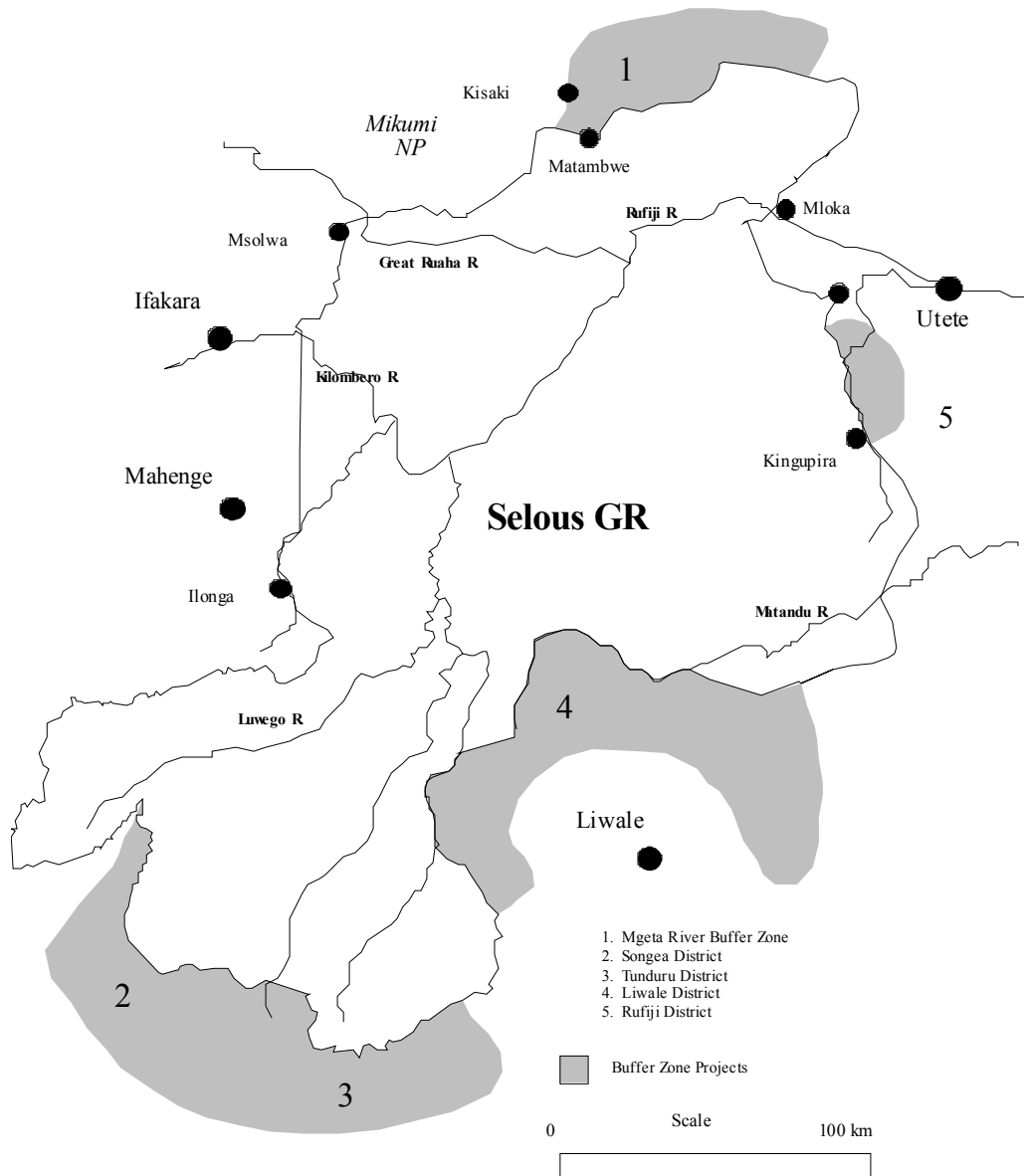


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Conservation Attitudes of Villagers living next to the Selous Game Reserve

Sarah Gillingham



Selous, Saadani and Katavi Rukwa Conservation Programmes, Community Wildlife Management Wildlife Division
Deutsche Gesellschaft fuer Technische Zusammenarbeit
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Editors Note

This Discussion Paper contains the second part of Mrs. Gillingham's findings from her PhD research, carried out over two seasons in the Northern Bufferzone of the Selous Game Reserve.

The first one, describing the socio-economic context of the communities in the Mgeta valley, was published as Selous Discussion Paper NR. 22.

In the meantime, her PhD-Thesis has been published. All concerned with the Community Wildlife Management Programme of the Selous regard the work of Sarah Gillingham as very beneficial for the further development of the programme. The recommendations are practical and will be taken into account, especially the problem of social differentiation in the communities of the Mgeta river valley and unequal access to the benefits of the programme.

As the scope of the German supported wildlife programmes has increased and new programmes have started (Saadani and Katavi/Rukwa Conservation Programmes, Advisor to Community Wildlife Management Section of the Wildlife Division), the Discussion Paper series has been renamed "Tanzania Wildlife Discussion Papers". The numbering of the editions remain consecutive.

The Discussion Papers may contain authors' views and positions which do not necessarily correspond with the official position of the Wildlife Division and the editors.

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Tanzania Wildlife Discussion Papers

**Conservation Attitudes of Villagers living next to the Selous Game
Reserve, Tanzania**

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August 1998

TABLE OF CONTENTS

List of Tables

List of Figures

List of Abbreviations

1.0	INTRODUCTION	1
2.0	STUDY SITE: THE MGETA RIVER BUFFER-ZONE	2
3.0	FIELDWORK TECHNIQUES, DATA AND ANALYSES	4
4.0	DESCRIPTIVE ANALYSES	6
4.1	Perceptions of the Selous Game Reserve	6
4.2	Local support for conservation: Data from the fixed-response attitude statements	9
4.3	The perceived benefits of wildlife	10
4.4	Awareness of the activities of the wildlife management institutions	12
5.0	FACTORS INFLUENCING CONSERVATION ATTITUDES	16
5.1	Perceptions of land use conflicts and problems of living next to SGR	16
5.2	Perceptions of wildlife benefits	16
5.3	Awareness of the activities of the wildlife management institutions	17
6.0	DISCUSSION	18
7.0	CONCLUSIONS	22

BIBLIOGRAPHY

APPENDICES

I	Socio-economic attributes of the MRBZ survey sample by village and for the entire sample.
II	Summary of results from the preliminary bivariate analyses of the factors influencing conservation attitudes held by MRBZ villagers.
III	Model parameters which determine the probability of a positive response in the logistic regression analyses of conservation attitudes held by MRBZ villagers.

LIST OF TABLES

<i>Table</i>	<i>Title</i>	<i>Page</i>
1.	Distribution of responses to the question “Why was SGR established as a game reserve?”	6
2.	Preferred land use options for SGR.	8
3.	Problems associated with living next to the SGR.	8
4.	Responses to the fixed-response statements concerning the perceived need for wildlife conservation.	9
5.	Percentages of respondents perceiving wildlife as a source of benefits i) for Tanzania; ii) for people living around the SGR; iii) at the level of the respondent’s household.	10
6.	Reported activities of the Department of Wildlife in the study villages.	13
7.	Reported activities of the SCP community wildlife management project in the study villages.	13
8.	Levels of knowledge of the workings of the CWM project.	15

LIST OF FIGURES

<i>Figure</i>	<i>Title</i>	<i>Page</i>
1.	Map of the Mgeta River Bufferzone in Morogoro Rural District showing locations of villages, village boundaries and the Wildlife management area relative to the Mgeta River and the railway line which together form the boundary of the Selous Game Reserve.	3
2.	Perceptions of wildlife benefits for people around the SGR (local-level) and for the respondent (household-level) relative to the mean amount of quota meat obtained during the 1994 hunting season.	12
3.	Proportions of respondents who expressed awareness, negative awareness or did not know about the activities of the Department of Wildlife and the activities of the CWM project in their village.	14

LIST OF ABBREVIATIONS

1. INTRODUCTION

Since the late 1970s, thinking on conservation has increasingly moved away from that described as the ‘fences and fines’ model (Wells *et al.* 1992) based on the designation of protected areas (PAs), towards more people-oriented strategies which aim to integrate human development needs with conservation objectives at the local scale. With this shift towards ‘conservation with development’, the need to understand human-environment relations and patterns of resource use in and around PAs has become widely recognised (Western 1994; Adams & McShane 1992; Martin 1987; McNeely & Pitt 1985; Kellert 1985; Marks 1984). Research on the conservation attitudes of local people is now seen as a useful tool for projects that seek to promote community participation in, and support for, sustainable systems of resource management (IIED 1994; Parry & Campbell 1992; Hill 1991).

