
58 protected area (Stellmacher *et al.*, 2012). This paradigm was results of failure of the
59 exclusion approach to manage the reserve sustainably. Excluding local communities from the
60 protected areas, both in terms of access and decision-making involvement can have adverse
61 effects on the effectiveness of the protected areas (Sowman *et al.*, 2011; Wicander, 2015).

62
63 Several scientific researches have been conducted and recommended that local people must at
64 least be involved in the decision making process and they should receive material benefits
65 from the wildlife conservation (Baldus, 2014). Recently, the government of Tanzania has
66 adopted a participatory approach to conservation as a result of persistent loss of wildlife
67 species and the constraints of a “fences and fines” approach (Wilfred, 2010). Therefore, this
68 study aimed at assessing the approaches used and constraints facing community participation
69 in wildlife conservation in game reserves, selecting the Rungwa Game Reserve location as a
70 case study.

71 **2. METHODS**

72 **2.1 Study Area**

73 The study was conducted in Rungwa Game Reserve focused in two studied villages, Rungwa
74 and Mwamagembe in Manyoni District in Singida region. It a unification of three game
75 reserves namely: Rungwa, Kizigo, and Muhesi that were established at different times.
76 Rungwa was the gazetted in 195, Kizigo (1972) and finally, Muhesi (1995) was added later to
77 be part of Rungwa (URT, 2011). The total area of Rungwa Game Reserve located at the

Central and Western part of Tanzania is 17,340 km² (WD, 2015). A large portion of Rungwa/Kizigo/Muhesi Reserves falls in Manyoni District whereas a small area is in the Chunya District in Mbeya region. Adjacent Districts are Sikonge, Chamwino and Iringa (URT, 2011). Rungwa Game Reserve is part of Rungwa-Ruaha Ecosystem that includes protected and unprotected areas (Figure, 1) with a total area of 50,886 km².

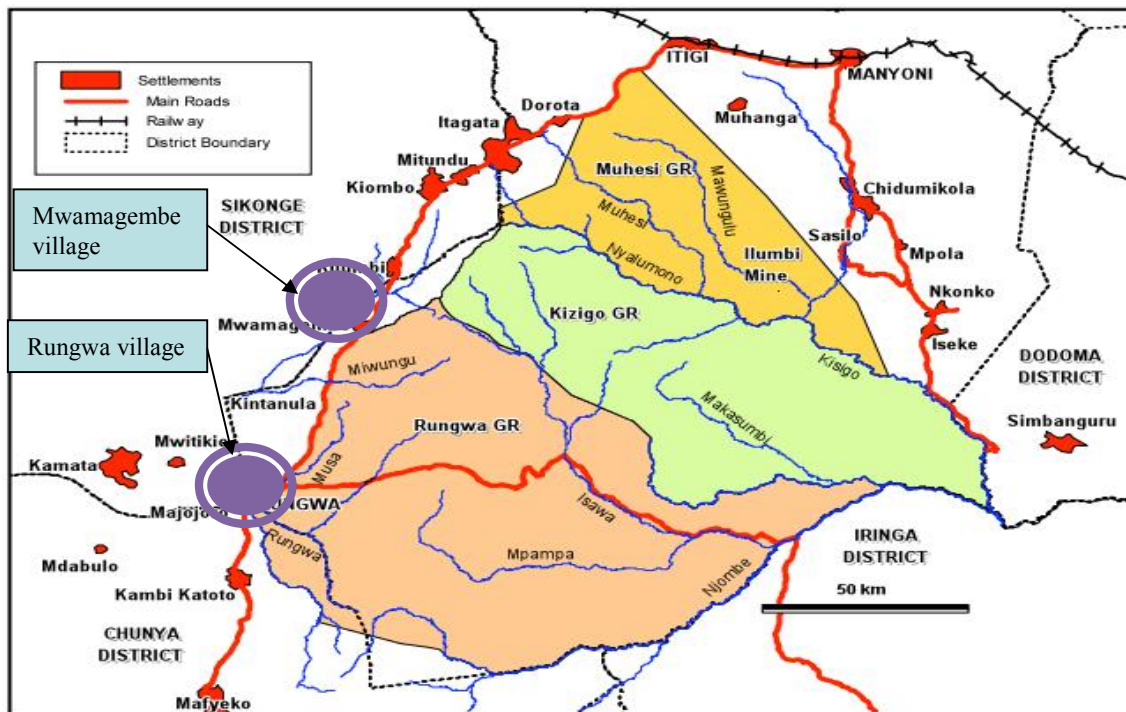


Figure 1: Map of Ruaha-Rungwa Ecosystem showing the study area (Source: URT, 2011)

The ecosystem is known to have the largest population of African elephants in Tanzania with regards to a survey that was conducted in 2013. The number of elephants was estimated to amount 20,090 individuals within the Ruaha-Rungwa ecosystem. It is considered to be the second largest wildlife area in Tanzania after the Selous-Mikumi ecosystem (TAWIRI, 2013).

