IOSR Journal of Environmental Science, Toxicology and Food Technology (IOSR-JESTFT)
e-ISSN: 2319-2402,p- ISSN: 2319-2399.Volume 10, Issue 12 Ver. I (Dec. 2016), PP 12-36
www.iosrjournals.org

The Management of Wildlife Resources in Protected Areas: a Case Study of South-Eastern Sector of Selous Game Reserve Ecosystem

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Abstract: *The study aimed at examining management of wildlife resources in protected areas (PAs) carried out in south eastern sector of Selous Game Reserve (SGR) ecosystem from September 2011 to September 2013. Specifically, the study intended to; identify community current land uses which affect management of wildlife resources in PAs, examine factors influencing people encroachment of PAs, determine effectiveness of existing wildlife management strategies in SGR and determine methods for scaling up the most successful wildlife management strategies in SGR. Two villages were involved namely Mpigamiti and Kikulyungu. Data were collected by using Survey and Participatory Rural Appraisal (PRA) methods. Collected data were analysed by using statistical package for social scientists (SPSS) (Version 14) software. Field results indicated that 85.0% of respondents can get more land for cultivation out of observed forest cleared land.Poached 'elephants' carcasses from 2010 to 2012 showed increasing poaching by 33.3% per year. Charcoal production, honey gathering, clearance for cultivation and local beliefs resulted to increase wildfires by 12.5% per year from 2005-2012. However, statistics showed population increase for 75% from 1988 to 2012. Field results showed SGR have insufficient involvement of local communities (88.3%). Moreover, benefit accrued from SGR is ineffective whereas 25% given to Liwale District Council was from six instead of 13 hunting blocks. Revealed field results shows awareness raising of resource use rights to communities given by SGR was considerable (42.6%). The study concludes management of wildlife resources in SGR is fairly sustainable. It is recommended that more understanding on resource use values and financials support to SGR are mainly vital to be encountered ensure effective management of wildlife resources.*

Keywords: *Protected areas (PAs), Wildlife resources, Ecosystem.*

I. Introduction

1.1 Background to the Study

Globally, protected areas (PAs) encompass the range of landscapes and seascapes that are managed to conserve and maintain elements of biodiversity and natural habitat (USAID, 2005). Protected areas are one of the main elements in building a local, national, or regional strategy for biodiversity conservation. This typology of PAs include strict nature reserves, national parks and monuments, wilderness areas, game management and hunting areas, and national forests. The number of PAs globally has increased both in size and number for over a century (Fig. 1). In year 2003, there were 102,102 PAs, covering about 11.5% of the Earth's land surface (~18.8 million km^2) (Chape *et al*., 2003). One year later, according to the statistics, globally there were 104,791 protected areas listed in the World Database on Protected areas (www.cbd.int), and the growth in protected areas systems world- wide continues to increase.

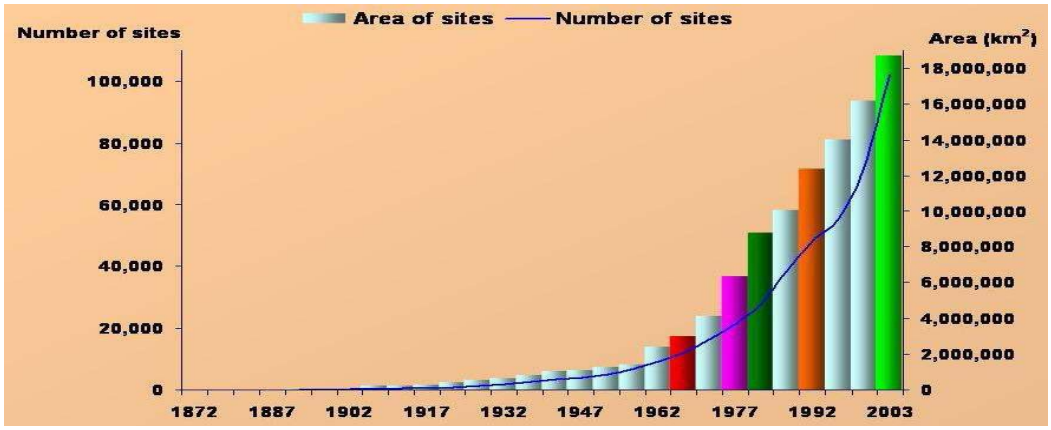

Figure 1.1: Cumulative Growth in Protected Areas by 5 Year Increment
Source: Adapted from Chape *et. al.* (2003) as cited by Papp (2008)

For PAs to be effective according to established objectives, management must be based on an understanding of the threats that faces the area. Mostly, threats facing PAs include encroachment of wildlife resources and their habitats (USAID, 2005). Nowadays destruction of wildlife habitats is a widespread phenomenon as it estimated to be 60% globally (Newmark and Hough, 2000). Human population pressure is the main contributor to this loss, mainly through deforestation prompted by increased demand for arable land, settlements and fuelwood. According to Hinrichson (1994), the majority of sub-Saharan Africa's population is dependent on fuelwood: 82% of all Nigerians, 70% of Kenyans, 80% of Malagasies, 74% of Ghanaians, 93 of Ethiopians, 90% of Somalians and 81% of Sudanese.In several parts of East Africa, local communities rely heavily on the natural resources (water, rangeland, firewood and bushmeat) for their livelihoods. Tanzania like any other African countries is not excluded from this scenario. In the late 1980s, the country had 43% of its original habitats (ca. 886 200 km^2) lost (WRI, 1989). Local extinction of fauna species and increased number of species that are prone to extinction in different localities manifest the impact of this loss (Brooks *et al.*, 2002). One of the measures to counter the extinction of fauna species was the establishment of PAs. However, the establishments of PAs deprived local people from legal access to many traditional resources particularly bush meat, which have led to antagonism among local communities towards wildlife and conservation authorities (Holmern *et al.*, 2004).

The formal or conventional wildlife conservation in Tanzania dates back from the German rules (Baldus, 2000). These rulers created wildlife conservation areas (WCAs) which were known as game reserves or hunting reserves with the aim of regulating the exploitation of wild animals. For example, by 1911, the German rulers had set aside about 5% of the colony into 15 protected areas (PAs) to conserve wildlife (Baldus, 2000). Until then, there was no WCA designated as national park. At the time of Tanzania's independence in 1961, there were only two national parks, that is, Serengeti and Lake Manyara. After independence, Tanzania increased the wildlife conservation areas to 12 National parks, 31 game reserves, 38 game controlled areas and the Ngorongoro conservation area, all covering almost 28% of the land area (MNRT, 1998).Selous ecosystem contains total area of 105,940 km^2 of continuous protected areas of various wildlife diversity and areas of sparse settlement (URT, 2005). The Selous ecosystem has the following components; Selous Game Reserve (*Est.* 47 000 km^2), Mikumi National Park (3 140 km^2), Udzungwa National Park (2 000 km^2), Kilombero Game Controlled Area (5 300 km^2), Peripheral Areas (35 000 km^2) and Selous-Niassa Corridor (11 500 km^2). Like other PAs, Selous game reserve (SGR) faces different challenges including competing wildlife resources utilization which thwart its sustainability.

1.2 Statement of Research Problem

The need for wildlife management in Selous ecosystem is undisputable. This comes from the outstanding biological, scientific, aesthetic and economic value of the area. The majority of these values stem from the region's prolific wildlife diversity. There is, however, a growing concern about the long-term viability of the Selous ecosystem due to increasing conflicts with neighbouring communities in management of protected areas imminent from unsustainable land use specifically shifting cultivation and overexploitation of wildlife due to illegal hunting. The increase of illegal hunting is likely to bring hazards to wildlife and loss in its diversity. Although, south eastern sector of Selous game reserve ecosystem is within Liwale district and most of Liwale district area are evidenced to be elephants habitat oriented ecosystem in Tanzania (URT, 2005). Yet, 62% of Liwale district is considered arable, over 50% of the district area is occupied by SGR and only 2% was actually under cultivation. Besides, agriculture practiced by small holder famers, much of the region is shifting cultivation with low production, and little surplus. In addition, much of the region is tsetse-infested, and thus is unsuitable for livestock keeping (*ibid*).In this case, poaching for bush meat is often undertaken to supplement diet out of necessity. However, there are evidences of increasing poaching for ivory inside and outside SGR at alarming rate. Current studies (TAWIRI, 2010; WWF, 2010 and MNRT, 2010) show that there is increasing ivory poaching due to increasing price in black market. This come, despite the efforts taken by global communities' initiatives such as convention on international trade in endangered species of wild fauna and flora (CITES) and government in antipoaching operations and involvement of communities in wildlife conservations through establishment of Wildlife management areas (WMAs). This scenario led to urgency for investigation on the community current land uses which affect management of wildlife resources in protected areas, factors influencing people encroachment of protected areas, effectiveness of existing wildlife management strategies in Selous ecosystem and methods for scaling up the most successful wildlife management strategy/strategies. The findings from this study were expected to help in reversing the situation.

1.3 Research Objectives

1.3.1 General Objective

The overall objective of this study was to examine the management of wildlife resources in protected areas cosseted south-eastern sector of SGR ecosystem.

1.3.2 Specific Objectives

Specifically the study intended to:

1. Identify community current land uses that affect management of wildlife resources in the study area.
2. Determine effectiveness of existing wildlife management strategies in the study area.
3. Determine methods for scaling up the most successful wildlife management strategy/strategies in the study area.

II. Research Methodology

2.1 Description of the Study Area

The Selous Game Reserve is situated in south-east Tanzania between 7^0 20'S and 10^0 30'S (Figure 2.1). The study was carried out in south eastern sector of Selous GR because it contains WMA (MAGINGO) which acts as the buffer zone to Selous GR. The study area has been selected as it has a concentration of wild animals and wood trees that provide good living habitats of large mammals outside game reserve. Furthermore, the study area is within nine villages bordering South-eastern sector of Selous game reserve which form the MAGINGO WMA. In this study, two villages out of nine villages namely, Mpigamiti and Kikulyungu were selected for the study. The choice of Mpigamiti and Kikulyungu villages was based on their conservation performance. Mpigamiti shows better performance, while Kikulyungu is the opposite.The SGR has a uni-modal distribution of annual rainfall that ranges from about 750 mm in the east to 1300 mm in the west. Temperatures in Selous GR range from about 13^0 C to about 41^0 C, with higher temperature occurring in the lower, eastern areas. There are four major soil types within the SGR include (i)Non-lateritic red and yellow soils on sandstones; (ii) Leached ferruginous soils in valley bottoms; (iii) Alkaline-sodic soils with hard pan characteristics; and (iv) Alluvial clays. The Great Ruaha and Rufiji rivers form a barrier between the miombo woodland in the south of Selous GR and the *Acacia-Combretum* wooded grassland of the north.