Previous surveys of the attitudes held by rural populations in developing countries have found high levels of public support for the conservation of wildlife and natural resources (Fiallo & Jacobson 1995; Ite 1995; Kangwana 1994; Newmark *et al.* 1993; Infield 1988; Harcourt *et al.* 1986). However, several of these studies have also shown that levels of public support for the wildlife and resource management institutions – PAs included – responsible for the practical implementation of conservation measures are more varied (Ite 1995; Kangwana 1994; Newmark *et al.* 1993; Infield 1988). The point that local resource users may agree with the principle of conservation, while resisting the implementation of conservation strategies by central government authorities, is highly relevant for the design and implementation of community wildlife management (CWM)¹ projects, which seek to establish mutually beneficial partnerships between rural communities, the state and other stakeholders interested in the wildlife resource. This process necessitates the reversal of antagonistic relations between rural communities and the external authorities responsible for wildlife management, which have in the past been associated with top-down strategies for protectionist conservation (Hough 1988).

The situation of the Selous Game Reserve in south-eastern Tanzania exemplifies several of the challenges facing CWM projects in Sub-Saharan Africa. The Selous is a protected area of exceptional conservation value in terms of its biological resources and ecosystem functions, which has had a long history of human-wildlife conflicts in the villages along its borders, and which experienced heavy commercial poaching for ivory and rhino horn during the late 1970s and 1980s (SGR management plan, 1995). The Selous Conservation Programme was established in 1988 in response to the poaching problem as one of two pilot initiatives for the

¹ ‘Community wildlife management’ is used in this paper as a general term to signify the regulated use of wildlife involving some form of community participation (after Hartley 1997). It covers the spectrum of participatory approaches to wildlife management from community based conservation by active participation (*sensu* Pimbert & Pretty 1996) to more passive benefit-sharing initiatives.

implementation of community wildlife management in Tanzania at that time (see Baldus 1991 for a description of the programme's objectives and activities).

This paper explores the attitudes of villagers living next the Selous towards the game reserve and the conservation of wildlife using data collected during a 15 month field study of human-wildlife interactions in agriculturalist communities along the game reserve's northern boundary. It goes on to provide a comparative analysis of how villagers perceive the activities of the local-level wildlife management institutions established under the SCP community wildlife management initiative as opposed to the state wildlife management authorities. Prior to this study, no quantitative assessment of villagers' conservation attitudes under the arrangements of the SCP project had been carried out; as such, it is hoped that the material presented in this paper will provide a baseline for the future development and monitoring of CWM in the Mgeta river buffer-zone.

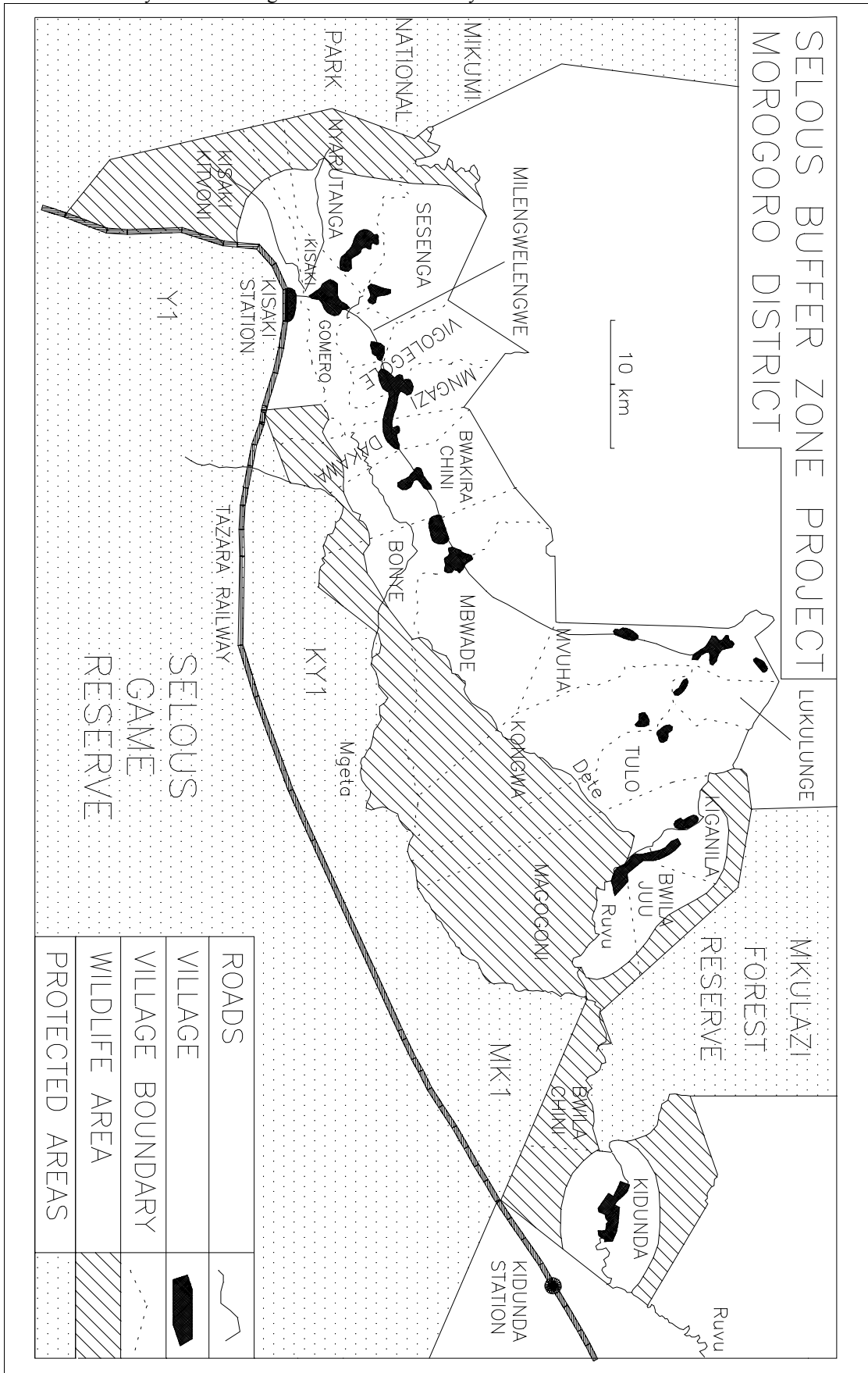
2. STUDY LOCATION: THE MGETA RIVER BUFFER-ZONE

Fieldwork for the study was carried out from May 1996 to July 1997 in the administrative division of Bwakira chini in Morogoro (rural) district. Bwakira chini division forms part of the Mgeta River buffer-zone (MRBZ)²; one of several bufferzones established around the game reserve by the Selous Conservation Programme (SCP) to promote community involvement in the sustainable utilisation and conservation of wildlife. Since 1989, the SCP initiative for community wildlife management (CWM) in MRBZ has involved: a consultative process of land-use planning for a wildlife management area; the creation of Village Wildlife Committees and the appointment of Village Scouts to take responsibility for wildlife management in that area; the allocation and hunting of annual village wildlife quotas as a meat supply; support for self-help and community development projects.

The Mgeta River buffer-zone covers a total area of 1,670 km² across three administrative divisions -- Bwakira chini, Mvuha and Ngerengere -- which incorporates the lands of 20 villages (see Figure 1), and in which the predominant topographic units are the floodplain and valley bottoms of the Mgeta river. It is an area of fertile alluvial and 'black cotton' soils, with a favourable annual rainfall regime of 900 - 1200mm and plentiful year-round surface water. A

² The Mgeta River Buffer-zone was described as the context for the study in an earlier discussion paper (Gillingham 1997): a summary of key features is given here for the reader's convenience.

Figure 1: Map of the Mgeta River Bufferzone, Morogoro Rural District showing the locations of the villages, village boundaries and the Wildlife management area in relation to the Mgeta River and the TAZARA railway line which together form the boundary of the Selous Game Reserve.



Source: Financial potential of the Selous Game Reserve and the buffer-zone

large proportion of the bufferzone land area (*ca.* 60%) remains under natural vegetation³ and thereby supports an abundant and diverse fauna; in particular, large populations of buffalo, wildebeest, impala and reedbuck are found at high densities on the swampy grasslands of the Gonabisi Open Area between the Mgeta and Ruvu confluence (Ardhi Institute 1991).

However, while the Mgeta River Buffer-zone is richly endowed in terms of its natural resources, it is relatively isolated in terms of transport and communications and is characterised by conditions of limited social and economic development (*pers. comm.* Mr. V. Lyamuya). Poverty is widespread within the MRBZ villages, such that a large proportion of village households own virtually no assets beside their own labour, earn very low cash incomes, and have limited access to health care and educational services (Gillingham 1997, 1998). During the 1980's the area was known as a 'hotspot' of commercial poaching activity (Krischke 1995). These conditions form the backdrop against which villagers' perceptions of, and relations to, wildlife and the wildlife management authorities must be interpreted and understood.

3. FIELDWORK TECHNIQUES, DATA AND ANALYSIS

In seeking to understand how the MRBZ villagers interact with wildlife in the context of the SCP initiative for community wildlife management, the study used a range of social science data collection techniques, including: Rapid Rural Appraisal (RRA); a questionnaire survey; and in-depth qualitative interviews. The use of qualitative and quantitative data collection techniques enabled the progressive accumulation and cross-checking of information during the fieldwork (Devereux & Hoddinott 1992). This paper examines the conservation attitudes expressed by MRBZ villagers on the basis of quantitative data collected from the questionnaire survey, but some qualitative material from the study is used for the interpretation of these data.

