

Attitudes of Rural Communities to Animal Wildlife and Its Utilization in Chobe Enclave and Mababe Depression, Botswana

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INTRODUCTION

For several decades onwards from the 1880s, control over natural resources was exerted rather widely in Africa by colonial powers through a system of centralized government. As a result, ownership and decision-making concerning wildlife were taken away from rural communities, and the people became passive observers of the wildlife resources living around them (Little & Brokensha, 1987; McCracken, 1987).

Nowadays, however, conservationists have a more liberal approach to the utilization of wildlife resources and are looking at ways to return the control of wildlife to rural communities (Motshwari Game (Pty) Limited, 1981; Western, 1982; Lewis & Kaweche, 1985; Martin, 1986; FGU, 1988; Lewis *et al.*, 1988). Lewis & Kaweche (1985) believe that a key objective of the new thrust in conservation development is to improve the attitudes of rural communities to wildlife. The main methods to be employed to improve local attitudes to animal wildlife should be: (1) increasing the benefits to rural communities affected by wildlife, and (2) directly involving the communities in the decision-making process (*cf.* Western, 1982).

Initial projects to improve attitudes of rural communities towards wildlife were centred around returning, to the inhabitants of the area, a proportion of the profits generated by wildlife activities (Martin, 1986). Benefits were usually in the form of finance, jobs, or a source of inexpensive protein through culling operations (Motshwari Game (Pty) Limited, 1981). These approaches were, however, fundamentally flawed or at least proved ineffective because of the lack of local participation in the decision-making process (Martin, 1986).

For popular participation to be successful, two important prerequisites are: firstly, a belief by the potential participants that participation will lead to real control and, secondly, that one's individual self-interest can be benefited by such participation (Inger, 1985).

Attitudinal surveys give guidance to policy- and management-decisions, and act as a baseline to test the effects of policy-decisions. Such surveys have been incorporated in developmental fields such as agriculture (CIMMYT, 1977) and agro-forestry (Raintree & Young, 1983) for a number of years, and yet have only recently been introduced in the conservation field (Keenan, 1984). Attitudinal surveys have been shown to be extremely effective in assessing the success of experimental policies

such as increasing benefits to communities and using locally-recruited game-guards (Lewis, undated).

In Botswana, the Department of Wildlife and National Parks (DWNP) has always had a liberal attitude towards wildlife benefits, so that citizens have direct access to wildlife resources. Unlike the situation in Zambia, where the price of licences is prohibitively high for rural people (Lewis *et al.*, 1988), the Government of Botswana maintains the price of citizens' licences at extremely low levels. In addition, the people who are dependent on wildlife are issued Special Game Licences to kill sufficient game to cover their protein requirements.

The aims of the present work are to investigate the attitude of two rural communities in Botswana towards wildlife and wildlife utilization, to examine the origins of these attitudes, and to draw conclusions regarding their implications for animal wildlife management.

STUDY AREAS

The two study-areas, Chobe Enclave and Mababe Depression, are in northern Botswana, separated from each other by the Chobe National Park (Fig. 1). The human population of the Chobe Enclave is made up mainly of Basubiya and Batawana tribesfolk communities, whereas that of the Mababe Depression consists of the Khwai, Mababe, and Sankoyo, villages, inhabited mainly by Bayei and Basarwa tribesfolk. Both areas have high concentrations of wildlife, with a similar diversity of wildlife species (Cumming & Taylor, 1989). Rainfall averages range from 650 mm per annum in the Enclave to 550 mm in the Mababe Depression.

The residents of the Mababe Depression are in a 'cattle-free zone' imposed for veterinary reasons, and therefore rely for their livelihood on hunting, crop production, or a combination of those activities. Many members of the Mababe area have no lands (or only small lands). They therefore qualify for Special Game Licences. The residents of Chobe Enclave, on the other hand, have cattle and, on average, larger croplands than those of the Mababe Depression who have any at all. Few of the inhabitants of the Enclave qualify for Special Game Licences.

At present, approximately half of the Enclave is used for traditional agriculture. The remaining area is located to the south-west and is used by wildlife from the Chobe National Park for watering during the dry season. Timber is commercially extracted from the Chobe Forest Reserve

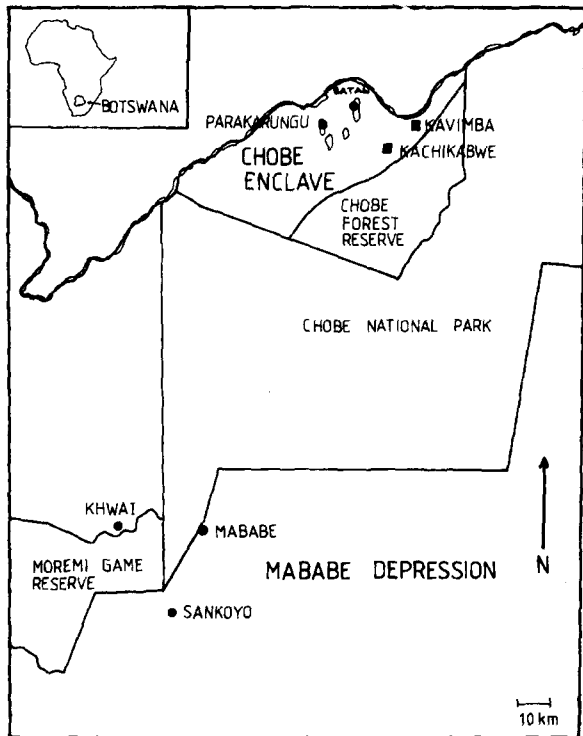


FIG. 1. Sketch-map indicating location of the study areas, villages, etc.