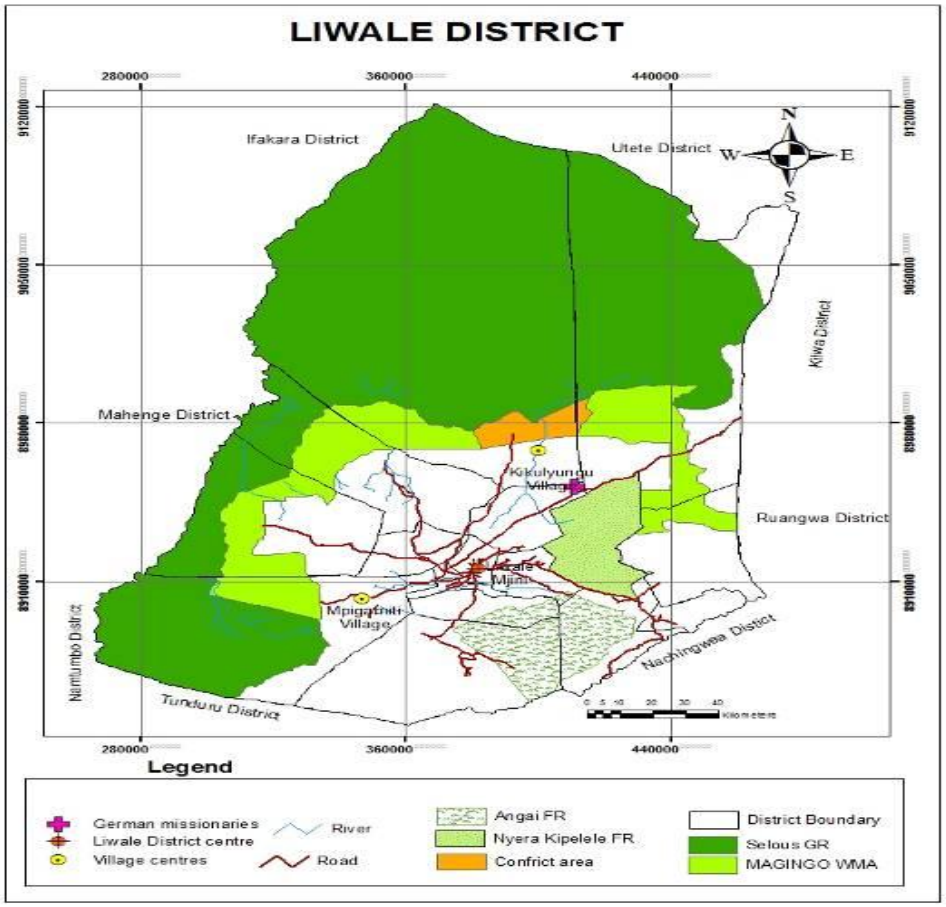

Figure 2.1: South-Eastern Sector of Selous Ecosystem
Source: Liwale District Office (2013)

SGR has a great species diversity of large mammals compared with other areas of miombo woodland (URT, 2005). SGR has 57 species of large and small mammals. This diversity is due to: the variety of its land forms and of habitats; the availability of food and water; and, its great size and remoteness.

SGR can be divided into five distinct physiographic units, each dominated by different associations of large mammals (Rodgers 1980). Briefly, these are:

1. The far south: highly dissected and eroded surfaces; flat ridges of miombo woodland; numerous steep stream beds, riverine forests and grassland. Elephant, buffalo, and waterbuck predominate in the valleys, and sable and greater kudu on the hills. Hartebeest are plentiful, but impala and wildebeest are confined to short grass ridges near the major rivers.
2. The southwest and northwest corners: mountainous; rainfall over 1200 mm; dense forest and some thickets. Large mammal densities are generally low with elephant, buffalo, and sable predominating.
3. The west: low-lying land with high rainfall; crossed by the Kilombero, Msolwa, and Luhombero Rivers; vegetation varies from open flood plain and swamp to riverine forest to dense miombo. Buffalo, elephant and hartebeest predominate, while kudu are absent.
4. The centre: undulating miombo-*Combretum* open woodland with some hill massifs. Elephant, buffalo, impala and hartebeest predominate; wildebeest are scarce on the open grassland near sand rivers.
5. The east: scattered tree grassland. A wide variety of herbivores predominate at high densities.
6. The Rufiji River marks the southern limit of the common or Maasai giraffe (*Giraffa camelopardalis camelopardalis*), and also to some extent divides the Nyassa wildebeest (*Connochaetes taurinus taurinus*) population into a southern race with a white chevron marking on the nose from a northern race with a much less pronounced marking.

2.2 Research Design

A cross sectional survey design was employed. This type of research design utilizes different groups of people who differ in the variable of interest, but share other characteristics such as socioeconomic status, educational background, and ethnicity. Cross sectional survey design has various merits includes (i) it takes place at a single point in time, (ii) does not involve manipulating variables, (iii) allows researchers to look at numerous things at once (age, income, gender) and (iv) often used to look at the prevalence of something in a given population.

2.3 Sample Size and Sampling Procedures

2.3.1 Sample Size

Sample size refers to the number of items to be selected from the universe to constitute a sample (Kothari, 2000). Due to nature of the study and population of study villages, the sample size of 70 respondents was sufficient which composed of household respondents (60), District commissioner (DC) (1), Village natural resources officers (VNROs) (2), Village executive officers (VEOs) (2), District game officer (DGO) (1), Sector Warden of SGR (SWS) (1), Village development officers (VDOs) (2), MAGINGO WMA chairman (MWC) (1).

2.3.2 Sampling Procedures

A list of all households from the updated village register book in the study villages was the sampling frame. Sampling unit for this study was a household. Households was defined as a group of people living together and identifying the authority of one person the household head, who is the decision maker for the household (Katani, 1999). Simple random sampling was used to identify the sample units. In this method every household has an equal chance of being selected. Where a candidate happened to come from the same household, one was dropped (Bouma, 2000; Henn *et al*., 2006; Veal, 1997; and Kaswamila, 2009).

Table 1.1: Respondent Sample Composition

Category of respondent	**District**	**Villages**		
		Mpigamiti	**Kikulyungu**	**Total**
Villagers		30	30	60
Village Executive officers (VEOs)		1	1	2
Village Natural Resources Officers(VNROs)		1	1	2
District Commissioner (DC)	1			1
District Game officer (DGO)	1			1
Sector warden of SGR (SWS)	1			1
Village Development Officers (VDOs)		1	1	2
MAGINGO WMA Chairman (MWC)	1			1
Total	**4**	**33**	**33**	**70**

30 households from each village (Mpigamiti and Kikulyungu) were interviewed by taking into consideration the nature of the study as supported by Kajembe and Luoga (1996), Akitanda (1994) and Mbwambo (2000). The distribution of households in the study villages are shown in Table 1.1. Judgmental/purposive sampling technique was used to obtain 10 key informants and they were including DC, VNROs, DGOs, SWS, VDOs, MWC and VEOs. The researcher selected this sample due to the following reasons; one reason is due to the time limit which is 2 years for proposal development and presentation, data collection, analysing and report writing, another reason is the resource limit and geographical situation of the area, which is rural locality.

2.4 Data Types and Sources

Both primary and secondary data were used. Primary data for the study were obtained from household's heads of Mpigamiti and Kikulyungu villages in Liwale district. The data collected were socio-economic issues regarding current community land use which affect management of wildlife resources in protected areas, factors influencing people's encroachment of protected areas, and effectiveness of management of wildlife resources strategies in Selous ecosystem. Secondary data for this study were published and unpublished reports obtained from SGR, Villages, and Ward or District offices. Data accessed were in the form of reports, manuscripts and other documents found in office files and other collections regarding this study. In addition, an audience with local government leaders to get their position and their suggestions on the issues and problems addressed in this research were made.

2.5 Data Collection Methods

In order to attain the overall aim and objectives of this study, a combination of methods and techniques were employed. Different scholars stress the need to use a combination of methods and develop a more "rigorous methodology" as they are useful to corroborate and ensure validity, not providing proof but improving consistency across methods in a process of triangulation (Kumar, 2005 cited by Kaswamila, 2009). Through a 'rigorous' methodology that include "triangulation", answers that can be believed to be valid, reliable and representative/typical are possible (Kaswamila 2009, Tribe & Summer, 2004; Denscombe, 2003). Multiple methods are useful as they look at the research from several viewpoints just as surveyors were place instruments on three hilltops to get overlapping data sets concerning the valley or plain below (Olsen, 2004 cited by Kaswamila, 2009).

2.5.1 Survey

The survey is a non-experimental, descriptive research method or is a data collection tool used to gather information about individuals (Babbie *et al*., 1973). Surveys are generally standardized to ensure that they have reliability and validity. Standardization is also important so that the results can be generalized to the larger population. The merits of survey includes (i) Surveys allow researchers to collect a large amount of data in a relatively short period of time, (ii)Surveys are less expensive than many other data collection techniques, (iii) Surveys can be created quickly and administered easily, and (iv) Surveys can be used to collect information on a wide range of things, including personal facts, attitudes, past behaviors and opinions. For the purpose of this study, survey method was comprised of household questionnaire survey and in-depth interview techniques.

2.5.1.1 Household Questionnaire Survey

Face-to-face semi-structured questionnaires were administered to the sampled households. Semi-structured questionnaire survey was preferred to structured questionnaire because it normally yields better quality data than the latter. They can be used with informants who are illiterate, blind, bedridden or very old and when a respondent does not understand the question the researcher can translate and elaborate to bring the right meaning as explained much by Gillham (2005); Miler & Wilson (1983); and Kaswamila (2009). The household questionnaire survey were useful in acquisition of quantitative information for statistical analysis, acquiring much social economic information quickly, community current land use which affect management of wildlife resources in protected areas, factors influencing people encroachment of protected areas, effectiveness of existing management of wildlife resources strategies used for management of Selous ecosystem. The questions were translated into Swahili as much as the majority of respondents speak Swahili. Before administering the questionnaires one task was accomplished, this was training of research assistants included questionnaire pre-testing as part of training. The researcher, in collaboration with Village leaders recruited one research assistants in each Village and under went a two to three days training. The training covered basic principles of interview administration, probing techniques and how to record responses of interviewees. The use of local research assistants aimed at reducing research or experimental bias effect (Miller & Wilson, 1983; Kaswamila, 2009), to exploit local people's willingness to provide information to a person they know well than to a stranger.

The use of local research assistants also helped to reduce research costs. During research assistants training, questionnaire pre-testing was done in Barikiwa village which is within MAGINGO WMA and is adjacent to Selous GR aimed to test questionnaire wording, sequencing and layout; to train and test fieldworkers; and to estimate response rates and time. Pre-testing also assessed whether the questions are clear, specific, answerable, interconnected and substantially relevant (Kaswamila, 2009). The exercise was helped to re-design the questionnaire. Some ambiguous questions were removed and others were re-phrased. After revision, the questionnaires were duplicated ready for use in the social survey. The instrument was self-administered to 10 respondents following procedures described by White (2002) and Mauch *et al., (*2003).