During the questionnaire survey, respondents in a randomly selected sample of 202 households were interviewed in the four villages of Milengwelengwe (n = 50), Dakawa (n = 52), Gomero (n = 52) and Mbwade (n = 48). As often as possible the selected respondents were either the household head (81%) or the wife of the head of household (13%). On occasions when neither of these possible respondents was present, or when women (the wives) were reluctant to answer the questionnaire, another permanently-resident adult member of the household was interviewed (< 6%). The survey questionnaire was designed to collect information on the respondent's background (gender, age, education); the household's characteristics (size, length of residence, ethnic origin), socio-economic status and economic

³ The vegetation of MRBZ is broadly characterised the *Acacia-Combretum* open woodland or wooded grassland formation that dominates the northern sector of the Selous (Rodgers 1979).

activities; and on the respondent's attitudes and perceptions concerning wildlife, the Selous Game Reserve, and the wildlife management authorities.

The benchmark and socio-economic data collected from the survey -- summarised in Appendix I -- are discussed in an earlier paper (Selous Discussion Paper Nr 22, Gillingham 1997). The main findings shown by these data are that the MRBZ population is heterogeneous in terms of its ethnic composition, with over 20 different groups represented. Most households in the sample (57%) originated outside the buffer-zone, although over half these immigrants came from other parts of Morogoro (rural) District or Morogoro Region. The peak period of immigration to MRBZ (1971-'80) coincided with the implementation of the government policy of villagisation during the early 1970s, but the rate of immigration has since dropped markedly and is now low. Nevertheless, the age structure for households sampled shows a growing population with 46% of its members under the age of 15 (Gillingham 1998). The literacy level of respondents in the sample was low, such that only 42% had completed a primary school education. Smallholder farming, wage labour and a range of petty trading activities form the basis of the local economy, as there are few opportunities for off-farm, salaried employment.

In this paper, attitudinal data from open questions and a set of fixed-response statements in the questionnaire are presented as response frequencies for the entire sample, and for men and women separately. In the case of the open questions, *post hoc* response categories for the descriptive analyses were constructed after the collection of the data. Where multiple responses were possible on an open-response question, the data are presented as the percentage of respondents giving each response, and so for some questions may sum to over 100%. Following these descriptive analyses, the influence of factors such as gender, age, education, wealth, ethnicity, membership of a village government committee (status), and access to bushmeat from the village wildlife quota, on the attitudes expressed in response to the open questions was examined. For this purpose responses were re-categorised as being indicative of positive, neutral ('don't know') or negative attitudes. Using SPSS (the Statistical Package for the Social Sciences, version 6.4.1), preliminary bivariate analyses -- crosstabulations and non-parametric analyses of variance -- were used to identify which of the socio-economic and resource use factors were significantly related to the responses given on each of the attitudinal components; a summary of the results of these analyses is given in Appendix 2.

The multivariate technique of logistic regression was then used to determine which of the identified factors were significant in predicting responses to each attitudinal question (the dependent variable), while controlling for the effects of all the other variables (Mascie-

Taylor 1994). In each case the logistic regression model was fitted by the forward stepwise selection of variables which significantly improved the model's goodness of fit as measured by the log likelihood ratio test. The significance levels reported in this paper ($-2LL$) are for the results of the log likelihood ratio test for each of the variables entered in the analysis, while the model χ^2 values reported show the overall significance of the final model. In conducting the logistic regression analyses 'don't know' answers for the dependent attitudinal variable were grouped with 'negative' responses, based on the assumption that the response 'don't know' represented a neutral or potentially negative attitude.

4. DESCRIPTIVE ANALYSES

4.1 *Perceptions of the Selous Game Reserve*

As part of the questionnaire survey respondents were asked "Why do you think the Selous Game Reserve was established?" The most frequent response to this question was that the game reserve had been established to protect wildlife (see Table 1). In contrast, relatively few respondents mentioned the role of the Selous as a source of wildlife products. This pattern of response suggests that most villagers perceive the game reserve to function primarily in a protective, rather than a productive, capacity. Interestingly, the response category 'Other' included several respondents who were of the opinion that the game reserve was established to protect local people from the depredations of wildlife, a response which points to the perceived importance of conflicts in defining human-wildlife relations (see below).

Table 1: Distribution of responses to the question "Why was SGR established as a game reserve?" Data are presented by gender and for the whole sample as the % of respondents.

<i>Response</i>	<i>% Men</i> (n=128)	<i>% Women</i> (n=72)	<i>% Total</i> (n=200)
a) To protect wildlife/ stop poaching	48.4	37.5	45.5
b) As a source of foreign exchange	28.9	4.2	20.0
c) To provide wildlife products	5.5	4.2	5.0
d) For future generations (indirect)	10.9	4.2	8.5
e) Other ¹	12.5	4.2	9.5
f) Don't know	20.3	52.8	32.0

¹ This category includes the following responses that were given by less than 3% of respondents: that the game reserve was established a) as a result of the government's decision; b) for the benefit (unspecified) of the villagers in its surrounding area; and c) to protect villagers from wildlife by ensuring their separation from each other.

A notable feature of the distribution of responses in Table 1 is that the 'don't know' category was the second most frequently given response to the question. This limited awareness among the survey respondents, which appears surprising given the long history of the Selous as a protected area, is likely to reflect the distances separating the villages from the reserve

boundary, which enable most villagers to collect the natural resource products they need from village lands (Gillingham 1998). Thus, villagers do not need to encroach on the land and resources of the Selous for their subsistence requirements, and -- poachers aside -- many have accordingly limited direct experience of the game reserve. This explanation is supported by the finding that only 20.8% of the survey respondents reported actually having been into the game reserve⁴. Women were more likely than men to give 'don't know' responses (partitioned chi-squared analysis: $\chi^2 = 29.52$, d.f. = 1, $p < 0.001$), and there was also a tendency for fewer women than men to identify the function of the game reserve as a source of foreign exchange ($\chi^2 = 6.591$, d.f. = 1, $p < 0.1$).

Responses to the question "Would you like to be allowed to use the land inside the SGR for some purpose other than wildlife conservation?" are given in Table 2. On this issue, over half the sample were of the opinion that the pattern of land use in the game reserve should not change (responses a and b combined: 52%). Several respondents who thought that the Selous should be kept as an area for wildlife conservation explained their response by saying that there was no shortage of farmland in the surrounding village areas. Most people who thought the game reserve was unsuitable for use by humans said that the abundant wildlife inside the game reserve would cause problems for anyone who tried to farm there, while a few also mentioned the limited availability of water inside the Selous. Although some respondents were in favour of allowing local people rights to use the area's resources, either for the collection of natural resource products or by a mixed land use strategy, only a minority of the respondents in MRBZ expressed the opinion that the game reserve should be converted outright to human land uses such as cultivation or grazing instead of conservation.

The data shown in Table 2 therefore do not suggest a widespread perception of land use conflicts between the game reserve and its surrounding human population. However, responses to the follow-up question "Does living next to the Selous game reserve cause problems for the people in this village?" show that only a minority of respondents perceived that they did not experience any problems. Conflicts with wildlife were the most widespread source of complaint associated with living next to the game reserve (see Table 3), with the major problem reported being that of wildlife crop-damage⁵. In contrast, restricted access to natural resources and 'other' problems were much less frequent sources of complaint associated with living next to the game reserve.

⁴ The reasons given for having entered the game reserve included: doing casual labour, visiting friends or relatives at the game reserve sector headquarters or seeking treatment at the dispensary there. Given that no one admitted to entering illegally to poach, cut timber etc., the figure in the text is probably an underestimate of the proportion of respondents who have been into the game reserve, but it does suggest that, for the majority of villagers, direct contacts with the game reserve in the context of day-to-day living are limited.

⁵ The issue of crop-damage was also prominent in the pattern of response given when respondents were asked to rank the problems affecting their agricultural production (Gillingham 1998).

Table 2: Preferred land use options for the SGR with data presented as the % of respondents by gender and for the entire sample.

<i>Response</i>	<i>Response category</i>	<i>% Men (n=126)</i>	<i>% Women (n=72)</i>	<i>% Total (n=198)</i>
a) Keep area for wildlife conservation.	Positive	47.6	27.8	40.4
b) Area unsuited for use by humans	Positive	11.9	11.1	11.6
c) Allow collection of natural resource products (inc. hunting)	Mixed	13.5	13.9	13.6
d) Allow mixed use: agriculture and wildlife conservation	Mixed	11.1	5.6	9.1
e) Convert to cultivation, grazing.	Negative	10.3	22.2	14.6
f) Don't know	Neutral	5.6	19.4	10.6

Table 3: Problems associated with living next to the SGR with data presented as % respondents and by gender and for the entire sample.