(cf. Fig. 1) but the area is also used for cattle-grazing; Elephant (*Loxodonta africana*) and Buffalo (*Syncerus caffer*) use the Reserve for grazing in the wet season.

The recent history of the region is closely linked to the rinderpest epidemic of 1896–98 which involved the virtual eradication of animal wildlife and led to the decline of tsetse-flies (Child, 1968). After the epidemic, the Basubiya tribe's cattle-posts were spread out in the present-day Chobe National Park. Wildlife populations were low, and consequently little competition existed between people and wildlife. As the tsetse-fly spread, people and their livestock were forced into the Chobe Enclave.

Khwai village consists of Baqanikwe Basarwa tribesfolk who have inhabited the northern Okavango for an extensive period. The people of Mababe village are Basarwa of a different origin. The inhabitants of Sankoyo are Bayei tribesfolk, and could be a result of the first migrations of Bayei from Eastern Caprivi to the Delta (Tlou, 1976).

Loss of land to wildlife and conservation has occurred in both study areas; in the Enclave, land was lost during the proclamation of the Chobe National Park in 1961 (Child, 1968) and access to the forest reserve has been restricted since then. In the Mababe Depression, land was lost to wildlife when Moremi Game Reserve was proclaimed in 1965, and when the Chobe National Park was extended in 1980 to link it to Moremi Game Reserve (cf. Fig. 1). The extension of Chobe National Park resulted in residents of Khwai and Mababe villages losing their prime hunting area.

METHODS

Attitudinal Survey

The study, conducted in June 1989, covered 22 villages and settlements, which are referred to henceforth

as 'villages' throughout the text. The sub-chiefs and headmen held 'kgotla' meetings to discuss the questionnaire and voice community opinions. Kgotla meetings are public meetings in which representatives of the families belonging to the 'kgotla', and locally-based officials, are expected to attend. The results of discussions held at the meetings are relayed back to the villages by the participants.

The household was considered the sample unit in the questionnaire study. The household is here defined as a group of people with family links who share the basic resources of cropland, livestock, and hunting rights. To obtain a representative sample of the households, two approaches were used: (1) In the Mababe Depression, of which recent high-resolution aerial photographs were not available, every household was sampled if any occupant or occupants were present (of the 102 households, 63% were sampled); (2) In the Chobe Enclave, high-resolution and recent aerial photographs were available. All household clusters were identified and all households within randomly selected clusters were sampled (of the 675 households, 25% were sampled).

The questionnaires were in Setswana, the Botswana national language. A total of 231 questionnaires were administered with the help of four Botswana assistants. Only adults over 18 years of age were interviewed, and if no suitable representative of a household was located, that household was not enumerated. The questionnaire contained 92 questions, of which 47 were of fixed format and 45 were open-ended (copies available from David Parry). In addition, informal interviews were held with representatives of the professional hunting companies operating in the region. Information about wages and additional benefits of employees were obtained during these interviews.

Data Analysis

The method of Principle Components Analysis (PCA)* was used to develop indices for 'wealth' and 'attitude to wildlife'. The attitude index consisted of eight variables (questions), while the index on wealth contained five variables. Continuous variables with high standard deviations were log-transformed.

The value of annual wildlife products was calculated from the value of the meat produced and the present prices offered for skins and skulls in Botswana (BGI Tanning Company, 1988). The amount of actual meat was calculated by using a dressed proportion of 0.55 of average animal weight (Martin, 1987). For consumption, it was assumed that all meat was consumed by the hunter's household. Children under 15 years of age were considered to consume 25% of the amount of meat which an adult consumes (Marks, 1973). The illegal offtake amount is unknown and hence excluded from analysis. The local value of livestock was calculated from prices provided by respondents with livestock (P = Pulal = US \$0.5). The values are: cattle P492, donkeys P35, goats P40, and chickens P5 (n=20 for each species).

Initial analysis of the ranked data was undertaken by means of cross tabulations; any Chi-squared results which

*This method allows combination of a number of variables into a single variable which is a linear combination of the original variables.

had an expected frequency of <5 were reanalysed, using either the Mann–Witney test in the case of independent variables with only two classes, or the Kruskal–Wallis test in the case of independent variables with more than two classes. The continuous data were examined, firstly by use of correlation (if appropriate) and then by means of one-way ANOVA.

NEGATIVE EFFECTS OF WILDLIFE

Crop Production

All but one of the respondents cultivated lands, and the majority of crop farmers (78%) complained of wildlife-related damage. The species most often cited as a problem to crops was Elephant (71% of all respondents) (Table I). Of the respondents who had an opinion as to whether they had lost land to wildlife interest, 59% considered they had so lost land. A significant number of respondents (81%) considered that loss of land to animal wildlife interests had a negative effect on the household economy (Chi-square $P < 0.001$, d.f. = 1).