2.5.1.2 In-Depth Interview

In-depth interview was done by using key informants. Key informant interviews are advantageous because they often provide data and insight that cannot be obtained with other methods. They provide flexibility to explore new ideas and issues that is not being anticipated in planning the study but are relevant to its purpose. The researcher were using check list for key informants, then they were given their views on existing wildlife resources management strategies on Selous ecosystem, related studies in their areas and also they were recommend on how wildlife resources management strategies can be improved so as achieving sustainability. At that time researcher was recording the relevant information which relate with the study.

2.5.2 Participatory Rural Appraisal (PRA)

Participatory rural appraisal (PRA) is a label given to a growing family of participatory approaches and methods that emphasize local knowledge and enable local people to make their own appraisal, analysis, and plans (Chambers,1992). PRA uses group animation and exercises to facilitate information sharing, analysis, and action among stakeholders (Theis and Grady, 1991). Although originally developed for use in rural areas, PRA has been employed successfully in a variety of settings. The purpose of PRA is to enable development practitioners, government officials, and local people to work together to plan contextappropriate programs (Chambers, 1992). PRA techniques can be combined in a number of different ways, depending on the topic under investigation. For the purpose of this study focus group discussions (FGDs) and transect walks were used.

2.5.2.1 Focus Group Discussions (FGDs)

Two focus group discussions in each village with villagers were organised. During discussions, the researcher acted as a facilitator, tape recording and ensures that everyone will have a say. The age group of discussants were at least 18 years of age as they are mature enough and know what they are discussing. A checklist was used to cover discussion themes, which hinged on effectiveness of existing wildlife resources management strategies in Selous ecosystem and to incorporate best management strategies in modern ways of PAs management.Each discussion group comprised 5-6 people as recommended by Mikkelsen (1995) that, groups must be small since groups with large number of people is difficult to manage. Also focus group discussions have their own disadvantages that not every one who will be invited will attend but if some of them have shown up, you will have to run the session regardless (Cooksey and Lokuji, 1995). 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 (Charmaz, 2005; Kaswamila, 2009) and also ensure that views of the minority groups are captured.

2.5.2.2 Transect Walks

Direct field observation were made using transect walk whereby two transect walk were made in each study village each one starting from the centre of sub-village. Distance of transect walk was 100 metres from the centre of sub-village to the direction of Selous GR then 100 metres left then continue 100 metres to the direction of SGR then 100 metres right and the procedure were continued up to the/near boundary of SGR where coordinates using GPS and notes was taken for the purpose of the researcher to observe the changes land use pattern in the study area, effects of human activities on wildlife habitat and how wildlife damages crops of the people living adjacent to SGR. Direct field observation was done together with some villagers to cross check some of the issue raised during questionnaire surveys and focus group discussions. Various photographs related with study were taken in advance as the evidence so as to be presented on the chapter of results and discussion of findings if and only if the researcher financial position will allow.

2.5.3 Documentation

Archive information for this study was published and unpublished obtained from SGR, Village, and Ward or District offices. Data accessed were in the form of reports, manuscripts, books, journal papers and other documents found in office files and other collections. Documented information in related to wildlife resources management strategies in Selous ecosystem, effectiveness of existing wildlife resources management strategies,

and methods for scaling up most successful strategy were accessed. Similar information was also being sought from Village experts (agriculture, wildlife and community development). This information was supplement data collected from interviewed households.

2.6 Data Analysis Methods

2.6.1 Qualitative Data Analysis

Data collection using key informant interview, group discussion and archive information were mainly qualitative in nature. As pointed out by several social science researchers, qualitative data analysis has no one right way to proceed with analysis (Hesse-Biber & Leavy, 2004; Kaswamila, 2009) and this necessitated use of coding and memoing for narrative information and/or secondary data. Coding is the reading the text line by line and carefully coding each line, sentence and paragraphs thereby describing themes/ideas (Punch, 2000; Kaswamila, 2009). Memoing (memo writing) on the other hand is the theorising write up of the ideas about codes, which assist researchers to illuminate ideas and relationships in the data (*ibid*.). Furthermore, the data obtained through observation (transect walk) and pictures were reviewed to enhance focus group and questionnaire survey methods during analysis of descriptive data and write parts of the final report as were being observed.

2.6.2 Quantitative Data Analysis

As for questionnaire survey, before the detailed data analysis, questionnaires were thoroughly examined, variables coded and then imported into SPSS version 14 software package. This examination process was done to all questionnaires used in the survey. The data analysis then followed the two main stages of reduction and display (Coffey & Atkinson, 1996). Data reduction involved editing and summarising of data through coding, and memoing. Descriptive analysis technique was used to examine the relationship between two variables by the use of cross tabulation method and figures.

III. Findings and Discussions

3.1 General Information on Respondents in the Study Villages

The study population comprised of males and females with different ages, family size and education background (Table 4.1). Of the household heads interviewed, 81.7% were above 25 years old. This was important to the management of wildlife resources in SGR because they understand the historical trend of their areas as well as the various indigenous technical knowledge (ITK). The study villages were found to have large household sizes. Results show that 43.3% have 1-5 persons per household and 56.7% have more than 5 persons. This is due to the culture of marrying many wives (polygamy) which results into a lot of dependants to feed and take care of. Education background of the surveyed population was at most primary education (83.3%), very few had at least secondary education (5.0%). This is due to shortages of schools especially primary school resulting into children walking long distances to school. There was no single secondary school in Mpigamiti village/ward and one secondary school in Kikulyungu village which belongs to Mkutano ward with only two teachers. This implies that, low education level provides low payment employment opportunities to tourism industry of SGR.The study villages found to have low income per month resulted mostly from small-scale farming compared to standard living cost needed in the study area. Results shows that 80.0% have income less than Tsh. 60,000, and 20.0% above Tsh.60, 000, whereas 48.3% below Tsh.30, 000 which means below Tsh. 1,000 per day (See Table 3.1). This shows that those employed villagers have high income compared to non-employed (see Table 3.2) which shows that 69.6% of employed villagers have income per month above Tsh. 120,000 compared to unemployed villagers 86.5% have an income per month below Tsh. 60,000.

Table 3.1: General information on residents of study villages

Information	**Villages**		
(a)Age class:	Mpigamiti n=30	Kikulyungu n=30 4(13.3%)	Overall N=60
18-24 Years	7(23.3%)	9(30.0%)	11(18.3%)
25-35 Years	8(26.7%)	8(26.7%)	17(28.3%)
36-44 Years	8(26.7%)	5(16.7%)	16(26.7%)
45-65 Years	5(16.7%)	4(13.3%)	10(16.7%)
Above 65 Years	2(6.7%)		6(10.0%)
(b)Sex:		24(80.0%)	
Male	23(76.7%)	6(20.0%)	47(78.3%)
Female	7(23.3%)		13(21.7%)
(c)Education background:			
Informal education		5(16.7%)	
Basic adult education	6(20.0%)	4(13.3%)	11(18.3%)

Primary	1(3.3%)	15(50.0%)	5(8.3%)
Secondary	19(63.3%)	4(13.3%)	34(56.7%)
Above secondary	3(10.0%)	2(6.7%)	7(11.7%)
	1(3.3%)		3(5.0%)
(d)Household size:			
1-5Persons		10(33.3%)	
6-10Persons	16(53.3%)	11(36.7%)	26(43.3%)
11-15Persons	11(36.7%)	7(23.3%)	22(36.7%)
Above 16Persons	2(6.7%)	2(6.7%)	9(15.0%)
	1(3.3%)		3(5.0%)
(e)Income per month:			
Below Tsh.30,000		17(56.7%)	
TZS 30,000-59,000	12(40.0%)	9(30.0%)	29(48.3%)
TZS .60,000-89,000	10(33.3%)	0(0.0%)	19(31.7%)
TZS 90,000-119,000	4(13.3%)	2(6.7%)	4(6.7%)
TZS 120,000-149,000	0(0.0%)	2(6.7%)	2(3.3%)
TZS 150,000-179,000	1(3.3%)	0(0.0%)	3(5.0%)
TZS 180,000-209,000	2(6.7%)	0(0.0%)	2(3.3%)
Above TZS 209,000	1(3.3%)	0(0.0%)	1(1.7%)
	0(0.0%)		0(0.0%)

Source: Research Findings, 2013

Also the results show that the study population has 38.3% of employed villagers while 61.7% are unemployed. Mostly those villagers who are employed work in Tourism industry, and those who are not employed are likely to engage themselves in other socio-economic activities including encroachment of wildlife resources (Illegal hunting - poaching activities). Those unemployed people are the one who are poor compared to employed villagers.

Table 3.2: Income level of Respondent per Month

Income per month:	**Employed N=7**	**Unemployed N=53**	**Overall N=60**
Below TZS 30,000	0(0.0%)	29(54.7%)	29(48.3%)
TZS.30,000-59,000	0(0.0%)	19(35.8%)	19(31.7%)
TZS 60,000-89,000	0(0.0%)	4(7.5%)	4(6.7%)
TZS.90,000-119,000	1(14.3%)	1(1.9%)	2(3.3%)
TZS.120,000-149,000	3(42.9%)	0(0.0%)	3(5.0%)
TZS 150,000-179,000	2(28.6%)	0(0.0%)	2(3.3%)
TZS 180,000-209,000	1(14.3%)	0(0.0%)	1(1.7%)
Above TZS 209,000	0(0.0%)	0(0.0%)	0(0.0%)

Source: Research Findings, 2013

The study villages observed to have large household size with low income of her people as a result people concentrates on utilizing wildlife resources in the protected areas. Alternatively, if considers employments in tourism industry, it has seen whites paid much compared to blacks and this is common in many tourism companies includes Tanganyika Wildlife Safaris (TAWISA) and Tanganyika Wildlife company Ltd (TAWICO) which have invested in SGR – South eastern sector ecosystem (comprises eight (8) hunting blocks). This implies that, affirmative action policies may need to be adopted for a period of time to improve the conditions of the excluded and to make for more equitable access to job opportunities.

3.2 Community Current Land uses which Affect Management of Wildlife Resources in protected areas

3.2.1 Access to Land and Land Tenure in the Study Area

The land tenure system in the study area is given in Table 3.3. The dominant land ownership system is individual land obtained through inheritance (85.0%). This is followed by rent land (15.0%) where the majorities are females who were either divorced or widowed because the customary law for accessing land did not favor them. The minimum farm size owned by an individual farmer was 1 ha, while the maximum farm land was 15 ha. Average farm land per farmer was 3 ha. Regarding land area, 88.3% of the respondents have land parcels between1-5 ha and 11.7% had more than 5 ha. However, 23.3% of the respondents claimed that land was not enough. For possibilities to get more land for cultivation, 85% claimed that it was possible either through formal application to the village government (81.7%), buying from those with big farms (10.0%) and renting on temporary basis (8.3%) (Table 3.4). Even though, the majority of respondents (83.3%) indicated the possibility of getting additional piece of land. During the focus group discussions it was found that there is a problem of fertile land for rice farming in Mpigamiti resulted to land use conflicts. The conflict arose in 2010 after MAGINGO WMA getting user right for the area while immigrants invaded the area and cultivated protected land and used water from the Liwale River without prior consultation and permission from the village and MAGINGO leaders. While in Kikulyungu village, the villagers were evicted from MAGINGO WMA due to

border conflict between the village and SGR. The villagers claimed that, Kihurumila dam is within the village land contrary to Government gazette announcement No. 275 of 1974 which declare the boundaries of SGR as explained much in section 4.4.7 of this chapter.