<i>Response</i>	<i>Response category</i>	<i>% Men (n=128)</i>	<i>% Women (n=72)</i>	<i>% Total (n=200)</i>
a) Do not experience any problems	Positive	28.1	22.2	26.0
b) Restricted access to natural resources	Negative	9.4	5.5	8.0
c) Conflicts with wildlife (crop-damage, personal injury)	Negative	50.0	40.3	46.5
d) Other ¹	Negative	14.1	2.8	10.0
e) Don't know	Neutral	10.2	36.1	19.5

¹ The 'Other' category includes the following responses: boundary disputes with the game reserve, the harassment of suspected poachers caught by Wildlife Division employees, the inadequate response of game scouts to wildlife crop-damage events (see below) and the fact that villagers are not always allowed to use the dispensary at the game reserve's northern sector station of Matambwe.

The data in both Tables 2 and 3 show significant differences between the patterns of response from men and women. With regard to preferred land use options for the game reserve, proportionately more women than men gave 'don't know' answers (partitioned $\chi^2 = 9.32$, d.f. = 1, $p < 0.01$) or recommended the conversion of the game reserve for human usage (partitioned $\chi^2 = 7.52$, d.f., $p < 0.01$). Concerning the perceived problems of living next to the game reserve, women were again more likely to give 'don't know' answers (partitioned $\chi^2 = 20.90$, d.f. = 1, $p < 0.001$).

4.2 Local support for conservation: Data from the Fixed-Response Attitude Statements

Data collected by means of fixed-response statements also indicate that, while there exists widespread local support for the concept of wildlife conservation, it does not extend to situations in which the villagers feel their interests and livelihoods are being threatened by wildlife. Thus the majority of respondents accepted the need to protect wildlife (Table 4:

statements A and C) and approved of the regulation of hunting offtakes (statements B and C). Using the pairs of opposite statements (A and C; B and D) to cross-check the responses given, responses to the A-C statement pair were found to be 74% concordant such that 69% of respondents consistently agreed with the need for the protection of wildlife. Similarly, responses to the B-D statement pair were 75% concordant, such that 72% of respondents expressed approval of the regulation of hunting. In contrast, the finding that almost 60% of respondents agreed with statement E concerning the problem of crop-damage indicates a widespread resentment towards the costs of co-existence with wildlife, particularly among women (partitioned $\chi^2=5.66$, d.f.1, $p<0.02$).

Table 4: Responses to fixed-response statements on the perceived need for wildlife conservation with data presented as the % of respondents by gender and for the entire sample.

<i>Attitude statement</i>	<i>Response</i>	<i>% Men</i>	<i>% Women</i>	<i>% All</i>
A. It is important to protect wildlife for our children. (n. men = 124; n. women = 63)	Yes	91.1	79.2	87.2
	No	2.4	4.8	3.2
	D/ K ¹	6.4	15.8	9.6
B. People who poach wild animals should be punished. (n. men = 125; n. women = 64)	Yes	95.2	87.5	92.6
	No	0.0	1.6	0.5
	D/ K	4.8	10.9	6.9
C. There are so many wildlife animals nowadays that the laws to protect them are no longer necessary. (n. men = 124; n. women = 61)	Yes	8.9	16.4	11.4
	No	80.6	67.2	76.2
	D/ K	10.5	16.4	12.5
D. Villagers should be allowed to hunt as many animals as they need (for food). (n. men = 124; n. women = 64)	Yes	15.3	20.3	17.0
	No	81.5	59.4	73.9
	D/ K	3.2	20.3	9.1
E. Wild animals (that) cause crop damage are pests and should all be shot. (n. men = 128; n. women = 65)	Yes	54.7	67.7	59.1
	No	40.6	21.5	34.2
	D/ K	4.7	10.8	6.7

¹ Don't know

4.3 *The perceived benefits of wildlife*

Respondents were also asked whether they thought wildlife brought benefits for Tanzania; whether it brought benefits for the villagers living next to the Selous game reserve; and whether it brought benefits for themselves personally. The patterns of response to these questions (see Table 5) show that fewer respondents perceived benefits from wildlife for local people living around the game reserve, and for themselves personally, than for Tanzania ($\chi^2= 26.56$, d.f. = 2, $P <0.001$). Regarding the perceived benefits of wildlife for Tanzania, women were more likely than men to give 'don't know' (partitioned $\chi^2 = 7.12$, d.f. = 1, $p < 0.01$) or negative responses (partitioned $\chi^2 = 21.02$, d.f.=1, $p < 0.001$). Women were also more likely to give 'don't know' responses to the questions on the perceived local-level and household level benefits of wildlife (local-level: partitioned $\chi^2 = 29.36$, d.f.= 1, $p < 0.001$; household level: partitioned $\chi^2 = 14.87$, d.f.= 1, $p < 0.001$).

Table 5: Percentages of respondents perceiving wildlife as a source of benefits i) for Tanzania, ii) for people around the SGR and iii) at the level of the household.

<i>Question and No. of respondents</i>	<i>Response</i>	<i>% Men (n=128)</i>	<i>% Women (n=72)</i>	<i>% Total (n=200)</i>	<i>Gender analysis</i>
i) Does wildlife benefit Tanzania? (n=199: 127 men, 72 women)	Yes	84.2	50.0	71.9	$\chi^2=28.15$ d.f.=2 p < 0.001
	No	7.9	16.7	11.1	
	D/K ¹	7.9	33.3	17.1	
ii) Does wildlife benefit people living around SGR? (n=199: 128 men, 71 women)	Yes	64.6	36.6	54.5	$\chi^2=29.91$ d.f.=2 p < 0.001
	No	33.1	38.0	34.8	
	D/K	2.4	25.4	10.6	
iii) Does wildlife benefit you? (n=200: 128 men, 72 women)	Yes	53.9	34.7	47.0	$\chi^2=15.74$ d.f.=2 p < 0.001
	No	44.5	51.4	47.0	
	D/K	1.6	13.9	6.0	

¹ D/K = 'Don't know'.

Comments made by respondents who gave negative or don't know answers on the question about the benefits of wildlife for Tanzania suggest that these people view the government, the government wildlife management authorities and/ or foreign tourists as the sole beneficiaries of wildlife at the national level. In the words of a respondent from Gomero village "*The government do not tell us what are the benefits of wildlife, nor do they tell us what can be had from looking after it*" (Questionnaire 103, 9/09/95). This perception that the *wakubwa* (literally 'big people', a term used to denote external actors with power and influence) rather than the villagers, who bear the authority and responsibility for wildlife and can therefore benefit from its management, was also expressed by respondents (38.6%) who agreed (*i.e.* gave a negative response) with the statement that 'villagers are not involved at all in deciding the best ways to conserve wildlife'. The pattern of response to the statement that 'the government is more concerned with looking after animals than after people', whereby 50% of respondents agreed, similarly reflects the perception that wildlife management remains the domain of the state to the disadvantage of the villagers.

Similar comments to the effect that villagers do not have the necessary authority to access wildlife benefits were made by some respondents who gave neutral or negative answers regarding the benefits of wildlife at the local and individual levels. However, for these questions, respondents complained about the expense, limited availability and inequitable distribution of the wildlife quota meat as reasons for a negative response.

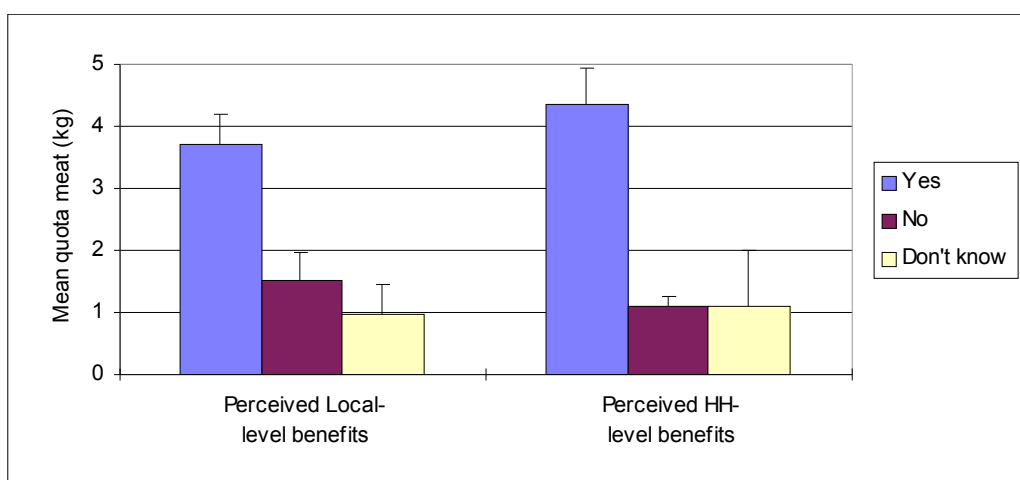
The generation of tourist revenues, and the harvesting of wildlife products were reported by 69.9% and 46.9% of respondents respectively as the main benefits of wildlife to the nation. Relatively few respondents (9%) cited the benefits of conserving wildlife for future generations, while a larger proportion of respondents (23.1%) either cited 'Other' benefits,

such as employment and the aesthetic value of seeing wild animals, or did not specify a reason for their positive response. Patterns of response by men and women differed ($\chi^2 = 33.47$, d.f.= 3, $p < 0.001$). Women were less likely than men to mention the foreign exchange benefits of wildlife (partitioned $\chi^2 = 8.43$, d.f.= 1, $p < 0.01$), and more likely to give ‘Other’ -- usually non-specific -- responses (partitioned $\chi^2 = 25.03$, d.f.= 1, $p < 0.001$).