The game reserve, which is popular for trophy hunting is characterized by Miombo woodlands which offer the special habitats for a number wildlife species among others

93 including lions, leopards, buffalos, zebras, elephants, impalas, and more than 300 species of
 94 birds. On average, about 100 trophy hunters visit the reserve annually. Lions, leopards, and
 95 buffalos are the top earners (in terms of hunting fees), although buffalos and zebras are the
 96 most commonly hunted species.

97 The population of the Manyoni District according to Tanzania population census general
 98 report 2012 stands at 296,763 people while two villages, Rungwa and Mwamagembe have
 99 2,209 and 6,462 people, respectively (URT, 2013). The villages were selected out four
 100 villages based on their close proximity to the Rungwa Game Reserve, easily accessible places
 101 and representatives for adjacent village to Rungwa Game Reserve with a presence of diverse
 102 socio-economic activities.

103 The reserve is surrounded by a number of tribes including Kimbu, Nyamwezi, Sukuma, Gogo
 104 and the original Rungwa tribe from which the word Rungwa was derived. Agriculture, both
 105 livestock keeping and crop production are main economic activities for adjacent communities
 106 (URT, 2011). Tobacco is a popular commercial crop grown in isolated complexes. Other
 107 crops grown mostly for subsistence include maize, beans, cassava, groundnuts, and
 108 sunflower.

109 Bee keeping is popular activity with honey and beeswax being an important source of
 110 household income. Livestock keeping is also practiced in the settled areas on a small scale
 111 (URT, 2013). Some villages around Rungwa Game Reserve suffer from crop destructions,
 112 livestock attacks and injury and loss human life caused by problem animals. The management
 113 has commitment to intervene when these problems occur (URT, 2011).

114 The reserve lies in three important watersheds drained by Rivers Rungwa, Ugalla and Ruaha
 115 flowing into three different basins, Lake Rukwa, Lake Tanganyika, and Rufiji basin
 116 respectively. The reserve falls in a predominantly semi-arid area characterized by generally
 117 low rainfall (URT, 2013). Normally, experiences a long dry season from June to November

and a single rainy season from November to April. Amount of rainfall ranges from 500 mm to 700 mm and the mean annual temperature is 28°C (Nahonyo, 2001). During the wet season, Rungwa Game Reserve receives adequate supplies of water from an extensive network of seasonal rivers, namely: Rivers Rungwa, Miyungo, Musa, Iyonga, Kizigo, and Nzombe. Water scarcity is one of the major challenges faced by the reserve during the dry season.

2.2 Research Design

The field research design is the arrangement of condition for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2012). The field survey was carried out in February, in two villages namely Rungwa and Mwamagembe in Manyoni District. The study used cross-section research design, which is most common method in social survey research as it allows data to be collected from different respondents at a single point in time (Zheng, 2015). Also, cross sectional research design gathers data from a pool of participants with varied characteristics and demographics known as variables (Jarvista, 2003).

2.2.1 Sampling Procedures

In the study, both probability sampling and non-probability sampling were used. In probability sampling, each individual was chosen entirely by chance and each member of the population had an equal chance of being included in the sample. Under probability, simple random sampling was used to select respondents because it reduces biasness during sample selection.

Non-probability sampling also was used. This is the sampling procedure which does not afford any basis for estimating the probability that each item in the population has a chance of being included in the sample (Kothari, 2012). Under this technique, purposive sampling was

used to select 10 well informed people on wildlife conservation activities. That included management of the Rungwa game reserves responsible for anti-poaching, hunting, tourism, Community Based Conservation (CBC) activities, companies dealing with hunting and tourism, Ward Executive Officers (WEOs), and Village Executive Officers (VEOs).

2.2.1.1 Sampling

Burns and Grove (2003) define sampling as a process of selecting a group of people, events, or behavior with which to conduct a study.

2.2.1.2 Sampling Frame

Sampling frame is defined as the elementary units or the group or clusters of such units my form the basis of sampling process, thus sampling frame consists of a lists of items from which the sample is to be drawn (Kothari, 2012). For the case of the study the sampling frame was the total number of households in two villages namely Rungwa which has 1452 households and Mwamagembe which has 2544 households making a total of 3996 households out of four villages surrounding the Rungwa Game Reserve.