Table 3.3: Land Ownership in Study Villages

Information	**Villages**		
(a)Land ownership:	Mpigamiti n=30	Kikulyungu n=30	Overall N=60
Individual	24(80.0%)	27(90.0%)	51(85.0%)
Rent	6(20.0%)	3(10.0%)	9(15.0%)
(b)Land owned in hectares:			
1-5 ha		24(80.0%)	
6-10 ha	29(96.7%)	4(13.3%)	53(88.3%)
11-15 ha	1(3.3%)	2(6.7%)	5(8.3%)
Above 15 ha	0(0.0%)	0(0.0%)	2(3.3%)
	0(0.0%)		0(0.0%)
(c)Land available:			
Enough		24(80.0%)	
Not enough	22(73.3%)	6(20.0%)	46(76.7%)
	8(26.7%)		14(23.3%)
(d)Possibility to get more land:		26(86.7%)	
Yes	25(83.3%)	4(13.3%)	51(85.0%)
No	5(16.7%)		9(15.0%)

Source: Research Findings, 2013

Table 3.4: Means to Acquire Land by Study Villages

Information:	**Frequency**	**Percent**
Application to the village government	49	81.7
Buying	6	10.0
Rent	5	8.3
Total	60	100

Source: Research Findings, 2013

Furthermore, information obtained from MAGINGO WMA office and DLO shows that, study villages bordering SGR have land use plans made by Tanzania Land Use Plan Commission (TLUPC) in collaboration with Liwale District Council (LDC) and Ministry of Land, Housing and Settlement (MLHS) in 2008 funded by WWF while excluding SGR in planning process. This in one way or another is among of the cause of border conflict between Kikulyungu village and SGR where the village land use plan map showed the border to be in Matandu River inside SGR where Kihurumila dam is automatically inside the village.

Therefore, this shows that, all professionals were only listening to villagers without considering other laws like Wildlife Conservation Act No. 12 of 1974 which declares the boundaries of SGR. During 2010 boundary conflict resolution between MAGINGO WMA and SGR done by the committee made by then Minister of MNRT which involved professionals from TLUPC, LDC, MLHS, MNRT and SGR also Village elders of conflicting villages of Ndapata, Barikiwa, Chimbuko, Kikulyungu and Kimambi (MWMA and SGR office reports, 2010). At the end of resolution, all villages except Kikulyungu agreed with the Government Notice No. 275 of 1974 which declares the boundaries of SGR.Consequently, land shortage in the study villages is not experienced but is endorsed to poor agricultural practices especially shifting cultivation which associated with deforestation of Miombo woodlands. Each respondent in study villages have an average of 3.0 ha, then with proper application of agricultural inputs, food shortages will be history.

3.2.2 Agriculture

Agriculture is a major economic activity and source of income around Selous game reserve ecosystem. Many villagers in Liwale district practice shifting cultivation associated with destroying miombo forests which are also habitat for wild animals thereafter causing human-wildlife or wildlife-crops interactions/conflicts. Precisely, this behavior is due to low population in Liwale district for long time (from 2002 census) where it was estimated to have one hundred thousand people with average of one person per two square kilometers suitable for agriculture and outside protected areas.Cultivated crops in the study area can be categorized into three main groups namely annual, semi perennial and perennial crops. Major annual cultivated crops include maize (*Zea mays*); rice (*Oryza sativa*) and sorghum (*Sorghum vulgare*). Semi perennial cultivated plant species are cassava (*Manihot esculenta*), sugar cane (*Saccharum officinarum*) and banana (*Musa esente*, *Musa cavendishii*, and *Musa sp*). Perennial cultivated plant species are cashewnut (*Anacardium ocidentale*) and coconut (*Cocos nucifera*). Other minor cultivated plant species are simsim (*Sesamum sp*), groundnuts (*Arachis*

hypogea), melon (*Cucurbita mero*) and Pigeon beans (*Cajanus cajan*). Fruits plant species cultivated in study area include mango (*Mangifera indica*) and Orange (*Citrus sp*) and pawpaw (*Carica papaya*). However, perennial and semi perennial crops are grown on small scale level but all crops are grown for subsistence and trade, but cashew nuts remains the principal cash crop.These crops attract wild animals which are the source of conflict of interests between conservation and agriculture. The study villages show that 88.6% of respondents suffered from wildlife related problems while only 11.4% had not experienced the problem (Table 3.5).

Table 3.5: Response on Problem Animals Destroying Crops and Human Life

Information:	**Percentages: N=60**
(a)Availability of problem animals:	
Yes	88.6%
No	11.4%
(b)Common problem animals:	
Elephant *(Loxodonta africana)*	89.4%
Vervet monkeys *(Chlorocebus aethiops)*	66.7%
Bushpig *(Potamochoerus porcus)*	68.2%
Olive baboon *(Papio anubis anubis)*	53.0%
Warthog(*Phacochoerus aethiopicus)*	15.8%

For (b) Multiple responses answers were obtained
Source: Research Findings, 2013

The study found the animals that damage crops in the field include elephants (89.4%), velvet monkeys (66.7%), bushpigs (68.2%), olive baboons (53.0%) and warthogs (15.8%) (Table 4.5). Rats were reported by many respondents that they cause great damage on stored cereal crops at home compared to fields' crops. During transect walk and focus group discussions it was found that, damage to crops varied from one village to another and from one plot to another within the study area. The areas which are more affected are those within the wildlife corridor which the most preferred crops by animals were maize, cassava, sugarcane, melon and cashew nuts. During focus group discussions, the wild animals that damage crops were categorized into three main groups:

a. All wild animals' species which damage crops during the day. These include Vervet monkey (*Cercopithecus aethiops arenarius*), Rufiji blue monkey (*Cercopithecus mitis monoldes*) and yellow baboon (*Papio cynocephalus*).
b. All wild animals' species which damage crops at night. These include African elephant *(Loxodonta africana*), bushpig (*Potamochoerus porcus*), buffalo (C*yncerus caffer*) and hippopotamus (*Hippopotamus amphibius*).
c. All animals' species that cause minor damage of crops at night. These include warthog (*Phacochoerus aethiopicus*), eland (*Taurotragus oryx*), greater kudu (*Strepsiceros strepsiceros*), bushbuck (*Tragelaphus scriptus*), impala (*Aepyceros melampus*), black backed jackal (*Canis mesomelas*), Reed buck (*Redunca redunca*), porcupine (*Hytrix africae astralis*) and cane rat (*Thyronomys swinderianus*).

Elephants, bushpigs and baboons are animals that cause greater damage to maize farm plots both in wet and dry season. Baboons start to destroy maize seedling immediately after germination. They jab germinated maize seedlings and continue to damage crops in the growing season until they are harvested. Elephant start to feed on maize seedlings between 3 - 4 weeks after germination and continue to damage the crops until they are harvested. The relative ranking of damage caused by elephant varies in the study area. Elephants were found to enter crops most in both wet and dry season depending on the location of the field from the feeding routes or direction of reserve. Bushpigs were reported to use stems of maize and sorghum at early stage.

The measures taken by farmers to control include non lethal deterrents applied by farmers include oil chilled ropes and chilled elephant dung blocks. The farmers who applied oil chilled ropes and chilled dungs around their farm plots in the study area had less crops loss or raided by animals especially elephants. In both study villages of Mpigamiti and Kikulyungu the peasants who applied the deterrents of elephants in their farm plots yielded much and had large farms plots compared to those who do not apply. The use of non lethal deterrents towards elephants was more common in Mpigamiti village (See plates 3.1- 3.2) rather than Kikulyungu village. Therefore, as suggested by Kagaruki (2004) crop production in the study villages would be increased if more efforts toward preventing crop damage were focused on the control of weeds, crop diseases, and smaller species such as bush pigs, baboons, rodents or birds.


Plate 3.1: Oil chilled Ropes Around Farm Plot. Plate 3.2: Chill- Elephant Dung bricks
Source: Research Findings, 2013

However, protected area and their wildlife resources not only represent problems for people living around them. There is also an overall great deal of respect, affection and positive culture associate with the populations of wild game. Wild animals are part of people's lives, their identity and attachment to the land. There is also a considerable faith in the manager's capability to alleviate problems around communities, and in protecting natural resources. However, major threat recently is a limited range of opportunities and alternatives in a situation characterized by wide spread poverty and increased population pressure around wildlife areas, yet it remains important to facilitate the potential for social and community mobilization that is the pre-requisite for good wildlife management (Bayona, 2003).In Liwale district the sands is loamy, which are very imperfectly drained, "have very severe limitations that restrict their capability to produce perennial forage crops" (Hathout 1993). As a result, agriculture throughout much of the region is in the form of shifting cultivation, Furthermore, population growth of people and ghastly land uses in study villages brings pressure on resources available as results of habitat destruction and environmental degradation. During transect walk, it was seen that, many farms area directing towards the boundary of SGR which implies that, people are not only interested with growing crops only but their eyes are on wild animals.

The existence of conflicts within protected areas is based on the differing term-utilization attached to the resources of the environment. The objectives behind the conservation scheme is to conserve natural resources for long-term benefits, while the concern of the inhabitants of protected areas is the need to have a means of livelihood for survival. The different functional interpretations given to protected areas have generated the varying degrees of conflicts experienced.

3.2.3 Poaching and Law Enforcement in the Study Area

Hunting of wildlife has already resulted in reduced populations of several resident herbivore species (Campbell and Hofer, 1995; Campbell and Loibooki, 2000 and Ngowe, 2004). Table 3.5 shows number of arrested poachers and exhibits from 2005 up to 2010 and actions taken. The results shows that, out 67 poachers arrested from 2005 to 2010 only 10 poachers were taken to court of law while 54 poachers compounded and paid a sum of Tsh. 3,230,000/=. Moreover, poaching remains a chronic problem in wildlife conservation in Protected Areas. In SGR and MWMA areas, the poachers mainly use guns for killing elephants whose price of the tusks rise everyday in black market due to the need of the trophies in Asian markets. Elephants trophy poaching in the study area was rampant in the year 2011 after rise of black market where one kilogram of elephant tusk in Liwale sold up to Tsh. 300,000/=. This is evidenced by having a total of 67 poached elephants' carcasses in SGR-Southeastern sector, MWMA and Liwale open area in the year 2010 to 2012. Additionally, evidence comes from seizing a lot of elephant ivory tones in Asia especially China and Vietnam and claimed coming from Tanzania (Interpol reports, 2012). Killing of other species include hartebeest, buffalo, eland, impala and others mostly using wire snares are for subsistence and selling almost within the district. These poaching activities are for business especially elephants ivory are transported mainly using blind ports along shores of Indian Ocean in Lindi and Mtwara regions. Recent data available shows that until September 2012 there are 16 blind ports for smuggling elephant tusks which transported to Zanzibar and Dar es Salaam ready for overseas transportation (Interpol reports, 2012).