Access to bushmeat was the predominant response of men and women concerning the benefits of wildlife at the local (88.0%) and personal (83.0%) levels. Some respondents however qualified their positive answers by references to the limited nature and distribution of the benefits at these levels, an example being the comment of a respondent in Dakawa village that *“there are limited benefits: we get a small amount of bushmeat but the amount of money that it [sale of the meat] brings is not enough to use for the development of the village”* (Questionnaire 112, 14/09/95). A much smaller proportion of respondents (16.7%) mentioned the local benefits of wildlife in terms of its role as a source of revenue for village development projects. In terms of personal benefits, 9.6% of respondents cited the contribution of wildlife to national revenues used in the provision of government services (health care, roads, schools etc.), as a wildlife-related benefit, albeit an indirect one. ‘Other’ benefits such as employment, aesthetic values etc. were also mentioned at both the local (17.6%) and individual (22.3%) levels.

A pattern running through all three sets of data is that the majority of respondents referred to the direct, utilitarian benefits of the resource, rather than intangible, non-material benefits. The emphasis on access to game meat as the primary benefit of wildlife at the local and individual levels suggests that the CWM project has, by providing a legal supply of game meat to the villagers of MRBZ, fostered the positive valuation of wildlife among the MRBZ villagers. The findings that respondents who recognised wildlife benefits at the local and personal levels had obtained more quota meat than those reporting neutral or negative views (for local-level benefits Kruskal-Wallis $\chi^2 = 45.89$, d.f.= 2, $p < 0.001$; for benefits at the personal level Kruskal-Wallis $\chi^2 = 31.55$, d.f.= 2, $p < 0.001$; see Figure 2) support this interpretation of the data.

Figure 2: Perceptions of wildlife benefits for people around SGR (local-level), and for the respondent (household-level) relative to the mean amount of quota meat obtained during the 1994 hunting season.



4.4 Awareness of the Wildlife Management Institutions

When asked “What does the Department of Wildlife do for the people of this village?”, only 34.7% of respondents gave answers which were categorised as showing a non-negative awareness of the Department’s activities in their village (see Table 6 and accompanying note). Almost two thirds of respondents either said that the Department of Wildlife ‘does nothing’ in their villages or gave outright negative answers (34.2%), or were unaware of any activities of the Department of Wildlife in their village (31.1%). Comments made by respondents who gave negative answers suggest that the apparent antagonism towards the government wildlife management authorities stems from the perceptions that Department of Wildlife employees are unfairly privileged in terms of their access to the wildlife resources which villagers are denied, and that the Department’s Game Scouts are over-zealous in terms of harassing local people unnecessarily, while failing to catch the ‘real’ poachers.

Table 6: Reported activities of the Department of Wildlife in the study villages with data presented as % of respondents by gender and for the entire sample.

Response	Response category ¹	% Men (n = 126)	% Women (n = 70)	% Total (n = 196)
1) Nothing/ negative	Negative	42.1	20.0	34.2
2) Supply bushmeat to villagers	Positive	12.7	10.0	11.7
3) Problem animal control against crop-damage	Positive	20.6	2.9	14.3
4) Anti-poaching activities/ wildlife protection	Positive	11.9	5.7	9.7
5) Other ²	Positive	4.0	1.4	3.1
7) Don't know	Neutral	15.9	59.6	31.1

¹ Where respondents mentioned a specific activity of the Department of Wildlife in their village, their answers were categorised as positive. However, it should be noted that the term ‘positive’ is used to indicate a positive level of knowledge rather than positive attitude, because it was not possible to assess the extent to which response categories two to five were indicative of actual approval or support for the institution.

² The response category ‘Other’ includes people who mentioned that the Department of Wildlife provides medical assistance at the Matambwe dispensary (n=2), and those who said the Department’s employees were helping villagers to learn to manage the wildlife on village lands (n=4).

When asked “What does the SCP community wildlife management project do for the people of this village?” 42.9% of respondents expressed a non-negative awareness of the activities of the project, the most frequent response category being that the project provided bushmeat for villagers (Table 7). The project’s activities in terms of wildlife management and the establishment of village and self-help development projects were also mentioned but less frequently. While a relatively small proportion of respondents (16.3%) either said the project ‘does nothing’ or gave responses indicative of a negative awareness of its activities, 40.8% gave neutral (‘don’t know’) answers to the question.

Table 7: Reported activities of the SCP community wildlife management project in the study villages with data presented as % of respondents by gender and for the whole sample.

<i>Response</i>	<i>Response category</i> ¹	<i>% Men</i> (n = 126)	<i>% Women</i> (n = 70)	<i>% Total</i> (n = 196)
1) Nothing	Negative	15.1	18.6	16.3
2) Supply bushmeat to villagers	Positive	28.6	17.1	24.5
3) Anti-poaching / wildlife management	Positive	16.6	2.9	11.2
4) Village development projects	Positive	17.5	1.4	11.7
5) Don’t know	Neutral	31.0	58.6	40.8

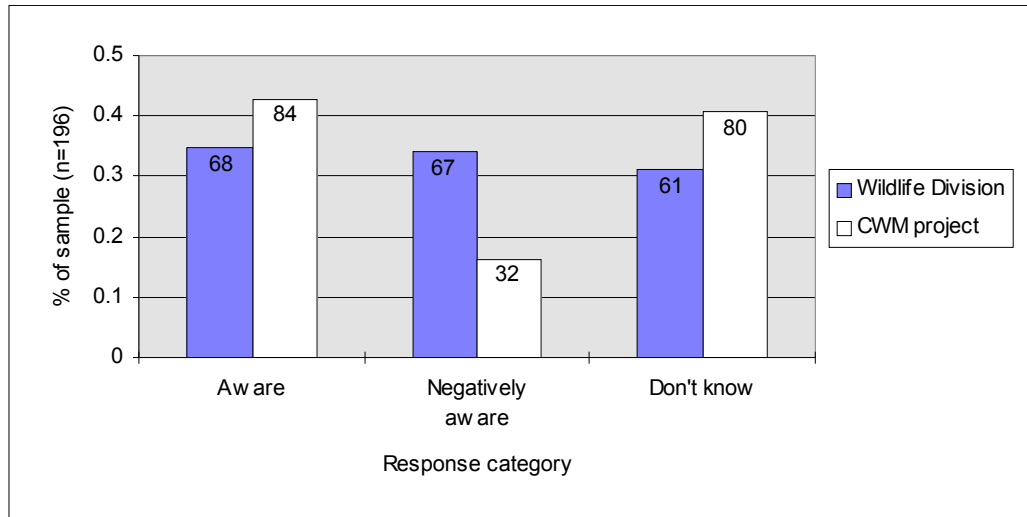
¹ As for note 1 to Table 6.

Comments made by respondents in the negative and neutral response categories concerning the activities of the CWM project suggest that their perception of the project was as an initiative organised by higher or outside authorities – either the village elite, or the project staff – which was, as such, of little concern to villagers at the grassroots level. This viewpoint is illustrated in the following statement by a respondent in Mbwade village that “*the people who know about those matters are the wakubwa [elite] of the village; we small people don’t get to know anything*”. A few of the more cynical respondents complained that the ‘foreigners’ were actually hunting for their own benefit; and that the project was a means of persuading local people to protect wildlife for limited positive returns.

For both of the above questions patterns of response differed significantly for men and women, because women were more likely than men to give ‘don’t know’ responses (partitioned chi-squared analysis concerning the activities of the Department of Wildlife: partitioned $\chi^2 = 43.34$, d.f.= 1, $p < 0.001$; concerning the activities of the CWM project: partitioned $\chi^2 = 18.51$, d.f.= 1, $p < 0.001$). Comparing the overall patterns of response to the two questions shows that awareness of the activities of the Department of Wildlife in the

survey sample differs from that of the activities of the CWM project ($\chi^2 = 16.62$, d.f.= 2, $p < 0.001$; Figure 3).

Figure 3: Proportions of respondents who expressed awareness, negative awareness or did not know about the activities of the Department of Wildlife and the activities of the CWM project in their village. The data are presented as the % of respondents in each response category with the actual frequencies as the data labels on the graph.



A partitioned chi-squared analysis showed that fewer respondents expressed a clearly negative awareness of the CWM project’s activities than did so for the activities of the Department of Wildlife (partitioned $\chi^2= 12.62$, d.f.= 1, $p < 0.001$). However, more respondents were unaware of the activities of the CWM project than were unaware of the activities of the Department of Wildlife (partitioned $\chi^2 = 4.00$, d.f.= 1, $p < 0.05$).