TABLE I

Wildlife Species Responsible for Crop Losses During the 1989 Wet Season. Respondents were able to name as many as they thought were responsible (n = 230 respondents and 335 named wildlife species).

Species	Total % of respondents complaining
Elephant (<i>Loxodonta africana</i>)	71
Mice	16
Kudu (<i>Tragelaphus strepsiceros</i>)/ Duiker (<i>Sylvicapra grimmia</i>)	16
Birds	12
Warthog (<i>Phacocoerus aethiopicus</i>)	11
Baboon (<i>Papio ursinus</i>)/ monkey (<i>Cercopithecus pygerythrus</i>)	11
Hippo (<i>Hippopotamus amphibius</i>)	8
Buffalo (<i>Syncerus caffer</i>)	1

Livestock Production

Only 12% of households had no livestock. Of the households which owned livestock, 59% complained of livestock losses during the preceding 12-months' period. The average loss per household, expressed as the percentage of the value of the livestock, was 12%. The depredations on livestock represents an average loss to each household of between P23.80 per annum in Mababe village and P1,100.00 in Kachikabwe village. There is a direct positive correlation between stock losses and livestock assets ($r = 0.39$, $P < 0.01$). Lions (*Panthera leo*) were responsible for the losses of most (57% of cases and 83% of value) (Fig. 2).

The total effect of Lions and Hyenas (*Crocuta crocuta*) was similar to that found in 1987 by Polet (1989). Most of the kills in Polet's study were of stray animals killed at night (69%), with a further loss to Lions of 25% directly from kraals (enclosures) at night. Only 6% of kills occurred during the day. This illustrates the problem of labour requirements in herding the cattle to ensure that they return to their kraals in the evening. The DWNP (Department of Wildlife and National Parks)

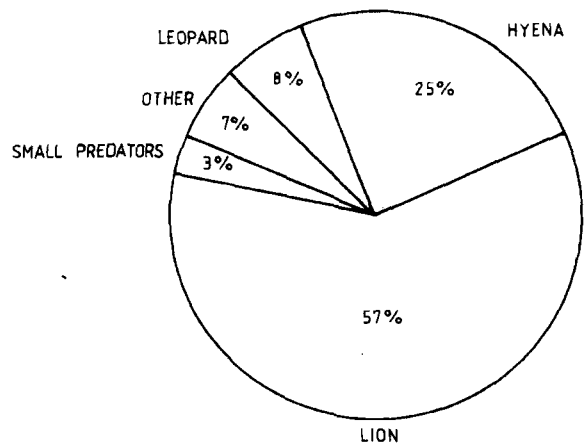


FIG. 2. Percentages of perceived wildlife responsible for livestock lost in the study areas during the period June 1988 to June 1989 (n = 120).

considers that cattle losses due to wildlife predation are, on average, in the region of 50–200 animals per year from the Chobe Enclave (F. Benn, Principal Game Warden, Chobe National Park), whereas the results of the present study and Polet's research (1989) indicate that losses vary from 769 to 1,266 animals per year (which latter figure represents 2.5 animals per cattle-owning household).

Personal Injury and Compensation

The percentage of households which had members of the family injured within the last three years was 2.2%. All injuries occurred whilst hunting Buffalo.

There is confusion concerning people's rights to protect their assets and claim compensation, yet the majority of people feel they have a right to compensation. Of the people unaffected by wildlife depredations, 29% felt that compensation was not necessary, while only 7% of people affected felt no need for compensation (Chi-square, $P < 0.05$, d.f. = 1).

BENEFITS FROM WILDLIFE

Licences were held by 21% of respondent households, of which 46% were Special Game Licences (see above) and the rest were normal game licences. Citizens of Botswana receive more than 50% of the licences allocated within the study area (Government of Botswana, 1988), and yet the majority of respondents felt that the professional hunting companies and the DWNP were the major users of wildlife in their area (Fig. 3).

There has been a reduction in access to wildlife, which is not due to any decline in wildlife numbers (people see wildlife numbers as increasing), but rather a result of the licence quota system. The quota system for licences allows not only the residents of the area affected by wildlife, but all people in Botswana, to apply for a licence. The Remote Area Dwellers — the segment of society most reliant on wildlife — complained bitterly that they had no firearms to kill the wildlife. Their effective traditional methods of hunting are illegal, and the permissible methods are ineffective when other people use rifles to hunt in their area (Petje, 1988). Outlawing the most effective traditional methods of killing wildlife is

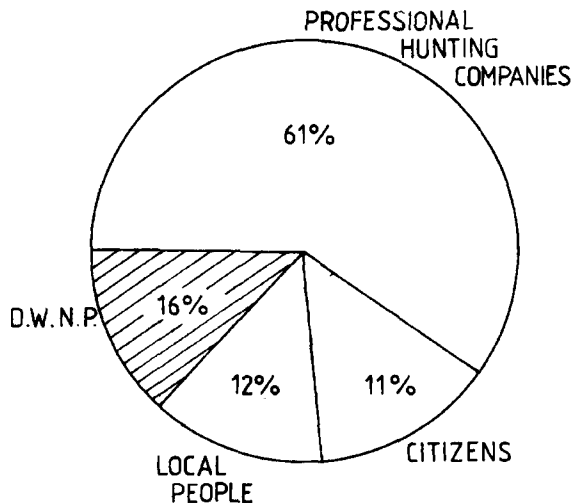


FIG. 3. Local community perceptions as to who uses most wildlife in their area. Results expressed as the percentage of people (n = 139).

equivalent to preventing legal access to wildlife resources.