Table 3.5: Poachers Arrested by SGR South Eastern Sector from 2005 to 2010

	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Number of Poachers arrested	14	7	5	10	16	15	**67**
Number of poachers taken to court of law	1	-	1	3	3	2	**10**
Number of cases in court of law	1	-	-	2	3	1	**7**
Number of cases convicted in court of law	-	-	-	1 null proscue	1 jailed 30 years,	1 jailed 10 years	**3**
Number of cases continues in court of law	-	-	-	2	2	1	**5**
Number of poachers fined	13	7	4	7	13	10	**54**
Total fines collected	630,000	660,000	220,000	520,000	500,000	700,000	**3,230,000**
Guns and other exhibits	.375, Dikdik meat	Buffalo meat	Hartebeest meat	6 elephants tusks, 2 hippo tusks, Dikdik meat	25 elephants tusks 25, Dikdik meat, 100 tmbers	.375,17 timbers, insya meat	**2 guns, 31 elephant tusks, 2 hippo tusks, 117 timbers, Dikdik, Buffalo, Hartebeest and Insya meat.**

Source: SGR South Eastern Sector Office, 2013

Despite being included in the environmental crimes, poaching and other illegal harvesting of wild resources are on increase. In discussion with the focus groups, the reasons for poaching reported was the traditionally local community preferred for wildlife meat to that of livestock. The local people don't practice livestock keeping and it is also a part of the culture for Wangindo tribe to conduct hunting using traditional weapons (Since then they were hunters and gatherers). In the past, the kill was distributed freely to the neighboring households contrary to these days where wildlife meat is sold. However, increasing poverty has made poaching to be commercialized. Wire snares and guns have proved effective especially to all herbivores except elephants killed by guns and poisons. The wire snares reduce the risk of poachers being arrested by wildlife authorities since a normal hunting involves a lot of chasing for the wounded animals. It is only a romantic myth that bush meat originated from small-scale consumptive poaching which is less destructive than commercial trophy poaching.Although, villagers are involved in the management of wildlife, illegal hunting is still observed in the WMA which covers 373,358 hectares. The reason behind is that the villages governments and MAGINGO WMA have low capacity to invest in anti-poaching activities regarding the huge area. For instance, patrol budget for MAGINGO WMA was Tsh.59M and 60 M for 2010/11 and 2011/12, respectively. Meanwhile, the income from their hunting quota and share from the department of Wildlife was Tsh. 50 Millions and 63 Millions for 2010/11 and 2011/12, respectively.

However, anti-poaching operations conducted by Taskforce (National and Trans – National High Crimes Intelligence Unit - NTHCIU) managed to withdraw 147 guns from Liwale district in September 2012. In addition, more than six hundred ammunition used in illegal killing of wild animals were caught. But, poaching still continues as evidenced by seizing of 61 pieces of elephants tusks weighed 98.2kg equivalent to 34 complete tusks accounted to 17 live elephants killed in October 2012. SGR is priotised anti-poaching activity to be highly ranked than other activities. Each game scout/warden/officer is supposed to patrol at least 20 days per month in order to make sure everywhere inside and outside SGR where are reached. Due to this it is easy to succeed in all identified management strategies of SGR and its adjacent land uses.The number of poachers arrested in the study area has been decreasing with time. But this does not mean that poaching is also decreasing due to the fact that those cases available are for poachers' arrested outside SGR whereby inside SGR there is a big war between poachers and game scouts. For instance until November 2012 there were eleven (11) different poaching cases in Liwale district court and ten (10) of them have given decision whereby majority were sentenced to jailed for 20 years or 5 years (SGR – South eastern sector office, 2012). Personal observation and experience in the area show these cases results in court do not do not bring security to available wildlife resources for future generation. Thus, more actions are needed to make sure every individual have a sense of ownership to these resources and foregone any other factors contributing to encroachment of the available resources.Conversely, the study population found to have high trust on the management of SGR. Results (Figure 3.6) show that 58.6% of study population rank good, 21.2% rank considerable, 9.1% excellent and the remaining percentage rank somehow and very little. This shows that SGR management should keep up with its management strategies for the future generation.

Figure3.6: SGR Performance on Protection of Wildlife Resources
Source: Research Findings, 2013

3.2.4 Encroachment for Fuelwood, Logging and Mining

Encroachment for fuelwood, logging and mining is increasing daily in the study area as alternative source of income for their livelihoods. During transect walks in Mpigamiti village, two mining tunnels were seen but the miners shift due to emerge of other mining areas in other villages outside WMA member villages. However, logging was increased in WMA member villages as these are the only areas in Liwale district concentrated with valuable trees for logging and timbering. In the year 2012, twenty six (26) people and more than 4,000 timbers which were illegally harvested were arrested inside WMA, Forest reserves and open areas by Tanzania forest service (TFS) in collaboration with Selous GR. The growing number of people, farms and wildlife in the Liwale Region are leading to increased conflict between the needs of conservation and development as explained much by Weladji and Tchamba (2003), World Bank (2008), Nelson (2009 and 2010) and Wilfred (2010). Tree planting help to reduce shortage of fuelwood and logging which are important for households' consumption. The study villages found to have high concentration of people who do no adopt trees planting strategy contrary to the national agenda (DGO, 2012). The results (Table 3.6) shows that 76.7% of the study villages do not plant trees so the only source of fuelwood and other needs results from trees are depended on cutting down natural trees available in the village and inside MWMA and SGR, only 23.3% of the respondents plant trees for different reasons, among which fuelwood account 33.3% for Mpigamiti and 66.7% Kikulyungu.

Table 3.6: Growing of trees and its purposes

Information	**Mpigamiti**	**Kikulyungu**	**Overall**
(a)Growing trees:	9(30.0%)	5(16.7%)	14(23.3%)
Yes	21(70.0%)	25(83.3%)	46(76.7%)
No			
(b)Purpose of growing trees:			
Fuelwood	1(33.3%)	2(66.7%)	3(100%)
Building material	6(60.0%)	4(40.0%)	10(100%)
Soil fertility maintenance	3(60.0%)	2(40.0%)	5(100%)
Wind breakers	0(0.0%)	0(0.0%)	0(0%)
Shades	14(77.8%)	4(22.2%)	18(100%)

For (b) multiple responses answers were obtained
Source: Research Findings, 2013

Besides, results in Table 3.7 shows that 95% of respondents in study villages are dependent on natural regeneration of trees to tackle fuelwood shortage. The study villages were found to have no crucial measures taken for dealing with shortage of fuelwood. 50% of respondents infrequent had practiced private tree planting. Similarly, 36.7% of respondents infrequent practice agro-forest and those who infrequent practice communal tree planting were 3.3%. This implies more encroachment in study area.

Table 3.7: Measures Taken to Deal with Fuelwood Shortage

Practice	**Frequency of use**			
	Often	Infrequent	Not used at all	Overall
(a)Agro-forest	0(0.0%)	22(36.7%)	38(63.3%)	60(100%)
(b)Private tree planting	1(1.7%)	30(50.0%)	29(48.3%)	60(100%)
(c)Communal tree planting	0(0.0%)	2(3.3%)	58(96.7%)	60(100%)
(d)Natural regeneration	57(95.0%)	1(1.7%)	2(3.3%)	60(100%)

Source: Research Findings, 2013

Also during focus group discussion, it was found that, population in the study area engage themselves in encroachment of mining in the PAs especially in MWMA. This was evidenced by having mining holes in Mpigamiti village while village game scouts do not intervene because there is no seriousness on implementing by-laws due to fact that, until now no research of type of mine found in the village land.

4.2.5 Wildfires

Control of wildfires is one among the strategies for conservation of biodiversity and natural/wildlife resources. The study villages found to have very few people adopt strategies/practices to control loss of wildlife resources. Results in Table 3.8 show that 83.3 % of the respondents in the study villages do not adopt any strategy include minimization of wildfire and only 16.7% of the respondents adopt strategy/practices for controlling loss of wildlife resources.

Table 3.8 Uses of Strategy/Practices to Control Loss of Wildlife Resources

Information:	**Mpigamiti n=30**	**Kikulyungu N=30**	**Overall N=60**
Yes	6(20.0%)	4(13.3%)	10(16.7%)
No	24(80.0%)	26(86.7%)	50(83.3%)

Source: Research Findings, 2013

Moreover, SGR south eastern sector is surrounded by 9 villages include study villages. Study villages form part of the migratory route for migrating elephants thus causing severe crop damage and loss of life in some instances. Wildfires occur frequently inside MWMA, forest reserves and open areas. The major causes of these fires are charcoal production, honey gathering, clearance for cultivation and local beliefs. Wildfires have overwhelming effects on the biodiversity and ecology of the Selous ecosystem thereof calls for efficiency and effective management especially when occur at the wrong season.In Liwale district more than eight wildfires reported each year in different villages bordering MWMA and SGR. Figure 3.7 shows reported incidences of wildfires from 2005-2012. The extent of damage to MWMA is immeasurable but SGR have natural firebreak from villages which is the river Matandu. Available by-laws for preventing wildfires were aware to many villagers but traditional ways of starting the fire is unavoidable as mostly done at night hours.

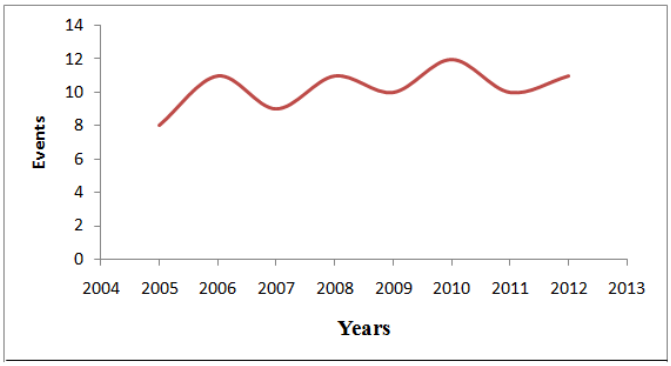

Figure 3.7: Incidence of Wildfires from the Year 2005 to 2012

Year	2005	2006	2007	2008	2009	2010	2011	2012
Events	8	11	9	11	10	12	10	11

Source: DGO Office, 201

3.3 Effectiveness of Existing Wildlife Management Strategies

3.3.1 Involvement of Local people in SGR Management

The results in Table 3.10 shows that 88.3% of respondents say SGR management do not involve villagers in different management activities of wildlife resources and solving their problems, and only 11.7% agree with SGR involvement of villagers in it various activities.