Using the question “What does the SCP wildlife management project do for the people of this village?” to screen out people who were unaware of the project’s activities, a sub-sample of 82 respondents were asked three factual questions concerning the role and responsibilities of the Village Wildlife Committee (VWC)⁶. These follow-up questions (What does the VWC do?; How does the VWC obtain revenue for wildlife management?; How are the VWC revenues used?) were used to assess the respondent’s knowledge of the local-level workings of the CWM project. A composite ‘project knowledge’ indicator was calculated by scoring

⁶ During the early stages of the survey, some respondents who answered that the community wildlife management project did ‘nothing’ for the villagers were not asked the follow-up questions. This bias in data collection means that people who were categorised as negatively aware of the project’s activities are under-represented in the sub-sample; the bias is taken into account in the interpretation of the data. Due to the paucity of female respondents to the follow-up questions (n = 10), which reflects the high proportion of women who gave ‘don’t know’ answers on the screening question, separate analyses of the data by gender were not possible.

every correct answer to the factual questions as +1, resulting in a scale which ranged from 0 to 5 with a mean of 2.06.

On this scale respondents scoring 3 or more points and were categorised as well-informed; those who scored 1 or 2 points were categorised as showing some knowledge, while the remainder who were unable to answer any of the questions were categorised as uninformed. By extrapolating the proportions of well-informed respondents (see Table 8) to the whole sample, it was estimated that only 21% of the respondents surveyed showed an understanding of the responsibilities and working of the village wildlife committee as the local institution responsible for the implementation of the CWM project. Those respondents who were well-informed were more likely to hold a position on one of the village government committees or Village Wildlife committee ($\chi^2 = 19.07$, d.f.= 2, $p < 0.001$), and also received significantly more quota meat on average than respondents in the lower knowledge categories ($\chi^2 = 20.25$, d.f. = 2, $p < 0.001$).

Table 8: Levels of knowledge of the workings of the CWM project with data presented as % of respondents in the sub-sample who were aware and negatively aware of the project's activities.

<i>Project knowledge category (scores)</i>	<i>% Aware (n=70)</i>	<i>% Negatively aware (n=11)</i>	<i>% All (n=81)</i>
Well-informed (3 points or more).	44.3	27.3	42.0
Some knowledge (1-2 points).	25.7	27.3	25.9
No knowledge (0 points).	30.0	45.5	32.1

5. FACTORS INFLUENCING CONSERVATION ATTITUDES

5.1 *Perceptions of Land Use Conflicts and Problems associated with living next to SGR*

Logistic regression analysis to predict responses concerning preferred land use options for the Selous showed that individuals holding negative or neutral opinions were significantly differentiated by gender and age – but not by education -- from individuals who were opposed to a change in land use for the game reserve (see Appendix 3, for the parameters in this and all following models). Men were more likely than women to respond positively, *i.e.* to oppose the need for a change in land use to suit human needs ($-2LL = 9.95$, d.f. = 1, $p = 0.001$). With regard to age, respondents in the middle age categories 2 (26-35 yrs) and 3 (36-45 yrs) were more likely to give positive answers than respondents in the youngest (18-25 yrs old) and the older (46-65 yrs and > 65 yrs) age categories ($-2LL = 10.17$, d.f. = 1, $p = 0.037$). The model was significant (Model $\chi^2 = 18.03$, d.f. = 5, $p = 0.003$) and predicted 60.61% of cases correctly, in approximately equal proportions for negative (62.1%) and positive (59.2%) responses.

Concerning the perception of problems associated with living next to the Selous, none of the factors gender, education, wealth, status, village or access to bushmeat were found to be significant predictors of response in the logistic regression analysis. This lack of a result reflects the extremely widespread perception of problems linked with the game reserve; in effect, so many people perceive these problems that they cannot be characterised as specific to sub-groups within the population (see discussion of this point in section 6).

5.1 Perceptions of Wildlife Benefits

The variables identified by the logistic regression analysis as significant predictors of perceived wildlife benefits for Tanzania were education, gender and the amount of quota meat obtained. Thus, respondents categorised as illiterate⁷ were less likely to perceive wildlife benefits at this level than those in all other educational categories ($-2LL = 6.87$, d.f. = 3, $p < 0.001$); men were more likely than women to respond positively ($-2LL = 16.96$, d.f. = 1, $p = 0.009$); finally, the likelihood of a positive response also increased in relation to the amount of quota meat obtained by the respondent ($-2LL = 15.74$, d.f. = 1, $p < 0.001$). On this question, the predictions of the model (Model $\chi^2 = 61.5$, d.f. = 5, $p < 0.001$) were correct for 77.3% of the cases analysed.

In answer to the question concerning the perceived benefits of wildlife for local people around the Selous, people with status, *i.e.* those who were members of a village government committee, were more likely to respond positively than those villagers without status ($-2LL = 23.31$, d.f. = 1, $p < 0.001$); wealthier respondents were more likely to respond positively than those who were poor ($-2LL = 12.34$, d.f. = 3, $p = 0.002$); and men were again more likely to respond positively than women ($-2LL = 6.87$, d.f. = 1, $p = 0.009$). Overall, the predictions of the model (Model $\chi^2 = 51.53$, d.f. = 4, $p < 0.001$) were correct for 71.3% of the cases analysed.

On the question of perceived benefits of wildlife for the individual respondent, the variables identified as significant predictors of response were the amount of quota meat obtained and the status of the respondent. The likelihood of a positive response increased with the amount of quota meat obtained by the respondent ($-2LL = 25.56$, d.f. = 1, $p < 0.001$), and respondents with status were more likely to perceive wildlife benefits at the personal level than those without ($-2LL = 10.53$, d.f. = 1, $p = 0.001$). The predictive accuracy of this model (Model $\chi^2 = 52.92$, d.f. = 1, $p < 0.001$) was 73.6%.

5.3 Perceptions of the activities of the wildlife management authorities

⁷ Those people who had not received any formal education, who had neither been to adult literacy classes, nor primary school.

The variables identified as significant in predicting whether or not villagers perceived the Department of Wildlife as doing something for their village were status and gender in a model with the criterion for entering variables of 0.05. This model predicted 69.6% of responses correctly, with an accuracy of 91.6% for negative responses (those people who consider the Department of Wildlife does nothing for the village or who gave 'no response' answers), but an accuracy of only 29.2% for non-negative responses⁸. In trying to improve the model's predictive accuracy the variable entry cut-off value was relaxed to 0.10; this led to the identification of status, wealth and gender as significant variables in the model and a more equal distribution of correct predictions (83.2% negative responses correct, 43.1% non-negative correct; overall 69.0% correct). In this latter analysis (Model $\chi^2 = 27.06$, d.f. = 1, $p < 0.001$), respondents with status were more likely to express non-negative views of the Department of wildlife than villagers without status ($-2LL = 4.99$, d.f. = 1, $p = 0.026$), as were respondents from wealthier households ($-2LL = 7.19$, d.f. = 2, $p = 0.027$) and men ($-2LL = 4.96$, d.f. = 1, $p = 0.026$).

With regard to the perceived activities of the community wildlife management project, respondents holding negative or neutral opinions were significantly differentiated from individuals holding non-negative views of the project by gender, status and the amount of quota meat obtained. This model showed that men were again more likely to express an awareness of the activities of the project in non-negative terms ($-2LL = 10.12$, d.f. = 1, $p < 0.002$), as were respondents with status ($-2LL = 5.89$, d.f. = 1, $p = 0.015$), and the likelihood of a positive response increased with the amount of quota meat obtained by the respondent ($-2LL = 5.09$, d.f. = 1, $p = 0.024$). Overall the model (Model $\chi^2 = 33.90$, d.f. = 3, $p < 0.001$) correctly predicted 69.95% of responses, although it was more accurate for the prediction of negative responses (89.6% correct) than for non-negative responses (42.86% correct).

6. DISCUSSION

The data presented show that, although the Selous game reserve is widely perceived to exist in the national interests of wildlife conservation and revenue generation, the relations of the MRBZ villagers to the game reserve are not characterised by conflict over the use of lands inside the protected area. This finding reflects the situation of the MRBZ villages on a land- and resource-rich 'frontier', where most villages are located at distances of 5-15 km away from the boundary of the game reserve with much of their lands under secondary regrowth or natural vegetation (Ardhi Institute 1991). Where conflicts over access to resources in and around protected areas exist people tend to hold clearly-defined views on the issues involved

⁸ The term 'non-negative' is used deliberately in recognition of the fact that certain response categories were ambiguous as indicators of a positive attitude on the part of the respondents.

(Gorkhali 1986), thus the finding that almost one third of MRBZ respondents did not have an opinion as to why the Selous had been established as a game reserve supports this interpretation of the data⁹.

Data presented in section 4.2 from the fixed-response statements also indicate that the majority of respondents accepted the need for wildlife conservation and the regulation of hunting offtakes. The widespread expression of this conservation ethic was consistent with the finding that almost three-quarters of the sample recognised wildlife benefits at the national level (section 4.3). Roughly half of the respondents also recognised wildlife benefits at the local and personal levels.