2.2.1.3 Sampling Unit

Sampling unit is defined as anything that becomes the basis of selecting your sample such as an individual, family, household, members of an organization, residents of an area, is called a sampling unit (Kumar, 2011). For this study the head of households in the two villages were the basic sample unit.

2.2.1.4 Sample Size

Sample size refers to the number of items to be selected from the universe to constitute a sample (Kothari, 2012). Household sample sizes were calculated using Yamane (1967) formula. Yamane provides a simplified formula to calculate sample sizes (Israel, 2015).

The formula is expressed as:

166
$$n = N / (1 + N(e)^2)$$

167 Where:

168 n – Sample size estimate

169 N – Population size/ sampling frame

170 e – Error of prediction which will be 0.1 (90%)

171 The two villages have total households (N) of (3996). Using the above formula, the sample
 172 size became $3996 / 1 + 3996(0.1)^2 = 98$. The distribution of sample size to selected villages
 173 based on their proportional of their number of households. As results, 62 respondents were
 174 selected from Mwamagembe and 36 respondents from Rungwa villages.

175 **2.3 Data Collection Methods (Techniques and Tools)**

176 **2.3.1 Questionnaire Survey**

177 Structured interviews using questionnaire as a tool consisted of both open-ended and closed
 178 questions was employed. The open-ended questions were intended to give respondents
 179 opportunity to express their views and to increase the level of interaction between researcher
 180 and subject. A total of 98 heads of selected sample households were asked the same question
 181 in the same order and in the same way. Household survey is one of the most appropriate
 182 research methods because it is generally representative of the community. It is designed to
 183 provide information of the whole community as a whole and generally represents a complete
 184 geographical area (Polit, 2001). Data collected including information at the community level
 185 about the demographic characteristics and various aspects of community participation in
 186 wildlife conservation.

187 **2.3.2 Key Informant Interview**

188 Key informants were people with long term experience on the area as well as expert
 189 knowledge helped in counterchecking the credibility of data from other sources. For this

study, Key Informant Interview - included the management of the Rungwa Game Reserve, specifically the heads of the departments for Anti – Poaching Unit, Community Based Conservation, and Tourists Hunting , together with Ward Executive Officers and Village Executive Officers from two villages, Rungwa and Mwamagembe. Data collected from key informants were various records related to study such as financial records, supports records received from the Manyoni District Council and tourism hunting companies.

2.3.3 Non-Participatory Observation

Under this method, information is sought by way of the investigator's own direct observation without asking the respondent (Kothari, 2012). The community participation in wildlife conservation was assessed. Special attention was on the observation of the effects of community participation in wildlife conservation, feasible community development projects supported by the government or tourism agents, and sign posts and beacons) were observed. A checklist was used as tool in this method and data collected were photographs/plates.

2.3.4 Document Review

Secondary data means data that are already available i.e., they refer to the data which have already been collected and analyzed by someone else (Kothari, 2012). The documents reviews were used for collecting of secondary data. This involved searching available compendia, already compiled reports, books, researches, journals and other written sources. A checklist was used as a tool in this method. In addition several documents related to community participation were reviewed such as approaches used and constrain facing community that participates in wildlife conservation, records of approaches and activities for community participation in wildlife conservation. Data collected from the offices in the study area were in the form of reports, manuscripts and other documents found in office files.

2.3.5 Focus Group Discussion

A single focus group discussion in each village with villagers was conducted with community members for clarifying and cross-checking data/information gathered from respondents (Appendix 4). Mikkelsen, (1995) recommended that each focus discussion group must comprised 5-6 people, since groups with large number of people are difficult to manage. During discussions, the researcher acted as a facilitator and ensured that everyone had a say. The age groups of discussants were at least 18 years of age as they are mature enough and know what they are discussing.

Generally, focus group discussions have an advantage over interviews in that, people are allowed to give their opinion and talk in detail about their beliefs and feelings and also ensure that views of the minority groups are captured (Kaswamila, 2009). A tool which was used in this method became a part of the checklist. Data collected were related to awareness on the laws and by-laws, approaches for community participation and constraints facing community that participate in wildlife in wildlife conservation.

2.4 Data Processing, Analysis and Presentation

2.4.1 Data Processing

The collected data using questionnaires were organized into a manageable form (checked, edited and coded) and then entered into Statistical Product Service Solution (IBM-SPSS 20) for analysis. The data obtained from focus group discussion and observer checklist and key informants were organized and used to complement information from respondents.

2.4.2 Data Analysis

Data obtained using questionnaires were analyzed through descriptive statistics analysis that included the measure of central of tendency such as mean, frequency, range and percentages. The data obtained from focus group discussions and observer's checklist and key informants

were organized into manageable forms around themes and areas of concern for ease of interpretation and used to complement information gathered from respondents.