The volume of wildlife meat acquired legally by each household with a Special Game Licence was 295 kg per annum. In households with normal game licences it was 253 kg per annum. The calculated consumption is therefore between 46 and 65 kg per adult per annum if all meat was consumed by the household.

The calculated *per caput* financial returns from the animals shot, including the value of meat, skins, and skulls, was P131, which is more than nine times as high as the returns that people felt they received from wildlife (P14). Buffalo contributed most to the value of the wildlife hunted (64% of potential returns), Zebra (*Equus burchelli*) made up 19%, and Kudu (*Tragelaphus strepsiceros*) made up 9%. The licences which respondents desired most were those for species which would provide a high financial return and which were abundant locally.

Less-educated and poorer people have a significantly higher use of wildlife meat than the more educated (Chi-square, P < 0.05, d.f. = 1) and less poor (Chi-square, P < 0.001, d.f. = 1). Households receiving Special Game Licences had on average P391 worth of livestock holdings, which is one-twentieth of that of people not receiving Special Game Licences.

Wildlife-related work provided the highest proportion of formal employment (48% in the private sector) (Fig. 4), while 25% of informal sector employment was also wildlife-related (Fig. 4 right). The return to the study areas from employment in wildlife-related fields was in excess of P0.6 million per year, and is a major contributor to household income.

The returns from employment were 20 times as great as those from personal hunting, yet respondents perceived products from hunting as a more important benefit from wildlife than employment and tourism.

ATTITUDES TOWARDS ANIMAL WILDLIFE

As indicated above, people undervalued the benefits from animal wildlife, their perceptions as to the benefits from wildlife being based mainly on utilitarian aspects

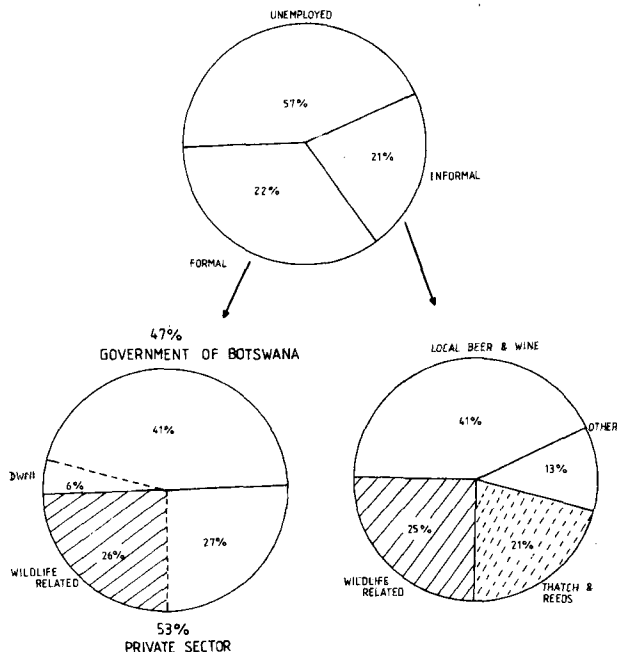


FIG. 4. Employment activities other than farming, of people over 15 years old, in the study areas (n = 1,763). Thatching grass and reed sales, as well as the brewing of local beer and wine, are included in the informal sector employment activities.

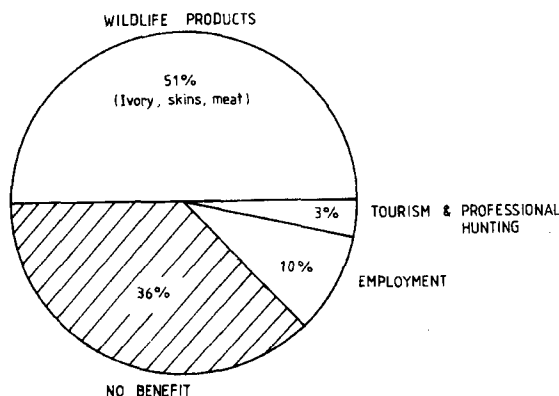


FIG. 5. Perceived benefits from wildlife in the Chobe Enclave and Mababe Depression (n answering = 184, n not answering = 47).

(Fig. 5), with 36% of respondents considering that there were no advantages to be gained from animal wildlife. The perceived disadvantages associated with animal wildlife related to personal danger (65%) and to losses in crops and livestock, with only 12% of respondents feeling that there were no disadvantages associated with animal wildlife (Fig. 6).