Table 3.10: Involvement of Local Community in SGR Management

Involvement of local Community:	Mpigamiti n=30	Kikulyungu N=30	Overall N=60
Yes	5(16.7%)	2(6.7%)	7(11.7%)
No	25(83.3%)	28(93.3%)	53(88.3%)

Source: Research Findings, 2013

The results show that SGR has poor communication with adjacent community in study villages. Furthermore, results Table 3.11 shows that, 46.6% of respondents rank existence of very little relationship between SGR and local communities. This implies that, SGR Community based conservation (CBC) section is not well equipped in making good relationship with its adjacent community. Due to limited fund, SGR – CBC section fail to mobilize information and knowledge usable for communities in time instead of available capacity to do so.

Table 3.11: Status of SGR to the Relationship with its Local Communities

Status of SGR	Mpigamiti n=30	Kikulyungu N=30	Overall N=60
Worse	4(13.3%)	0(0.0%)	4(6.7%)
Very little	12(40.0%)	16(53.3%)	28(46.6%)
Somehow	6(20.0%)	6(20.0%)	12(20.0%)
Considerable	5(16.7%)	2(6.7.0%)	7(11.7)
Good	3(10.0%)	6(20.0%)	9(15.0%)

Source: Research Findings, 2013

Local community involvement in wildlife resources management within and adjacent to PAs is vital as it help in extraction of indigenous technical knowledge (ITK) used by local community in conservation of fauna and flora. During focus group discussion it showed that, most of Ngindo tribe living adjacent to SGR has ITK which restrict cutting down some tree species or killing some animal species. For example "Msolo" is the type of hard wood tree used for rituals. The implication of this ITK is protection of those feared fauna and flora as explained much by Chandrakanth and Romm (1991).

3.3.2 Equitable Sharing by Villages of Benefits Accrued from SGR

SGR south eastern sector has six (6) hunting blocks (MT1, MH1, MB2, MA1, N2 and U3) while Liwale open area has two hunting blocks (Liwale north and Liwale south) whose contract ended in year 2012. These two blocks of open areas have been taken by MWMA and thereof resource management zone plan have to be followed effective from 2013. The plan there shows three tourist hunting blocks (Nachengo (854.33 km^2), Hokololo (914.60 km^2) and Naimba Plain (400.86 km^2). Meanwhile, income generated from tourist hunting is not enough to show tangible benefits to community. For example 25% obtained by district council in the year 2011/2012 was TZS 23,551,143.33/= and within it 15% was given to MWMA equivalent to TZS 14,130,686.46/=. If this income is divided for each village where MWMA has eight (8) member villages, each village will get TZS 1,766,335.81/=. The amount is meagre compared with efforts they used to fight for survival of those wild animals. However, the 2011/2012 season MWMA sold their Quota to Barlete hunting Safaris for TZS. 24,100,000/= which add to their income. But, the move is beneficiary to conservation because the buyer did not hunt for the said year so allow regeneration of wild animals while discouraging poaching. During interview, the government leaders in study villages were not comfortable with the share of money they get from MWMA. They asserted that, the money is not enough to offset the cost incurred from conservation of wild animals. The money obtained was used for antipoaching or contribution in building a classroom. For instance, the year 2012 Mpigamiti village uses their share for anti-poaching activities.

In addition to that, the investors in protected areas such as hoteliers, tour operators and professional hunters obtain benefits from wildlife whose survival is dangerous to rural communities. The foreigners are among the top beneficiaries of Tanzania's wildlife resources. Foreigners collude with corrupt Ministry officials to obtain the benefits (Kideghesho, 2009). Some Legislators in Tanzanian National Assembly decried the lack of

transparency in the allocation of hunting blocks (Kideghesho, 2009). They revealed that foreign-owned hunting companies are given licences on lucrative hunting areas, in the process leaving indigenous Tanzanians on the wayside. Twelve foreign companies were given 57 prime hunting blocks out of the total 147 blocks allocated in 2006, with each company owning on average five blocks (Kideghesho 2009). This scenario of 2006 is not far from that one of 2012. Under that circumstance, all wildlife management strategies will be difficult to implement as result of bureaucracy and corruption in all wildlife resources management system in the country.

3.3.3 Minimisations of Property Damage and Human Life Caused by Wild Animals

Protected areas in Tanzania are not fenced thus wildlife freedom of movement is almost boundless. District Councils have a duty to combat dangerous animals and assist farmers in crop protection. Many districts are understaffed and not adequately equipped to perform this duty (Hann and Kaggi, 2001). People who share the immediate boundaries with protected areas incur costs inflicted by wildlife conservation. Such costs include; loss of access to legitimate and traditional rights, damage to crops and other properties, livestock depredation, and risk posed to people's lives through disease transmission and attacks by wild animals.Out of the strategy used to minimize property damage and loss of life is the use of game scouts. Liwale district has seventy six (76) villages. Over 50% of these villages experience human wildlife conflict (HWC) especially those caused by elephant. This is due to the fact there are few game scouts distributed only in seven villages as shown in Table 3.12.

Table 3.12: Distribution of Game Scouts in Villages of Liwale district

S/N	DESIGNATION	VILLAGE
1.	SG/Asst. II	Lilombe
2.	SG/Asst. II	Mkutano
3.	G/Asst. III	Mirui
4.	G/Asst. IV	Liwale Mjini
5.	G/Asst. IV	Mpigamiti *
6.	G/Asst. IV	Nangano
7.	G/Asst. IV	Mlembwe

* Village suffer most the problem animal damage

Source: DGO office, 2013

During interview with DGO on 24th July, 2012; it was found that, low knowledge of district game scouts on non-lethal deterrents needed to be used for controlling problematic animals accelerate shooting of animals. These game scouts undergo short courses in wildlife management before they assume their duties. However these courses are inadequate. In the financial year 2009/2010, twelve (12) elephants were killed and other one hundred twenty nine (129) injured. Most of the injured died of injury to increase the mortality to seventy seven (77) (Table 3.13). Also, three people were injured and a total of 296 acres of different crops were destroyed as shown in Tables 3.14 and 3.15, respectively.

Table 3.13: Problem animals Killed or Injured by Game Scouts 2009/2010

S/N	TYPE OF ANIMAL	KILLED	INJURED
1.	Elephant (*Loxodonta Africana*)	12	129
2.	Hippo (*Hippopotamus amphibius*)	2	5
TOTAL		**14**	**134**

Source: DGO office, 2013

Table 3.14: People Injured by Dangerous Animals 2009/2010

S/N	DATE	VILLAGE	TYPE OF ANIMAL
1.	28.05.2009	Kipule	Leoppard (*Panthera pardus*)
2.	24.07.2009	Ndapata	Lion (*Panthera leo*)
3.	30.12.2009	Namalingo	Lion (*Panthera leo*)

Source: DGO office, 2013

Table 3.15: Extent of Crops Damaged by Animals 2009/2010 in the Study Area

S/N	TYPE OF CROP	TYPE OF ANIMAL	ACREAGE
1.	Cashewnuts (*Anacardium ocidentale)*	Elephant	48
2.	Maize (*Zea mays)*	Elephant	56
3.	Sorghum (*Sorghum vulgare)*	Elephant	70
4.	Rice (*Oryza sativa*)	Elephant and Hippo	30
5.	Cassava (*Manihot esculenta*)	Elephant	49
6.	Sesame	Elephant	18
7.	Banana (*Musa sp*)	Elephant	20
8.	Sweet potatoes	Elephant	5
TOTAL			**296**

Source: DGO office, 2013

The wildlife policy of 2007 statement unlike the previous one (of 1998) has failed even to give short-term and long-term strategies to address the human-wildlife conflict and instead the government is now trying to assign the responsibility to CBC institutions (Kaswamila, 2009). Tanzanian government does not intend to introduce a compensation scheme for damage caused by wildlife. The Government will devolve progressively the responsibility for Problem Animal Control (PAC) to operating Community Based Conservation (CBC) programmes and continue to give assistance where village communities have not developed this capacity (WPT, 2007).The government is silent on this issue because it shifts from Decentralisation of wildlife resources management (according to WPT, 1998) to Recentralisation (according to WPT, 2007). Liwale district is not distinguished from this scenario as it has eight (8) villages out of seventy six (76) forming CBC (MWMA). Thereof this approach is likely to exacerbate the problem for two reasons. First, there are few CBCs in areas where humans live with wildlife countrywide and where these institutions exist they are still in fantile and/or ineffective. Second, the institutions lack both human and finance capacity to deal with this sensitive and long-standing problem (*ibid*).

Furthermore, Sections 71 of Wildlife Conservation Act No. 5 of 2009 gives power to the Minister of MNRT make regulations specifying the amount of money to be paid as consolation to a person or groups of persons who have suffered loss of life, livestock, crops or injury caused by dangerous animals as stipulated much in Wildlife Conservation of Tanzania (Dangerous Animals Damage Consolation) Regulations (2011). Likewise, the Act considered only dangerous animals such as lion, buffalo, elephant and other animals categorized in fourth schedule for consolation of life, crops or injury while problems animals are not considered for this while contribute to crops destruction, injury or loss of life (URT, 2009).

3.3.4 Improvement of Relationship between Hunting Companies and Local People

According to tourist hunting regulations of 2010, all tourist hunting companies invested in all tourist hunting blocks must support socio-economic issues to surrounding communities like clean water, health, classrooms, unskilled jobs opportunities etc. The study area has two hunting companies (TAWISA (Tanganyika Wildlife Safaris) and TAWICO (Tanganyika Wildlife Company Ltd) which invested in eight hunting blocks, (Six (6) inside SGR and two (2) in Liwale open area). These two companies have those blocks for five years which ended in December 2012. TAWISA worked in six blocks (four inside SGR in south eastern sector (MT1, MH1, ML1and U3) and two in Liwale open area now MWMA (Liwale North and Liwale South)) and TAWICO worked in two blocks inside SGR (MA1 and U3). These companies plays a vital role in providing social service to villages adjacent to this blocks like building class rooms, drilling boreholes for water supplies and funding seminars concerning conservation issues.

During focus group discussion, it was found that, the villagers are confused with the direct benefits they expected to get from hunting companies like job opportunities, market for their vegetables and other handmade goods. Additionally, the companies deny villagers from using natural resources found in the area. This implies that, the hunting companies have not adopted active participatory approach of local communities in their activities which is very important in management of PAs. Furthermore, the Minister of MNRT is responsible for allocation of hunting block to the applicant upon advice from the Hunting Block Allocation Advisory Committee but all activities undertaken in the block are under the Director of wildlife as explained much in section 38 of WCA No. 5 of 2009

Data available in SGR-South eastern sector office show that since (Five years back-2007-2012) these companies took these blocks spent less than USD 50,000 on social services. For the period (2007 – 2012) they donated only on class rooms and conservation seminars to Barikiwa and Kikulyungu villages. Besides, the issue of employment to local communities is quietly complicated because more than 70% comes from outside the district even tent boy vacancies which do not need much formal education rather than experience. However, those hunting companies in study area neglect it due to their personal interests and make relationship with local communities to be mystified. Prominently, the government (SGR) is supposed to enforce the regulations but it is tardy due to languid and conservation politics.