2.4.3 Data Presentation

The analyzed data have been presented in tabular form, charts, plates, and figures.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics of Respondents

3.1.1 Age of respondents

The average age of the head of the household is 41.69 and ranges from about 22 to 75 years Table 1. Results from Table 1 indicate that a majority of respondents (25.50%) are between 45-54 years of age, with very few (6.1%) between 18-24 years of age. The adult group being the majority that is many respondents are mature enough to understand and take part in the decision making process for a particular community, while youth are very energetic, high risk taking and fast learners (Lazaro *et al.*, 2013).

3.1.2 Sex of Respondents

Findings from Table 1 reveal that most of the respondents (78.6%) were males, and large majority (68.4%) were married. This is possibly because the study was based on heads of households, and in Tanzania, traditionally men are mostly the heads of households.

Table 1: General Characteristics of Respondents

Variable	Frequency (n)	Percent (%)
Sex of Respondent		
Male	77	78.6
Female	21	21.4
Age of Respondent		
18-24	6	6.1
25-34	21	21.4
35-44	23	23.5
45-54	25	25.5

55 and above	23	23.5
Marital Status of Respondent		
Married	67	68.4
Single	21	21.4
Divorced	3	3.1
Widowed	2	2.0
Separated	5	5.1
Education Level of Respondent		
Non formal	10	10.2
Primary education	72	73.5
Secondary education	9	9.2
College/vocational	7	7.1
Occupation of Respondent		
Formal employment	6	6.1
Informal employment	92	93.9

3.1.3 Education Level of Respondents

Findings from Table 1 indicate that 73.5% of total respondents had a primary education and 7.1% had at least a college/vocational education. The possible reason could be due to the fact that primary education in Tanzania is compulsory. This is supported by Gould and Huber, (2008) and Katundu *et al.*, (2013) who argue that primary school education in Tanzania is nationally compulsory, and children are expected to attend school from age 7 to 13. Education affects many aspects of the lives, including their attitude and involvement in conserving wildlife resources living freely within their communal lands. With a local community population being illiterate or having a very low level of education, changing attitudes and opinions on wildlife conservation by creating awareness through formal education may be less successful (Machara, 2014). Similarly, Rao and Pawar, (2013) argue that high level of illiteracy in the communities could lead to impatience and conflicts, especially when the youths are not fully engaged.

3.1.4 Occupation of Respondents

Moreover, the results from Table 1 indicate that majority (93.9%) of respondents had informal employment and only a few (6.1%) had formal employment. The possible reason could be due to low level of education of most respondents as formal employment in most

cases requires people with higher level of education. This implies that low education level provides low payment employment opportunities (informal employment) to the tourism industry of the Rungwa Game Reserve.

3.1.5 Main Economic Activities of the Respondents

Findings from Table 2 indicate that farming activity had the highest frequency of responses (63.7%), followed by business (17.8 %), and livestock keeping (17.1%). The reason for a majority of people in the Rungwa and Mwamagembe villages engaging in farming activities might be due to land suitability or inadequate alternative economic activities. For example, URT (2011) argues that agriculture; both livestock keeping and crop production are main economic activities for adjacent communities to Rungwa Game Reserve.

Table 2: Main Economic Activities of the Respondents

Main economic activities	Responses	
	Frequency (n)	Percent (%)
Farming	93	63.7
Livestock keeping	25	17.1
Business	26	17.8
Nursing	2	1.4

3.2 Approaches and Activities Used for Community Participation in Wildlife

Conservation

Publicity and community based conservation are the popular approaches used for community participation in wildlife conservation, especially for communities living adjacent to the Rungwa Game Reserve.

3.2.1 Approaches Used for Community Participation in Wildlife Conservation

Results from Figure 2 indicate that community based conservation ranked the highest as the approach (64.6%) used for community participation in wildlife conservation. The reason for community based conservation to be ranked as the highest could be due to the fact that the community mostly receives material and financial supports from hunting companies and the government. A study conducted in Uganda by Mugisha, (2002) revealed that community based conservation (CBC) activities have afforded limited training opportunities to members of local communities neighboring protected areas through programs such as study tours, seminars, and workshops. Such activities are expected to have a ripple effect in increasing knowledge and improving local people's attitudes about wildlife and protected management. This implies that increased revenue to the local community will decrease poaching, but other factors must be taken in consideration regarding the degree of support for conservation coming from the communities (Watson *et al.*, 2013).