Wealth, Education, and Gender

Education has always been considered an initial step in improving people's attitudes to wildlife. Mordi (1987) found that education made people more conservation-conscious and less utilitarian in their attitudes towards wildlife, but in our present study education had no significant effect on attitude towards wildlife. We suggest that closer examination of surveys concerning attitudes to wildlife would show that the differences attributed to

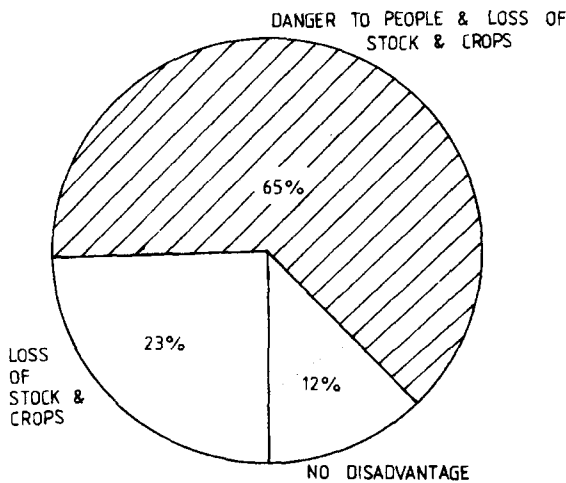


FIG. 6. The perceived disadvantages of wildlife in the Chobe Enclave and the Mababe Depression (*n* answering = 211, *n* not answering = 20).

education probably relate rather to differences in location (e.g. urban versus rural populations) and hence to differences in the direct effects of wildlife on people. There was no demonstrated difference in the attitudes of women and men to the benefits and disadvantages from animal wildlife.

By limiting this study to the rural areas, the variation between rich and poor is narrowed and both rich and poor live under the same general circumstances. The overall wealth-status of households had no significant effect on attitude to animal wildlife. This contradicts findings by Mordi (1987), who found increased aesthetic and scientific attitudes towards conservation from wealthier people. However, his sample included wealthy people from areas not affected by animal wildlife.

Cattle Ownership and Reliance on Wildlife

There were significant correlations between the numbers of cattle owned and the attitude to animal wildlife ($r = 0.269$, $P < 0.005$), and between the value of livestock owned and that attitude ($r = 0.2738$, $P < 0.05$). Respondents with fewer assets in livestock were more negative to wildlife than respondents with larger assets in livestock. In the present study, the households with fewer livestock were more dependent than others on wildlife owing to their lack of livestock and the help of a system of hunting permits which benefit these households. Similarly, households that were reliant on animal wildlife for their protein requirements were more negative towards such wildlife than those that were less reliant (Oneway ANOVA, $P < 0.001$, *d.f.* = 3).

The negative attitudes from households that were more reliant than others on animal wildlife at first seems a direct contradiction to the hypothesis that those who benefit most will be most positive in attitude. This contradiction comes about for the following reasons: those that rely on wildlife are the poorer and politically least powerful households, so their reliance on wildlife is reliance on something over which they have no control. These households realized that they were reliant on animal wildlife, as they expressed concern about potential reductions in hunting and fear of the dangers of hunting.

Wildlife Depredations and Land-use Conflicts

People experiencing crop- and stock-losses were, on average, more negative towards animal wildlife than people who did not experience such losses, although only crop-losses had a significant effect on attitudes (Oneway ANOVA, $P < 0.001$, *d.f.* = 1).

The relationship between agricultural losses due to animal wildlife and people's attitude is clear, with the villages which were least affected by wildlife depredations having the most positive attitude towards wildlife. People who were least effected by wildlife were significantly more positive than others towards wildlife (Oneway ANOVA, $P < 0.05$, *d.f.* = 4).

Livestock losses from animal wildlife are apt to be higher than returns from livestock sales and offtake, so understandably livestock and crop losses in the study areas are a genuine reason for complaint. Indeed stock-losses were the most commonly cited wildlife problem in a rural community in Natal (Infield, 1986).

Crop damage by animal wildlife affected the attitude towards it negatively. Similarly, Murindagoma (1988) found that crop damage and lack of compensation cause a generally negative attitude to animal wildlife in Zimbabwe. The most commonly-voiced solution to the problem of animal wildlife depredations in the study area was that the National Park should be moved further away from the people — even to a totally different part of Botswana.

In this study, respondents considered loss of land to animal wildlife interests as unjustifiable, due to the associated financial loss to the households involved. The people who considered loss of land to wildlife to be a financial problem, were more negative in their attitudes to wildlife than households which did not consider loss of land a problem.

Direct Benefits

There was a significant inverse relationship between households with members employed in wildlife-related jobs and the perception of how important wildlife was in the household economy, with only 25% of those employed in wildlife-related fields considering wildlife to be important to their household economies (Chi-square, $P < 0.05$, *d.f.* = 1). On the other hand, employment generated by wildlife was shown by Lewis et al. (1988) to influence positively public attitudes towards wildlife. Similarly, Infield (1986) identified employment as the most important contributor to improving attitudes towards animal wildlife. Employment affected people's attitudes, households with people employed in wildlife-related fields having a more positive attitude towards wildlife than those otherwise employed or unemployed (Oneway ANOVA, $P < 0.01$, *d.f.* = 1).

Although employment in connection with animal wildlife provided 88% of the returns from wildlife, it was perceived as a benefit by only 22% of the people questioned. Reasons why most respondents did not perceive such 'wildlife employment' as a significant benefit could be linked to (1) the loss of Special Game Licences when once employment is taken up, and (2) the view of hunting and tourist companies as being the direct beneficiaries from wildlife, with employees not relating

their employment to wildlife. The possibility that conservationists are misdirected when they emphasize the indirect utilitarian and economic aspects of conservation (Bell, 1987) may be important in this case, as the link between employment and animal wildlife is less direct than that of personal hunting.