3.3.5 Access to Ritual Sites inside SGR

According to URT (2005), many protected areas in Tanzania were used by communities for their livelihood before independence in 1961. This scenario is not exceptional to SGR where most of the study populations living adjacent to SGR used to live in this reserve before repatriation of 1968 after outbreak of sleep sickness caused by tsetse infested and villagisation of 1974. After the official gazettement of SGR with its boundaries in government gazette No. 275 of 1974 those people remained inside SGR were relocated. Their cultural and ritual areas remained within or adjacent the present SGR.The law governing game reserves prohibits entry except by the prior permission of the Director of Wildlife. Ever since then, access of local communities into the reserve to perform ritual worships has been denied. This situation is a cause to the prevailing bad relationships between the management and local people.

During focus group discussion, it was found that local communities have two season each year August and October to go for ritual worships they call "Ngende". The worshipers register their names to DC (District Commissioner) who passes them to Sector manager of SGR-South eastern sector who provide two game scouts for security and escorting the group which normally consist three hundreds (300) to five hundreds (500) people. The journey took fifteen days. The annual routine and general system of "Ngende" were formulated and given blessings by the Director of wildlife since then. For the case of good relationship with local community, no any bureaucracy taken to allow local people unless there is some information showing individuals with other businesses which bring negative impact to natural resources.

Environmentally this exercise is unfriendly due to fact that, these group took three to four days from Liwale to Ilonga (Mahenge) passing inside SGR, and they are using the same sleeping camps each year (Njenje, Mbarang'andu, Luwegu, Ligugu and Luwea) where they cut down trees for cooking and fire for security. Their camps are made adjacently to water bodies and consequently fishing activities for subsistence exercised. Under that circumstance, in the longrun, environmental degradation especially deforestation in these areas will be experienced. Furthermore, differing cultural value systems between protected area managers and their support communities have frequently resulted in incidences of conflicts particularly as many of the native societies within protected areas believe that the natural environments within these areas are sacred habitats which connect them to their religious inclinations. Hence, such areas are consciously protected from any form of intrusion.

Similar findings is reported by Ryan (1992) about farmers of the south East Asian region who traditionally honour sacred groves- patches of wilderness amidst agricultural fields and rural landscapes as abodes of their powerful deities. Also, Essien and Bisong (2009) reports that, the indigenous Indians of Panama, patches of forests are regarded as super natural parks for the refuse of wildlife and spirits, while the Tukano Indians of Brazil guard forests and waterways for spiritual recourse. The indirect effect of this is the protection of over 60% of the streams within the locality as sanctuaries for fishes and other aquatic life. Similarly, the taboo and religious traditional value placed on orange-utang population in the upper reaches of Butang-Ai river in southern Sarawak has resulted in the preservation of the animal population (James 1991).

3.3.6 Villages/SGR Boundary Conflicts

During focus group discussion in the study villages it was shown that, people around SGR are not familiar with the present boundary locations. A good example is in Kikulyungu village which claimed the boundaries of SGR to have been extended to include Kihurumila dam. This ideology made Kikulyungu village to be excluded from MWMA in April 2010 by the Minister of natural resources and tourism after the village denied the government gazette notice No. 275 of 1974 which declared the boundary of SGR showing the Kihurumila dam to be within SGR. This is supported by evidences seen in SGR-southeastern sector office where since 1972, there were groups in Kikulyungu village requested for permit from Director of wildlife to fish in the dam and were escorted by game scouts.This arena was initiated by the then prime minister, the late Rashid Mfaume Kawawa who requested the minister of natural resources to allow community to fish in the dam due to shortage of proteins in Liwale district. The exercise was stopped in 1982 after application of poisons in the dam as a fishing method killed four species of fish and other animals such as hippos, impala, crocodiles and heartbeats which used the water (SGR – South eastern sector office reports, 2010). Furthermore, the village maps of Kikulyungu village made in 2008 doesn't follow SGR boundaries declared on Government gazette notice No. 275 of 1974 as it shows Matandu river inside SGR to be the boundary of the Village. The district council agrees with the committee that, the SGR was established before the district council which was established in 1975 thereof they must respect SGR boundaries.

Consequently, Kikulyungu village demands for boundaries review because it believes Kihurumila dam area is used for ritual worships. The claim is based on the fact that Kihurumila dam always have animals so simplified their killings. Some leaders in the area suggested that, among youths who practice illegal hunting are horrified if the area continues to be in custody of SGR. A more or less similar case is experienced with villagers of Mpigamiti concerning MWMA boundary. More villagers are using the area for agriculture and the source of Liwale River is degraded because of this. The village has land use plan but invasion into conserved area is growing rapidly whereby if the investor will start operating in this area there will be huge conflict concerning the area.

3.3.7 Controls of Settlements and Agriculture in Migratory Routes

Settlements and agriculture are amongst the wildlife-human interaction which causes stress on natural resources in SGR-Liwale-Niassa ecosystem. In the study villages (Table 3.17), the respondents don't see these as great sources of stress on wildlife resources because their effects are seen in a long term basis, instead they rank interaction of wildlife and human/livestock is Very high (56.7%). The villages forgetting that, when make settlement or agriculture in migratory routes automatically interaction with wildlife will be great and the ecosystem will be disturbed as a result affect wildlife range area, genes distribution and migration of wild

animals. Whatsoever, agriculture ranked High (65%) and Settlement ranked Medium (63.3%). This shows that the wildlife population in SGR is at risk. Therefore, unless strategies to alleviate the situation are in place, environmental degradation including loss of wildlife habitat will not continue. This negative interaction between human and wildlife is also caused by other sources of stresses on natural resources in PAs as stipulated much by Hackel, (1999); URT, (2002); Johansen, (2002); UNDP, (2003) and Kideghesho, (2005).

Table 3.17: Sources of Stress on Natural Resources in SGR

Sources of stress	**Strength of stress**				
(a)Poverty/Low income	Very high	High	Medium	Low	Overall
(b)Ignorance	34(56.7%)	26(43.3%)	0(0.0%)	0(0.0%)	60(100%)
(c)Income generation from natural products	2(3.3%)	35(58.3%)	12(20.0%)	11(18.3%)	60(100%)
(d)Population increase	12(20.0%)	34(56.7%)	14(23.3%)	0(0.0%)	60(100%)
(e)Sabotage	1(1.7%)	37(61.7%)	21(35.0%)	1(1.7%)	60(100%)
(f)Uncontrolled burning	0(0.0%)	10(16.7%)	21(35.0%)	29(48.3%)	60(100%)
(g)Interaction between wildlife and human/ livestock	3(5.0%)	23(38.3%)	20(33.3%)	14(23.3%)	60(100%)
(h)Drought/Floods	34(56.7%)	22(36.6%)	3(5.0%)	1(1.7%)	60(100%)
(i)Agriculture	5(8.3%)	35(58.3%)	13(21.7%)	7(11.7%)	60(100%)
(j)Settlements	18(30.0%)	39(65.0%)	3(5.0%)	0(0.0%)	60(100%)
(k)Banditry	6(10.0%)	13(21.7%)	38(63.3%)	3(5.0%)	60(100%)
(l)Lack of land use plans	0(0.0%)	37(61.7%)	11(18.3%)	12(20%)	60(100%)
	2(3.3%)	0(0.0%)	18(30.0%)	40(66.7%)	60(100%)

Source: Research Findings, 2013

3.4 Methods for Scaling Up the Most Successful Wildlife Management Strategy/Strategies

3.4.1 Awareness Raising of Resource Use Rights to Communities

Results in Figure 3.8 show that 42.6% of study population rank considerable, 29.5% somehow, 16.2% good and only 5% rank worse. This shows that SGR should strengthen its community based conservation (CBC) section so as to scale up awareness in all communities living around to it.

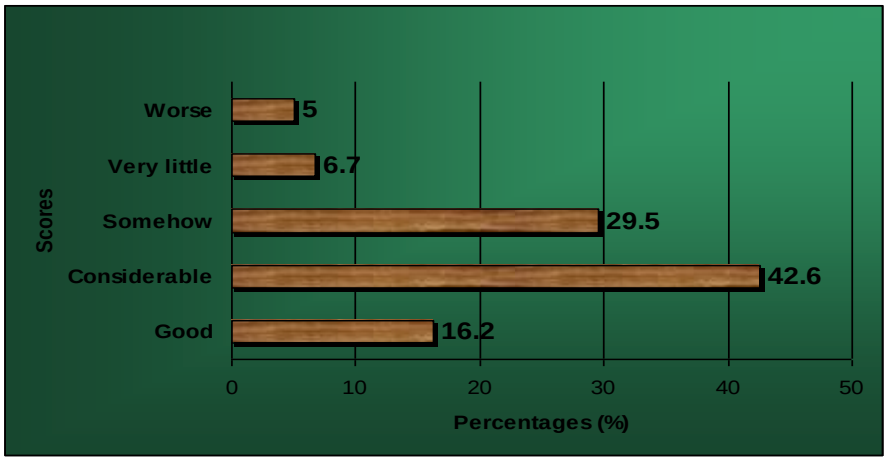

Figure 3.8: Role Played by SGR in Informing Adjacent Communities Conservation Education
Source: Research Findings, 2013

The study area found to have considerable role played by SGR in informing local community conservation education. Nevertheless, SGR provide conservation education through village meetings, seminars and workshops. Such awareness concerning wildlife conservation help to create sense of ownership to local communities as a result raise wildlife resources protection effort among the local community. However, the effort played by SGR in provision of conservation education was found to be insufficient. This is due to the fact that frequency of providing education is not determined by CBC section. There also need reversed to the methods /techniques for providing the knowledge so as to reach all groups in the communities as explained much by Sachedina (2008) and Goldman (2003). To attain better management of natural resources in SGR, local people should cooperate with other stakeholders to ensure natural resources within and outside SGR are protected. Local are the one who can easily identify poachers and give full cooperation to SGR management to combat wildlife encroachments. This can be possible if awareness raising to local people on resource use rights will be heighten. Local communities with their indigenous knowledge should be consulted on plans pertaining to management of protected areas. Among the reasons for involving local communities in protected areas planning is to ensure that, the need of these communities taken care and to have sustainable access and use of

natural resources. In other cases, involvement is centered on the need to enhance the development of new sources of income as a trade-off for restricted access to protected areas as explained much by Weladji and Tchamba (2003), Mbaiwa (2005), Holmern *et al* (2006) and Lutabingwa (2006).