Patterns of response concerning the other dimensions of the conservation attitudes assessed in the survey were however less positive. There is a widely-held perception that villagers are subject to significant costs of conservation, such that the majority of respondents reported conflicts with the game reserve regarding problems of wildlife damage to crops and property and the risk of human injury. The extent of local support for the wildlife management authorities is also limited. Thus, the majority of respondents were either unaware or negatively aware of the activities of the state wildlife management authorities (the Department of Wildlife) in their village. Although relatively few respondents expressed a negative awareness of the CWM project, many were seemingly unaware of the project's activities in their village. Wildlife is still widely perceived as belonging to the state which holds decision-making authority for its management and the villagers' sense of stewardship for the resource remains accordingly limited.

The conservation attitudes expressed by the MRBZ villagers are therefore broadly consistent with those reported from the attitudinal surveys reviewed in the introduction to this paper: local support for the principle of conservation is strong but there is less support for the wildlife management authorities responsible for the practical implementation of conservation measures. To understand this pattern of response in the MRBZ context, the perceived importance of the costs of living with wildlife – a perception which has been widely documented in studies of protected area-people relations in Sub-Saharan Africa (Bergin 1995; Hartley 1994; Hasler 1996; Hill 1997; Naughton-Treves 1996) -- provides a starting-point for analysis of the relationship between the Department of Wildlife and the villagers.

Although the MRBZ villagers perceive the problem of wildlife damage to crops and property as a concomitant of their proximity to the game reserve, a six-month programme of crop-

⁹ This result is broadly consistent with the findings of an earlier attitudinal survey in villages along the eastern and northern borders of the Selous (Newmark *et al.* 1993), in which respondents were asked how they would feel if the game reserve was abolished.

damage monitoring in the study village reported as being most severely affected (Mbwade) found that most of crop-damage incidents recorded in that time were caused by vervet monkeys, bushpigs and birds, *i.e.* pest species living in and around the village, while less than 5% of incidents were caused by large mammals (Gillingham 1998). The majority of the incidents recorded were of limited impact in terms of the area and intensity of damage caused, which also indicates that the actual crop losses to wildlife are lower than the reports of the problem appear to suggest. Thus the villagers' perception of the problem as one that is associated with the game reserve is not wholly accurate¹⁰; nevertheless, it is widespread to the extent of being almost universal, as shown by the lack of discrimination of the logistic regression analysis (section 5.1).

The data and analyses presented in this paper suggest that the perceived linkage between the Selous, wildlife and the problem of crop-damage stems from the MRBZ villagers' view of the game reserve as a protected area for wildlife, in combination with their understanding that authority -- and thus responsibility -- for wildlife management rests with the state. This interpretation is consistent with that reported by Bergin (1995) concerning protected area-people relations around Arusha National Park. Under these circumstances, the over-reporting of crop-damage losses is the only (legal) form of response and resistance to the problems of living with wildlife open to the MRBZ villagers. As villagers do not have the authority to carry out control measures against problem animals, they instead use a strategy of disproportionate complaint -- one of the typical 'weapons of the weak' (Scott 1985) -- to try and redress this imbalance of power, by seeking to influence interventions by the Department of Wildlife personnel in favour of human rather than wildlife interests¹¹.

The persistence of this conflict of interests therefore suggests that as yet many MRBZ villagers do not perceive their relationship with the state wildlife management authorities to have changed substantially: control of the wildlife resource is still exerted from the top-down by agencies outside and above the community. The expressions of mistrust and resentment by villagers towards the state wildlife management authorities, whereby the Department of Wildlife personnel are seen as being able to benefit (both legally and illegally) from wildlife, while preventing local people from doing so, reflect this situation of asymmetric power relations. The activities of the CWM project in the study area have yet to change the situation, partly because -- as shown by the descriptive analyses in section 4.4 -- villagers differentiate between the activities and associated roles of the project and the state wildlife management authorities.

¹⁰ This statement is not meant to imply that the MRBZ villagers do not experience real losses -- either directly or in the form of opportunity costs -- to wildlife.

¹¹ Heinen (1993) describes a similar situation in his study of human-wildlife conflicts around the Kosi Tappu Wildlife Reserve in Nepal.

There is however evidence to suggest that the implementation of the CWM project has improved the valuation of wildlife among those villagers who have had access to project benefits. Access to meat from the wildlife quota was found to be a significant positive influence on the perception of wildlife benefits at the national and personal levels; a similar but less significant tendency was found linking this factor to the perception of wildlife benefits at the local level. In contrast, the findings of attitudinal surveys carried out around the Selous Game Reserve (Kabigumila 1991) and Ruaha National Park (Hartley 1994) in areas where villagers did not have legal access to direct, wildlife-related benefits, showed that markedly lower proportions of the respondents perceived wildlife as being of personal benefit (SGR: 27%; RNP: 24%).

However, the inequitable distribution of quota meat according to the economic and political divisions that exist within the MRBZ study villages has meant that these impacts of the project to date have been largely confined to the village elite¹². This was shown by the results of the logistic regression analyses, which identified respondent status -- defined in terms of his/her membership of the village government institutions -- as a significant positive influence on perceptions of wildlife benefits at the local and individual levels. The findings that status was also a significant positive influence linked to awareness of the activities of the Department of Wildlife and those of the CWM project suggest that knowledge of -- and hence involvement in -- wildlife management issues among the MRBZ villagers is similarly concentrated in the hands of the elite who dominate the running of village public life.

Gender was a significant factor influencing perceptions of conflicts associated with the game reserve, wildlife benefits and awareness of the activities of the wildlife management institutions. Women were more likely than men to respond negatively or not to hold an opinion on all issues other than the perceived benefits of wildlife at the individual (household) level, and the perception of problems associated with the game reserve. These gender effects reflect the pattern of social stratification in the predominantly Muslim study villages, whereby public life and political activity are considered to be primarily male responsibilities (Swantz 1985). Not only is involvement in village public life considered inappropriate behaviour for women, but their heavy domestic and agricultural workload also precludes them from becoming active participants in that predominantly male domain. This, together with the lower standards of education among women than men (Gillingham 1997), means that women tend to be less knowledgeable than men with regard to the wider issues of

¹² This term is used to signify the minority of relatively wealthy village households, which generally comprise older, more educated and male household heads, and which have control over most of the cultivated land in MRBZ; and dominate both the production of crops for sale, and membership of the village political institutions (see Gillingham 1997, 1998).

wildlife management and conservation. Conservation attitudes among women are accordingly determined largely by the direct experience of the costs and benefits of conservation as they affect domestic life and farmwork.

The contrasting attitudes of the village elite versus the grassroots reflect the patterns of socio-economic differentiation within the study villages as they are played out in the context of the CWM project. By comparison with the village elite, the majority of villagers – especially women and the poor – tend to be poorly informed about the processes of wildlife management by both the state and village authorities, and marginalised in terms of access to project benefits, and therefore tend to dismiss the CWM project as being the private concern of the village elite. Limited community participation has led to a lack of accountability and transparency in the village institutions responsible for the local-level implementation of CWM activities. The resultant problems of mismanagement of village wildlife revenues and, in some cases the poor quality of wildlife management by these institutions, have in turn undermined the project's progress towards an effective partnership between the state and the communities for the co-management of wildlife.

7. CONCLUSIONS

This paper has presented and discussed data which demonstrate the existence of a significant level of local support for the conservation of wildlife and the existence of the Selous game reserve, but more limited awareness of, and support for, the activities of the state wildlife management authority and the CWM project. Its findings show that, while the distribution of tangible benefits from the CWM project has positively influenced the valuation of wildlife by some MRBZ respondents, issues of power and equity are crucially important in determining the relationships of the MRBZ villagers to both the state and local-level wildlife management authorities.

Thus the relationship of villagers to the Department of Wildlife continues to be characterised by a widespread mistrust; this stems from a combination of a perceived lack of decision-making authority for wildlife management and a paucity of accessible information. Perceiving themselves as powerless and disadvantaged in the face of this abstract authority, villagers tend to resort to passive forms of resistance – *e.g.* non-cooperation and vociferous complaint -- in an attempt to protect their interests. Similarly, the widespread lack of awareness of the activities of the CWM project reflects the outcome of inequalities and relations of power at the village level, which have constrained the participation by non-members of the village elite in the project's implementation.

The attitudinal data presented in this paper have implications for the long-term development of community wildlife management in MRBZ. The finding that relations of villagers to the state wildlife management authorities remain problematic indicates the need to raise local awareness of the activities of the Department of Wildlife as a transparent and accountable institution, and to make explicit its linkages to the activities of CWM project. The establishment of an effective co-management partnership between villagers and the Department of Wildlife also [*] presupposes/ will depend on/ require community mobilisation for wildlife management by collective action. In this context, the findings of the study suggest a need for representative village-level institutions for wildlife management to ensure the equitable distribution of project benefits, so that the grassroots majority of villagers have an incentive to participate in its implementation. The future development of the CWM project in MRBZ [*] could/ will otherwise be compromised by the growing disillusionment of marginalised villagers who do not experience it [*] as/ to [*] existing/ acting in their interests. The experience of the CWM project in MRBZ to date therefore suggests that structured inequalities and relations of power must be addressed at multiple levels for the effective design, implementation and evaluation of such initiatives.