The Mababe Depression people received a higher percentage of direct benefits per household from the hunting of wildlife than did the Chobe Enclave residents, yet it did not have a positive effect on their attitudes towards wildlife.

ATTITUDES TOWARDS THE DWNP

Spokesmen at 'kgotla' meetings said that their hunting in the past allowed for the selective reduction of problem animals such as Lions, Hyaenas, and Elephants, so that their depredations were formerly less. People complained that the wildlife depredations were getting worse, yet the control of problem animals provided by the Department of Wildlife and National Parks (DWNP) was not increasing to meet the demand. The increased problems were considered to be a result of increased animal wildlife populations in the Chobe National Park and the removal of Elephants from the hunting quota since 1983.

The efforts put into the control of problem animals by the DWNP did not relate to the amount of damage, but rather to: (1) the political power of a community, and (2) the DWNP perception of the land-use status of the area. For instance in the Mababe area, which received high crop losses (94% of respondents complained of crop damage due to wildlife), little problem-animal control activity was carried out; these communities are politically weak and within an area that has been zoned for wildlife developments.

Attendance at 'kgotla' meetings was poor, and people were apt to be hostile when conservation and animal wildlife issues were discussed. Respondents who had discussions with DWNP staff or other people concerning conservation, developed a more negative attitude towards wildlife than those respondents who had not had such discussions (Oneway ANOVA, $P < 0.001$, d.f. = 1). The negative relationship could be explained by the communities' perception of the ability of the DWNP to do its job, as a considerable proportion of the most affected respondents considered that the DWNP could not, or would not, do their jobs properly (Fig. 7). However, respondents living further from animal wildlife concentrations were significantly more positive towards the DWNP (48% said the DWNP does its job well, and 11% had no opinion) (Kruskal-Wallis, $P < 0.001$, d.f. = 4). A greater proportion of people who sustained losses to animal wildlife had poorer opinions than others of the DWNP's abilities to undertake its work (Chi-square, $P < 0.05$, d.f. = 1).

People who thought that the DWNP was doing its job well, said they did this by arresting people. This is similar to the findings of Lewis & Kaweche (1985) in Zambia, where rural communities envisage wildlife authorities primarily as a law-enforcement agency which serves the needs of the tourists and safari companies rather than the people.

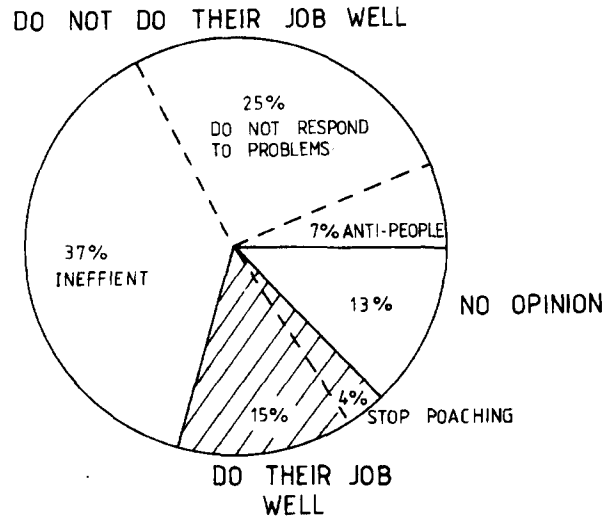


FIG. 7. Community perceptions of the Department of Wildlife and National Parks to undertake its tasks ($n = 230$).

DISCUSSION, CONCLUSIONS, AND POLICY IMPLICATIONS

The results of this research show that the people directly affected by animal wildlife had negative attitudes towards both the wildlife concerned and the wildlife authorities. Peoples' wealth and their standard of education had no effect on attitudes. Employment in wildlife-related industry, livestock ownership, and the absence of problems from animal wildlife, had a positive effect on peoples' attitudes. Negative attitudes were generated as a result of crop losses, reliance on wildlife, and discussions with conservation personnel.

It is generally considered that direct benefits from animal wildlife, such as hunting, improve peoples' attitude to wildlife (Western, 1982; Infield, 1986; Lewis *et al.*, 1988). Even though respondents felt that there were benefits to be gained from animal wildlife, this study has shown no relationship between direct benefits and improvement in attitudes towards wildlife. The reasons for this are: (1) people in the study area have always had the right to hunt, unlike the situation in Natal (Infield, 1986) and Zimbabwe (Martin, 1986); nor is it prohibitively expensive, as in Zambia (Lewis *et al.*, 1988); (2) people lose so much to animal wildlife that it is considered one's right to recoup some of the losses; (3) the group of people who rely most on wildlife are destitute, and possibly blame wildlife for their destitution; and (4) poverty, degree of political power, and luck, together play a major role in setting the often important question of whether a household obtains a hunting licence. Consequently, individuals have little control over access to wildlife resources.

Rural communities suffer chronic depredations from animal wildlife and are unable to overcome the problems involved. At the household level they experience financial loss: even within the study area, the people living further from wildlife and hence suffering less from wildlife-related problems, were more positive towards wildlife than those people living adjacent to wildlife concentrations. People do not see the national benefits: they are at the mercy of decisions made by authorities. Residents

of the study areas had lost control over their wildlife resources and had lost land to Nature conservation areas.