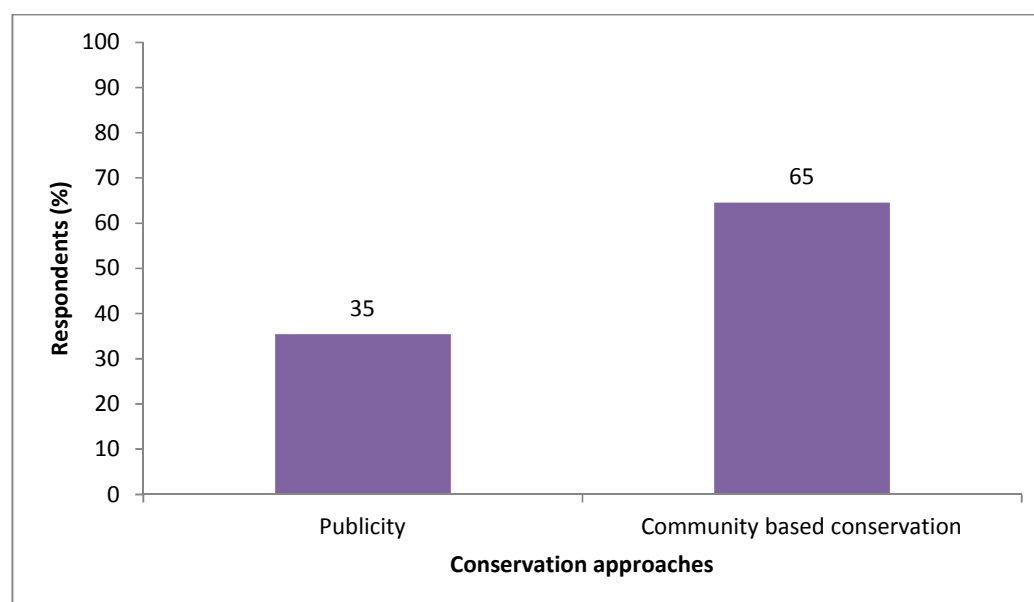


Figure 2: Approaches Used for Community Participation in Wildlife Conservation

In addition, the findings from Figure 3 also indicate that publicity approach was the least (35.4%) mentioned as approach used for community participation in wildlife conservation. This may imply that community receives inadequate conservation education from the Rungwa Game Reserve management. The representation of local communities in the planning process is expected to promote understanding of protected area management rationale, and to increase support for management initiatives (Rao, and Pawar, 2013). On the other hand, the results also show that the provision for services had the least (16.3%) respondents (Figure 2). The Game Reserve also provides other services to the communities including transport in case of emergencies (e.g., taking pregnant women to health centers in neighboring villages). Overall, 25% of the total revenue collected by the Game Reserve goes into supporting community activities in neighboring villages (WREMI International, 2016).

3.2.2 Activities Used to Involve for Community Participation in Wildlife Conservation

Results from Figure 3 indicate that building and construction of social services was the highest activity as part of community involvement (59.3%). The possible reason might be due to the fact that the community receives support from the government and hunting companies, or sometimes they are involved in the collection of building materials.

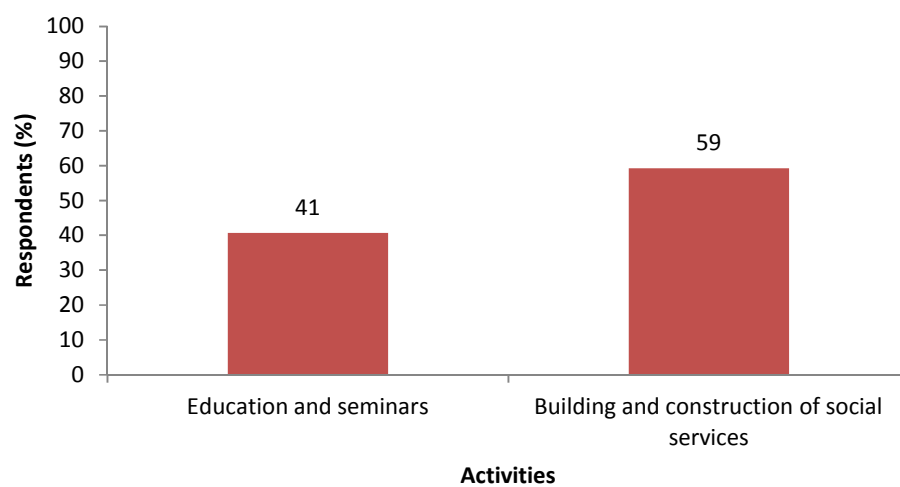


Figure 3: Activities Used to Involve for Community Participation in Wildlife Conservation

For instance, a few of the hunting companies and the government have supported community development projects such as building classrooms, teacher housing, village office buildings, construction of pit latrines, and providing desks to primary and secondary schools (Plates: 1 and 2).