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APPENDIX I: Socio-Economic Attributes of the MRBZ survey sample by village and for the entire sample.

VARIABLE	Milengwelengwe (n = 50)	Dakawa (n = 52)	Gomero (n = 52)	Mbwade (n = 48)	Total (n = 202)
<i>Position in HH</i>					
Male HH head	66.0% (33)	57.7% (30)	57.7% (30)	58.3% (28)	59.9% (121)
Female HH head	8.0% (4)	15.4% (8)	28.8% (15)	22.9% (11)	18.8% (38)
Spouse (wife)	26.0% (13)	19.6% (10)	---	6.3% (3)	12.9% (26)
Male relative	---	3.9% (2)	5.8% (3)	4.2% (2)	3.5% (7)
Female relative	---	2.0% (1)	7.7% (4)	8.3% (4)	4.5% (9)
<i>Female-headed HH</i>	8.0% (4)	19.2% (10)	32.7% (17)	27.1% (13)	23.8% (44)
<i>Ethnicity</i>					
Kutu	6.0% (3)	42.3% (22)	5.8% (3)	8.3% (4)	15.8% (32)
Luguru	44.0% (22)	15.4% (8)	38.5% (20)	39.6% (19)	34.2% (69)
Ndengereko	---	9.6% (5)	3.8% (2)	6.3% (3)	5.0% (10)
Ngindo	10.0% (5)	---	7.7% (4)	8.3% (4)	6.4% (13)
Ngoni	---	---	21.2% (11)	2.1% (1)	5.9% (12)
Pogoro	30.0% (15)	3.8% (2)	11.5% (6)	2.1% (1)	11.9% (24)
Zaramo	4.0% (2)	17.3% (9)	1.9% (1)	10.4% (5)	8.4% (17)
Other	6.0% (3)	11.5% (6)	9.6% (5)	22.9% (11)	12.4% (25)
<i>In-migrant HH</i>	56.0% (28)	26.9% (14)	65.4% (34)	80.9% (38)	56.4% (114)
<i>Age of Respondent</i>					
18-24 yrs	10.0% (5)	7.7% (4)	19.2% (10)	10.4% (5)	11.9% (24)
25-34 yrs	28.0% (14)	17.3% (9)	23.1% (12)	33.3% (16)	25.2% (51)
35-44 yrs	26.0% (13)	32.7% (17)	26.9% (14)	20.8% (10)	26.7% (54)
45-64 yrs	24.0% (12)	34.6% (18)	23.1% (12)	27.1% (13)	27.2% (55)
>65 yrs	12.0% (6)	7.7% (4)	7.7% (4)	8.3% (4)	8.9% (18)
<i>Education</i>					
Illiterate	40.0% (20)	38.5% (20)	34.6% (18)	39.6% (19)	38.1% (77)
Semi-literate	18.0% (9)	21.2% (11)	21.2% (11)	18.8% (9)	19.8% (40)
Literate	42.0% (21)	40.4% (21)	44.2% (23)	41.7% (20)	42.1% (85)
<i>HH income</i>					
Farming	98.0% (49)	94.0% (49)	100% (52)	96.0% (46)	97.0% (196)
Petty trading	32.0% (16)	31.0% (16)	25.0% (25)	29.0% (14)	35.1% (71)
Wage labour	22.0% (11)	29.0% (15)	19.0% (19)	23.0% (23)	33.7% (68)
Remittances	8.0% (4)	29.0% (15)	27.0% (27)	17.0% (17)	31.2% (63)
Formal employment	2.0% (1)	2.0% (1)	2.0% (2)	8.0% (8)	5.9% (12)
Other	12.0% (6)	6.0% (12)	23.0% (23)	33.0% (33)	36.6% (74)
<i>HH with Status</i>	18.0% (9)	17.3% (9)	17.3% (9)	12.5% (6)	16.3% (33)

APPENDIX II: Summary of results from the preliminary bivariate analyses of the factors influencing conservation attitudes held by MRBZ villagers towards the Selous Game Reserve, the benefits of wildlife and the activities of the state and local-level wildlife management institutions. The levels of significance of the results are shown as follows: *** for $p < 0.001$; ** for $p < 0.01$; and * for $p < 0.05$ (N.S. non-significant result).

<i>ATTITUDINAL DIMENSIONS</i>	<i>FACTOR</i> ¹							
	Gender (2)	Village (4)	Wealth (C)	Status (2)	Education (3)	Age (5)	Reported crop-damage impacts (2)	Quota meat received (C)
<i>Relations with SGR</i>								
• Perceived land use conflicts with SGR.	***	N.S.	N.S.	N.S.	**	*	N.S.	N.S.
• Perceived problems of living adjacent to the game reserve.	***	**	*	*	**	N.S.	N.S.	**
<i>Perceptions of Wildlife Benefits</i>								
• For Tanzania	***	N.S.	***	**	***	N.S.	N.S.	***
• For people living on the borders of SGR.	***	N.S.	***	***	***	N.S.	N.S.	***
• For the respondent and his/her household.	***	N.S.	***	***	**	N.S.	N.S.	***
<i>Relations to the wildlife management authorities</i>								
• Awareness of the activities of the Department of Wildlife.	***	N.S.	**	**	*	N.S.	N.S.	***
• Awareness of the activities of the CWM project.	***	N.S.	Trend ($p = 0.07$)	***	**	N.S.	N.S.	***

¹ Numbers in brackets show the number of categories for each factor; variables marked as (C) are continuous.

² The factor 'wealth' was measured by a household possessions score calculated to reflect the household's ownership of durable assets, including manufactured consumer goods, housing structural features and livestock holdings, identified as indicators of wealth during pilot work for the survey (see Gillingham 1997 for details of the method).

APPENDIX III: Model parameters which determine the probability of a positive response in the logistic regression analyses of conservation attitudes held by MRBZ villagers.

i) Perception of land use conflicts with the Selous game reserve (198 cases analysed).

<i>Variables in the equation</i>	<i>B (coefficient)</i>	<i>Wald statistic</i>	<i>d.f.</i>	<i>Significance</i>
Sex	0.97	9.56	1	.002
Age		9.62	4	.047
Age (1): 18-25 yrs	1.06	2.55	1	.110
Age (2): 26-35 yrs	1.49	6.28	1	.012
Age (3): 36-45 yrs	1.01	2.96	1	.085
Age (4): 46-65 yrs	0.44	0.59	1	.443
Constant	-1.43	6.38	1	.011

ii) Perception of wildlife benefits for Tanzania (185 cases analysed).

<i>Variables in the Equation</i>	<i>B (coefficient)</i>	<i>Wald statistic</i>	<i>df</i>	<i>Significance</i>
Sex (1)	1.05	6.81	1	.009
Educate		14.77	3	.002
Educate (1): Illiterate	-1.93	13.80	1	<.001
Educate (2): Adult education	-0.80	1.09	1	.296
Educate (3): Some primary	-1.28	3.42	1	.064
Access to quota	0.45	10.12	1	<.002
Constant	0.88	2.70	1	.100

iii) Perception of wildlife benefits for local people living around the SGR (185 cases analysed).

<i>Variables in the equation</i>	<i>B (coefficient)</i>	<i>Wald statistic</i>	<i>df</i>	<i>Significance</i>
Sex (1)	0.93	6.66	1	<.010
Status (1)	3.31	9.97	1	<.002
Wealth		11.31	2	<.004
Wealth (1)	-0.95	3.39	1	.066
Wealth (2)	0.44	0.96	1	.328
Constant	-0.72	2.27	1	.132

iv) Perception of wildlife benefits for the respondent and his/ her household (185 cases analysed).

<i>Variables in Equation</i>	<i>B (coefficient)</i>	<i>Wald statistic</i>	<i>df</i>	<i>Significance</i>
Quota amount	0.36	16.09	1	<.001
Status (1)	1.90	8.10	1	.004
Constant	-1.07	22.18	1	<.001

v) Awareness of the activities of the Department of Wildlife on behalf of villagers (184 cases analysed).

<i>Variables in the equation</i>	<i>B (coefficient)</i>	<i>Wald statistic</i>	<i>d.f.</i>	<i>Significance</i>
Status (1):Committee member	1.01	4.89	1	.027
Wealth		7.18	2	.028
Wealth (1): Poor	-1.19	5.85	1	.016
Wealth (2): Middling	-0.95	5.41	1	.020
Sex (1): Men	0.82	4.72	1	.030
Constant	-0.58	1.63	1	.202

APPENDIX III (continued)

vi) Awareness of the activities of the CWM project on behalf of villagers (183 cases analysed).

<i>Variables in the equation</i>	<i>B (coefficient)</i>	<i>Wald statistic</i>	<i>d.f.</i>	<i>Significance</i>
Sex (1): Male	1.13	9.43	1	.002
Status (1):Committee member	1.18	5.50	1	.019
Quota amount	0.11	3.86	1	.050
Constant	-1.55	22.72	1	<.001