The wildlife authorities are considered an inefficient wildlife police-force. The negative attitudes towards the DWNP are probably due to the following:

(1) The local communities experienced a real loss to animal wildlife and therefore have genuine grievances. They also see no improvements in the situation. Until these legitimate grievances are addressed, discussions on the benefits of wildlife will only increase antagonism.

(2) Conservation education usually assumes that the misuse of wildlife is due to ignorance. Such an education programme is best described as a clash of ideologies — the urban against the rural, in which the 'modern' programme seeks to re-educate rural people into accepting an urban-dominated use of the resource (Able & Blaikie, 1986). There is little hope at present that communities in the study area would be receptive to conservation education.

For wildlife-related developments in the area to be successful there would have to be a radical change in the approach of the local people. Without such a change the current initiatives are bound to fail, as the people are not behind the developments. For success the following issues need to be addressed:

1. Control of problem animals needs to be made more effective than at present, and current compensation mechanisms need improvement. Alternatively, agricultural areas must be physically separated from wildlife, e.g. through the use of electrified fencing. The negative effects of wildlife have to be minimized if an improvement in local attitudes is to occur. People undertake informal cost-benefit analyses, and at the moment it would appear that the costs of wildlife through crop- and stock-losses far outweigh the benefits.
2. Communities that are reliant on animal wildlife must have control over their wildlife resources. The issue of control appears to be critical, as benefits alone are insufficient to generate positive attitudes. Community institutions should be involved in decision-making concerned with problems of animal control, setting hunting quotas, anti-poaching, the distribution of local hunting licences, local land-use planning, and the tourist industry use of local resources. This model of local control is currently being adopted in Zimbabwe (Martin, 1986), and has reached the point where some communities are establishing their own safari company.
3. It must be assured that people in the areas affected by animal wildlife will associate employment in the wildlife industry with benefits from wildlife. This is probably not easily achieved; it requires a careful promotional exercise by DWNP and the wildlife industry, and/or a scheme whereby employees are linked directly to profits.
4. Openings for 'small enterprises' in the wildlife industry must be developed. An example is the boat (wood 'dug-out') industry in the Okavango Delta, in which local people act as guides and hire their dug-outs to tourists.
5. The hunting quotas must be manipulated to produce positive attitudes towards wildlife from local resi-

dents. For instance, revenue from species that produce problems for local people should be increased in the areas where those people live.

6. The image of the DWNP needs to be improved. This should partly come about through their more efficient control of problem animals. If people had more control over the resource, and DWNP saw the people as 'equal partners' in the wildlife industry, there would surely be an improvement in attitude. In addition, the public relations activities of DWNP need strengthening.

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SUMMARY

Rural communities in northern Botswana had negative attitudes towards animal wildlife even though they received benefits from it. The negative attitude was caused by wildlife damage to crops, losses of livestock to predators, loss of land to conservation, and lack of control over animal wildlife resources. The benefits derived from animal wildlife, such as the possibility of hunting, meat, cash income from animal products, and employment in the wildlife industry, were not highly valued, even though these benefits are of considerable importance to the local community (e.g. much of the local employment is wildlife-related).

Respondents who had fewer livestock and were more dependent on wildlife for protein, were more negative than others in their attitudes to animal wildlife. The beneficiaries of the wildlife industry were largely perceived as being the hunting and tourist companies. Respondents who were more affected by animal wildlife, those living closer to higher population-densities, and those having more crop losses, were more negative than others in their attitude to wildlife. The communities were distrustful of government motives and had a poor opinion of the Department of Wildlife and National Parks (DWNP).

It is suggested that the present wildlife development programmes in this region of Botswana are likely to fail unless a change in approach is adopted by the local populace. Essential to our mind for the success of these programmes is the reduction of the negative impacts of animal wildlife, through, for example, fencing of agricultural land, improved control of problem animals, and adequate compensation schemes. It is also essential that local communities be given more control over the wildlife resources than they currently enjoy.