Plate 1: Teacher's house built and desks in Rungwa Primary School support from hunting companies in Rungwa Game Reserve.



Plate 2: Pit latrine in Mwamagembe Primary School and Village Office built by support from hunting companies in Mwamagembe Villages

Additionally, findings also indicate that education and seminars showed the least (40.7%) activity for community participation (Figure 3). This could be due to that education and seminars was inadequately provided to the adjacent community by the Rungwa Game

Reserve management. The representation of local communities in the planning process is expected to promote understanding of protected area management rationale, and to increase support for management initiatives (Rao, and Pawar, 2013).

This is also supported by Kideghesho (2006), who argues that community participation also can be in the form of involvement in afforestation programs, provision of environmental education, and through sharing the benefits of the game reserve by financing some of the social service programs like education, health, water and transportation in the adjacent villages. The extent to which people participate in natural resources management depends on the approach used by conservation institutions, which largely is determined by the extent of power sharing, in this case, between the state and community (Mariki, 2015).

Nevertheless, the Rungwa Game Reserve has provided conservation education three times between 2013 and 2017 through village meetings, seminars, and cinema in studied villages (Appendix 6). The management of Rungwa Game reserve has started to build the beacons to the borderline between the reserve and adjacent villages at the same time putting restrictions and instructions boards (Plates: 3 and 4).

355



Plate 3

Plate 4

Plate 1: and 5: Beacon in Border between Mwamagembe Village and Rungwa Game Reserve and Warning Signboards

Furthermore, sensitizations of conservation education may impact on their participation in wildlife conservation activities requiring professionals, for instance tour operators, tour agents, experts, or facilitators for conservation education and other programs. As a result, this increases wildlife resources protection efforts, create a sense of ownership among the local community. For example, awareness about wildlife management issues has been raised in the communities through continuous sensitization, initially by the Mount Cameroon Project and Ministry of Environment and Forest (MINEF) and later by the wildlife management committees that helped community members to be more conversant with the wildlife law and its provisions (Akumsi, 2003).

The information obtained from focus group discussion in the studied villages, Rungwa and Mwamagembe also realizes that sensitizations conservation education to adjacent local community is very important in wildlife conservation as may impact on their participation and enhance sense of ownership and become more responsible in protecting and obtained more benefits.

3.3 Constraints Facing Communities in Participating in Wildlife Conservation

The results from Table 3 show constraints from a community in participating in wildlife conservation. The results indicate that inadequate conservation education was the most (22.4%) mentioned constraint that facing community participation in wildlife conservation. This could be due to the fact that conservation education was inadequately provided. The effort played by the Rungwa Game Reserve in the provision of conservation education was found to be insufficient as more efforts are needed for community to participate effectively for sustainable wildlife conservation. Secondary information obtained from the Rungwa Game Reserve revealed that conservation education was only provided three times between 2013 to 2017 through village meetings, seminars, and cinema in the study area villages

(Appendix 1). Such awareness concerning wildlife conservation helps to create sense of ownership to local communities, and as a result, raises wildlife resources protection efforts among the local community.

Table 3: Constraints Facing Communities that Participate in Wildlife Conservation

Constraints	Responses	
	Frequency	Percent
Inadequate conservation education	85	22.4
Poor governance and corruption	18	4.7
Inadequate community participation	9	2.4
Safety/security	75	19.7
Inadequate benefits from wildlife conservation	63	16.6
Poverty	64	16.8
Human-wildlife conflicts	66	17.4

There is also a need to reverse methods/techniques for providing the knowledge so as to reach all groups in the communities as supported by Sachedina, (2008) and Zella, (2016). On other hand, the findings from Table 3 depict that inadequate community participation in wildlife conservation was the least (2.4%) mentioned constraint facing community participation in wildlife conservation (Table 3). The possible reason for poor participation might be due to the provision of inadequate conservation education as claimed by most mentioned constraints that faces community participation in wildlife conservation. This could also be due to budget and facilities constraints facing the Rungwa Game Reserve management.

Another possible reason could be that the management of the Rungwa Game Reserve mostly relies on regular patrol and the use of fences and fines to the wildlife offenders. However, weaknesses of involving local communities include failure of national governments to give the communities full responsibility to manage, as well as lack of capacity on the part of the communities (Mugisha, 2002; Songorwa *et al.* 2000), were among constraints facing community participation elsewhere.