3.4.2 Improvement of SGR and MWMA Fund Base

During discussion with sector manager of SGR it was revealed that, for over five years (2005 – 2011) funds allocated to SGR from wildlife division under MNRT are far below budget requirements for management to meet the development and operational function properly. For instance the budget for SGR for financial year 2009/2010 and 2010/2011 were Tsh. 4.5 billions and 4.6 billions respectively, but received fund were less than Tsh. 3.0 billions for each year. However, ministry has started the retention scheme of 50% from income generated from SGR tourist hunting. This income will be allocated to wildlife management activities for implementation of General Management Plan (GMP) of 2005 – 2015. Besides, the tourist hunting companies, especially TAWISA give SGR-south eastern sector fuel as antipoaching donation. In the year 2012 TAWISA gave SGR-South eastern sector 9000 litres of diesel equivalent to Tsh. 20,700,000/=. The contribution is for antipoaching activities which supplement budget deficit. On the other hand, discussion with MWMA chairman reported that, the fund for MWMA will be improved starting the year 2013. This follows availability of investors to operate the three hunting blocks. In addition, the duty of protecting wildlife resources in SGR must be done twenty four hours daily and this scenario needs enough funds to pay for staffs, purchasing working facilities like cars, tents, uniforms, GPS and maps so as to reach goals, targets and programmes for maintaining integrities of this reserve in the Selous-Liwale-Niassa ecosystem. This will be met only by asking international organization and government to add fund to SGR so as to have implementable security planning.

3.4.3 Recruitment of Adequate Staff and Increase Working Facilities and Housing

Review of available records in SGR revealed that, SGR-southeastern sector is understaffed whereby currently there are 31 employees. This number is too small to meet management tasks for an area of 7200km^2 which means on average an individual patrols about 232.26 km^2. MWMA has an area of 373,358 hectares patrolled by 12 village game scouts (VGS) volunteering which means each VGS is responsible for 31113.17 hectares. These workers ratios goes against international working efficiency ratios for Game or park ranger which needs one person per twenty five squire kilometre (1Ranger/25 km^2) (URT, 2005). Therefore, SGR-south eastern sector alone needs 288 game scouts to meet the international standard of protecting the area (URT, 2005).The respondents in the study villages ranked SGR (Figure 3.12) to have 54.4% of considerable accomplishment of planned objectives and general working status of its staffs, 38.6% good and only 7% somehow. This shows that instead of having shortage of staffs and working facilities but local people still appreciate the job they do.

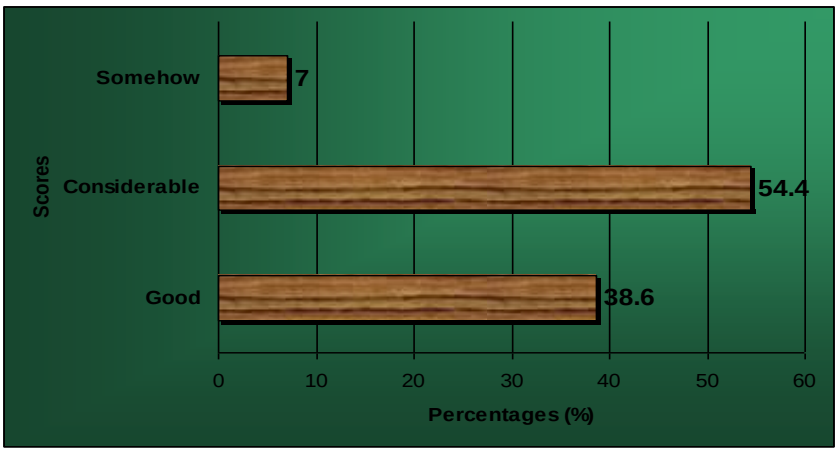

Figure 3.12: SGR Accomplishment of Planned Objectives and General Working Status of its Staffs
Source: Research Findings, 2013

Apart from having inadequate staff, SGR face the problem of working facilities, especially houses, guns, GPS, cars, computer systems and maps (standard sheets for patrol with ratio 1:50,000). In terms of guns there is only 89 guns. However, poachers have more sophisticated guns compared to the available working guns. 5 GPS and 3 land cruisers pick up are not enough for patrol activities. The presence of daily working equipments shows that efficiency and effectiveness of the SGR staffs is unsustainable unless the present situation will be scaled up to the required level so as to implement those identified strategies effectively as explained much by Milner-Gulland and Bennet (2003), Nahonyo (2001) and Ndibalema and Songorwa (2007).

IV. Conclusion and Recommendations

5.1 Conclusion

The study demonstrated that management of wildlife resources in PAs was prejudiced by looking on status of community land uses that affect wildlife resources, factors influencing people encroaching PAs, effectiveness of existing wildlife management strategies and methods for scaling up the most successful wildlife management strategy/strategies as follows: Communities' land use is major determinant for management of wildlife resources. Access to land in study area is possible and land is enough compared to population available. However, gender inequality experienced especially to women who are continued to be discriminated and denied direct access to land and insecure. Though, the land in the study villages under go land use plan, thereof land accessed by the community is mainly the one that planned for agriculture. Shifting cultivation is still practiced in the study area and need to be reversed so as communities adopt best agriculture practices that will use small farm plots which will be well mechanized in terms of pesticides, insecticides and fertilizers application.

The study area suffered from wild animals that destroy crops but adoption of application of non-lethal deterrents has become the best control measure. Also, conservation agriculture which is the new phenomenon in the study area need to be emphasised to be adopted quickly so as to protect biodiversity and land degradation resulting from deforestation. This will also lower pressure to wildlife destruction. Poaching, encroachment for fuelwood and wildfires cause wildlife habitat destruction and decrease of wildlife population as a result those direct and indirect benefits of wildlife resources in the ecosystem will be destroyed. Therefore, integrative participatory approach of local people and other stakeholders in relation to wildlife resources management and environment as a whole is vital in order to come up with collaborative sustainable wildlife resources management network in the ecosystem.

Factors that influencing people encroaching SGR includes poverty, population growth, inadequate conservation status of some critical habitats, and failure to compete effectively with alternative land uses. There is a myth says, poor people are agents of environmental degradation or wildlife resources destruction. Actually, human survival is critical if forces threatening the protected areas ecosystem are to be halted. It is illogical for anyone to accept a scenario where preservation of wildlife resources implies starvation. To reduce the pressures on wildlife resources and habitats, alternative strategies capable of reducing the necessity of encroaching into wildlife habitats should be adopted. The exponential growth of human population reduces the benefits per capita accrued from SGR. Further reduction of the benefits may corrode local support for conservation on the basis of 'no profit, no conservation' scenario.

Generally, benefit-based approaches is a fundamentally inconsistent due to the fact that, their design and implementation can hardly enhance the value of the wildlife resource to local people but cannot ensure equity access and cannot guarantee sustainability of the benefits to local communities. Therefore, the current benefits are less effective in inspiring sustainable conservation behaviors. This, however, does not mean that the SGR should abandon the benefit-based approaches and return to the 'fences and fines' approach. More comprehensive and integrated study that will offer more innovative and effective options in view of making the initiatives more conceivable is vital. The options should seek to increase more opportunities that will divert the communities from heavy reliance on wildlife species and habitats for survival.Nevertheless, effectiveness of existing wildlife resources management strategies is vital for sustainability of our wildlife in all PAs. Strategies and measures adopted to counter the degradation of wildlife resources so far have not succeeded in providing sufficient incentives and motivation to communities living adjacent to these PAs. Programmes such as command and control by government and linking development to conservation have failed to stimulate conservation and increase the income of the local populations. Although the local people benefit from hunting of wildlife roaming outside the protected areas, they are unlikely to tolerate loss of crops and domestic animals without grievance.

The study demonstrates that the value of wildlife-induced damage to crops and life is considerable higher than the wildlife-related benefits from SGR. Illegal hunting does not reduce the costs related to damage. Problematic animals control is a controversial issue in the communities, especially for elephants and carnivores like lions, which cause damage to livestock and can be an issue of fear and safety to humans. Similarly, in communities where the risk of property damage and loss of life by wildlife is perceived to be significant, local communities may be hostile to wildlife and oppose conservation programs.Consequently, the methods for scaling up the most successful wildlife management strategies in the study area must be punctually put into practice. If these methods are enhanced, thereof automatically the SGR GMP of 2005 – 2015 and MWMA Resource Management Zone Plan of 2010 – 2015 will be implemented effectively and efficiently. Meanwhile, awareness raising of resource use rights to communities, improvement of fund base to both SGR and MWMA and recruitment of adequate staffs and increase working facilities and housing are crucial.

5.2 Recommendations

5.2.1 Community Current Land Uses which Affect Management of Wildlife Resources in Protected Areas

Land tenure system should be gendered accessed by both groups includes divorced or widowed who customary laws does not favored them. Invaded reserved land for MWMA in Mpigamiti village should be taken into account by repatriating the invaders and make sure the present land use plan is followed. These will guarantee the longrun survival of wildlife. However, poor agricultural practices especially shifting cultivation should be reversed because it involved destroying miombo forests and other vegetation which used as the living habitats for wildlife as result of human-wildlife conflict (HWC). Therefore cultivation on permanent farm plots which are well mechanized in terms of pesticides, herbicides and fertilizers application is vital. Importantly, rampart elephant poaching should be reversed by improving working facilities, number of staffs, new techniques training and participation of other stakeholders such as Tanzania Revenue Authority (TRA), Tanzania Ports Authority (TPA), Tanzania forces (Police (Local police force and Interpol), Military (Tanzania Peoples Defense Force (TPDF) and Migration) and communities. Elephants' tusks smuggling routes along India Ocean in Lindi and Mtwara regions (blind ports) and all access roads from southern parts of Tanzania to Dar es Salaam should be rechecked incessantly.Nevertheless, increased unplanned wildfires cause consequences to human livelihoods and wildlife resources due to destruction of important habitat and ecosystem services which depended by people and other living organisms for their life. The communities should fling those unimportant beliefs for increasing wildfires in order to assure their future life which lies on ecosystem services.

5.2.3 Methods for Scaling Up the Most Successful Wildlife Management Strategy/Strategies

Awareness of resource use rights to communities is a continuous process and must taken into granted by SGR and MWMA until they are satisfied that people are aware and build sense of ownership to wildlife resources available in their areas. Community based conservation (CBC) seems to be dormant to SGR and MWMA due to insufficient fund, staffs and working facilities. These protected areas must give priority to this section due to fact that lack of ownership on wildlife resources will accelerate encroachments.Although, the budget allocated to SGR should reflect and able to solve the available challenges as results attain the acceptable protection and planned development projects. These projects include infrastructures inside SGR and staffs housing and field gears. For instance the budget should reflect maintenance of patrol, tourism and administrative roads (grading, building drifts/cravats to passable rivers), airstrips and field gears (patrol cars, fuels, sophisticated weapons, global positioning system (GPS), uniforms, tents, and maps (field standard sheets)). Importantly, increase number of staffs and improve their payments and motivation.

Acknowledgement

I am heartily thankful to my supervisor, Dr. Cosmas Haule from Department of Environmental Studies of the Open university of Tanzania whose encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the research subject into practice. His sage advice, insightful criticisms, and patient encouragement aided the writing of this research in innumerable ways.Lastly, I offer my regards and blessings to all of those who supported me in any respect during the completion of my research.

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