REFERENCES

- ABLE, N.O.J. & BLAIKIE, P.M. (1986). Elephants, people, parks, and development: The case of the Luangwa valley. *Environmental Management*, **10**(6), pp. 735–51.
- BELL, R.H.V. (1987). Conservation with a human face: Conflict and reconciliation in African land-use planning. Pp. 50–75 in *Conservation in Africa: People, Policies and Practice* (Eds D. ANDERSON & R. GROVE). Cambridge University Press, Cambridge, England, UK: viii + 346 pp., illustr.
- BGI Tanning Company (1988). *Buying Prices for Skins and Trophies*. Francistown, Botswana: 3 pp. (typescr.).
- CHILD, G. (1968). *An Ecological Survey of North-eastern Botswana*. Report to the Government of Botswana, United Nations Development Programme: 67 pp., illustr. (typescr.), obtainable from Department of Wildlife & National Parks, PO Box 131, Gaborone, Botswana.
- CIMMYT (1977). *Demonstrations of an Interdisciplinary Approach to Planning Adaptive Agricultural Research Programmes*. Research Report No 1, East African Economics Programme, Nairobi, Kenya: 35 pp. (typescr.).
- CUMMING, D.H.M. & TAYLOR, R.D. (1989). *Identification of Wildlife Utilisation Projects for the Department of Wildlife and National Parks, Government of Botswana*. Department of Wildlife and National Parks, Government of Botswana, Gaborone, Botswana: 73 pp., illustr. (typescr.).
- FGU-KRONBERG CONSULTING ENGINEERS [cited as FGU] (1988). *Review of Wildlife Utilization in Botswana and Proposals for the Development of Projects and Programmes in This Field*. Ministry of Commerce and Industry, Gaborone, Botswana: 154 pp., illustr. (typescr.).
- GOVERNMENT OF BOTSWANA (1988). Open-season hunting and live capture quotas. *Government Gazette* (Gaborone), **26**(17), pp. 15–23.
- INFIELD, M.M. (1986). *Improving Local Support for African Conservation Areas*. Institute of Natural Resources, Pietermaritzburg, South Africa: Monograph **8**, 27 pp. (typescr.).
- INGER, D. (1985). Constraints to popular participation in rural development. Pp. 31–9 in *The Theory and Practice of People's Participation in Rural Development* (Eds B.D. TSIANE & F. YOUNGMAN). Proceedings of the RECC Workshop, Kanye, Botswana: v + 65 pp. (typescr.).
- KEENAN, J. (1984). *The Pilanesburg Game Reserve: Report on the Socio-economic Effects of the Pilanesburg Game Reserve on the Surrounding Population, and the Attitudes of the Surrounding Population to the Game Reserve*. Pilanesburg Game Reserve, Mafeking, South Africa: 78 pp. (typescr.).
- LEWIS, D.M. (undated). *Survey of Perceptions Towards Wildlife for Two Village Communities with Different Exposure to a Wildlife Conservation Project*. Lupande Development Project, Nyamulum, Zambia: 44 pp. (typescr.).
- LEWIS, D.M. & KAWECHE, G.B. (1985). The Luangwa Valley of Zambia: Preserving its future by integrated management. *Ambio*, **14**, pp. 362–5.
- LEWIS, D.M., KAWECHE, G.B. & MWENYA, A.N. (1988). *Wildlife Conservation Outside Protected Areas — Lessons from an Experiment in Zambia*. 58 pp. (typescr.), available from Dr D.M. Lewis, Admade Project, National Parks of Zambia, Lusaka, Zambia.
- LITTLE, P.D. & BROKENSHA, D.W. (1987). Local institutions, tenure and resource management in East Africa. Pp. 193–209 in *Conservation in Africa: People, Policies and Practice* (Eds D. ANDERSON, & D. GROVE). Cambridge University Press, Cambridge, England, UK: viii + 346 pp., illustr.
- MARKS, S.A. (1973). Prey selection and annual harvest of game in a rural Zambian community. *East African Wildlife Journal*, **11**, pp. 113–28.
- MARTIN, R.B. (1986). *Communal Areas Management Programme for Indigenous Resources (CAMPFIRE)*. Department of National Parks and Wildlife Management, Harare, Zimbabwe: 69 pp. (typescr.).
- MARTIN, R.B. (1987). *Indigenous Multi-species Systems on Southern African Rangelands*. Presented at SADCC Rangeland Conference, Bulawayo, Zimbabwe: 47 pp. (typescr.).
- MCCRACKEN, J. (1987). Introduction. Pp. 1–3 in *Conservation in Africa: People, Policies and Practice* (Eds D. ANDERSON & R. GROVE). Cambridge University Press, Cambridge, England, UK: viii + 346 pp., illustr.
- MORDI, R. (1987). *Public Attitudes Toward Wildlife in Botswana*. PhD thesis, Yale University, New Haven, Connecticut, USA: xiv + 344 pp., illustr.
- MOTSHWARI GAME (PTY) LIMITED (1981). *Feasibility Study on the Utilization of Wildlife Resources: Final Report*. Government of the Republic of Zambia, Lusaka, Zambia: 129 pp. (typescr.).
- MURINDAGOMA, F. (1988). *Preliminary Investigations Into Wildlife Utilization and Land-use in Angwa, Mid-Zambezi Valley, Zimbabwe*. MPhil thesis, University of Zimbabwe, Harare, Zimbabwe: xii + 259 pp., illustr.
- PETJE, C.M.J. (1988). Remote area dwellers. Pp. 1–7 in *Sustainable Wildlife Utilization, the Role of Wildlife Management Areas* (Ed. P. HANCOCK). Kalahari Conservation Society, Gaborone, Botswana: 45 pp., illustr. (typescr.).
- POLET, G. (1989). The Chobe Enclave. MSc thesis, University of Utrecht, The Netherlands: 81 pp., illustr. (typescr.).
- RAINTREE, J.B. & YOUNG, A. (1983). *Guidelines for Agroforestry Diagnosis and Design: An Introduction to the ICRAF Methodology*. Diagnostic and Design Methodology Manual Series, No 1. International Council for Research in Agroforestry (ICRAF), Nairobi, Kenya: v + 62 pp., illustr.
- TLOU, T. (1976). The peopling of the Okavango Delta 1750–1906. Pp. 49–53 in *Symposium on the Okavango Delta*. Botswana Society, Gaborone, Botswana: vii + 278 pp., illustr.
- WESTERN, D. (1982). Amboseli National Park: Enlisting landowners to conserve migratory wildlife. *Ambio*, **11**(5), pp. 302–8.