4. Conclusion and Recommendations

The study about community participation in wildlife conservation conducted in Rungwa Game Reserve focused in two studied villages, Rungwa and Mwamagembe revealed to community participation is important in achieving both wildlife conservation goals and local community's livelihood needs. Publicity and community based conservation were the popular approaches used for community participation in wildlife conservation in community living adjacent to the Rungwa Game Reserve.

Generally, various activities were involved for community participation including supporting community projects, provision of conservation education, and seminars in the studied villages of Rungwa and Mwamagembe. The study findings indicated that poor/low conservation education to a community was the most mentioned constraint that faces community participation in wildlife conservation. The Rungwa Game Reserve should have a plan and funds in place for facilitating and implementing appropriate conservation approaches to include the community.

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572 APPENDICES

573 Appendix 1: Questionnaire for Head of Household

574 Tick ✓, fill in blanks or give brief descriptions where applicable

575 PART 1: RESPONDENT'S CHARACTERISTICS

576 Name of respondent.....village ward.....

- 577 1. Age of head of household.....
- 578 2. Sex of head of household 1. Male..... 2. Female.....
- 579 3. Marital Status of head of household
- 580 1. Married.....2. Single.....3. Divorced..... 4. Widowed..... 5. Separated.....
- 581 4. Education level of head of household
- 582 1. Non-formal education.....2. Primary education.....3. Secondary
- 583 education.....
- 584 4. College/vocational 5. University education
- 585 5. Occupation of the head of household 1. Formal employee 2. Informal
- 586 employee.....
- 587 3. Unemployed.....4. Self-employed..... 5. Others, please
- 588 specify.....
- 589 6. What are your main economic activities?
- 590 1. Farming..... 2. Livestock keeping.....3. Business.....
- 591 4. Other, please specify.....

592

593 **PART 2: APPROACHES USED FOR COMMUNITY PARTICIPATION IN**

594 **WILDLIFE CONSERVATION**

- 595 7. Are there approaches used for community participation in wildlife conservation in your
- 596 area?

- 597 1. Yes 2. No

- 598 8. If yes, what are the approaches used for community participation in wildlife conservation?

SN	Approaches used for community participation	Ways	Activities	Tick✓appropriate

1.	Conservation education	Services	Education and seminars	
2.	Community Based Conservation	Projects (SCIP) Revenue sharing Consolation for loss of human life or property	Building schools, offices, desks, dispensaries, dormitories Legal hunting, tourism Control dangerous and problem animals and provision of education and seminars	
3.	Resident hunting	Permit	Legal hunting	
4.	Establishment of Wildlife Management Areas	Give land	Legal hunting, tourism and investment	
5.	Others, please specify			

599

600 9. What is the size of your land (ha).....

601 10. How many livestock do you own? Cattle..... 2. Sheep..... 3. Goats.....

602 4. Donkeys..... 5. Others, please specify.....

603 11. What types of crops do you grow in your area? 1. Maize..... 2. Beans.....

604 3. Sorghum..... 4. Sunflower..... 4. Simsim..... 5. Tobacco...

605 6. Sweet potatoes..... 7. Others, please specify.....

606 12. For how long have you been residing in this place?

607

**PART 5: CONSTRAINTS OF COMMUNITY PARTICIPATION IN WILDLIFE
CONSERVATION ACTIVITIES**

13. Do you face any constraint in participating in wildlife conservation?

1. Yes 2. No.....

14. If yes, what are the constraints facing community participation in wildlife conservation in
your area?

SN		Tick appropriate
1.	Inadequate conservation education	
2.	Poor governance and corruption	
3.	Inadequate community participation	
4.	Safety/security	
5.	Inadequate benefits from wildlife conservation	
6.	Poverty	
7.	Inadequate institution and stakeholders coordination	
8.	Human-wildlife conflicts	
9.	Others, please specify	

Appendix 2: Checklist to the RGR Management Specifically Community Based

Conservation, Anti –Poaching and Tourist Hunting Departments

1. What wildlife conservation activities are conducted in the Rungwa Game Reserve?
2. Do members of the local community participate in wildlife conservation activities in your area?
3. If yes, in what wildlife conservation activities do they participate?
4. What approaches are they used for community participation in wildlife conservation in your area?
5. What are the constraints facing local people to participate in wildlife conservation activities?
6. What are the constraints facing Rungwa Game Reserve in wildlife conservation?

Secondary data from staff of RGR – community based conservation, anti –poaching and hunting tourism departments

7. Population – people/household/quarters
8. Number of hunting companies
9. Records of the tourism hunting companies contribution on the social services - support constructions of social amenities such schools, dispensaries, offices, roads

Appendix 3: Checklist to Ward Executive Officers and Village Executive Officers of the Rungwa and Mwamagembe Villages

1. What are the economic activities of local people in your area?
2. What wildlife conservation activities are conducted in your area?
3. Do members of the local community participate in wildlife conservation activities?

- 645 4. If yes, in what wildlife conservation activities do they participate?
- 646 5. What are the approaches used for community participation in wildlife conservation?
- 647 6. Are local communities involved in decision making regarding to wildlife conservation
- 648 activities?
- 649 7. What are the constraints facing local people to participate in wildlife conservation
- 650 activities?
- 651 8. Do Rungwa Game Reserve and hunting companies conduct any training/seminars to
- 652 adjacent local people?
- 653 **Secondary Data from Executive Officers and Village Executive Officers of the Rungwa**
- 654 **and Mwamagembe Villages**
- 655 9. Funds from wildlife conservation – revenue from hunting activities, hunting tourism
- 656 companies in 5 years and how was it spent
- 657 10. Community initiated projects – costs, if available

658

659

660 **Appendix 4: Checklist for Focus Group Discussion**

- 661 1. Awareness of the existence of Rungwa Game Reserve, how and when was it
662 established
- 663 2. Participation approaches and the activities used to participate in conservation
664 activities?
- 665 3. Awareness of the community on the law and by -laws on the community participation
666 in wildlife conservation
- 667 4. Assess what constraints facing community participation in wildlife conservation?

668 **Appendix 5: Checklist for Non-Participatory Observation**

669 Provide a list of potentials (aspects) you will observe (take photo), including

- 670 1. Buildings and infrastructure supported by conservation agencies
- 671 2. Areas with serious encroachment and areas delineated by community for wildlife
672 conservation purposes
- 673 3. Seized or forfeited properties from poachers used for illegal activities, for example
674 timbers, weapons, chainsaws
- 675 4. Brochures and other teaching aids for conservation awareness creation to local
676 communities

677 **Appendix 6: Activities Involved for Community Participation in Wildlife Conservation**

S/N	DATE	TYPE OF CE	APPROACH	PARTICIPANTS
1	19/09/2011	Benefits of wildlife conservation Problem and dangerous wild animals	Public meeting	Rungwa village leaders Villagers Member of the Environmental

		Protection of water catchments Restriction of human activities within 500m from reserve boundary		committee
2	28/09-01/10/2011	Benefits of wildlife conservation Problem and dangerous wild animals Restriction of human activities within 500m from reserve boundary Illegal settlement	Public meeting	Representative from RKM game reserve, Village leaders and villagers in Kintanula Mwamagembe Kiombo Kambikatoto
3	17/11/2011	Important of rehabilitating water dam to wildlife and adjacent local community Restriction of human activities within 500m from reserve boundary and wildlife corridors Improvement of the community and the game reserve relation	Public meeting	Member of the Parliament (MP) Rungwa village leaders Villagers Member of the Environmental committee
4	26/03/2015	Benefits of wildlife conservation Education about problem and dangerous wild animals. Procedures for consolation caused by	Public meeting Cinema	Rungwa villagers Other villages Itigi Damwelu Lulanga Itagata Mitundu

		problem and dangerous animals Restriction of human activities within 500m from reserve boundary and wildlife corridors		kambikatoto
5	27/5/2015	Benefits of wildlife conservation Education about problem and dangerous wild animals. Procedures for consolation caused by problem and dangerous animals Restriction of human activities within 500m from reserve boundary and wildlife corridors Anti- poaching using trained dogs	Public meeting Cinema	Representative from RUNAPA Representative from RKM game reserve Villagers in Manda Ilangali Simbanguru Mpapa Nkonko Sasilo Imalampaka Ipululu
6	16/06/2015	Benefits of wildlife conservation Education about problem and dangerous wild animals. Procedures for consolation caused by problem and dangerous animals Restriction of human activities within 500m from reserve boundary		Representative from RUNAPA Representative from RGR game reserve Representative from Anti poaching unit Iringa and Manyoni Representative from Chamwino and Iringa Districts Villagers in Manda

		and wildlife corridors		Ilangali Chamwino Mpwayungu
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678 **Source:** Rungwa Game Reserve (2017).

679 NB: On 17th June, 2013 the Director of Wildlife Division reached agreements on
 680 Implementation of resolution of tourism stakeholders meetings, whereby among others issues
 681 agreed, community development fees – fund paid by hunting companies to wildlife division
 682 for community development do not reach ultimate beneficiaries.

683 **Implementation-** hunting companies are allowed to contribute directly to villages to support
 684 development projects and avail evidence to Wildlife Division for follow – ups.